Documentation in Support of Category 4e for WBID 1497G: Lake Mirror

Waterbody/Watershed Identification

Organization	City of Lakeland (COL) – Local Government Agency
Point of Contact	Laurie Smith, 407 Fairway Avenue, Lakeland, FL 33801, laurie.smith@lakelandgov.net, 863-834-6276
Waterbody(s)	WBID ID 1497G – Lake Mirror
No. Waterbody / Pollutant Combinations	1 waterbody segment; Verified and/or Impaired for Nutrients (Chlorophyll-a, Total Nitrogen, and Total Phosphorous) on the Sarasota Bay-Peace-Myakka Group 3/ Cycle 4 Assessment.
EPA Completed TMDL	EPA has not completed a TMDL for the impaired waterbody segment listed in this document.

Description of Baseline Conditions

Watershed(s)	Basin Group 3, Sarasota Bay- Peace- Myakka (HUC 03100101)
Baseline Data	The available Cycle 3 data for Lake Mirror are provided below. Bioassessments and Annual geometric mean (AGM) Chlorophyll-a (CHLA), Total Phosphorous (TP), and Total Nitrogen (TN) were reviewed to assess verified impairments during the 2009 through 2012 and 2013 through 2020 Verified periods. The long-term true color and alkalinity geometric means were calculated to be 13.9 PCU and 88.7 mg/L, respectively, using the long-term period of record data from 2009 to 2020. Data were obtained from Impaired Waters Run 60.

WBID	Waterbody Name	Parameter	Criterion Concentration or Threshold Not Met	Data*
1497G	Lake Mirror	Nutrients (CHLA)	≤ 20 µg/L	AGMs# 2009 (53 µg/L) 2010 (44 µg/L) 2011 (43 µg/L) 2012 (43 µg/L) 2013 (38 µg/L) **2015 (34 µg/L)** 2016 (64 µg/L) **2017 (38 µg/L)** **2018 (34 µg/L)** **2019 (47 µg/L)** 2020 (31 µg/L)

WBID	Waterbody Name	Parameter	Criterion Concentration or Threshold Not Met	Data*
1497G	Lake Mirror	Nutrients (TP)	Chl-a AGM ≤ 20 µg/L, TP AGM ≤ 0.09 mg/L; If Chl-a has Insufficient or No Data to calculate AGM or if Chl-a AGM > 20 µg/L, TP AGM ≤ 0.03 mg/L	AGMs 2009 (0.10 mg/L) 2010 (0.11 mg/L) 2011 (0.08 mg/L) 2012 (0.09 mg/L) 2013 (0.06 mg/L) 2014 (0.07 mg/L) **2015 (0.07 mg/L)** 2016 (0.11 mg/L) **2017 (0.07 mg/L)** **2018 (0.08 mg/L)** **2019 (0.09 mg/L)** 2020 (0.08 mg/L)
1497G	Lake Mirror	Nutrients (TN)	Chl-a AGM ≤ 20 µg/L, TN AGM ≤ 1.91 mg/L; If Chl-a has Insufficient or No Data to calculate AGM or if Chl-a AGM > 20 µg/L, TN AGM ≤ 1.05 mg/L	AGMs 2009 (1.30 mg/L) 2010 (1.16 mg/L) 2011 (1.35 mg/L) 2012 (2.30 mg/L) 2013 (1.32 mg/L) 2014 (1.15 mg/L) **2015 (1.12 mg/L)** 2016 (1.38 mg/L) **2017 (1.15 mg/L)** **2018 (1.00 mg/L)** **2019 (1.03 mg/L)** 2020 (1.11 mg/L)

***Bolded values represent data used in the 2013 to 2020 verified period assessment.** Non-bolded values either do not meet the data sufficiency requirements used by FDEP to verify impairment, or they represent data from previous verified impairment assessment periods.
#Data for 2014 were not available in IWR Run 60.

Map	**Attachment 1** delineates the watershed area.

Evidence of Watershed Approach

Area of Effort	Lake Mirror is located within the Peace River watershed and the immediate contributing watershed to the lake is 125 acres in size. The lake is located within the Lakeland/Bone Valley Upland lake region of Florida, in the eastern portion of Polk County. Lake Mirror encompasses a surface area of approximately 18 acres, with a maximum water depth of 17.1 feet and an average water depth of 8.9 feet. Lake Mirror is not influenced by inflows from any other lakes and its water discharge to Lake Parker (at high water levels) through an adjustable control structure (City of Lakeland 2010).
Key Stakeholders Involved and Their Roles	The City of Lakeland oversees the Lake Mirror assessment and restoration projects. The Southwest Florida Water Management District (SWFWMD) and/or Florida Department of Environmental Protection (FDEP) may be involved in future restoration projects by providing cooperative funding.
Watershed Plan & Other	*Impaired Waters Listing* The area includes the watershed drainage area from the Lake Mirror watershed within 1497G. This WBID is impaired for nutrients (chlorophyll-a and TP) based on the years the

Supporting Documentation	AGMs and sample sizes were exceeded during the Verified Period (2009-2015). In FDEP's latest version of the Comprehensive Verified Impaired List (August 18, 2020), Lake Mirror is not listed as impaired for total nitrogen (TN). However, according to FDEP's preliminary Biennial Assessment Verified List, TN concentrations in Lake Mirror meet the listing threshold for the verified list based on data obtained during the 2013 through 2020 verified period assessment. *Watershed Plan* The City's overall Watershed Plan to restore Lake Mirror includes projects to improve water quality in the lake. The City will focus on the implementation of structural and non-structural stormwater improvements in the watershed and in the lake, and will also include shoreline restoration, aquatic vegetation management, sediment management, stormwater quality improvement, street sweeping and public education. In the Atkins and ESA **2019 Water Quality Management Plan,** laboratory analyses of surface water monitoring data and phytoplankton presence indicate that in-lake water quality is limited by TP and that projects involving enhancement and/or maintenance of native emergent or submerged vegetation should be a priority (further detail is provided in the Restoration Work Section). *Supporting Documentation* The surface water quality monitoring data analysis from the **2019 Water Quality Management Plan** found that the CHLA and TP reductions required are in excess of the range of reductions seen with implementing only traditional lake management techniques such as stormwater retrofits. Therefore, water quality restoration projects will also focus on re-vegetation efforts, whole lake aeration, shoreline restoration, and sediment management in addition to addressing stormwater loads. The preliminary sediment characterization results from Wood's Sediment Characterization study found large deposits of soft sediment (estimated 77,337 cubic yards) in Lake Mirror (**Attachment 2**). Phosphorous fractionation results show somewhat elevated concentrations of biologically available phosphorous (571 – 1,834 mg/kg) within areas of the lake with high organic accumulation. Sampling locations and results can be found in the **Wood Lake Mirror 4e Plan Technical Support Services Technical Memorandum DRAFT (2021)**. Due to the high potential for internal loading, water quality restoration projects will also need to focus on sediment management alternatives such as chemical amendment and/or targeted sediment removal.
Point Sources and Indirect Source Monitoring (Sites)	There are 57 stormwater discharges in the Lake Mirror watershed, including 17 minor outfalls, eight retention/detention outfalls, seven stormwater discharges, three flumes, and 22 end of pipe inputs (please see **Attachment 3**). The majority of the existing residential developments within the watershed utilize sanitary sewer for wastewater treatment provided by the City of Lakeland. The entire area is regulated by a MS4 permit # FLS000015-004, issued by FDEP to Polk County and co-permittee City of Lakeland. Note: Generic Permits for stormwater discharge from large and small construction activities are considered temporary; therefore, are not included in this listing.

Nonpoint Sources	The northern bank of Lake Mirror is lined with commercial structures and roadways, while the southern bank is surrounded by institutional development. The Lake Mirror watershed consists mostly of institutional and commercial land use, with some residential areas (please see **Attachments 4 and 5**). There is no wetland fringe associated with the lake, as it is completely surrounded by impervious ground cover and developed up to the water's edge all the way around. Less than ¼ of the shoreline along Lake Mirror is natural shoreline, while the remaining shoreline has been hardened by seawalls. The natural shoreline has experienced significant erosion in the past due to runoff from surrounding developed areas. As previously discussed, the sediment characterization results from Wood's Sediment Characterization study indicate presence of localized soft sediment within the center of the lake with high potential for phosphorous release, in Lake Mirror. Additional sediment samples may be collected and analyzed to determine the impact that internal nutrient cycling from sediment flux has on internal loading and water quality conditions in the lake. The primary nonpoint sources of nutrients are assumed to be internal sediment loading and stormwater runoff. Several studies are currently being conducted to characterize both internal and external nutrient nonpoint sources that impact in-lake water quality.
Water Quality Criteria	Lake Mirror is a low-color lake with high alkalinity (lake assessment type 2). Based on the procedure for determining numeric nutrient criteria (NNC), outlined in Rule 62-30.531, F.A.C., the NNC for nutrients in Lake Mirror are 20 ug/L, 0.03 – 0.09 mg/L, and 1.05 – 1.91 mg/L for chlorophyll-a, total phosphorus, and total nitrogen, respectively, which is anticipated to be achieved upon successful implementation of the Water Quality Restoration Plan.
Restoration Work	Individual project locations, descriptions, cost, and completion dates (actual and anticipated) are included below and summarized in greater detail within **Attachment 6**. **Ongoing** • The City of Lakeland has a robust street sweeping program in place where the streets within the Lake Mirror watershed are swept approximately once to twice per month; downtown Lakeland streets within the contributing drainage of Lake Mirror are swept twice per week. The City is currently reviewing options that would allow tracking of street debris, and subsequently nutrient load, removed within distinct drainage basins. During the previous NPDES reporting year (October 1, 2019 through September 30, 2020) a total of 1,896.29 tons of street debris was swept from City streets, removing 1,032.62 lbs, of TN and 2,257.07 lbs. of total phosphorus loading to City lakes. See **Attachment 7** for the current street sweeping routes and schedule. • Polk County passed a Fertilizer Ordinance in 2013, which was adopted by the City of Lakeland. See **Attachment 9** for ordinance document. Additional relevant City ordinances are provided at the end of this document for reference. • The City regularly participates in educational and outreach events that provide education regarding stormwater pollution and lake ecology. The education and outreach program consists of public events, social and digital media, and school presentations: ○ Public events such as the annual Green Celebration Earth Day event every April

    - Annual Water, Wings & Wild Things educational event sponsoring more than 2,500 second grade students from Polk County
    - School presentations to more than 10 classrooms annually as part of the Great American Teach in each November (K-5)
    - Cardboard Boat Challenge and Lakes Festival attended by more than 500 participants each October
    - Social Media (City of Lakeland Facebook and Instagram) posts featuring "Water Warriors Tuesday" and "Lakefront Friday" with 486,000 impressions in FY19 and up almost 300,000 in FY20
    - The City has produced public service announcements featuring Toby's Water Warriors (Toby the Turtle, Finn the Fish, Ollie the Otter, and Hope the Heron) highlighting the importance of healthy lakes and stormwater pollution prevention actions that are shown before each movie screening at Lakeland movie theaters, (as well as on multiple cable TV channels combining for more than 2,000,000 views annually
    - Distribution of educational materials including educational activity books, Adopt a Lake, Living at the Lake, and Stormwater Pollution Prevention brochures (more than 1,000 pieces annually)
- The City has robust submerged and emergent aquatic plant management plans that include targeted removal of nuisance and invasive species and introduction of beneficial aquatic plants for water quality and shoreline protection
- Employment of a City Environmental Code Enforcement Officer that focuses on stormwater pollution prevention, illicit discharge identification and elimination activities within City limits

Completed

- Lake Mirror Bathymetric survey
- Lake Mirror Submerged Aquatic Vegetation (SAV) survey

Planned and Underway

Specific pollutant load reductions were not calculated for the Lake Mirror projects, but the cumulative effect of these projects will reduce nutrient loadings and will improve water quality of the subject waters.

Ten restoration activities are planned or currently underway within the Lake Mirror Watershed with an estimated cost of $1.076 million. Several of the projects are expected to commence upon approval of the 4e application, while some are currently underway, with an estimated completion date of 2023. These projects will focus on improvement of surface water quality, habitat enhancement, reductions in sediment flux and transport from erosion, and selection of additional restoration projects. Several of the current investigations will result in implementation of additional stormwater treatment and water quality improvement projects in the future. Funding for the selected projects, contingent upon results from ongoing studies, is included in the Stormwater Capital Improvement Plan (CIP).

- The City is planning an additional Assessment and Feasibility study of Lake Mirror to evaluate surface water quality and potential sediment flux. This study will allow for appropriate selection of additional restoration activities.
- Geosyntec is currently completing a BMP Feasibility Study for Lake Mirror. The study is expected to be complete by mid-2023. Upon completion of the study, the City will select appropriate, effective BMPs for stormwater treatment that will be funded in the Stormwater Capital improvement Plan (CIP). This study includes the following elements:

- Further delineation of stormwater contributing areas
- Stormwater quality assessment and laboratory analysis
- Water quality modeling to determine pollutant loading capacities
- Development and ranking of proposed BMPs for stormwater treatment

- Wood has completed a sediment characterization and muck thickness study for Lake Mirror to assess the extent that internal sediment cycling may have on nutrient loading into the lake. Sediment capping was proposed to address the sediment driven internal nutrient load.
- ESA is currently conducting a Before, After Control Investigation using a Solar Bee to evaluate the efficacy of water circulation in Lake Mirror. The study will conclude in June 2022, at which time the City will develop a final design and implement circulation and/or aeration within Lake Mirror, using CIP funds.
- Shoreline restoration and revegetation efforts are ongoing. In 2020, approximately 250 feet of eroded shoreline was repaired using Dredgesox technology. The shoreline was regraded, stabilized, reinforced with the Dredgesox liners packed with sediment removed from the lake bottom, and revegetated. Submerged and emergent native aquatic vegetation, including pickerel weed, duck potato and eelgrass have been planted along the shoreline for stabilization and enhancement.
- Replanting of Floating Treatment Wetlands to be completed in 2021
  - Planting of wetland species on previously deployed units
- Reintroduction of native aquatic plant species is ongoing
  - Continuous efforts to promote native vegetation in Lake Mirror. Additional planting is planned for Summer of 2021 including eelgrass grown on coir mats at the Lakes & Stormwater Division's aquatic plant nursery.

Critical Milestones/Monitoring

Anticipated Critical Milestone(s) and Completion Dates:

Additional information is contained within **Attachment 6**.

- Sediment Characterization- Complete
- Before, After, Control and Impact Study of Water Circulation and Aeration – In progress, with an anticipated completion date of 2022
- Lake Assessment and Feasibility Study - Planned, with an anticipated completion date of 2022
- BMP Feasibility Study – In progress, with an anticipated completion date of 2023

Monitoring Component

Existing and ongoing City of Lakeland and Polk County Division of Natural Resources ambient water quality monitoring programs:

The City of Lakeland's L&S Division, in coordination with the Polk County Natural Resources Division, completes ambient monitoring of Lake Mirror, on a quarterly basis.

Lake	Station	Start Date	End Date	Number of Samples				
				TN (mg/L)	TP (mg/L)	TSS (mg/L)	ChlA (ug/)	ChlA C (ug/L)
Lake Mirror	MIRROR-COL	9/17/2007	3/16/2021	58	81	56	72	72
Lake Mirror	MIRRORWQ	11/21/1988	3/16/2021	462	466	466	465	362

A list of parameters sampled, as part of the ambient monitoring program, is provided as **Attachment 8.**

City of Lakeland Biological Monitoring
The City of Lakeland completed a Lake Vegetation Index (LVI) for Lake Mirror on May 25th, 2021.

Wood sediment characterization for City of Lakeland:
Wood collected four sediment cores from locations within Lake Mirror on May 13th, 2021 to characterize the physical and chemical composition of the sediment. Analyzed parameters include grain size (i.e. % silt and % clay), % dry weight, bulk density, volatile solids, total phosphorus, total Kjeldahl nitrogen, ammonia, total organic carbon, iron, calcium, aluminum, nitrate-nitrite, total sulfur, and the full suite of phosphorus fractionation parameters. At the time of sampling, in-situ measurements of pH, temperature, specific conductance, and dissolved oxygen were also collected in the lake at various depths at each sampling location. A complete list of parameters and sediment quality results can be found in the **Wood Lake Mirror 4e Plan Technical Support Services Technical Memorandum DRAFT (2021).** Further review of these initial data is being conducted to determine if additional sampling efforts will be needed to calculate sediment nutrient flux rates, internal loads and to assess the effectiveness of various treatment alternatives.

City of Lakeland Phytoplankton Monitoring:
Phytoplankton samples are collected quarterly and analyzed for cyanobacteria. The City samples phytoplankton on a quarterly basis and data can be provided upon request.

SWFWMD water level monitoring program:
The SWFWMD recorded water levels monthly, from 2007 to 2019, at Station 19087.

Other Key Dates

Estimated Date for Delisting from Verified List or Removal from Study List	WBID 1497G (Lake Mirror) is in the state's Group 3 Sarasota Bay – Peace – Myakka Basin. The current review and assessment cycle (the initial biennial assessment) is scheduled for completion in 2022. This waterbody is currently impaired for nutrients (chlorophyll-a and total phosphorus) and the earliest opportunity for delisting would happen during the upcoming biennial assessment. However, if these parameters do not meet delisting requirements, they will remain in assessment category 4e for an additional biennial assessment cycle, which will postpone TMDL development.

Financial Commitments

Estimated Implementation Cost	Total Financial Commitment of Completed Projects $1.076 M Total Anticipated Ongoing /Planned Financial Commitments $500,000 The estimated 20-year operation and maintenance cost is $500,000 (if applicable). *Additional grant applications may be submitted for subsequent activities, including SWFWMD CFI and/or 319(h) Clean Water Act Section grants.

Land Acquisition (if applicable)	**Funding Source:** Total……..$__NA_____

References:

City of Lakeland Codes/Ordinances:

Code of the City of Lakeland, Ordinance no. 5080, Chapter 86, Section 86-3:

It shall be unlawful for any person to throw, spill, place deposit or leave, or cause to be thrown, spilled, placed, deposited or left, or to permit any servant, agent or employee to throw, spill, place deposit in or upon any street, highway, alley, sidewalk, park or other public place in the city any dirt, sweepings, filth, shells, garbage, vegetables, dead carcasses, sewage, slops excrement, compost, stable manure, ashes, soot, tin cans, rags, wastepaper, leaves, brush, weeds, grass, straw, hay, excelsior, shavings, barrels, crates, boxes, litter, or loose combustible material; materials subject to be carried by the wind, or unwholesome, noisome or putrescible matter of any kind.

Code of the City of Lakeland Land Development Regulations under Natural Resource Protection Regulations, *Article no. 34.06.05.01*:

Adequate measures of erosion control shall be established upon all applicable sites. Compilation of all features on site may necessitate unified measures of control. Adequate measure of control shall be defined as those needed to minimize or eliminate any transfer or removal of soil from a site during a rainfall event.

Code of the City of Lakeland, Chapter 86, Ordinance 5080 Section 86-4

It shall be unlawful for any person to allow any swill, slops or malodorous or noxious liquids to run, drop, or fall into or upon any sidewalk, street, alley, park, lake, stream, or other public place and it shall be unlawful for any person to allow any water, grease, or any slippery matter to fall, drop, or to be deposited upon any sidewalk, street, highway, or alley within the city.

City of Lakeland. 2010. 2009 Lakes Report. City of Lakeland Lakes and Stormwater. 64 pp

ESA and Atkins. 2019. City of Lakeland Water Quality Management Plan. 337 pp

MS4 Annual Report:

ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/Phase_I_MS4s/FLS000015_Polk_County/Lakeland/Permit%204%20Year%203%20Annual%20Report/

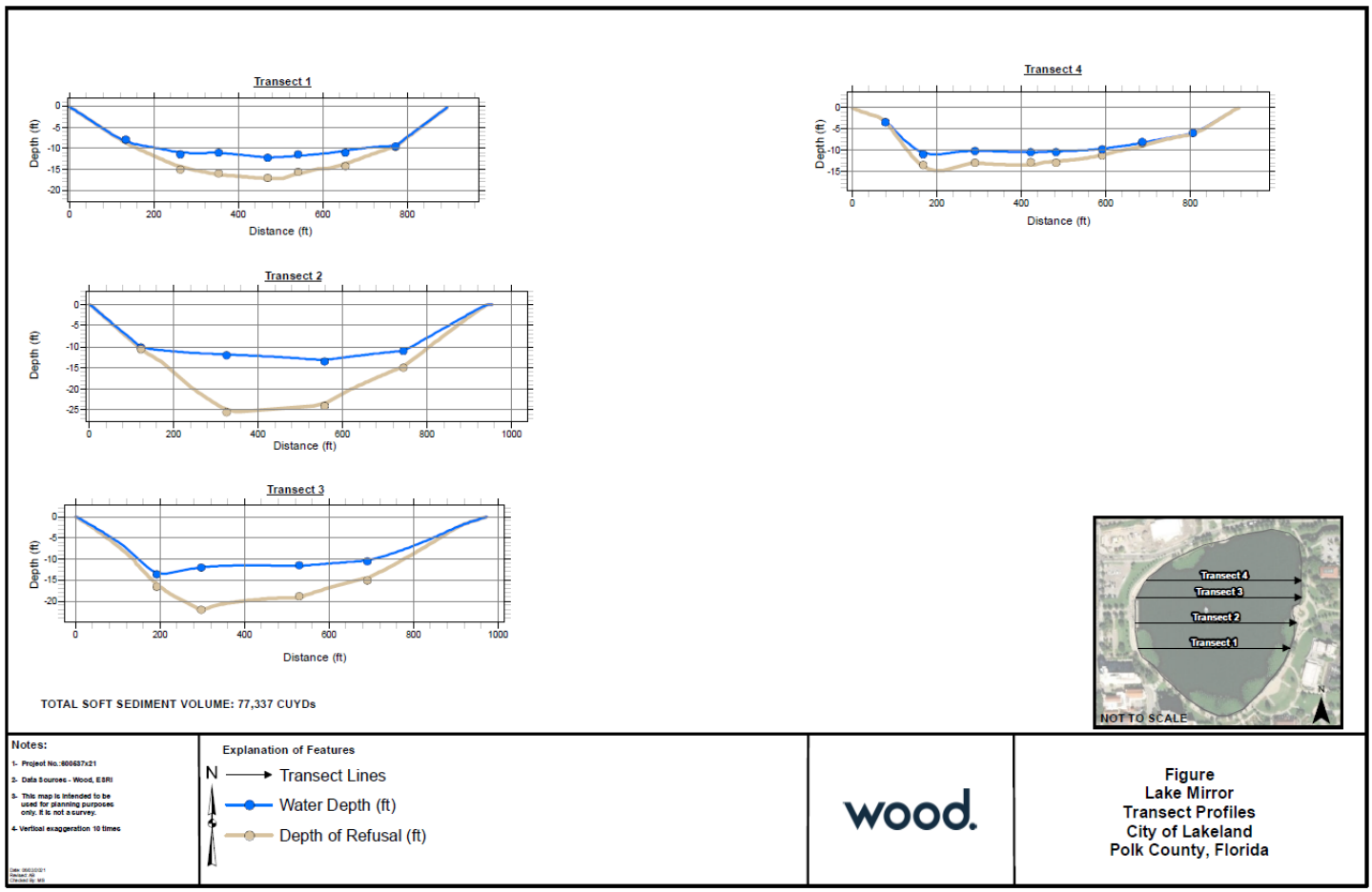
Attachments: Supporting Documentation

1) Lake Mirror Location Map
2) Lake Mirror Soft Sediment Transect Profiles
3) Lake Mirror Contributing Outfalls Map
4) Lake Mirror Land Use Map

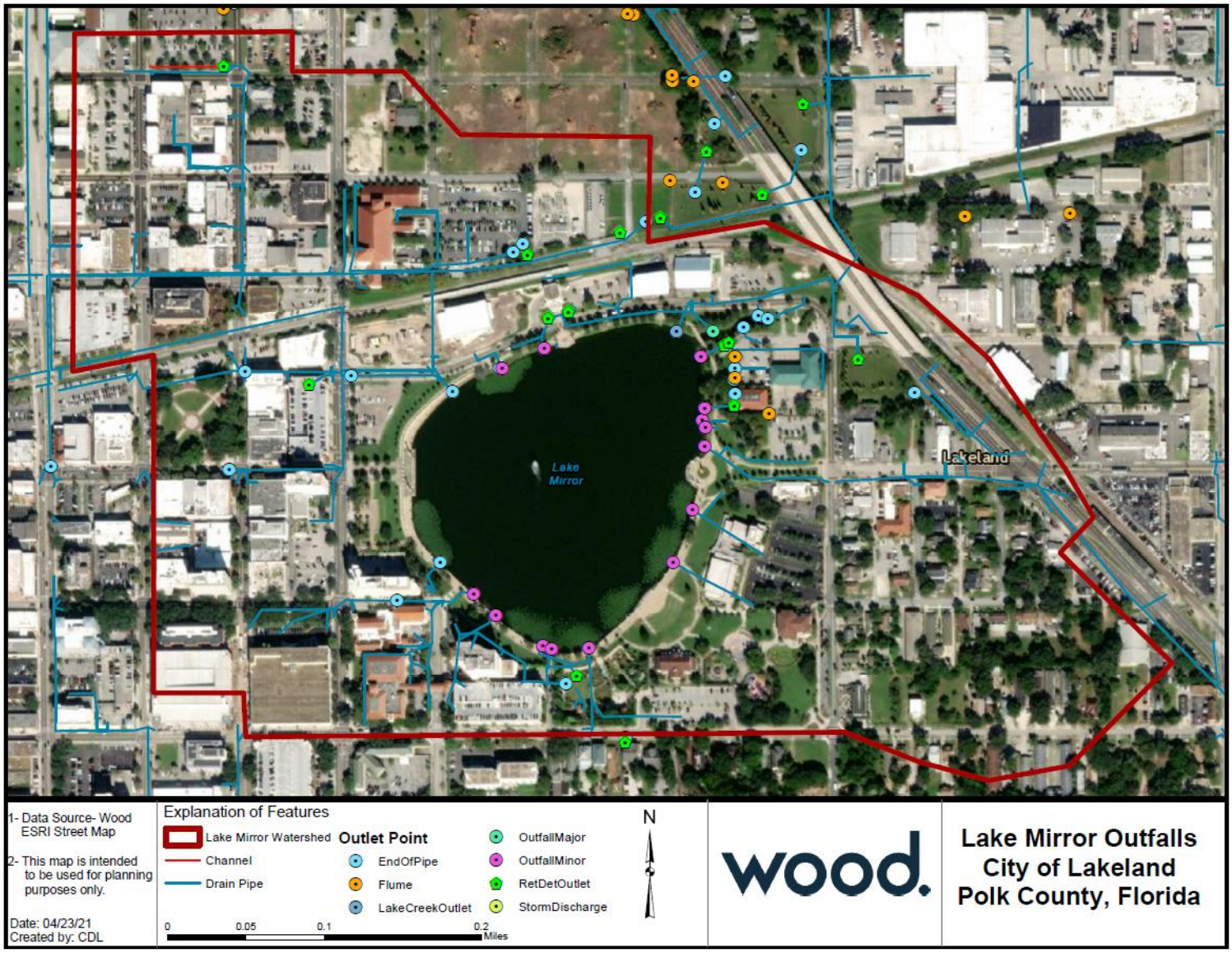
5) Land Use Description and Acreage Table
6) City of Lakeland Completed & Planned Projects
7) City of Lakeland Street Sweeping Route and Zones
8) Water Quality Monitoring Program Sampled Parameters Table
9) Polk County Fertilizer Ordinance (*provided under separate cover as a .zip file)*
10) 2019 City of Lakeland Water Quality Management Plan (*provided under separate cover as a .zip file)*
11) Wood Lake Mirror 4e Plan Technical Support Services Technical Memorandum DRAFT(*provided under separate cover as a .zip file)*

Attachment 1- Location Map

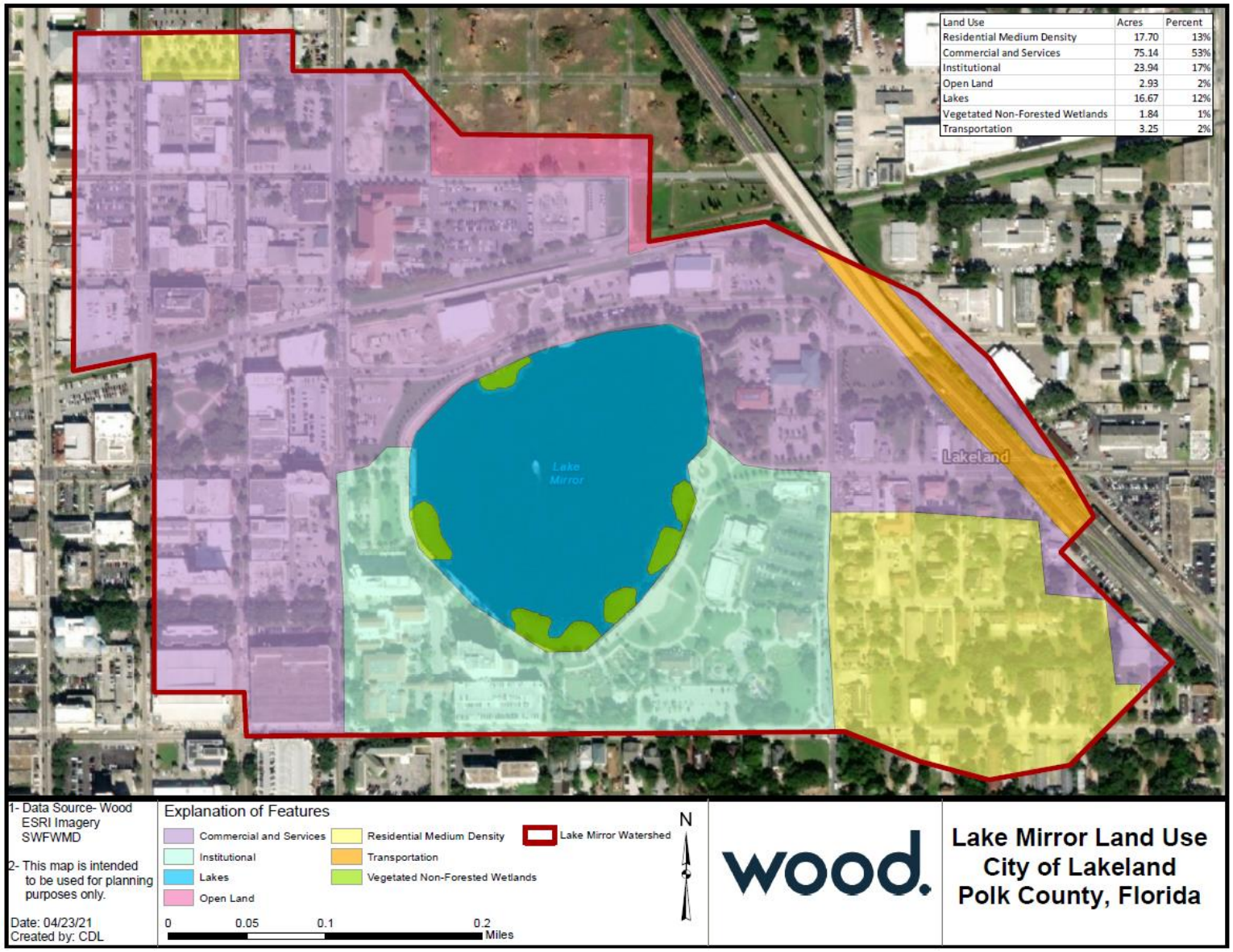
Attachment 2- Soft Sediment Transect Profiles



Attachment 3- Contributing Outfalls Map



Attachment 4- Land Use Map



Attachment 5- Land Use Description Table

FLUCCS CODE	LAND USE DESCRIPTION	AREA (AC)	PERCENT
1200	Residential Medium Density	17.70	14%
1400	Commercial and Services	75.14	60%
1700	Institutional	23.94	19%
1900	Open Land	2.93	2%
6400	Vegetated Non-Forested Wetlands	1.84	1%
8100	Transportation	3.25	3%
Total		125	100%

Attachment 6

City of Lakeland Stormwater Projects in the Lake Mirror Watershed

Completed and Ongoing Projects

Project Name	Description	Cost	Restoration Activity	Completion Date
Floating Treatment Wetlands	Deployment of a floating wetland	$10,000	Uptake of nutrients to improve water quality	2019
Sediment Characterization (Wood)	Screening level muck thickness survey and sediment characterization to establish if sediment flux has potential to impact the system	$16,000	Analysis of physical and chemical parameters of sediment and mapping of soft-sediment thickness. If sediment is found to be a major source, then sediment management project will be developed to reduce internal load.	Summer 2021
Shoreline Restoration (City)	Restoration of natural shoreline and revegetation efforts (approximately 250 linear feet per year since 2019)	$45,000	Revegetation of the natural shoreline and littoral shelf with submerged and emergent native plant species to promote stability	Ongoing (restoration completed as needed)
Shoreline Restoration (City)	Dredgesox technology to repair eroded shoreline	$15,000	Restored shoreline reduced sedimentation into the lake	Ongoing (repairs are completed as needed))
Native aquatic plant species planting (City)	Reintroduction of native aquatic plant species	$30,000	Placement of coconut fiber mats inoculated with eel grass to re-establish healthy population of aquatic vegetation and improved water quality	Ongoing (indefinitely as needed)

Attachment 6 (cont'd)

Planned Projects

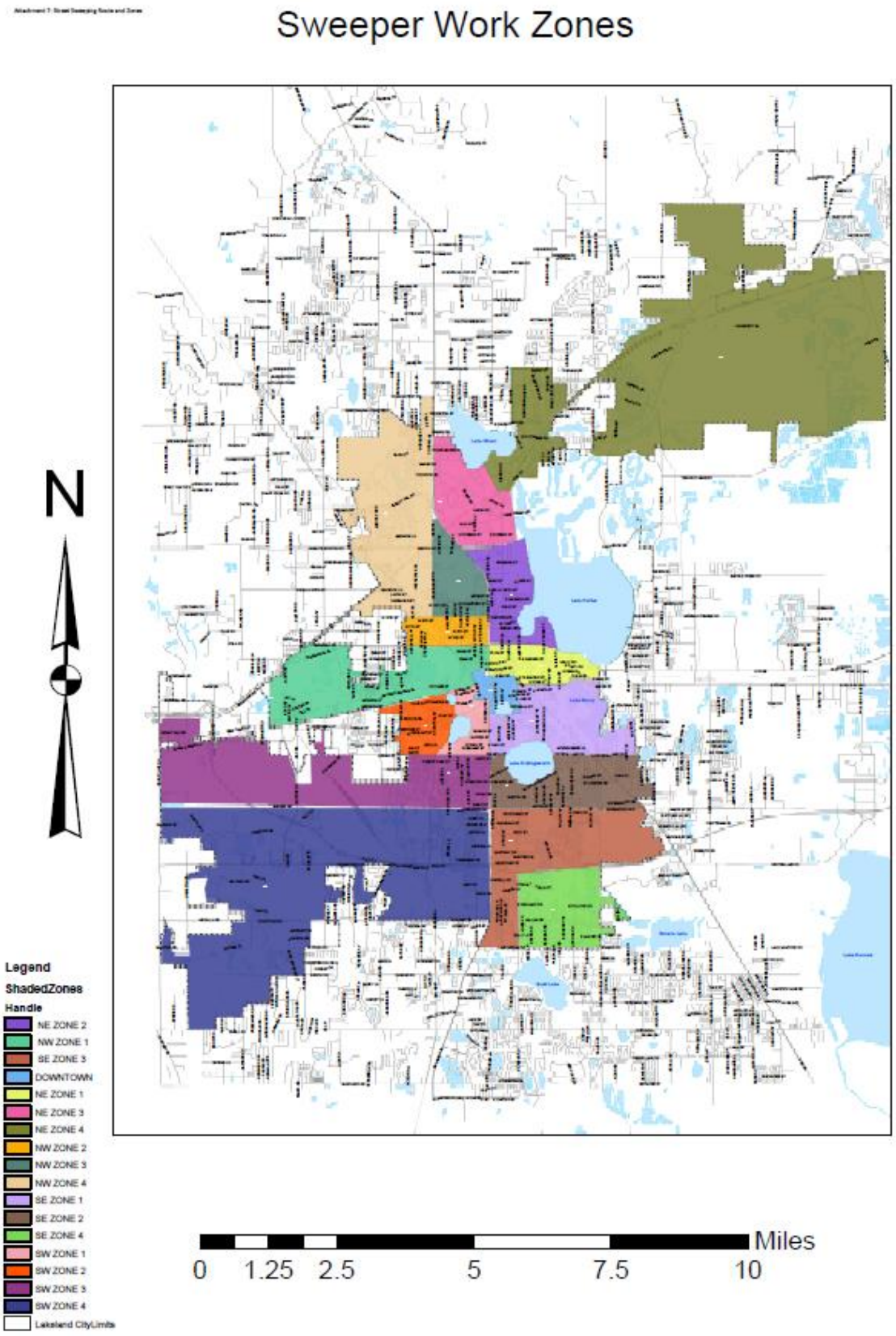
Project Name	Description	Cost	Restoration Activity	Estimated Completion Date
Before, After, Control and Impact Study of Water Circulation and Aeration (ESA)	Water quality sampling before, during, and after installation of a Solar Bee water circulation unit to improve surface water quality	$95,000	Add aeration system to the lake to enhance circulation and increase dissolved oxygen levels and reduce nutrient flux from sediments	2022
BMP Feasibility Study (Geosyntec)	Assessment and review of stormwater and ambient water quality, development of models to determine pollutant loading capacities and flood routes, and development of ranked BMPs to treat stormwater	$165,000	Selection of appropriate, effective BMPs for stormwater treatment to improve water quality	2023
Lake Assessment and Feasibility Study	Evaluation of Lake Mirror surface water quality	$36,000	Study will be conducted to allow for appropriate selection of restoration activities	2022
Floating Treatment Wetlands	Replanting of wetlands originally deployed in 2019	$25,000	Uptake of nutrients to improve water quality	June 2021
Rain Gardens	Construction of rain gardens at select locations	$50,000	Nutrient reductions and groundwater recharge	Conceptual phase – to be completed by 2024
Promenade Inlet Retrofit	Retrofitting existing inlets to include tree wells enhanced with BAM	$100,000	Treatment of stormwater runoff prior to discharge into the lake	Conceptual phase – to be completed by 2025
Hollis Gardens Enhancement	Florida friendly landscaping, bioswale installation, and/or rain gardens	$125,000	Additional nutrient uptake and reduced fertilizer runoff	Conceptual phase – to be completed by 2025
Upflow Filter	Installation of an upflow filter containing BAM	$125,000	Stormwater treatment prior to discharge to Lake Mirror	Conceptual phase – to be completed by 2026
Pump and Treat	Construction of a pump and treat system with a subsurface detention system with BAM	$200,000	Nutrient reductions	Conceptual phase – to be completed by 2027
Lake Mirror Sediment Treatment	Targeted treatment of the sediment via chemical inactivation to reduce internal nutrient cycling and loads to the lake	$75,000 - $270,000	Nutrient reductions from internal loading	Conceptual phase – to be completed by 2027

Attachment 7- Street Sweeping Routes and Zones

Truck 1	Truck 2	Truck 3	Truck 4	Truck 5	Truck6
NE 1 NE 2 NE 3 NE 4 each zone swept every 3 weeks	NW 1 NW 2 NW 3 NW 4 each zone swept every 3 weeks	SE 1 SE 2 SE 3 SE 4 each zone swept every 3 weeks	SW 1 SW 2 SW 3 SW 4 each zone swept every 3 weeks	Lake Basins This truck sweeps roads immediately adjacent to lakes on an ongoing basis	Parking Lots/landfill Every Wednesday
Also sweeps downtown every Monday & Thursday	Also sweeps downtown every Monday & Thursday	Also sweeps downtown every Monday & Thursday			

- We have six sweepers; one mechanical and five vacuum trucks.
- The mechanical sweeper (Truck 6) does parking lots, the landfill, and the C&M yard.
- One of our vacuum trucks (Truck 5) does the lake basin route on an ongoing basis.
- The other four vacuum trucks (Trucks 1 - 4) are assigned to zones. We have four zones and each zone is broken up into quadrants. They sweep quadrants in a clockwise rotation within the zone.
- It takes the crews about three weeks to complete one zone rotation.
- The downtown quadrant is swept by three trucks (Truck 1 - 3) twice a week on Mondays and Thursdays.

Attachment 7- Street Sweeping Routes and Zones (Cont'd)



Attachment 8- Water Quality Monitoring Program Parameters

Ambient Monitoring Program Sampled Water Quality Parameters
Alkalinity, Total
Chloride
Chlorophyll a, corrected for pheophytin
Chlorophyll-a, uncorrected for pheophytin
Dissolved Oxygen
Hardness, Ca + Mg
Iron
Magnesium
Nitrogen, ammonia (NH3) as NH3
Nitrogen, Kjeldahl
Nitrogen Oxides (NOx)
Total Nitrogen (TN)
pH
Phosphorus as P
Phosphorus, orthophosphate as P
Secchi disk depth
Sodium
Specific conductance
Sulfur, sulfate (SO4) as SO4
Temperature, water
Total Suspended Solids (TSS)
True Color
Turbidity