



City of Naples

**Spring Lake Restoration Assessment Report -
2019**

Prepared for:

City of Naples

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Appendix 1. Spring Lake Basin Runoff Volume Contribution
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List of acronyms

Amec	Amec Environment & Infrastructure, Inc.
BMP	Best Management Practices
CIB	curb inlet baskets
Cu	copper
FDEP	Florida Department of Environmental Protection
FGCU	Florida Gulf Coast University
GIS	Geographic Information System
MSBU	Municipal Service Benefit Unit
NSBB	nutrient separating baffle box
SCTL	soil clean-up target levels
SFWMD	South Florida Water Management District
STEPL	Spreadsheet Tool for the Estimation of Pollutant Load
TN	total nitrogen
TP	total phosphorous
TSS	total suspended solids
USEPA	US Environmental Protection Agency
Wood	Wood Environment & Infrastructure Solutions, Inc.



Executive summary

Wood Environment & Infrastructure Solutions, Inc. (Wood) understands the importance of stormwater lakes for effective management of pollutant loads within the City. Years of high pollutant loadings have decreased the treatment capacity of some of the City's stormwater lakes. The City implemented the Stormwater Lakes Management Plan in 2012 with the assistance of data and analysis from Wood (formerly Amec Foster Wheeler Environment & Infrastructure, Inc.) that quantitatively described the health and pollutant removal efficiency of each lake, including Spring Lake (Lake 11) and East Lake (Lake 31), and identified those areas that would be most effectively remediated by future capital improvement projects.

The function of stormwater Lake 11, more commonly known as Spring Lake, is to store and direct stormwater to Naples Bay to mitigate flooding, reduce peak flows during rainfall events, and reduce loadings of pollutants to waters of the State. Furthermore, the citizens of the city of Naples, particularly the residents adjacent to Lake 11, value the amenities provided by Lake 11 and other City lakes. They desire an attractive lake front, without nuisance algal blooms or other objectionable conditions that may result from temporary water quality variations that are inherent to stormwater ponds and lakes. Wood understands these components and will provide adequate evaluation during the restoration assessment to provide the City with a detailed plan for achieving restoration and improved functionality of Lake 11.



1.0 Background

Stormwater Lake 11 (Spring Lake) discharges directly to the smaller stormwater Lake 31 (East Lake). Most of the stormwater flowing into Lake 31 comes from the outfall of Lake 11. Thus Lake 31's outfall quality is similar to that of Lake 11, and the City's current water monitoring program (Cardno, 2015-2018) reflects that by monitoring only the outfall of Lake 31. These data reflect the integrated performance of Lakes 11 and 31. In the past both Lakes 11 and 31 have been monitored (e.g., Amec, 2013). These lakes reduce loadings of Total Suspended Solids (TSS), Total Phosphorus (TP), Total Nitrogen (TN), copper (Cu), and fecal coliforms to Naples Bay. Nonetheless these were identified as lakes whose pollutant treatment effectiveness is less than optimal (Amec, 2013). Specifically, Lake 31 produces the highest loading of TN, TP, and fecal coliform of any of the City's stormwater lakes that discharge to Naples Bay, while both lakes discharge relatively high loadings of Cu, compared with other City stormwater lakes (Amec, 2013). The ultimate receiving water body for these lakes is Naples Bay, and Wood Environment & Infrastructure Solutions, Inc. (Wood) has evaluated pollutants in Lake 11 and Lake 31, including the effects associated with loading from Lake 11 to Lake 31.

1.1 Objectives

In order to restore Lake 11, Wood has evaluated traditional methods for removal of muck sediments, such as mechanical dredging and hydraulic dredging, as well as consider methods for continued maintenance with increased aeration and floating vegetation islands. The removal of muck sediments would

- Reduce the re-release of nutrients (i.e., reduce internal loading) to the water column and improve the efficiency of treatment of nutrient-rich stormwater inputs.
- Reduce the potential for dissolved oxygen depletion that can produce objectionable odors and potential fish kills.
- Increase the depth and storage capacity of the lake to improve its flood mitigation effectiveness
- Increase the residence time of water in the lake which should improve effectiveness of Lake 11 in removing stormwater pollutants including TSS, TN, and TP, and improve water quality in discharges to Lake 31 and ultimately to Naples Bay.

The removal methodology will be dependent on the thickness, consistency, and characteristics of the muck material. Mechanical dredging requires heavy equipment and would not be efficient in removing fine organic sediment. Mechanical dredging also requires a large footprint for dewatering since the material needs ample time to dry for hauling to a disposal area. Hydraulic dredging is a relatively low impact method of sediment removal with few effects on the surrounding environmental system.

Other design elements for Lake 11 and the watershed to reduce downstream loadings of pollutants of concern and improve water quality within Lake 11 have been reviewed for implementation. These could include littoral shelves, enclosed sediment sumps or catch basins at stormwater inflows to remove trash and debris prior to entering the infrastructure system, rain gardens in open spaces within the basin (either in public right of ways or in homeowner areas), baffles projecting from the Lake bank into the Lake to increase retention time, and increased street sweeping.

Public involvement, including surrounding Old Naples residents, is important to the implementation and success of the Lake 11 improvements. One of the biggest challenges for this project will be coordination

with the public and designing an efficient dewatering system that can minimize disturbance to the surrounding community. Public involvement would need to include an outreach program involving agency coordination and outreach to the media, businesses, community groups, and the general public using appropriate methods and tools to solicit input and provide details on the project. The outreach program would also include mailers (flyers) directed at elected officials, agencies, property owners and tenants to announce public information meetings and provide information about the project.

Finally, Wood has evaluated local, state, and federal grant opportunities for Lake 11, including the creation and use of a Municipal Service Benefit Unit (MSBU) for the surrounding properties to provide on-going maintenance for the Lake. However, there are multiple funding mechanisms that could be utilized for a project of this scope, and Wood will determine the most applicable during the evaluation.

1.2 Existing Data Review Summary

Wood reviewed the following reports for data and information related to Lake 11 and the surrounding watershed:

- City of Naples Stormwater Quality Analysis, Pollutant Loading and Removal Efficiencies, January 2012 (Amec, 2012)
- City of Naples Stormwater Lakes Maintenance & Restoration Plan, March 2012 (City of Naples, 2012)
- Florida Gulf Coast University (FGCU), Bathymetry and Sediment Characterization of Spring Lake, February 2013 (FGCU, 2013)
- City of Naples Semi-Annual and Quarterly Stormwater Infrastructure Monitoring Final Report, January 2013, (Amec, 2013)
- City of Naples Semi-Annual and Quarterly Stormwater Infrastructure Monitoring Final Report, March 2014 (Amec, 2014)
- Cardno Quarterly Stormwater Sampling Results, 2015 – 2018 (Cardno)
- Existing South Florida Water Management District (SFWMD) Permits
- Geographic Information System (GIS) and Stormwater Spatial Data

Each report was reviewed with a focus on water quality data, specifically for TSS, TP, TN, bacteria, and Cu. The review included both Lake 11 and Lake 31 because the two water bodies are connected, and nearly all stormwater flowing through Lake 31 flows directly from Lake 11. Data for samples from within Lake 11 and Lake 31 were loaded into a database for water quality trend analyses summarized below. In addition, supporting qualitative data is summarized below.

1.2.1 Prior Studies of Stormwater Treatment and Sediment Quality

Amec (2012) rated City stormwater ponds for their efficacy and function. The ratings are on a relative scale of 1 to 100 where 100 is the City lake that is least effective in treating stormwater for TSS, TN, TP, Cu, and bacteria. Lake 11 and Lake 31 were relatively poor performing stormwater treatment ponds; Lake 11 had a final score of approximately 48 and Lake 31 had a final score of approximately 89. These ratings were updated in the Amec (2013) stormwater infrastructure monitoring report. For Lake 11 the final score was approximately 54 and for Lake 31 the final score was approximately 100. The City used this information in developing its Stormwater Lakes Maintenance & Restoration Plan (City of Naples, 2012).

Amec (2013) also included pollutant specific rankings for nutrients (TN/TP), Cu, and fecal coliform. These rankings included only the 5 lakes that would benefit most from Best Management Practices (BMP) implementation; Lake 11 ranked 4th for Cu and Lake 31 ranked 1st for nutrients and 1st for fecal coliform. As stated in Amec (2013), the rankings are intended to be used as a preliminary assessment of potential future stormwater treatment improvement projects efforts. Although these rankings were not updated in the following City of Naples 2014 stormwater monitoring report (Amec, 2014), data reviewed indicated that “water quality has remained relatively steady in Spring Lake (Lake 11) since 2008.” Water quality trends are explored further in the “Water Quality” section below.

FGCU (2013) conducted a bathymetric survey of Lake 11, providing valuable information about the physical characteristics of the lake; the report also includes data on sediment and water quality. The bathymetric survey revealed steep banks around the pond, with a more prominent in-lake shelf along the northern perimeter (FGCU, 2013). Sediment accumulated in the deeper areas of the pond, however the northern shelf was covered by material with high organic and nutrient content (FGCU, 2013). The pond was eutrophic (for nitrogen) and sediment samples from 2008 contained concentrations of arsenic, Cu, lead, total residual petroleum hydrocarbons, and benzo-a-pyrene that exceeded default soil clean-up target levels (SCTLs) (FGCU, 2013).

1.2.2 SFWMD Permits

SFWMD Permit No. 11-01705-P was issued on November 19, 2010 for the Phase 2 Stormwater Improvements. The work permitted in Phase 2 included improvements of stormwater conveyances along roads and construction of three dry detention areas (not connected to Lakes 11 or 31).

1.2.3 GIS and Stormwater Spatial Data

Wood also reviewed the spatial data in ArcGIS, including stormwater infrastructure locations provided by the City of Naples. The infrastructure dataset included the locations of inlets, outfalls, detention areas, conveyances and other structures within the Lake 11 watershed and structures upstream and downstream of the Lake 11 watershed. Additionally, Wood reviewed the topography (LiDAR elevations) and has determined that there is sufficient coverage of the watershed.

1.2.4 Water Quality

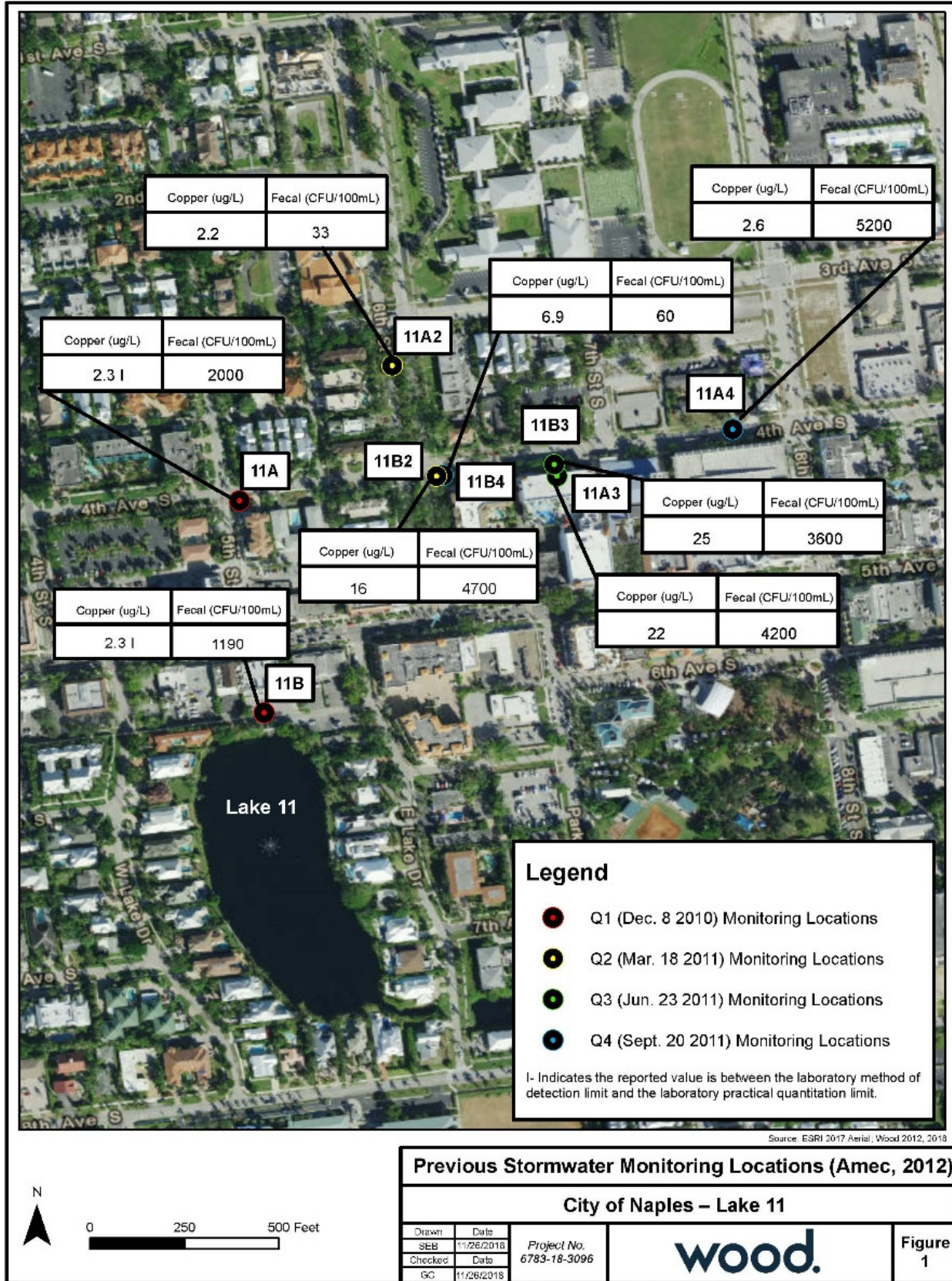
TSS, TP, TN, fecal coliform and enterococcus (bacteria), and Cu data for Lakes 11 and 31 from the above referenced reports were loaded into a database. These data included samples collected by Wood (under previous company names of MACTEC, Amec and Amec Foster Wheeler) from 2008 to 2013 and data collected by Cardno from 2015 to 2018. The data collected by Wood was previously summarized in the City of Naples (2014) monitoring report, which concluded that water quality trends were relatively stable from 2008 to 2013. Wood compared the stable dataset from 2008-2013 and the recent 2015-2016 dataset and concluded that the recent data is consistent with the Wood dataset and that water quality has been relatively steady over the 8-year Lake 11 monitoring period.

Quarterly stormwater samples were collected from conveyances within the Lake 11 catchment as part of the Amec (2012) monitoring program and can be used to determine portions of the watershed that produce high pollutant loading. These “roaming” samples were collected at different locations in each quarter. In the first quarter, Lake 11 sub-basin conveyances (sample locations 11A and 11B) as shown in Figure 1 exceeded the fecal coliform standard of 800 CFU/100 mL and Cu concentrations at or nearby

these locations exceeded the Cu standard of 3.7 micrograms per liter. During the second quarter, samples 11A2 and 11B2 were collected further upstream. Increased fecal coliform and Cu concentrations in the 11B2 samples indicate potential loading from the conveyance on the SE corner of 6th St S and 4th Ave N, compared to lower concentrations in 11A2, indicating minimal bacterial and Cu loading from the areas north of the intersection of 6th St. S and 4th Ave N. In the third quarter, both roaming samples (11A3, 11B3) were collected from upstream of 11B2 and produced high concentrations of fecal coliform and Cu, similar to the concentrations observed at 11B2. Cu concentrations were lower in the fourth quarter samples (11A4 and 11B4, also located upstream of Lake 11) while fecal coliform concentrations were similar to the concentrations observed in the second and third quarters. These data could be used to identify areas where runoff to Lake 11 could be treated, if feasible.

1.2.5 Conclusions of Data Review

After assessing available data from Lake 11 and Lake 31, Wood has determined that the current water and sediment quality dataset is sufficient for the engineering evaluation task (Task 2) and additional sampling is not needed from within the stormwater ponds. However, additional survey data for the stormwater infrastructure such as inverts, sizes, and material consistency will be needed to update the models for the Lake subbasin. Additional stormwater sampling could also pinpoint the source for the upstream contamination observed in the 2011 monitoring (Amec, 2012) and determine if recent City of Naples sewer system improvements have improved stormwater quality in conveyances leading to Lake 11. Wood recommends collection of additional stormwater samples at a subset of the previously sampled locations from Amec (2012) and shown in Figure 1. Locations to be monitored will be selected based on prior contaminant concentrations with consultation from the City.



2.0 Engineering Evaluation

Wood delineated the Lake 11 and Lake 31 watersheds using a combination of data:

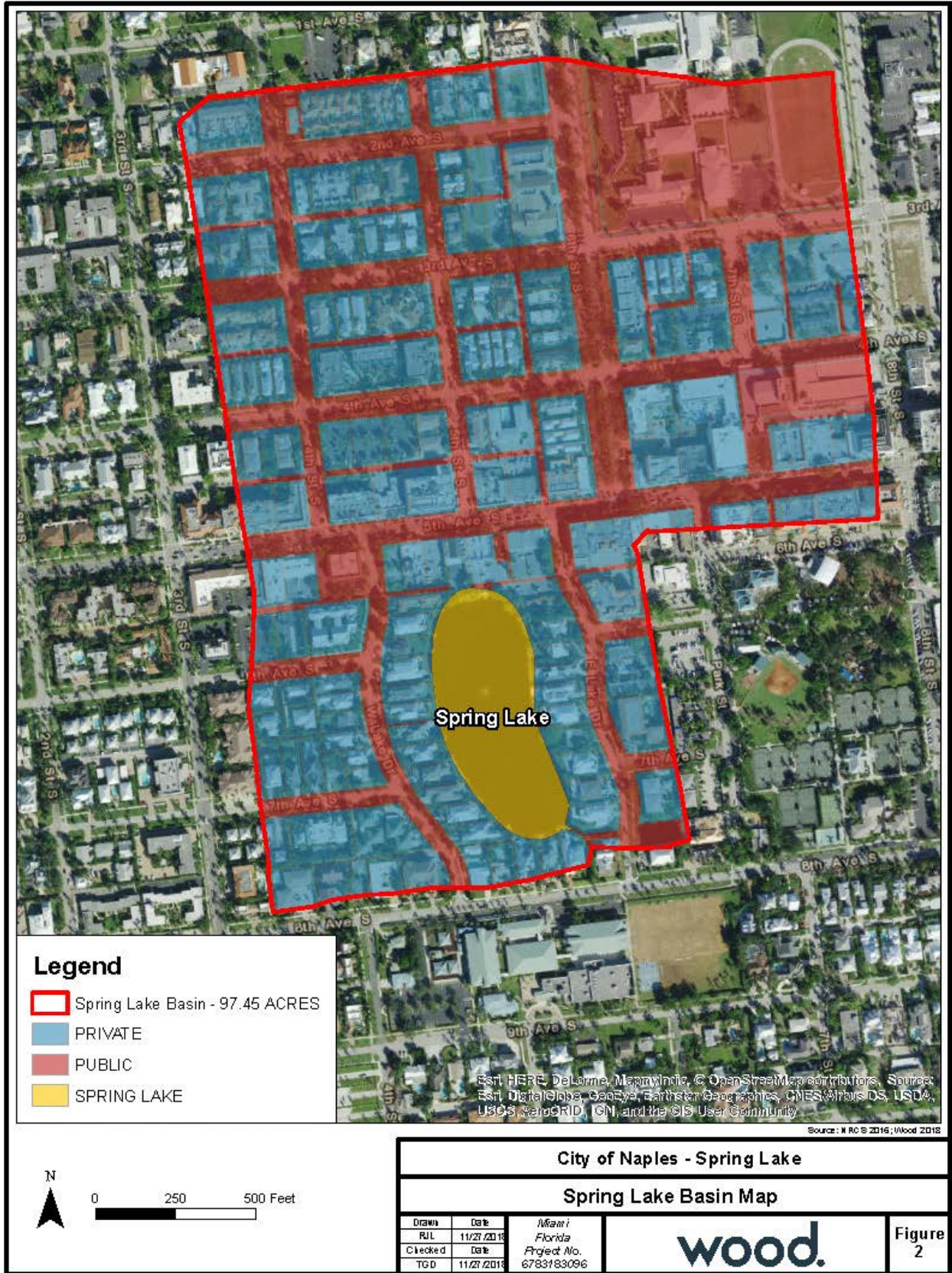
- Stormwater infrastructure database provided by the City. This database included locations of inlets, outfalls, detention areas, conveyances and other structures within the Lake 11 watershed and structures upstream and downstream of the Lake 11 watershed.
- LiDAR data
- City of Naples Stormwater Quality Analysis, Pollutant Loading and Removal Efficiencies, January 2012 (Amec, 2012)
- Aerial interpretation

Upon completion of the initial delineation, a field visit was held on November 8, 2018 to ground truth the basin delineation. This resulted in identification of additional sample points to determine water quality at various points within the watershed, along with identification of additional survey that is required. However, the basin delineation was largely verified during the field visit as shown in Figure 2.

2.1 Resource Inventory

Wood evaluated the soils, stormwater runoff, and land use within the Lake watershed to understand the associated water quantity for the contributions to the Lake. Per the SOW modification, an engineering analysis was performed to determine inflows into Spring Lake from stormwater runoff throughout the basin. The analysis determined the total runoff from various land uses within the basin by using the rational equation ($q=ciA$), as depicted in the Appendices A. The calculation allows for variation in land cover, impervious/DCIA, and pervious areas based on land use and soil types within the basin.

All soil types within the basin fell within the urban soil type. For consistency with the Stormwater Master Plan, a hydrologic soil group of C was assumed for these soils, as it is common that these soils have some improved drainage properties within the developed areas. Rainfall intensity, i , was calculated at 2.85 in/hr based on the City's Comprehensive Plan (2013) Policy 1-11. Each pairing of land use and soil type was broken down by acreage, A , contributing to the lake. The entire Spring Lake basin acreage was accounted for in the analysis. In addition, a union was created in GIS to pair the land ownership (whether is it publicly or privately owned) with the land use and soils. The result of this analysis provided flow weighted averages (cfs) from separate ownership areas (public vs private) within the basin. These will be used in the future funding analysis to see which areas are contributing more flow than other areas within the basin. The summarized result of this analysis is provided in Table 1 and Appendix A.



Path: C:\Users\greg.corning\OneDrive\City of Naples\Lake 1117\Task 2 - Engineering\Basis\Basis\Figure 2 Spring Lake Basin Map.mxd greg.corning Date Saved: 11/29/2018 2:34:54 PM



Table 1. Summary of Spring Lake Basin Runoff Volume Contribution

Parcel Description	Public vs. Private	Parcel ID (Count)	Volume Contribution Q=CIA(cfs)	Volume Contribution (percentage)
Churches	Private	4	3.56	2.14
Clubs, lodges, union halls	Private	1	0.11	0.07
Condominiums	Private	776	38.34	23.04
Financial institutions	Private	2	2.36	1.42
Hotels, motels	Private	2	2.74	1.65
Miscellaneous residential	Private	1	0.93	0.56
Mixed use - store and office or store and residential combination	Private	9	4.62	2.78
Multi-family - fewer than 10 units	Private	7	3.04	1.83
Municipal, other than parks, recreational areas, colleges, hospitals	Public	5	4.11	2.47
Office buildings, non-professional service buildings, multi-story	Private	6	4.70	2.83
Office buildings, non-professional service buildings, one story	Private	1	0.17	0.10
Orphanages, other non-profit or charitable services	Private	1	0.92	0.55
Parking lots, mobile home parks	Private	11	5.80	3.49
Public county schools - including all property of board of public instruction	Public	1	13.86	8.33
Single family	Private	67	21.75	13.07
Stores, one story	Private	11	5.10	3.06
Vacant commercial	Private	1	1.08	0.65
Vacant institutional, with or without extra features	Private	1	0.28	0.17
Vacant residential	Private	8	2.85	1.71
Right of way	Public	6	50.07	30.09
Total	-	921	166.39	100.00



3.0 Water Quality Evaluation

Water quality assessment work by the City and MACTEC (2012) identified Spring and East Lakes as lakes with relatively poor water quality and suboptimal stormwater treatment effectiveness. These findings led to further investigations in stormwater quality in the conveyances to Spring Lake, referred to as roaming samples. The roaming sampling program was reported by Amec (2013), and indicated the highest loads are contributed to Spring Lake from conveyances along 4th Avenue South (flowing west). Additional treatment of stormwater to or in that conveyance could be relatively effective. On the other hand this area is densely developed, limiting the treatment options available. The primary contaminants of concern in Spring Lake are TSS, TP, TN, Cu, and fecal coliform.

3.1 Sediment Characterization

3.1.1 Sample Evaluation

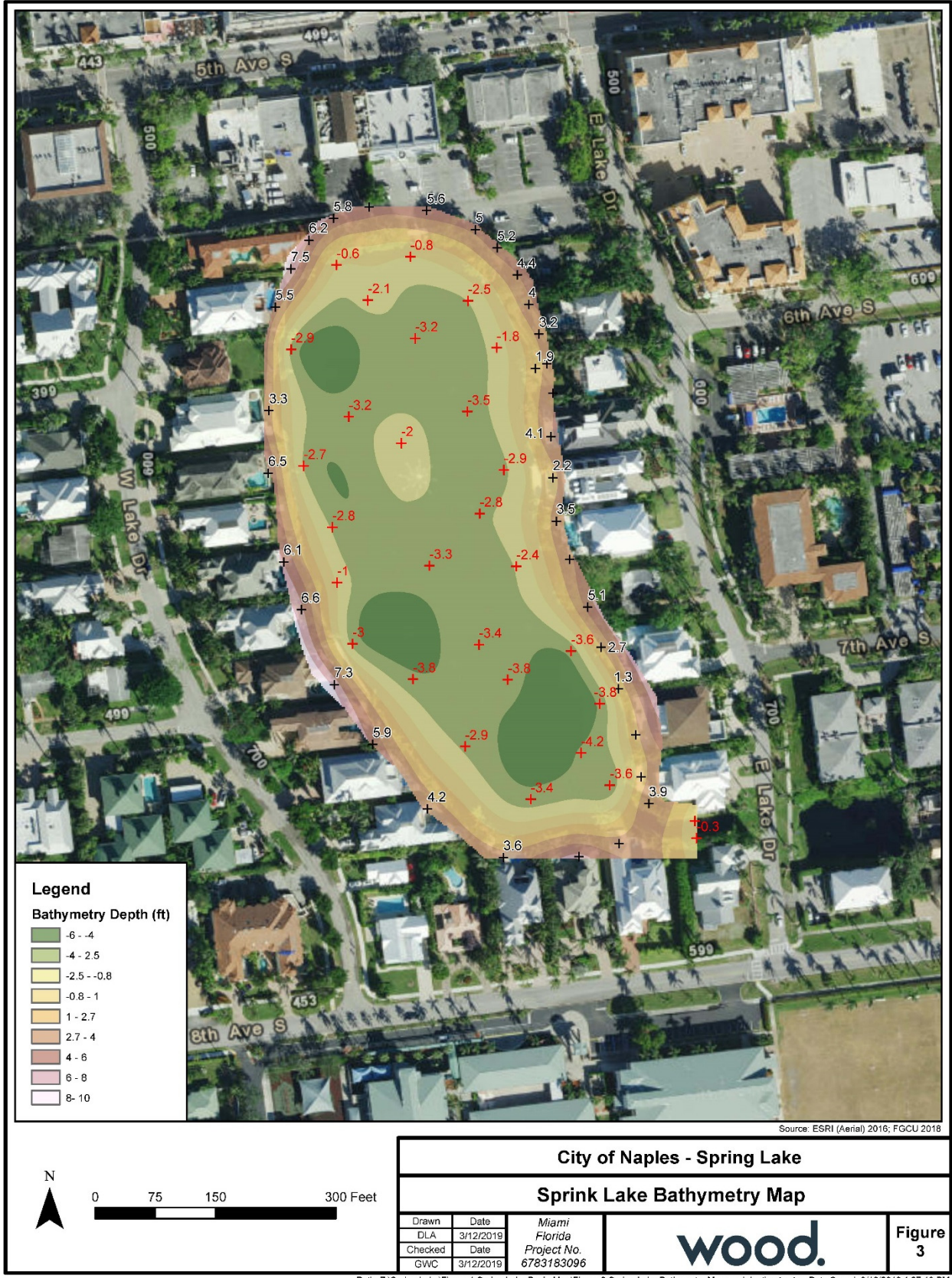
Wood evaluated Spring Lake sediment using previous studies by FGCU (2013) and Wood (MACTEC, 2008). FGCU researchers produced bathymetric maps, assessed pond nutrients and trophic status, estimated pond volume and sediment and floc thickness and volume, and analyzed sediment metal concentrations. The 2008 study conducted by Wood (fka MACTEC) was smaller in scope and included water and sediment quality sampling (MACTEC, 2008).

According to FGCU, the average unconsolidated sediment volume was 6,968 cubic yards and average sediment thickness of 10.5 inches over the lake bed. Overall, sediment has accumulated in the deeper areas of the lake and the thickest sediment layer (27.2 inches) was found in the southern portion of the lake.

The FGCU study found that floc had higher organic content than sediment. Sediment nutrient concentrations corroborate water quality data and indicate that the lake is nitrogen limited. FGCU stated that Spring Lake appears to be hypereutrophic. FGCU also analyzed 15 sediment samples for metals (Ag, Al, As, Ba, Cd, Cr, Cu, Hg, Ni, Pb, Se, and Zn) and Wood analyzed three sediment samples for metals (As, Cd, Cr, Cu, Hg, Pb), polycyclic aromatic hydrocarbons (PAHs), and total recoverable petroleum hydrocarbons (TRPH). In the combined dataset (FGCU+MACTEC), metals and organic contaminants exceeded SCTLs. Arsenic and Cu exceeded SCTLs in nearly all samples collected by FGCU and aluminium and lead exceeded SCTLs in one and two samples, respectively. TRPH and benzo-a-pyrene exceeded SCTLs in 2008 (MACTEC, 2008).

3.1.2 Disposal Options

Beneficial reuse is the preferred disposal method of sediment dredged from Spring Lake. In a 2004 technical memo [Florida Department of Environmental Protection (FDEP), 2005], the FDEP provided guidance for beneficial use of stormwater system sediments that receive runoff from non-industrial areas. These sediments must be dewatered, but then may be used in several applications, including initial cover at landfills or in road construction or road maintenance. If the dredged material has low concentrations of benzo-a-pyrene, it may be used as construction or industrial fill or as a soil amendment in nonresidential areas. Additional uses may be approved by the FDEP provided contaminant concentration testing and calculations (95% upper confidence level for demonstrating compliance) demonstrate that the material will not pose a significant threat to environment or public health. If not approved for beneficial reuse, the dredged material will be disposed of in a Class I landfill.



4.0 Water Quality Improvement Technologies

BMPs that could improve water quality within Spring Lake include dredging, bio-augmented aeration, floating islands, littoral shelf modifications, and littoral shelf plantings. There are also several in-line stormwater system improvements that can treat these contaminants upstream of entering the lake, including exfiltration trenches, curb inlet baskets, and rain gardens and/or vegetated swales at key locations within the basin.

Several BMPs and treatment approaches, including floating islands, aerators, rain gardens, native planting, are specifically mentioned in the City's 2010 20-year plan for the restoration of Naples Bay (see AECOM 2018). Specifically, the plan proposed installation of floating islands and aerators at 10 sites, and, as of 2018, floating islands have been installed in 7 stormwater lakes in the City (AECOM, 2018). Therefore, use of floating islands and aerators, if appropriate, could help fulfil the City's Naples Bay restoration plan. These technologies, and additional BMPs that could potentially improve water quality in the Lake and ultimately Naples Bay, are described below.

4.1 Dredging



There are two traditional methodologies for removal of muck sediments, mechanical and hydraulic dredging. Based on the above results for thickness and consistency, it is recommended to utilize a hydraulic dredging system as a mechanical dredging requires heavy equipment and would not be efficient in removing fine organic sediment. Mechanical dredging also requires a large footprint for dewatering since the material needs ample time to dry for hauling to a disposal area. Hydraulic dredging is a relatively low impact method of sediment removal with few effects on the surrounding environmental system. Hydraulic dredging includes a floating dredge, which essentially acts as a floating vacuum cleaner, and a temporary pipeline to transport the dredged material as a slurry to the dewatering site. The volume of the sediment slurry is greater than the in-situ volume of the sediment. The volume of dredge material can be better controlled with a hydraulic dredge than with mechanical dredging techniques. There are various

types of hydraulic dredges available for sediment removal, such as the swing ladder, cutterhead, horizontal auger, plain suction, pneumatic, specialty dredge heads and diver-assisted dredge heads.

Based on past project experience, dredging has shown positive results in the improvement of water quality with Lakes, including City of Naples Lake Manor. That being said, the technology is expensive and requires a large vacant footprint to dewater and dispose of the dredged material. The sediment data gathered for the Lake showed an average thickness of 10.5 inches resulting in an estimated dredge volume of 6,968 cubic yards. The organic muck would be removed via hydraulic vacuum dredge and dewatered using either a mechanical or passive or combination system. The mechanical dewatering system would entail a system of shakers to remove the trash and solids from the slurry and then the material would be passed through a series of belt presses to compress and dry the material prior to being disposed of in a roll off container, finally the effluent would be passed through a clarifier tank and then discharged back into the Lake.

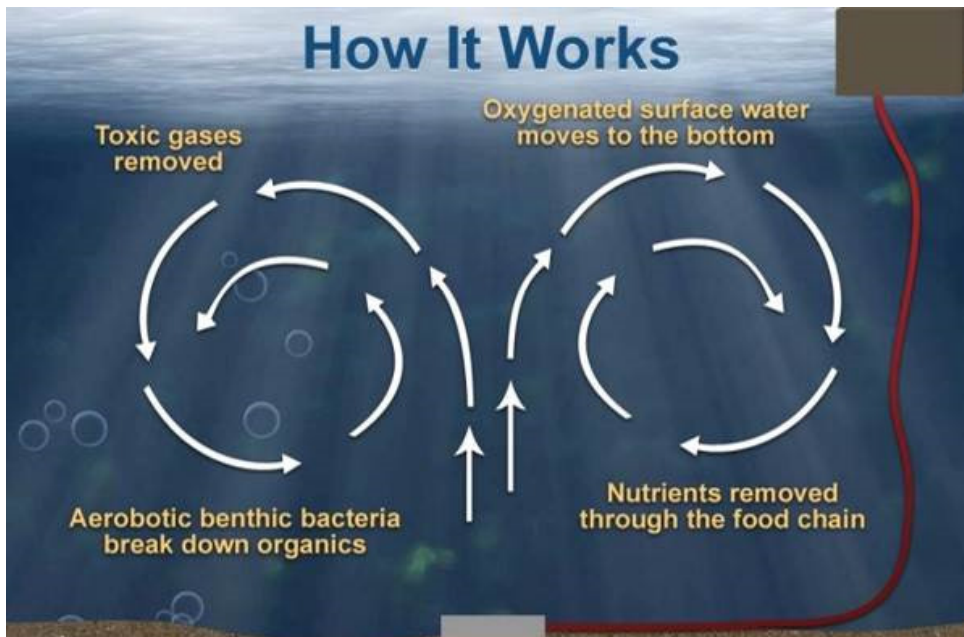


The passive dewatering system would entail a system of roll off containers with designed screens and weirs to separate the trash and solids from the slurry and then the material would be pumped into roll off containers lined with geotextile bags to compress and dry the material prior to being disposed of, finally the effluent would be discharged back into the Lake.



Based on the available dewatering area surrounding the Lake a passive dewatering system with a series of roll off containers lined with geotextile bags and a polymer injection system is recommended for the Spring Lake dredging. The chemical results indicated the material exceeds the FDEP SCTLs for certain contaminants and therefore the disposal will need to be reevaluated during the design process to determine if the material can be mixed and beneficial reused or sent to an approved Class I landfill for disposal. The cost of the dredging alternative will be much greater if the dredged material requires disposal in a landfill. Wood's experience on previous similar projects indicates that beneficial reuse would probably be acceptable to FDEP.

4.2 Bio-Augmented Aeration



Stagnant water leads to accumulation of harmful and dangerous bacteria, low dissolved oxygen prohibits more beneficial aerobic bacteria from living, muck accumulates faster than the anaerobic bacteria can process it and excess nutrients from fertilizer and run-off add to the cloudiness of the water. Aeration can correct and reverse these problems. When an aeration system is installed and turned on in a water body, a rotation of water begins that forms a doughnut pattern around the diffuser, see figure above. Water is taken into the bubble stream at the diffuser and moved toward the surface by the rising bubbles.

Introduction of aerobic bacteria will expedite this process and will cause compression of the muck as the bacteria breaks down the organic material. When the Lake bottom is anaerobic, roots and other organic material pile up without being decomposed. This leads to a large collection of organic material that remains in an undecomposed state until it is slowly broken down by anaerobic bacteria. Anaerobic decomposition is 30 to 40 times slower than aerobic decomposition, and many lakes accumulate organic material due to fertilizer runoff and other contaminants faster than this process occurs. With the introduction of oxygen at the lake bed, aerobic bacteria can take over and decompose muck more quickly. The bacteria that will be introduced to accomplish this are broad spectrum strains of naturally occurring bacteria with the ability to degrade most organic compounds.

Bio-augmented aeration consists of small solar powered aeration systems coupled with biological enhancements such as macro-algae. Bio-augmented aeration is completed in a modular approach, with a typical spacing of approximately 100 feet between aeration systems. Given the size of Spring Lake, it is estimated that approximately 24 aeration units would be needed, based on the area of Spring Lake.

4.3 Floating Islands



Floating islands provide nutrient uptake from the permanent pool of the wet detention pond. Floating islands generally consist of components of a typical wetland, but instead of a soil medium, the roots are anchored in an inert, floating medium and suspended within the water column. This provides the plants direct access to the soluble, bioavailable nutrients that are within the water column and targeted for removal. The floating root mass also provides an ideal substrate for periphyton growth, which works

synergistically with the emergent vegetation to enhance nutrient uptake and sequestration. If designed correctly, this direct interaction between wetland root mass and water column nutrients can provide for very efficient nutrient flux and uptake and represents one of the strengths of these hydroponic systems.

Floating island nutrient removal efficiency can be variable and is highly dependent upon proper installation and maintenance. Researchers at University of Central Florida (Chang, et al., 2012) reported removal of up to 54% of TP, 32% of TN, and 48% of nitrate where the rooting media included *Bold & Gold™*. Researchers from New Zealand have reported about 40% removal of TSS and suspended Cu (Borne, et al. 2013), and more than 50% removal of TN and TP (White and Cousins, 2013).

Several researchers recommend covering 5% or less of the stormwater pond by floating islands, which in the case of Spring Lake would be less than 11,000 square foot, at an installed cost of \$220,000 or less (\$20 per square foot but could be substantially less if City staff and/or community volunteers participated in construction and installation). Coverage of less than 5% would result in lesser pollutant removal effectiveness but could still be effective as a secondary treatment alternative to the primary dredging or augmented aeration implementation. Annual maintenance costs are estimated at less than 5% of construction cost. Cost information from Virginia Cooperative Extension Publication BSE-76P (Sample, et al. 2013).

4.4 Littoral Shelf Modifications and Plantings



Some areas of the Spring Lake shorelines are eroded and overly steep and could benefit from littoral shelf modifications and plantings. Littoral shelf plantings and modifications would limit nutrients and runoff from the adjacent lawns from entering the lake, as well as provide additional nutrient uptake within the lake from the additional littoral shelf plants that are dependent on the available nutrients within the lake targeted for removal. In addition to water quality benefit, littoral shelf modification of the overly steep areas within the banks would provide a safety upgrade for the lake to return the side slopes to a more gradual slope.

Exfiltration trenches consist of a subsurface retention system incorporating conduit such as perforated pipe surrounded by natural or artificial aggregate which would temporarily store and allow runoff to percolate into the surrounding soil. Exfiltration trenches promote more efficient infiltration of surface runoff to shallow groundwater tables by detaining stormwater and evenly distributing it throughout the base of the trench. Exfiltration trenches reduce pollutant loads primarily by way of surface runoff volume reduction, however additional reductions in suspended solids, oxygen demanding materials, heavy metals, bacteria, and some varieties of pesticides and nutrients such as phosphorus may be removed as runoff percolates through the soil. Exfiltration trenches can remove 60 to 100% of trace metals, 40 to 80% of TP and 40 to 80% of TN (SFWMD 2002). Installation costs for exfiltration trenches can range from \$2.50 to \$7.91 per cubic ft of treatment volume.

4.6 Nutrient Separating Baffle Boxes and Curb Inlet Baskets



Curb inlet baskets (CIB) are designed to be placed in front of a curb inlet or opening to prevent the migration of sediment into the storm drain system while allowing water to pass through. The filter allows water to temporarily pond behind the inlet which allows deposition of suspended solids. Sediment and soluble pollutants such as phosphorus and petroleum hydrocarbons are filtered from runoff water as it passes through the interior organic media. Other advantages of installing inlet filters include easy maintenance, replacement and repair.

Nutrient separating baffle box (NSBB) is a structural BMP used for water quality treatment at the outfall of storm drains. The box primarily removes sediment and suspended solids from stormwater. The Type II boxes widely used in South Florida consist of an aluminium screen basket with a horizontal bottom at an elevation below the invert of the influent pipe but above the top of baffles. Incoming flow passes through the screen basket, which captures leaves, trash, and other large materials. In addition to capturing the large sized materials and preventing their passage into the baffle box effluent, the material captured in the screen basket is held above and out of the water column. The purported effect is to reduce or eliminate the leaching that would occur if the captured material were submerged. Since leaching of leaves would release biochemical oxygen demand, nitrogen and phosphorus, removing leaves from the

stormwater and holding the captured leaves out of the water column results in a reduction of nutrient loading to the receiving water body.

An evaluation of NSBB based on Suntree technology generally removes 90% TSS, 20% TN and 19% TP from the water being directed to the system. An evaluation of CIBs removal capacity was performed by the Orange County Lake Management Program and determined from a sample of 250 CIBs units that average annual reductions of 0.20 kilogram per year TN and 0.050 kilogram per year TP could be achieved for each CIB (Dix et al., 2011).

4.7 Rain gardens



Rain gardens are shallow, constructed depressions that are planted with deep-rooted Florida-Friendly plants. A rain garden slows down the rush of water from impervious surfaces, holds the water for a short period of time and allows it to naturally infiltrate into the ground. Rain gardens are usually integrated into a site's landscaping to receive runoff from hard surfaces such as a roof, a sidewalk, a driveway, or parking area. Rain gardens offer significant habitat enhancement and aesthetic value while being optimized for stormwater runoff treatment. Rain gardens are among the most effective BMP at removing pollutants from stormwater. Treatment primarily occurs in the root zone and soil media, where nutrients and dissolved pollutants are removed. Site applications of rain gardens include open spaces, parks, golf courses, commercial or industrial developments and residential developments.

Rain gardens allow approximately 30 percent of runoff to be filtered into the ground. A properly-designed rain garden can filter one inch of rainfall in four hours. Rain gardens also filter stormwater pollution, around 90 percent of Cu, lead and zinc; 50 percent of nitrogen; and 65 percent of phosphorus, which could otherwise flow into storm drains and eventually bodies of water. (American Society of Landscape Architects, 2018)

4.8 Vegetated swales



Treatment swales are shallow stormwater conveyance channels with vegetation covering the side slopes and bottom. Treatment occurs as runoff flows through the vegetation and infiltrates into the soil matrix. Swales can be designed as part of the stormwater conveyance system and can eliminate the need for some curbs, gutters and storm drains. They are also well suited to treat runoff from roads and highways because of their linear nature. The treatment effectiveness is correlated to the residence time of the runoff in the swale, and therefore, flow-based swales tend to be considerably longer than other types of treatment BMPs. Site applications of vegetative swales include road shoulders and medians, parking lot islands, open spaces and parks. Swales can reduce TP by 25%, TN by 10% and TSS by 65% (STEPL, USEPA, 2004). Grass swale installation can cost \$0.60 to \$1.60 per sq. ft (SFWMD, 2002)

The City of Naples Streets and Stormwater Department is an active partner in the community promoting and providing technical information on the use of treatment swales to reduce runoff volumes and pollutant concentrations into the surrounding Naples Bay and Gulf of Mexico (City of Naples, 2014).

5.0 Alternative Analysis

Wood has evaluated various alternatives for stormwater improvements within the Lake watershed, along with restorations activities within the lake, to improve the functionality of the Lake to reduce impacts to the Naples Bay.

Based on FGCU (2013) Spring Lake is equipped with a fountain and two aerators, which at the time of their visit wasn't functioning optimally. They noted that data to support the effectiveness of these technologies was lacking and recommended that when implementing any technologies, a detailed monitoring plan be included to accurately demonstrate success.

Primary treatment technologies such as dredging, and bio augmented aeration are used to shock and restart the Lake to provide for more immediate results and allow the Lake's stormwater treatment efficiencies to return.

In-catchment treatment technologies which are implemented in the upstream portion of the watershed prior to outfall into the lake provide prolonged treatment efficiencies and can be effective polishing alternatives for continued health of the Lake. In addition, various in-lake treatment options also would provide restoration and improvement of the lake health.

The below analysis provides a comparison of each BMP type discussed above and the site-specific pros and cons for implementation within Spring Lake.

Table 2. Spring Lake BMP Technologies Pros vs. Cons

BMP	Pros	Cons
Primary		
Dredging	Removes the contaminated sediment and provides additional storage for the Lake. Restarts the stormwater lake treatment capabilities at completion of project. No long-term operation and maintenance.	Requires a significant staging area for dewatering. Construction impacts, such as noise, traffic and aesthetics for the surrounding property owners. Potential high cost for disposal of material based on chemical analysis.
Bio-Augmented Aeration	Low cost to install and minimal staging area restraints for equipment.	Operation impacts, such as noise, and aesthetics for the surrounding property owners. Long term operation and maintenance.
In-Lake		
Floating Islands	High efficiency at pollutant removal and low cost to install and maintain	Routine maintenance required to ensure effectiveness and reduce Lake aesthetics for the surrounding property owners.
Littoral Shelf Modifications and Plantings	High efficiency at pollutant removal and low cost to install and maintain. Provides shoreline stabilization and aesthetics for the surrounding property owners.	Routine maintenance required to ensure effectiveness. The use of geotextile bags filled with Lake sediment have a potential for leeching back into the Lake and causing continued water quality impacts.
In-catchment		
Exfiltration Trenches	High efficiency at pollutant removal and small footprint for implementation.	Routine maintenance required to ensure effectiveness. Limited impact to the watershed and Lake.



BMP	Pros	Cons
Nutrient Separating Baffle Boxes and Curb Inlet Baskets	NSBB high efficiency at pollutant removal and provides educational feature for surrounding community. CIBs small footprint and easy to install.	Routine maintenance required to ensure effectiveness. CIB provide limited impact to watershed and Lake. NSBB high cost and requires modification to stormwater drainage system.
Rain gardens	Provides aesthetics to the surrounding community.	Limited impact to the watershed and Lake. Routine maintenance required to ensure effectiveness.
Vegetated swales	High efficiency at pollutant removal and low cost to install and maintain. The City is already implementing vegetated swales within owned right of ways.	Limited impact to the watershed and Lake. Need land to provide sufficient storage to provide pollutant removal efficiencies.

Based on the evaluation, we recommend that the implementation of the following in-Lake technologies would be most effective at providing water quality benefits to the Lake:

- Floating Islands
- Nutrient Separating Baffle Box

We also recommend through the City's Streets & Stormwater Department mission that the in-catchment technologies be implemented and maintained to provide the water quality benefits to the Lake:

- Curb Inlet Baskets
- Rain gardens with exfiltration trenches
- Vegetated swales

Further evaluation on the primary technologies for effectiveness, ease to implement, ease of permitting, property owner disruption, time to achieve the restoration, and cost for implementation, and operation, and maintenance. The purpose of the evaluation criteria is to rank the technologies by potential for success in improving the water quality associated with Spring Lake in addition to implementation cost. All criteria were scored from 0 to 5.

Table 3. Spring Lake Primary Technologies Matrix

Technology	Effectiveness (0-5)	Ease to Implement (0-5)	Permitting (0-5)	Homeowner Disruption (0 to 5)	Time (0-5)	Cost (0 to 5)	Total	Rank
Dredging	5	3	5	2	2	3	20	1
Bio-augmented Aeration	2	2	3	2	2	3	14	2



The following rankings were developed for bio-augmented aeration:

Effectiveness (2) – Provides targeted improvement in reduction of organics, but the radius of influence of the aeration systems is limited and requires a substantial number of units.

Ease to Implement (2) – Assembly and installation of the aeration systems can be completed quickly. However, a significant effort is associated with obtaining homeowner approval for the installation of the compressors that will feed the units.

Permitting (3) – Based on previous projects, a de minimis permit may be issued for this technology however additional water quality sampling maybe required to ensure that the bacteria doesn't cause any residual effects in the Naples Bay.

Homeowner Disruption (2) – Some homeowners may consider the aeration units to be a nuisance based on the noise and potential impacts to the water clarity during the initial start-up of the units, i.e. turbidity.

Time (2) – It is expected that improvements to water quality could take up 6 months to be observed.

Cost (3) – Construction cost of \$100,000 for the bio-augmented aeration system. Long term operation and maintenance costs will be approximately \$45,000 per year. Therefore, the two-year contract for construction and operation is approximately \$190,000.

Total: 14

The following rankings were developed for dredging:

Effectiveness (5) – Removes greater than 95% of the organic material in the Spring Lake

Ease to Implement (3) – Assumed a passive dewatering system with 10 roll off containers; 1 roll off container for trash, 1 roll off container for sandy sediments and 8 roll off containers lined with geotextile bags for the organic sediments with a requirement of 0.12 acre staging area. The estimated time for dredging is 180 days dependent on the estimated volume of 6,968 cubic yards.

Permitting (5) – Previously permitted as a permit modification based on existing permits.

Homeowner Disruption (2) – Closed canal for the duration of the project. The equipment will also cause a moderate noise impact near the project area.

Time (2) – It is expected that improvements to water quality will improve within 1 month once the project is completed.

Cost (3) – Completion cost of \$1,045,200, no long term electrical and operation and maintenance costs for the dredging.

Total: 20

5.1 Results

Based on the evaluation, we recommend the implementation of the following restoration alternatives for Spring Lake, Figure 4.

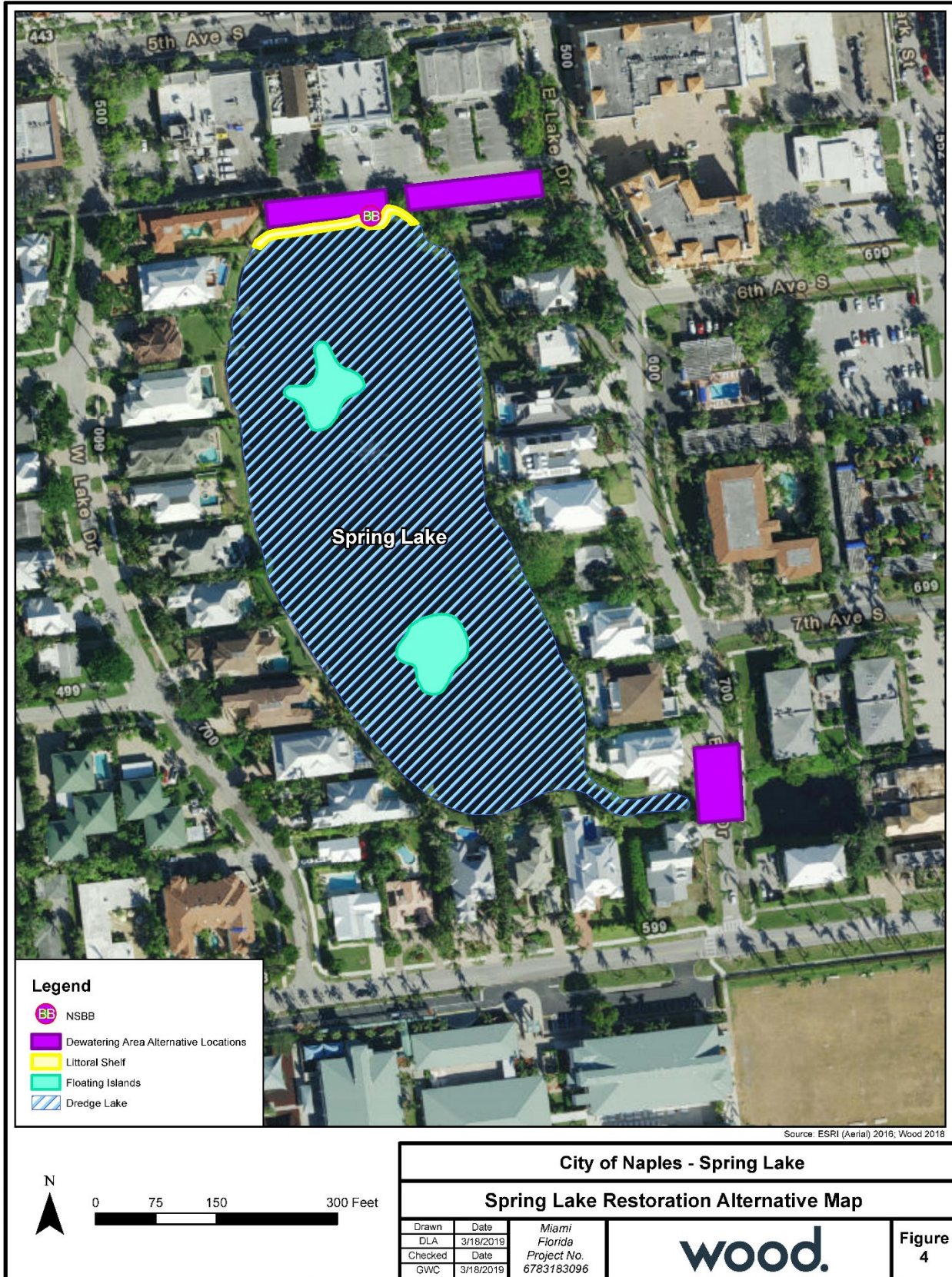


Table 4. Spring Lake Selected Restoration Alternative Conceptual Cost Estimate

BMP	Estimated Quantity	Unit	Unit Price	Amount
Dredging	6,968	CY	\$150	\$1,045,200
Floating Islands	11,000	SF	\$20	\$220,000
Nutrient Separating Baffle Boxes	1	EA	\$200,000	\$200,000
Littoral Shelf	0.5	AC	\$30,000	\$15,000
Subtotal				\$1,480,200
Total Construction Estimate (plus 15% contingency)				\$1,702,230
Bi-Annual Maintenance - Floating Islands	2	YR	\$9,625	\$19,250.00
Quarterly Maintenance - Nutrient Separating Baffle Boxes	4	YR	\$500	\$2,000.00
Bi-Annual Maintenance - Littoral Shelf	2	YR	\$750	\$1,500
Subtotal				\$22,750
Total Annual Maintenance Estimate (plus 15% contingency)				\$26,163
Design and Permitting				\$170,223
Construction Administration and Engineering Inspections				\$119,156
Total Design, Permitting, Construction Administration and Engineering Inspection Fees				\$289,379

The next steps for the project implementation would be completing the following items:

- Obtain bathymetric and topographic data for the Spring Lake and surrounding stormwater infrastructure
- Conduct an environmental and engineering site analysis
- Verify FGCU soft sediment volume by limited coring, collect additional stormwater and/or sediment samples for chemical analysis as discussed herein
- Complete design including final dewatering and disposal location
- Submit permit application to SFWMD
- Prepare construction procurement package

Wood also recommends pre and post construction water quality monitoring to assess the improvements to Spring Lake. Baseline conditions must be established first, and Wood recommends increasing frequency of the East Lake outfall sampling. Currently, Cardno conducts quarterly monitoring; this should be increased to monthly monitoring for two years prior to construction. For statistical confidence it would be desirable to have 20 monthly water quality results pre-construction. After construction and allowing a limited time for TSS to return to pre-construction levels, we recommend resuming monthly water quality sampling of East Lake for approximately 2 years (post construction monthly sampling duration should be not less than pre-construction).

Statistical evaluations (such as t-tests) should be performed, comparing pre and post construction water quality data for effects of the project on key water quality indicators (Cu, TN, TP, TSS, fecal coliforms). The statistical analysis should evaluate whether those tests should be performed using reported concentrations or log-transformed concentrations. Trend tests should consider seasonality (e.g., Seasonal Mann Kendall). If statistically significant trends indicate water quality measures are improving post-construction, the monitoring frequency could be reduced (presumably returning to quarterly). These results should be reviewed and characterized not less than annually.



Wood recommends calculation of pollutant mass removed by dredging. Using records of amount of sediment removed during dredging, the mass of sediments removed should be estimated. This data, in conjunction with the contaminant concentrations in dredge spoil, FGCU (2013) and MACTEC (2008), would then be used to calculate the mass of pollutants removed by dredging.

Wood also recommends calculation of the change in volume and residence time of Spring Lake as a result of sediment removal, or other changes to lake volume (e.g., due to littoral shelf construction). Use models such as those presented by Amec (2012) to estimate any improvements expected and compare with any improvements observed during the recommended water quality monitoring.



6.0 Funding Evaluation

6.1 Objectives

Attaining sufficient project funding is one of the most challenging steps in any restoration project. The focus of this section is to accomplish the following objectives:

- 1) Review and identify the funding opportunities,
- 2) Evaluate the funding needed and the breakdown of cost per parcel based on private vs. public.

6.2 Funding Resources

6.2.1 Funding Options

The City has several funding options to generate revenue to perform maintenance and dredging for Spring Lake, with varying levels of complexity in procedures to implement. The purpose of generating revenue is a key consideration. The City may:

- Create a Special Tax District, with the support of voters in the watershed.
- Create a Special Non-ad valorem Assessment, based on special benefit to property owners in the watershed, referred to as MSBU
- Increase Stormwater Utility fees, citywide, to include all lake management maintenance and operational programs
- Budget capital project needs from City general fund reserves and incorporate continuing maintenance needs into on-going program priorities within the Stormwater Utility, with no rate increase attributable to the Spring Lake capital project.
- Budget capital project needs from the Stormwater Utility reserves, adding the project to the Utility CIP and implement when enough reserves can be allocated to Spring Lake.

There are six key considerations Wood used in evaluating the funding options available.

- (1) Contribution from all Property Owners: Will all property owners contribute revenue with shared responsibility or will the charges to fund the services only be assigned to taxable parcels?
- (2) Vote of Impacted Property Owners: Is a vote of the property owners within the watershed required? This adds complexity to the process and requires education and outreach to the impacted property owners to provide information on the special election.
- (3) Public Outreach and Education: Is public support critical to implementation of the capital project and long-term maintenance needs? All options require education of the public; however, a Special Tax District and MSBU require specific, targeted outreach to develop support and establish an understanding of the revenue needs. Outreach must address the ultimate purpose for improving and sustaining the performance of the Lake over time and motivate people to act.
- (4) Continuous Revenue Generation: To maintain the Lake capacity and performance in water quality protection, provide routine maintenance, generate a reserve for future capital needs and dredging and upgrade systems installed, as an on-going component of stormwater operations, requires a revenue that is dedicated and continuous.

- (5) Capital and Maintenance Program: Is it the City’s purpose to address the current conditions of the Lake and on-going, long-term maintenance? If yes, a program budget is developed and funded annually.
- (6) Capital Only: Is it the City’s purpose to address the current condition of the Lake? If yes, resources in the Capital Improvement Project (CIP) budget is funded as a one-time cost.

Funding options are not equal in complexity and ease of implementation. The following table provides a comparison of attributes.

Revenue Source	All Properties Contribute	Voter Approval	Public Education	On-going Revenue	Capital and Maintenance	Capital Only
Utility Fees – No Increase*	Yes**	No	Yes	Yes	Yes	Yes
Utility Fees – Citywide	Yes**	No	Yes	Yes	Yes	Yes
Special Tax District	No	Yes	Yes***	Yes	Yes	Yes
Special Assessment District	Yes	No	Yes***	No	No	Yes
General Fund Reserves	No	No	Yes	No	No	Yes
Utility Fund Reserves	Yes	No	Yes	No	No	Yes

- * Utility Fees with no increase in rates requires prioritization of the project against other needs funded by the utility and determine when to dredge the Lake based on funding.
- ** Vacant and undisturbed parcels are exempt from the utility fee if not served by a water meter.
- *** Public education is critical during the implementation of a Special Tax District or a Special Assessment District.

If continuous revenue creation to maintain the Lake in perpetuity is a key driver, a Special Tax District or budget from the Stormwater Utility can sustain revenue growth over decades. If a one-time capital project is the implementation approach, then all methods listed can accomplish the goal.

6.2.2 Loans

The Clean Water State Revolving Fund provides low-interest loans to local governments to plan, design, and build or upgrade wastewater, stormwater, and nonpoint source pollution prevention projects. This option was researched and not considered viable. The priority for these funds is heavily targeted to water supply and wastewater management capital needs, with only two stormwater projects identified as priorities in 2019, both from small and/or disadvantaged communities. Though interest rates are attractive (0.50% to 2.5%) the availability of funding is limited and may require the City to wait for multiple application cycles before the dredging project is eligible and approved. Providing local resources and flexibility in implementation allows the City to initiate the project in a timely manner. (Chapter 62-503, F.A.C.)

6.2.3 MSBU – Non-Ad Valorem Special Assessment District

Typically, a MSBU does not provide continuous revenue to support long-term operation and maintenance of the Lake. It distributes the cost of the project, defined specifically in the resolution of intent, to all property owners in the watershed. An assessment role is prepared, on a property by property basis. An interest rate is established, providing to each owner a payback period, typically up to six years, but can be up to 20 years. If the owner chooses to pay in full immediately, the amount owed can be impacted by an early-payment discount offered by the Tax Collector. Discounts must be taken into consideration when establishing the overall project cost and a decision on how discounts are covered within the project budget should be determined. For example, will the Stormwater Utility operating budget cover the



impacts when owners pay immediately, at a discount? A review of early payment of taxes at a discount for property owners within the watershed may provide insight regarding the impacts. A financial model should be developed to project total revenue need.

The Uniform Method of collection for special assessments pursuant to section 197.3632, Florida Statutes requires the use of data that is available on the ad valorem tax roll. Accordingly, the challenge is to develop a non-ad valorem assessment program which employs property information that is readily available or reasonably should be included and consistently updated on the ad valorem tax roll. The following assumptions and legislative declarations support a finding that the Spring Lake project confers a special benefit on the assessed parcels, as follows:

- Protecting and enhancing their value, use and enjoyment;
- Promoting health, welfare, convenience and safety for all assessed property owners in the assessment area;
- Stabilization of or the increase of property values; and
- Improved appearance of the assessment area.

The development of the proposed assessment methodology is based upon the assumptions that appropriate legislative findings are prepared and included in the assessment resolution required to implement the project.

The steps required to implement and collect the proposed special assessments on the ad valorem tax bill is summarized below. The City will be required to follow the statutory deadlines provided in Section 197.3632, Florida Statutes, to implement the special assessment.

- (1) Resolution of intent
- (2) Assessment ordinance
- (3) Initial assessment resolution
- (4) Notice to property owners (mailed and published)
- (5) Public hearing and final assessment resolution
- (6) Certification of the assessment roll and collection of assessments

The following table identifies parcels within the watershed, by land use described in the tax assessors file, with the percentage of flow as the basis for distributing the project costs to each land use type. In addition, the table provides a projection of total costs and annual costs (using a 2 percent interest rate and a 6-year payback period) for each property owner within a land use category.

The Annual Payback for a Special Assessment District is calculated on the basis of a 6 year payback at 2% interest. It is stated as a credit to the City. The City's liability for parcels within the watershed is \$817,070 for total project cost, less annual maintenance. Maintenance costs of \$26,163 are not included in the table. It is assumed that these annual costs will be covered within the overall operating budget of the Stormwater Utility.

Parcel Description	Public vs. Private	Parcel ID (Count)	Volume Contribution (percentage)	Total Project Estimate \$ 2,459,574	Cost Allocation Per Parcel	Annual Payback 6yr/2% Int
Churches	Private	4	2.14%	\$52,624	\$13,156	(\$2,349)
Clubs, lodges, union halls	Private	1	0.07%	\$1,626	\$1,626	(\$290)
Orphanages, other non-profit or charitable services	Private	1	0.55%	\$13,599	\$13,599	(\$2,428)
Vacant institutional, with or without extra features	Private	1	0.17%	\$ 4,139	\$4,139	(\$739)
Hotels, motels	Private	2	1.65%	\$40,503	\$20,251	(\$3,615)
Mixed use - store and office or store and residential combination	Private	9	2.78%	\$68,293	\$7,588	(\$1,355)
Office buildings, non-professional service buildings, multi-story	Private	6	2.82%	\$69,475	\$11,579	(\$2,067)
Office buildings, non-professional service buildings, one story	Private	1	0.10%	\$2,513	\$2,513	(\$449)
Financial institutions	Private	2	1.42%	\$34,885	\$17,443	(\$3,114)
Stores, one story	Private	11	3.07%	\$75,388	\$6,853	(\$1,224)
Vacant commercial	Private	1	0.65%	\$15,965	\$15,965	(\$2,850)
Single family	Private	67	13.07%	\$321,508	\$4,799	(\$857)
Condominiums	Private	776	23.04%	\$ 566,741	\$730	(\$130)
Multi-family - fewer than 10 units	Private	7	1.83%	\$44,937	\$6,420	(\$1,146)
Parking lots, mobile home parks	Private	11	3.49%	\$85,735	\$7,794	(\$1,391)
Vacant residential	Private	8	1.71%	\$42,129	\$5,266	(\$940)
Miscellaneous residential	Private	1	0.56%	\$13,747	\$13,747	(\$2,454)
Public county schools - including all property of board of public instruction	Public	1	8.33%	\$204,878	\$204,878	(\$36,576)
Right of way	Public	6	30.09%	\$740,134	\$123,356	(\$22,022)
Municipal, other than parks, recreational areas, colleges, hospitals	Public	5	2.47%	\$60,754	\$12,151	(\$2,169)

6.2.4 Special Tax District

Special Tax Districts, such as the East Naples Bay Special Taxing District established in 1987, are similar in function as the MSBU, except they require a vote of the impacted property owners. Based on the Florida Constitution Article VII, Section 9, the City may establish a special tax district creating an ad valorem tax, assessed and collected only from taxable properties within the District.

A referendum of the qualified electors residing within the District is called by resolution of the City Council to determine whether a Special District millage is levied. The resolution identifies the properties to be



taxed, the purpose of the District, the amount of the millage, and the services to be delivered using the revenue generated.

The accounting of the revenue is separate from other funds of like purpose, such as the Stormwater Utility.

Providing public education and outreach is critical to assist in informing the impacted electorate of the need, purpose, structure, and impacts of a millage for improvements to the Lake, both immediate and long-term needs. The State provides guidance on the process and the mandatory elements of the local ordinance to set up a special tax district.

Using the current assessed value of taxable properties in the watershed (approximately \$716M), the potential revenue at a 0.10 millage rate is approximately \$715,000 annually.

6.2.5 Stormwater Utility

The City's Stormwater Utility charges properties based on three categories of land use:

- (1) Single-family residential, per month at \$13.68.
- (2) Multifamily residential, per unit per month at \$13.68.
- (3) Non-residential per total number of average residential units (1,934 square feet of impervious area) per month at \$13.68 per billing unit.

Vacant and undisturbed parcels are exempt from the utility fee provided they are not served by a water meter. (City Code, Article VI, Sec. 303-331).

The Stormwater Utility fees generate approximately \$4.8M a year currently. The Stormwater Fund may address the cost of project implementation and on-going maintenance by:

- a. Absorbing the cost within the current budget, prioritizing the project within the CIP and on-going maintenance programs. This approach will likely delay implementation of the project, recognizing that there is a backlog of projects to be funded with current resources.
- b. Increasing current rates (shown above), citywide. Increasing rates on a case-by-case basis, driven by implementation of one capital project at a time, can create negative reactions from the public and not recommended. If a rate increase is considered to address the needs of lake-management, a rate study is recommended, to incorporate all outstanding lake-management needs, based on the most recent Stormwater Lake Maintenance and Rehabilitation Plan (2012). The Plan addresses needs, both capital and maintenance, across the City and rates raised to address these needs, impacting all rate-payers, can provide dedicated resources not only for Spring Lake, but for all lakes within the Plan.

The Plan does not fully address all lakes within the City and this funding approach may require an update of the Plan to capture a complete inventory of the lakes, a condition assessment, and a determination of the current and future cost for maintenance, capital investment and long-term rehabilitation or replacement.

This funding approach is viable and may provide the long-term funding for the operation/maintenance/dredging of Spring Lake but may delay any action for a period of months or years.

6.2.6 Grants

Wood has direct experience with obtaining and managing local, state, and federal grant funding for a variety of projects including assisting the City with the Lake Manor SFWMD Grant. In addition to the SFWMD grant program offered by the State of Florida, the FDEP administers a funding program, total maximum daily loads to help local governments implement BMPs designed to reduce pollutant loads to impaired waters from urban stormwater runoff.

The recent update of the Stormwater Master Plan Update (AECOM, 2018) provides a thorough review of the available grants that could support the Spring Lake project. Section 12, subsection 12.3, Funding Sources, details the available grants. Rather than duplicate effort, it is recommended that the City review the grant options detailed in the Master Plan update.

Many of the requirements for the grant programs are similar; however, each grant application has its own format. The elements listed below are typical documentation that will need to be provided as part of the grant proposal submittal.

- Applicant Contact Information
- Project Location Details
- Type of Project
- Project Objective
- Project Synopsis
- Project Description
- Expected Project Benefits
- Project Work Plan
- Project Monitoring Plan
- Project Budget
- Amount Requested
- Applicant Matching Amount
- Cooperating Partners/Match
- Benefits to Community
- Community Involvement
- Project Milestones
- Project Deliverables
- Project Team
- Required Forms
- Literature Cited
- Appendices

6.3 Path Forward

The use of the Special Assessment District provides the resources needed and assigns the costs to the properties benefiting from the improvements providing direct accountability to the watershed impacted. Use of unrestrictive reserves from the Stormwater Utility or General Fund to provide cash requirements to implement the project provides immediate resources while assigning the costs to the benefited properties. Grants may provide additional funding but are not predictable or reliable as a primary source of funding. The timing of project implementation will dictate whether grants are a viable options.

Upon approval of the restoration alternative for Spring Lake, Wood will work with the City in evaluating the aforementioned funding mechanism in greater detail and determining an economical distribution based on the parcels within the watershed based on the selected funding mechanism.



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Appendix A
Spring Lake Basin
Runoff Volume Contribution

Parcel ID	Legal Subdivision	Parcel Description	Public vs. Private	FLUCFCS CODE	Level II FLUCCS CODE	FLUCFCS: Land Use Cover Description	Hydrologic Soil Group for CN Lookup	Acres	CN	Runoff Coefficient C	i (inches/hr)	Q = CIA (cfs)
12-021-09450000169	HAMILTON CLUB A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-09450000185	HAMILTON CLUB A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-10770000029	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-10770000045	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000061	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000087	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000100	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000126	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000142	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000168	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000184	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000207	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000223	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-10770000249	KENSINGTON GARDENS	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11205000027	LAKERIDGE VILLAS A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.03	94	0.724	2.85	0.06
12-021-11205000043	LAKERIDGE VILLAS A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11205000069	LAKERIDGE VILLAS A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11430360008	LAKEVIEW TERRACE BLK A LOT 5	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.25	94	0.724	2.85	0.52
12-021-11430400007	LAKEVIEW TERRACE BLK A LOT 6	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.22	94	0.724	2.85	0.45
12-021-11430480001	LAKEVIEW TERRACE BLK A LOT 7	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.22	94	0.724	2.85	0.45
12-021-11430600001	LAKEVIEW TERRACE BLK A LOT 9	SINGLE FAMILY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.28	94	0.724	2.85	0.58
12-021-11430640003	LAKEVIEW TERRACE BLK A A POR-	VACANT RESIDENTIAL	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.11	94	0.724	2.85	0.22
12-021-11430680005	LAKEVIEW TERRACE BLK A LOT 11	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.24	81	0.390	2.85	0.27
12-021-11430720004	LAKEVIEW TERRACE BLK A LOT 12	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11430760006	LAKEVIEW TERRACE BLK A LOT 13	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.24	81	0.390	2.85	0.27
12-021-11430800005	LAKEVIEW TERRACE BLK A LOT 14	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.27
12-021-11430840007	LAKEVIEW TERRACE BLK A LOT 15	VACANT RESIDENTIAL	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.28	81	0.390	2.85	0.31
12-021-11430880009	LAKEVIEW TERRACE BLK A LOT 16	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11430920008	LAKEVIEW TERRACE BLK A S	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-11430960000	LAKEVIEW TERRACE BLK A LOT 18	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.25
12-021-11431000008	LAKEVIEW TERRACE BLK A THE S	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.22	81	0.390	2.85	0.24
12-021-11431080002	LAKEVIEW TERRACE BLK A LOT 20	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.25	100	0.809	2.85	0.58
12-021-11431120001	LAKEVIEW TERRACE BLK A LOT 21	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.27
12-021-11431200002	LAKEVIEW TERRACE BLK A LOT 22	VACANT RESIDENTIAL	Private	5300	5300	RESERVOIRS	C	0.25	100	0.809	2.85	0.58
12-021-11431240004	LAKEVIEW TERRACE BLK A LOT 23	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11431320005	LAKEVIEW TERRACE BLK A LOT 25	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11431360007	LAKEVIEW TERRACE BLK A LOT 27	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.26	100	0.809	2.85	0.60
12-021-11431400006	LAKEVIEW TERRACE BLK A LOT 29	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.27	100	0.809	2.85	0.61
12-021-11431440008	LAKEVIEW TERRACE BLK A LOT 31	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.28	100	0.809	2.85	0.64
12-021-11431480000	LAKEVIEW TERRACE BLK A LOT 35	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.21	100	0.809	2.85	0.49
12-021-11431520009	LAKEVIEW TERRACE BLK A LOT 36	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.24	100	0.809	2.85	0.55
12-021-11431560001	LAKEVIEW TERRACE BLK A LOT 37	SINGLE FAMILY	Private	5300	5300	RESERVOIRS	C	0.23	100	0.809	2.85	0.54
12-021-11431600000	LAKEVIEW TERRACE BLK A LOT 38	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11431720003	LAKEVIEW TERRACE BLK B W 60FT	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.26	94	0.724	2.85	0.53
12-021-11431800004	LAKEVIEW TERRACE BLK B LOT 7	MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL COMBINATION	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.11	94	0.724	2.85	0.23
12-021-11432000007	LAKEVIEW TERRACE BLK C LOT 1	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.10	94	0.724	2.85	0.20
12-021-11432040009	LAKEVIEW TERRACE BLK C LOT 2	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.12	94	0.724	2.85	0.26
12-021-11432160002	LAKEVIEW TERRACE BLK C THAT	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.62	94	0.724	2.85	1.29
12-021-11432240003	LAKEVIEW TERRACE BLK C THAT	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.32	94	0.724	2.85	0.65
12-021-11432280005	LAKEVIEW TERRACE BLK C LOT 9	CLUBS, LODGES, UNION HALLS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.05	94	0.724	2.85	0.11
12-021-11432440007	LAKEVIEW TERRACE BLK D W 50FT	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-11432520008	LAKEVIEW TERRACE BLK D W 16.67	FINANCIAL INSTITUTIONS (BANKS, SAVING AND LOAN COMPANIES, MORTGAGE COMPANIES, CREDIT SERVICES)	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.55	94	0.724	2.85	1.14
12-021-11432521007	LAKEVIEW TERRACE BLK D W 23.33	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.14	94	0.724	2.85	0.28
12-021-11432522006	LAKEVIEW TERRACE BLK D W 50FT	MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL COMBINATION	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.00	94	0.724	2.85	0.01
12-021-11432685008	LAKEVIEW TERRACE BLK D	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.11	94	0.724	2.85	0.23
12-021-11432700006	LAKEVIEW TERRACE BLK D	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.13	94	0.724	2.85	0.27
12-021-11432880007	LAKEVIEW TERRACE BLK E THE N	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.20	81	0.390	2.85	0.22
12-021-11432920006	LAKEVIEW TERRACE BLK E S 93FT	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.22	81	0.390	2.85	0.24
12-021-11432960008	LAKEVIEW TERRACE BLK E LOT 10	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.21	81	0.390	2.85	0.23
12-021-11433000006	LAKEVIEW TERRACE BLK E LOT 11	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.20	81	0.390	2.85	0.22
12-021-11433040008	LAKEVIEW TERRACE BLK E LOT 12	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.20	81	0.390	2.85	0.23
12-021-11433080000	LAKEVIEW TERRACE BLK E LOT 13	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.21	81	0.390	2.85	0.24
12-021-11433120009	LAKEVIEW TERRACE BLK E W 60FT	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.19	81	0.390	2.85	0.21
12-021-11433160001	LAKEVIEW TERRACE BLK E LOT 14	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.14	81	0.390	2.85	0.15
12-021-11433200000	LAKEVIEW TERRACE BLK E LOT 15	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.16	81	0.390	2.85	0.18
12-021-11433240002	LAKEVIEW TERRACE BLK E LOT 16	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.28	81	0.390	2.85	0.31
12-021-11433260008	LAKEVIEW TERRACE BLK E LOT 17	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.25	81	0.390	2.85	0.28
12-021-11433280004	LAKEVIEW TERRACE BLK E, E	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.25	90	0.611	2.85	0.43
12-021-11433720001	LAKEVIEW TERRACE BLK F W 33.33	MULTI-FAMILY - FEWER THAN 10 UNITS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.16	90	0.611	2.85	0.28
12-021-11433800002	LAKEVIEW TERRACE BLK F E1/2 OF	MULTI-FAMILY - FEWER THAN 10 UNITS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.28	90	0.611	2.85	0.48
12-021-11484000026	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.52	94	0.724	2.85	1.07
12-021-11484000042	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000068	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000084	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000107	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000123	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000149	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000165	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11484000181	LA MAJORCA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-11550000028	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	1.39	90	0.611	2.85	2.42
12-021-11550000044	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-11550000060	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-11550000086	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-11550000109	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-11550000125	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					

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12-021-1155000141	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000167	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000183	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000206	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000222	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000248	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000264	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000280	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000303	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000329	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1155000345	LANTANA IN OLD NAPLES	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1161000023	LA SERENA IN OLD NAPLES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.45	81	0.390	2.85	0.50
12-021-1161000049	LA SERENA IN OLD NAPLES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-1161000065	LA SERENA IN OLD NAPLES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-1161000081	LA SERENA IN OLD NAPLES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-1162000026	LAS DUNAS A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.44	90	0.611	2.85	0.76
12-021-1162000042	LAS DUNAS A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1162000068	LAS DUNAS A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1162000084	LAS DUNAS A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1213090026	MANORS AT ST THOMAS	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.47	90	0.611	2.85	0.82
12-021-1213090042	MANORS AT ST THOMAS	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1213090068	MANORS AT ST THOMAS	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1213090084	MANORS AT ST THOMAS	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-1258900027	MCCABE BUILDING, THE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.21	94	0.724	2.85	0.43
12-021-1258900043	MCCABE BUILDING, THE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1323990023	MUSTIQUE OF OLDE NAPLES	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-1323990049	MUSTIQUE OF OLDE NAPLES	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.14	81	0.390	2.85	0.15
12-021-1323990065	MUSTIQUE OF OLDE NAPLES	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.14	81	0.390	2.85	0.15
12-021-1323990081	MUSTIQUE OF OLDE NAPLES	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.18	81	0.390	2.85	0.20
12-021-1358000025	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.00	94	0.724	2.85	0.00
12-021-1358000041	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000067	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000083	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000106	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000122	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000148	NAPLES FIFTH AVENUE 365 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000229	NAPLES FIFTH AVENUE 375 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.00	94	0.724	2.85	0.00
12-021-1358000245	NAPLES FIFTH AVENUE 375 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000261	NAPLES FIFTH AVENUE 375 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000287	NAPLES FIFTH AVENUE 375 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-1358000300	NAPLES FIFTH AVENUE 375 THREE	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850040003	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.58	94	0.724	2.85	1.19
12-021-13850080005	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850120004	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850160006	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850200005	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850240007	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850280009	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850320008	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850360000	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850400009	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850440001	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850480003	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850520002	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850560004	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850600003	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-13850640005	NAPLES LARCHMONT A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-14020700004	NAPLES T 4 BLK 16 LOTS 1 - 5 &	MISCELLANEOUS RESIDENTIAL (MIGRANT CAMPS, BOARDING HOMES, ETC.)	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.45	94	0.724	2.85	0.93
12-021-14020840003	NAPLES T 4 BLK 16 LOTS 17-21,	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.38	94	0.724	2.85	0.79
12-021-14020920004	NAPLES T 4 BLK 16 LOTS 22, 23	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.71
12-021-14021480006	NAPLES T 4 BLK 18 LOTS 7 & 8	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.15	90	0.611	2.85	0.26
12-021-14021920003	NAPLES T 4 BLK 19 LOTS 17 +	VACANT RESIDENTIAL	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.14	90	0.611	2.85	0.24
12-021-14026840007	NAPLES T 5 BLK 16 W 100FT OF	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14026880009	NAPLES T 5 BLK 16 E 100FT OF	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14026920008	NAPLES T 5 BLK 16 W 100FT OF	PARKING LOTS (COMMERCIAL OR PATRON), MOBILE HOME PARKS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14026960000	NAPLES T 5 BLK 16 W 150FT OF	MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL COMBINATION	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.52	94	0.724	2.85	1.07
12-021-14027000008	NAPLES T 5 BLK 16 LOT 6 W	MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL COMBINATION	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14027040000	NAPLES T 5 BLK 16 E 150FT OF	VACANT COMMERCIAL	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.52	94	0.724	2.85	1.08
12-021-14027520009	NAPLES T 5 BLK 18 LOTS 11 +	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.23	90	0.611	2.85	0.40
12-021-14027720003	NAPLES T 5 BLK 18 LOTS 23 +	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.23	90	0.611	2.85	0.40
12-021-14028160002	NAPLES T 5 BLK 19 LOT 24	MULTI-FAMILY - FEWER THAN 10 UNITS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.12	90	0.611	2.85	0.20
12-021-14032600008	NAPLES T 6 BLK 16 E 50FT OF	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.15	94	0.724	2.85	0.31
12-021-14032640000	NAPLES T 6 BLK 16 W 100FT OF	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.25	94	0.724	2.85	0.52
12-021-14032680002	NAPLES T 6 BLK 16 LOTS 17-19	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14032720001	NAPLES T 6 BLK 16 LOTS 20- 22	STORES, ONE STORY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.35	94	0.724	2.85	0.72
12-021-14032760003	NAPLES T 6 BLK 17 LOTS 1 + 2	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-14032800002	NAPLES T 6 BLK 17 LOTS 3 + 4	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-14033280003	NAPLES T 6 BLK 18 E 12 FT OF	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.08	81	0.390	2.85	0.09
12-021-14033320002	NAPLES T 6 BLK 18 N1/2 OF	MULTI-FAMILY - FEWER THAN 10 UNITS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.09	81	0.390	2.85	0.11
12-021-14033360004	NAPLES T 6 BLK 18 LOTS 4-6	CHURCHES	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.35	81	0.390	2.85	0.39
12-021-14033400003	NAPLES T 6 BLK 18 LOTS 7- 16 &	CHURCHES	Private	1400	1400	COMMERCIAL AND SERVICES	C	1.15	94	0.724	2.85	2.37
12-021-14033440005	NAPLES T 6 BLK 18 LOTS 17 & 18	CHURCHES	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.27	94	0.724	2.85	0.55
12-021-14033480007	NAPLES T 6 BLK 18 LOTS 19 +	CHURCHES	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-14033520006	NAPLES T 6 BLK 18 LOTS 21 +	SINGLE FAMILY	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-14033720000	NAPLES T 6 BLK 19 LOT 12 AND	VACANT INSTITUTIONAL, WITH OR WITHOUT EXTRA FEATURES	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.13	94	0.724	2.85	0.28

Parcel ID	Legal Subdivision	Parcel Description	Public vs. Private	FLUCFCS CODE	Level II FLUCCS CODE	FLUCFCS: Land Use Cover Description	Hydrologic Soil Group for CN Lookup	Acres	CN	Runoff Coefficient C	i (inches/hr)	Q = CIA (cfs)
12-021-19899000040	SUMMERHILL RESIDENCES	SINGLE FAMILY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.15	94	0.724	2.85	0.31
12-021-19899000066	SUMMERHILL RESIDENCES	SINGLE FAMILY	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.15	94	0.724	2.85	0.32
12-021-20400000127	350 6TH AVENUE SOUTH	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.17	90	0.611	2.85	0.30
12-021-20400000143	350 6TH AVENUE SOUTH	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.22	90	0.611	2.85	0.38
12-021-20479000022	TOMAC	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.13	90	0.611	2.85	0.23
12-021-20479000048	TOMAC	SINGLE FAMILY	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.12	90	0.611	2.85	0.21
12-021-20561000024	TOWN VIEW VILLAS CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.28	90	0.611	2.85	0.48
12-021-20561000040	TOWN VIEW VILLAS CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20621000029	TRE VILLE A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.23	94	0.724	2.85	0.48
12-021-20621000045	TRE VILLE A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-20621000061	TRE VILLE A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-20650000029	TUSCAN, THE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.03	90	0.611	2.85	0.04
12-021-20650000045	TUSCAN, THE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20650000061	TUSCAN, THE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20650000087	TUSCAN, THE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20650000100	TUSCAN, THE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20736000024	UPTOWN VILLAS CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.26	94	0.724	2.85	0.53
12-021-20736000040	UPTOWN VILLAS CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-20859970028	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.68	90	0.611	2.85	1.19
12-021-20859970044	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20859970060	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20859970086	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20859970109	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20859970125	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20859970141	VILLA FIRENZE A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20930160029	VILLAS AMANTEA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C	0.22	94	0.724	2.85	0.46
12-021-20930160045	VILLAS AMANTEA A CONDOMINIUM	CONDOMINIUMS	Private	1400	1400	COMMERCIAL AND SERVICES	C					
12-021-20930300025	VILLAS CALABRIA A CONDOMINIUM	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.22	81	0.390	2.85	0.25
12-021-20930300041	VILLAS CALABRIA A CONDOMINIUM	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-20931000023	VILLAS DEL TORRES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.23	81	0.390	2.85	0.26
12-021-20931000049	VILLAS DEL TORRES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-20931000065	VILLAS DEL TORRES	CONDOMINIUMS	Private	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C					
12-021-20932010025	VILLAS ENCANTADA A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.69	90	0.611	2.85	1.21
12-021-20932010041	VILLAS ENCANTADA A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20932010067	VILLAS ENCANTADA A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20932010083	VILLAS ENCANTADA A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20932010106	VILLAS ENCANTADA A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20934000020	VILLAS MILANO A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.38	90	0.611	2.85	0.66
12-021-20934000046	VILLAS MILANO A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20934000062	VILLAS MILANO A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20934000088	VILLAS MILANO A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935000029	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.37	90	0.611	2.85	0.65
12-021-20935000045	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935000061	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935000087	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935000100	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935000126	VILLAS NAPOLI A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935003026	VILLAS VERACRUZ A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.35	90	0.611	2.85	0.60
12-021-20935003042	VILLAS VERACRUZ A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20935003068	VILLAS VERACRUZ A CONDOMINIUM	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C					
12-021-20940000027	VILLAS OF OLDE NAPLES PARCEL A	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.10	90	0.611	2.85	0.18
12-021-20940000043	VILLAS OF OLDE NAPLES PARCEL B	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.07	90	0.611	2.85	0.13
12-021-20940000069	VILLAS OF OLDE NAPLES PARCEL C	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.07	90	0.611	2.85	0.13
12-021-20940000085	VILLAS OF OLDE NAPLES PARCEL D	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.07	90	0.611	2.85	0.13
12-021-20940000108	VILLAS OF OLDE NAPLES PARCEL E	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.07	90	0.611	2.85	0.13
12-021-20940000124	VILLAS OF OLDE NAPLES PARCEL F	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.07	90	0.611	2.85	0.13
12-021-20940000140	VILLAS OF OLDE NAPLES PARCEL G	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.10	90	0.611	2.85	0.18
12-021-20940000166	VILLAS OF OLDE NAPLES PARCEL H	CONDOMINIUMS	Private	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	0.12	90	0.611	2.85	0.21
12-021-6	PARCELS WITH NO VALUES (ROW)		Public	1400	1400	COMMERCIAL AND SERVICES	C	14.72	94	0.724	2.85	30.38
12-021-7	PARCELS WITH NO VALUES (ROW)		Public	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	4.31	81	0.390	2.85	4.79
12-021-8	PARCELS WITH NO VALUES (ROW)		Public	1330	1300	RESIDENTIAL, HIGH DENSITY (SIX OR MORE DWELLING UNITS PER ACRE)	C	5.72	90	0.611	2.85	9.97
12-021-9	PARCELS WITH NO VALUES (ROW)		Public	1710	1700	INSTITUTIONAL	C	1.09	87	0.614	2.85	1.91
12-021-10	PARCELS WITH NO VALUES (ROW)		Public	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	2.72	81	0.390	2.85	3.02
12-021-11430120002	LAKEVIEW TERRACE BLK A N 90 FT	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	Public	1400	1400	COMMERCIAL AND SERVICES	C	0.09	94	0.724	2.85	0.19
12-021-11430280007	LAKEVIEW TERRACE BLK A S 70 FT	OFFICE BUILDINGS, NON-PROFESSIONAL SERVICE BUILDINGS, MULTI-STORY	Public	1400	1400	COMMERCIAL AND SERVICES	C	0.53	94	0.724	2.85	1.10
12-021-11430290000	LAKEVIEW TERRACE BLK A	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	Public	1400	1400	COMMERCIAL AND SERVICES	C	0.01	94	0.724	2.85	0.01
12-021-11431040000	LAKEVIEW TERRACE BLK A S 2FT	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	Public	1210	1200	RESIDENTIAL, MEDIUM DENSITY (TWO-FIVE DWELLING UNITS PER ACRE)	C	0.02	81	0.390	2.85	0.02
12-021-19010880007	SEABOARD REPLAT T 8 BLK 16	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	Public	1400	1400	COMMERCIAL AND SERVICES	C	1.73	94	0.724	2.85	3.57
12-021-19010920006	SEABOARD REPLAT T 8 BLK 16	MUNICIPAL, OTHER THAN PARKS, RECREATIONAL AREAS, COLLEGES, HOSPITALS	Public	1400	1400	COMMERCIAL AND SERVICES	C	0.15	94	0.724	2.85	0.32
12-021-19011520007	SEABOARD REPLAT T 8 ALL OF	PUBLIC COUNTY SCHOOLS - INCLUDING ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	Public	1710	1700	INSTITUTIONAL	C	7.92	87	0.614	2.85	13.86
12-021-2	PARCELS WITH NO VALUES (WATER)		Spring Lake	5300	5300	RESERVOIRS	C	4.98				
								97.43				166.40