APPENDIX B:

MONITORING NETWORK AND DATA COLLECTION

B.1 Automated Monitoring Network

In accordance with the Monitoring Plan, FPL has installed an extensive automated monitoring network to collect groundwater, surface water, and meteorological data over a broad area surrounding Turkey Point. A brief overview of each component of the monitoring network is provided below. All sampling and laboratory analysis are conducted in accordance with the QAPP (FPL 2013).

B.1.1 Meteorological Monitoring

A meteorological station (TPM-1) was set up near the center of the CCS (Figure 2.1-1) in June 2010. This station consists of a weather transmitter (WXT520, Vaisala, Inc., Helsinki, Finland) and a quantum sensor (190SA, LI-COR, Inc., Lincoln, Nebraska) attached to a datalogger (CR1000, Campbell Scientific, Ltd., Logan, Utah) and telemetry system. It is mounted 15 feet (ft) above the ground surface; the parameters measured are listed in Table 2.1-1. Technical specifications for the instrumentation are provided in Appendix I of the QAPP (FPL 2013). The Vaisala WXT520 measures solar radiation, wind speed, wind direction, air temperature, and relative humidity. However, due to issues with the Vaisala rainfall sensor, rain monitoring was transitioned to a TB-3 tipping bucket sensor (Hydrological Services, Inc., Liverpool, New South Wales, Australia) in June 2015. All other parameters continue to be reported from the Vaisala WXT520. Monitoring at TPM-1 has been continuous for the reporting period, with data recorded hourly. Data are uploaded via telemetry to the FPL database on a daily basis.

In addition to the meteorological station at TPM-1, FPL initially installed rainfall gauges around the CCS to gain information on the distribution of rainfall, particularly in the CCS. However, it was subsequently determined that the rainfall data generated by high-resolution Next Generation Radar (NEXRAD) utilized by the SFWMD could be more useful and accurate, as this rainfall data could be provided in integrated cells that encompass the CCS. With approval from the SFWMD, FPL began relying on the NEXRAD data for the water budget beginning in June 2013. There are a total of 13 cells that fully or partially encompass the CCS. The data used are downloaded directly from the SFWMD DBHydro website and processed to calculate rainfall in the CCS. The rainfall data are weighted to account for the coverage area each cell represents compared to the total area of the CCS. For example, if a cell covers 10% of the CCS, then only 10% of rainfall from that cell is used to calculate the average daily rainfall value. The area encompassed by all cells is then aggregated to obtain the total rainfall over the CCS. NEXRAD data are particularly useful for the water budget since zones have been set up that represent different spatial conditions in the CCS based on considerations such temperature, seepage, and evaporation. Rainfall in cells are weighted based on their coverage of each zone, thereby enabling a more detailed breakdown of water gains in and out of the CCS at different locations. NEXRAD data are available from 1996-2019; however, the SFWMD has indicated that they have more confidence in the data from the past 11 years due to improvements in technology and consistency in analysis. The NEXRAD data are available and downloaded from the SFWMD DBHydro website (https://www.sfwmd.gov/science-data/dbhydro).

In addition to the rainfall data at TPM-1 and NEXRAD, FPL also compares rainfall with the SFWMD long-term S20F gauge site (data from 1968 to 2019). The difference between the NEXRAD data and single-point continuous measurements made at locations such as at TPM-1 and S20F is that the NEXRAD data are being used to calculate average daily rainfall over 4,600 acres of CCS surface water while the individual stations measure rain at a single location. For temperature, data from the Homestead General Aviation Airport (Homestead Airport) are used to compare against TPM-1.

B.1.2 Groundwater Monitoring

Fourteen well clusters (TPGW-1 through TPGW-14) were installed in and around the CCS in 2010 (Figure 1.1-2). Each well consisted of three wells stratified by depth and defined as "S" for shallow depth wells, "M" for intermediate depth wells, and "D" for deep depth wells. Each well was discretely screened in a high-flow zone with 2 to 5 ft of screen. The depth to each well screen interval was determined in conjunction with the USGS and located in high-flow zones within the Biscayne Aquifer.

In each of these wells, two automated probes manufactured by In-Situ, Inc. (an Aqua TROLL® 100 [AT100] and a Level TROLL® 500 [LT500]) were deployed, primarily between June and September 2010, and set to record water quality parameters and water elevations, respectively. The measured groundwater quality parameters are actual conductance and temperature. Specific conductance, salinity, density, and total dissolved solids are calculated by the instrumentation based on the measured parameters. Water elevations are calculated from the pressure data and reference level settings. Readings were initially set to record data at 15-minute intervals; however, in consultation with the Agencies, the frequency was changed to 1-hr intervals from February-April 2013. The probes are connected to a telemetry unit, and the data at each of these sites are currently transmitted nightly to the Electronic Data Management System (EDMS) by a satellite or cellular-connected telemetry units. From July 2016-early 2019, transmission was via a satellite telemetry system, but the systems were switched out to a Campbell Scientific datalogger connected to a cellular system between March-June 2019. All telemetry units are powered with 12-volt batteries that are recharged by solar panels.

During the reporting period (June 2018 through May 2019), the automated station data were typically recorded and stored on the instrument; however, due to telemetry issues, the data were not always transmitted to the FPL database on a daily basis. If the system did not automatically transmit the data, FPL downloaded the data from the probes and then posted the information to the EDMS. In the past, data were routinely downloaded from probes during the cleaning and calibration events; however, data downloads have occurred more frequently, depending on need.

As part of the routine monitoring, all well clusters are purged annually to remove any stagnant or stratified water in the casing above the well screen. Stratification can occur as a result of leakage of less dense water at or near the well surface or changes in groundwater chloride concentration in the formation over time. If the density of the water in the solid casing above the well screen differs from the density of the water in the formation, the water level readings may be slightly

affected and not fully representative of the actual water elevation/pressure at the screened interval.

During the reporting period, FPL converted monitoring well cluster TPGW-7 from a flush-mounted well in a vault to stick-up construction to eliminate over topping issues caused by flooding. While the vault provided more protection from vandalism, overtopping was impacting the representativeness of water level elevations in the deep well. Water quality results were not impacted. During the reporting period, risers were installed on the wells at well cluster TPGW-7 to prevent issues with the wells being overtopped with flood waters. The new, surveyed top-of-casing elevations are included in Table 1.1-2. In prior years, FPL had converted a number of other wells that were originally constructed as flush-mounted to stick-up, including TPGW-2, TPGW-3, TPGW-6, TPGW-12, and TPGW-13, to address overtopping issues.

The deployed probes are visited at 8- to 10-week intervals for cleaning and calibration verification. Readings from all the probes are verified using the protocols and ranges specified in the QAPP. If a probe does not meet the verification requirements, then the probe is calibrated to reset the settings on water quality and water level value. If a probe is not able to be calibrated or reset, then the unit is swapped out.

Over 3.0 million automated groundwater data points are generated each year. All raw automated hourly data are made available to the Agencies upon receipt by FPL in the EDMS on a nightly basis for the stations that are on telemetry. Missing data or data from stations not on telemetry is patched in shortly after manual retrieval by the field crew during site visits. This data then undergoes a lengthy QA/QC process that begins with the review of the time-series of the data. Calibration field logs (Appendix F), field water level and water quality qualifiers (Appendix E), field notes, quarterly sampling data, and any other additional data (e.g., rainfall, meteorology, plant operations) are reviewed in conjunction with the automated data in order to help qualify the data. Data are qualified, as appropriate, using the qualification codes outlined in the QAPP (FPL 2013). A detailed description of qualifiers is provided in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a) and the QAPP (FPL 2013). These qualifiers are consistent with those used by FDEP and/or the SFWMD. Data are QA/QC-ed every 8-10 weeks, typically within several months of a probe cleaning/calibration event and all appropriate qualifiers applied.

B.1.3 Surface Water Monitoring

Currently, 28 surface water probes (AT100s and AT200s) are deployed throughout the monitoring area (20 stations), generating more than 1 million data points each year. These surface water stations were installed as part of the monitoring network primarily from June 2010 through September 2010 with input from the Agencies. While there have been a few minor changes over the years, the monitoring locations during the reporting period include automated surface water stations at the following locations:

- Seven stations in the CCS (TPSWCCS-1 through TPSWCCS-7);
- Five stations in adjacent canals (TPSWC-1 through TPSWC-5);

- Three stations in the Interceptor Ditch (TPSWID-1 through TPSWID-3); and
- Five stations in Biscayne Bay and Card Sound (TPBBSW-3 through TPBBSW-5, TPBBSW-10, and TPBBSW-14).

In addition, in 2010, a non-automated station was set up at the Card Sound Road canal (TPSWC-6) as part of the monitoring network.

Currently, all automated stations record water quality and water elevation data, with the exception of Bay stations TPBBSW-4 and TPBBSW-5, which record only water quality parameters. The measured surface water quality parameters are actual conductance and temperature. Specific conductance, salinity, density, and total dissolved solids are calculated by the instrumentation based on the measured parameters. Water elevations are calculated from the pressure data and reference level settings. While a number of the sites that record surface water data have two probes (top and bottom), some have only one probe, depending on surface water depth and other considerations. When two probes are used at one location, one probe is placed near the surface and typically measures water quality parameters and pressure/water level (In-Situ, Inc., Aqua TROLL® AT200 [AT200]), while the second probe (AT100) is placed 1 ft from the bottom and only measures water quality parameters. When only one probe is deployed at a location, with the exception of the Bay stations, it is generally an AT200 placed approximately 1 ft from the bottom. Table 3.2-1 summarizes the probes currently used at each surface water station and the parameters measured; these are the same as those reported for the previous reporting period. Data are QA/QC-ed every 8-10 weeks, typically within several months of a probe cleaning/calibration event and all appropriate qualifiers applied.

B.2 Analytical Monitoring

Groundwater, surface water and rainfall samples were collected four times during the reporting year (June 2018, September 2018, December 2018, and March 2019) and analyzed for parameters listed pursuant to the Monitoring Plan (i.e., quarterly versus semi-annual parameters) and incorporating approved reductions by the SFWMD in 2013. Marsh and mangrove porewater samples are collected four times a year as well (August 2018, November 2018, February 2019, May 2019) and analyzed in similarly defined semi-annual and quarterly events. Biscayne Bay porewaters are collected twice a year, during the spring (May 2019) and fall (September 2018) events.

Water samples were analyzed by FPL's Central Laboratory (ions, metals, nutrients), TestAmerica Laboratory Inc. (boron, strontium, sulfide, fluoride), and one of three laboratories (USGS Tritium Laboratory, University of Miami Rosenstiel School of Marine and Atmospheric Science Tritium Laboratory, or Isotech Laboratories Inc.) for tritium, depending on laboratory capacity. Leaf samples are analyzed at the Stable Isotope Lab at the University of Miami. Additional samples are also collected for QA/QC purposes per FDEP protocols and as outlined in the QAPP (FPL 2013).

B.2.1 Groundwater

Groundwater samples were collected quarterly from discrete screen intervals from the shallow, intermediate, and deep wells for each of the 14 well clusters (TPGW-1 through TPGW-14). In addition, groundwater samples were also collected from historical wells (TPGW-L3, TPGW-L5, TPGW-G21, TPGW-G28, and TPGW-G35). These historical wells are continuously screened across the formation, with the exception of TPGW-G28, which is hard-cased to 16 ft below the top of casing. Samples from TPGW-L3, TPGW-L5, TPGW-G21, TPGW-G28, and TPGW-G35 were collected at 18 ft and 58 ft below the top of casing. All samples were collected per the methods outlined in the QAPP (FPL 2013).

B.2.2 Surface Water

Surface water quality samples were collected quarterly for laboratory analyses from 19 stations (28 surface water samples per event) as part of this annual monitoring program (Table 3.0-1). The sampling methods followed FDEP protocols and remained the same as described in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a); samples are still being collected from 1 ft below the top and 1 ft above the bottom of the water column, with the exception of the CCS and the Bay stations. Samples collected in the Bay, as required per the Monitoring Plan (SFWMD 2009), were collected 1 ft above the bottom of the water column, regardless of depth.

B.2.3 Tritium Rainfall

To help assess the contributions of tritium via rainfall, seven rainfall collectors were installed around the CCS, co-located with the groundwater stations (Figure 2.1-1). These collectors consist of a rainfall funnel attached to a 5-gallon container with an inch of mineral oil (to prevent evaporative loss). The cumulative rainfall collectors are retrieved during groundwater sampling and a 250 mL bottle of water is siphoned off for tritium analysis. Quarterly monitoring at these stations has remained the same since the stations were installed in 2010 and 2011.

Evaporation pan data were collected by FPL on a monthly basis from March 2011 to October 2015 from a series of stations located in and around the CCS (Figure 2.1-1). The setup and collection of the evaporation pan sampling is described in previous years' reports. A summary of these data is available in the Comprehensive Pre-Uprate Report (FPL 2012a) and the Comprehensive Post Uprate Report (FPL 2016a).

B.3 Ecological Monitoring

Details on the transect plot set-ups, sampling methods, and materials can be found in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a). Figure 1.5-1 shows the sampling locations, and Table 1.1-1 includes the ecological parameters measured during the reporting period. During the reporting period, plant community characteristics (composition, cover, canopy, height, productivity), leaf characteristics, nutrient content in the leaves, and porewater

quality were assessed in 12 transects in marsh and mangrove areas around the CCS (Figure 1.5-1). Two (one each in the marsh and mangrove) of these transects are in reference areas. The parameters collected are dependent on the locations and frequency of the monitoring.

In Biscayne Bay/Card Sound, during the reporting period, submerged aquatic vegetation (SAV), coral and sponge community composition and cover, nutrient content in seagrass leaves and sediment, light attenuation, and porewater quality were assessed in eight transects that paralleled the shoreline (Figure 1.5-1). This monitoring is conducted twice per year.

B.3.1 Marsh and Mangroves

Details of the plot establishment and monitoring setup are provided in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a). Briefly, twelve transects were established across the landscape surrounding Turkey Point (Figure 1.3-1). The transects were monitored to characterize and observe changes in ecological characteristics over time, as described in the Monitoring Plan (SFWMD 2009b). A total of 16 marsh, four tree island, and 12 mangrove 20-meter (m) by 20-m (20x20) plots were established along six marsh and six mangrove transects. Nested within each 20x20 plot were four 1-m by 1-m (1x1) subplots and four 5-m by 5-m (5x5) subplots. The 5x5 subplots were designed to capture changes in the woody species, while the 1x1 subplots were designed to measure changes within the herbaceous community. Of the 32 marsh, tree island, and mangrove 20x20 plots, six were established as reference transects (four in the marsh and two in the mangroves).

A reduction in ecological monitoring was implemented per the SFWMD letter and email dated July 23, 2013 (SFWMD 2013b, 2013c; Table 5.1-1). As part of the reduction, the mangrove vegetation monitoring events were reduced to once a year. Marsh vegetation monitoring continued to be conducted on a quarterly basis, while tree islands were sampled semi-annually for porewater only. Porewater ionic analyses were limited to chloride and sodium, and stable isotopic analyses were eliminated from all sites; tritium continues to be sampled at all sites quarterly, and nutrients are sampled at all sites semi-annually.

B.3.1.1 Vegetation Monitoring

In the 1x1 plots, either 30% of the plants or 15 individuals (whichever value was greater) of the dominant species were tagged. Tagged plants were measured for the parameters needed to calculate biomass estimates. Parameters required for the biomass equations varied with species, but measurements included length, diameter at base, and number of live leaves. This methodology is adapted from the non-destructive phenometric assessment of Everglades sawgrass biomass, as developed by Daoust and Childers (1998). Biomass estimates were subsequently used to calculate annual plot productivity and turnover in grams per square meter.

For the woody species, three trees were tagged in each 5x5 subplot, and up to six branches per tree were tagged. Only dominant species were individually measured. Tree species selection was based on the dominance of each species, and individuals of a species were chosen based on which general tree size represented the highest percentages of biomass in the subplot. For

example, if 60% of the coverage of red mangrove (*Rhizophora mangle*) in a subplot was made up of small trees and 40% of the subplot was made up of large trees, two small trees and one large tree were tagged. Canopy width and length (and depth for white mangrove [*Laguncularia racemosa*] only), height, main stem diameter, and number of branches were recorded for each tagged tree to obtain tree biomass based on published allometric equations (Coronado-Molina et al. 2004).

Additional information about biomass and productivity calculations for dominant woody and herbaceous species is provided in both the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a) and Appendix K. The percent cover values are reported as percentage categories, per the QAPP (FPL 2013) (Table 5.1-5). As ecological sampling initially began in October/November 2010, sawgrass Annual Net Primary Productivity (ANPP) calculated using data collected from November of one year to November of the following year.

B.3.1.2 Leaf Nutrients

Marsh leaf nutrients were collected in November 2018 and May 2019 while mangrove leaf nutrients were collected in May 2019 only. Leaves are collected from the dominant herbaceous and woody species within each plot; however, collections are taken from individuals located outside each of the 20x20 monitoring plots. Further details can be found in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a).

All leaves collected are then dried at 60 degrees Celsius (°C) to constant weight and ground to a powder and homogenized. The marsh and mangrove leaf samples are weighed prior to being ground to obtain leaf sclerophylly and dry biomass (for productivity) values. All samples are then analyzed for leaf total carbon (TC), total nitrogen (TN), total phosphorus (TP), carbon ($\delta^{13}C$), and nitrogen ($\delta^{15}N$) isotope values.

B.3.1.3 Porewater Monitoring

Specific conductance and temperature were recorded in the field from porewater at 0-, 30-, and 60 cm depths, with analytical samples collected at 30 cm for nutrient analyses from all marsh, mangrove, and tree island plots; this is conducted per the Monitoring Plan (SFWMD 2009b) and detailed in Appendix C of the QAPP (FPL 2013) and the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a). Marsh porewater is still collected quarterly but tree island and mangrove porewater is now collected bi-annually as part of these reductions. The sampling protocol, however, remains the same. In brief, samples were collected from the northeast 1x1 and 5x5 long-term monitoring subplots at all sites. The two subplot samples are composited into a single sample that is submitted for laboratory analysis. Samples were analyzed quarterly for sodium, chloride, and tritium, and semi-annually for chloride, sodium, tritium, nitrate-nitrite as nitrogen, unionized ammonia, ammonia as N, TN, total Kjeldahl nitrogen (TKN), phosphorus, and orthophosphate (OP).

B.3.2 Biscayne Bay/Card Sound

On-going ecological monitoring has been conducted on a semi-annual basis since September 2010, with the entire period of record extending through May 2019. The sampling design is based on the Monitoring Plan (SFWMD 2009b) and approved SFWMD revisions (2013b, 2013c), and adheres to the QAPP (FPL 2011a, 2013). Four study areas were selected for ecological sampling—three adjacent to the CCS within Biscayne Bay and Card Sound (BB1, BB2, and BB3) and one reference site in Barnes Sound (BB4) (Figure 1.5-1). The current annual reporting period is for monitoring conducted during September 2018 and May 2019 (one fall event and one spring event).

Briefly, within each of the four study areas, two 2-kilometer (km) long, shore-parallel transects were used to monitor ecological conditions (Figure 1.5-1). These transects, designated "a" and "b," were located approximately 250 m and 500 m from shore, respectively. The original study area included transects that extended 3 km from the western shoreline. The outer transects, "c," "d," and "e," were dropped from the study in the fall of 2013. Each transect was divided into eight 250-m-long segments. A 1-square-meter point randomly selected along each 250-m-long segment during the initial sampling event in September 2010 was used as the permanent location for all future sampling events (Table 5.2-1). These points were numbered 1 through 8. Thus, a sampling point designated as BB1-b-4 represents Area BB1, transect b, and sampling point 4. This design produced a total of 16 sampling points per study area and 64 points for all areas combined. Methods used for data collection during this reporting period followed the QAPP (FPL 2013) and were consistent with those used throughout the historical period of record, as reported in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a).

B.3.2.1 Physical Parameters and Surface Water Quality Data

General environmental data were collected at each sampling point, including tidal cycle, air temperature, wind speed and direction, and sky conditions. The tidal cycle (high, low, ebb, or flood tide) was recorded based on published tide tables. A National Institute of Standards and Technology-certified thermometer was used to determine air temperature. Wind speed was measured using a Kestrel 2000 pocket wind meter, and wind direction was determined using a compass. Sky conditions were noted as clear (0% to 25% cloud cover), partly cloudy (25% to 50% cloud cover), mostly cloudy (50% to 75% cloud cover), or overcast (more than 75% cloud cover). Notes were made of any precipitation during the sampling event.

Light attenuation was measured at a single, fixed sampling point (Sampling Point 4) along each transect. A data logger (LI-1400, LI-COR, Lincoln, Nebraska) was connected to a spherical sensor (LI-193) and a quantum sensor (LI-190) to measure light (micromoles per square meter per second [μmols/m^2/sec]) at depth and at the surface, simultaneously. The LI-193 sensor was mounted in a weighted black frame, while the LI-190 sensor was placed in an unshaded area on the boat. In water depths less than 1.5 m, three measurements were taken: 0.3 m below the surface, mid-depth, and 0.3 m above the bottom. In water depths greater than 1.5 m, five measurements were taken at equidistant depths starting at 0.3 m below the surface and finishing at 0.3 m above the bottom. Records of light measurements were made as the sensor was lowered

to each depth and again as the sensor was raised, for a total of six to ten readings per sampling point. Sampling depth and time of sampling were recorded for each paired surface and underwater reading. For this report, the sample depths were rounded to the nearest 0.5 m (excluding the surface sample depths) to more accurately compare light attenuation between sites with differing total water depths.

A Hach® Quanta water quality meter was used to measure water quality at each sampling point. Monitored variables included temperature (°C), specific conductance (milliSiemens per centimeter, converted to µS/cm for reporting purposes), salinity, dissolved oxygen (DO; mg/L), pH (standard units), oxidation reduction potential (millivolts), and turbidity (nephelometric turbidity units). Salinity was calculated (not measured directly) by the water quality meter using conductance and a temperature correction normalized to 15°C and is reported in PSS-78. Water column measurements were taken approximately 0.3 m below the surface and 0.3 m above the bottom.

B.3.2.2 Submerged Aquatic Vegetation Surveys and Ecological Observations

Surveys for SAV were conducted at all 16 sampling points within each study area (eight/transect). Four 0.25-m quadrats were thrown from the boat roughly equidistant within a 3-m radius around each marked sampling point. The SAV within each of the four quadrats was examined and the percent cover was recorded on underwater datasheets. Each of the 23 pre-established categories of SAV (Table 5.2-2) used by the SFWMD, Florida Fish and Wildlife Fisheries Habitat Assessment Program, and the Miami-Dade County Department of Regulatory and Economic Resources were scored using the Braun-Blanquet Cover Abundance (BBCA) Index methodology previously described in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a). The BBCA method assigns a score to each species or taxonomic group based on its contribution to bottom coverage, as follows:

0	=	bare
0.1	=	<5% cover with a solitary individual/shoot
0.5	=	<5% cover with few individuals/shoots
1	=	<5% cover with numerous individuals/shoots
2	=	≥5% cover and ≤25% cover
3	=	>25% cover and ≤50% cover
4	=	>50% cover and ≤75% cover
5	=	>75% cover

The macrophyte scores for the four quadrats were averaged to produce a mean score for each sampling point and then the mean scores for each of the eight sampling points were averaged to produce a mean transect score. To ensure consistency in SAV assessments among FPL and the various agencies that might utilize the data, BBCA scoring was conducted only by divers who had previously attended annual Interagency Calibration Exercises hosted by the SFWMD in Key Largo (May 16, 2019).

Sediment depth, an important variable in determining suitable habitat for seagrasses, was measured within each scored quadrat. A rod was inserted into the substrate in the center of the quadrat and near each of its four corners, and depth to refusal (i.e., underlying hardbottom) was recorded for each of the five points. Those values were then averaged to produce a mean depth to hardbottom for each SAV sampling point. Collecting data from the four corners and center point of each quadrat was first conducted during the spring 2017 sampling event.

A qualitative characterization of benthic conditions surrounding each sampling point was made by a diver at the beginning of each SAV survey. This characterization generally encompassed an area within a 5- to 10-m radius of the sampling point (range of visibility). Observations were recorded under three main categories:

- Overall Conditions: radius and visibility (in feet) of the area that was assessed and the overall biotic coverage (Open, Fairly Open, Moderately Open, Mostly Covered, and Uniform);
- Qualitative Assessment: seagrass, drift algae, and *Batophora* coverage in the surveyed area (Sparse, Sparse to Moderate, Moderate to Dense); and
- Characterization: the quantity of calcareous algae, sponges, corals, and gorgonians found in the area (None, Few, Many).

The benthic substrate in the immediate vicinity of each sampling point was also qualitatively characterized by noting the presence/absence of the following sediment types: sandy, shell hash, silty, or rubble. If a handful of substrate was picked up, released, and then settled relatively quickly with little drift, it was classified as sandy. If a plume was evident and it settled more slowly, it was classified as silty. Pockets of shell fragments mixed in with the sand were classified as shell hash, while rocks or hardbottom exposed or just beneath a veneer of sediment were classified as rubble.

B.3.2.3 Leaf Nutrients

Seagrass leaf collections occurred during the fall 2018 monitoring event at the same two consistent points along each transect (1 & 4 on transect *a*, and 2 & 5 on transect *b*). At each point, divers collected blades of turtle grass (*Thalassia testudinum*), the dominant seagrass species, by clipping the blades at the water-substrate interface. All leaves collected are immediately put on ice and/or refrigerated. Epiphytes are then scraped off the seagrass leaves prior to drying.

All leaves collected are then dried at 60°C to constant weight and ground to a powder and homogenized. All samples are then analyzed for leaf TC, TN, TP, $\delta^{13}C$, and $\delta^{15}N$ isotope values.

B.3.2.4 Biscayne Bay Porewater

Field parameters for porewater are measured and recorded at all eight points along each transect. After completing porewater field parameter monitoring at all eight points along a transect, the

specific conductance data was reviewed, and the sampling point with the highest specific conductance value was then sampled for laboratory analysis. At each of these sampling points, the porewater sampler was inserted to a sediment depth of 30 cm, and tubing was attached between the sipper and a peristaltic pump on the boat. Porewater was collected at 30 cm below the sediment surface using the methods described in the Comprehensive Pre-Uprate Monitoring Report (FPL 2012a). If sediment depth was less than 30 cm, the bottom was probed within a 2- to 5-m radius of the sampling point until the target depth could be reached. Porewater was extracted with a Pushpoint Sampler and specific conductance measured with a Hach® Quanta water quality meter; temperature was measured in-situ with a thermocouple datalogger (TCTemp1000, ThermoWorks, Inc., Lindon, Utah). For each sample, 500 to 750 mL of porewater was extracted from two sampling locations (<0.5 m apart). After collection, the two porewater samples were combined and homogenized and subsequently distributed into pre-labeled bottles for laboratory analyses in accordance with the QAPP (FPL 2013). Samples were analyzed for sodium, chloride, nitrate-nitrite as nitrogen, unionized ammonia, ammonia as N, TN, TKN, phosphorus, OP, and tritium each event.