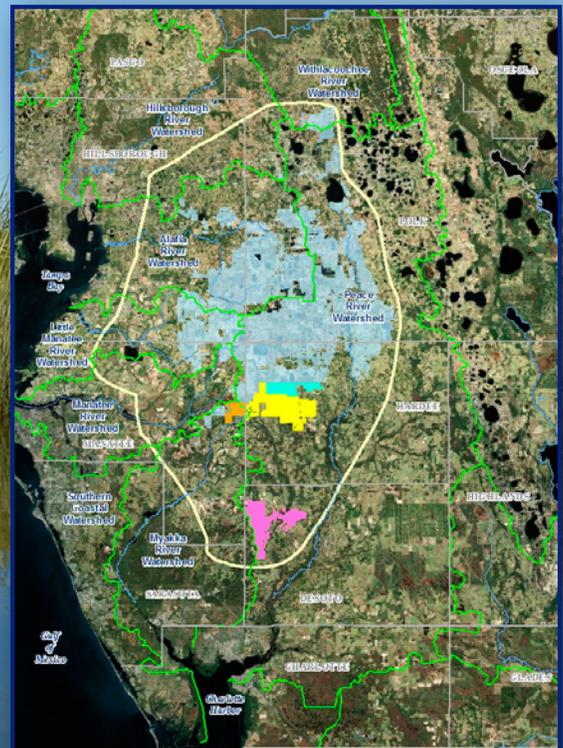


APPENDIX I

EXAMPLES OF COMPENSATORY MITIGATION PERFORMANCE STANDARDS, MONITORING REQUIREMENTS, AND ADAPTIVE MANAGEMENT PERMIT CONDITIONS



Appendix I

Examples of Compensatory Mitigation Performance Standards, Monitoring Requirements, and Adaptive Management Permit Conditions

The following are provided as examples only. The special conditions that would be part of any USACE permits, if issued, may differ from these examples. Such conditions would ensure compliance with the 2008 Compensatory Mitigation Rule. Based on USEPA's comments in its July 30, 2012, and August 23, 2012, letters concerning mitigation and other issues, the USACE and the USEPA have both committed to coordinate development of the performance standards, monitoring conditions, and adaptive management conditions for the four Applicants' Preferred Alternatives in accordance with the 404(q) procedures.

Additional special permit conditions may be appropriate based on the need to assess the function of the wetlands and streams along with the form of wetlands and streams, consistent with the 2008 Mitigation Rule. The two main system types (wetlands and streams) have been classified to ensure the appropriate descriptors of success for the appropriate wetland types. For wetlands the FLUCCS is used (Forested Wetlands - Bay Swamps, & Herbaceous Wetlands - Freshwater Marsh) and for streams the Rosgen classifications are used (Rosgen Level II Class designation). Each classification is then defined by its hydrology, hydraulic, geomorphology, physiochemical and biotic/biological functions. The examples found in this appendix provide measurements that make up metrics used to reflect performance measures of success for most of these functions. The biotic/biological function in this appendix has examples for the floral part of the biota. Additional consideration will be given to including the faunal or wildlife portion of the biotic/biological functions.

Examples of biotic performance measures for wetlands and streams already exist within Florida. These include, but are not limited to FDEP bioassessment methods for wetland ecosystems, a macroinvertebrate Stream Condition Index and a macroinvertebrate Wetland Condition Index. The potential permit conditions that would support faunal performance measures would be similar to the floral permit condition examples in this appendix. Specifically, this appendix has examples of measurements (species percent cover) that derive metrics (forest structural classification, species diversity). These metrics have performance measures (% cover made up of specific species, sustainability) that are related to a level of success or trend toward success that is desired. Some of this appendix's floral performance measures are defined by selected reference conditions (Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the (applicable) basin).

Ecological Performance Standards for Mitigation

1. WETLAND PERFORMANCE STANDARDS

1.1 Forested and Herbaceous Created Wetlands

- a. The Permittee will meet the criteria for wetlands as detailed in 1987 Corps of Engineers Wetlands Delineation Manual, and/or any regional supplement of the Delineation Manual utilized by the Jacksonville District at the time the permit was issued or mitigation was established.
- b. Forested and Herbaceous Created Wetlands – The Permittee will create forested and herbaceous wetlands where the soils will exhibit hydric characteristics by the end of the monitoring period for all created wetlands such that they will meet the minimum jurisdictional criteria.
- c. Forested and Herbaceous Created Wetlands - will be considered successful when Special Conditions ____ (wetland creation) and ____ (wetland performance standards) have been met without intervention in the form of irrigation, removal of undesirable vegetation or replanting of desirable vegetation for at least a two (2) consecutive year period after removal of the perimeter ditch and berm system.
- d. Forested and Herbaceous Created Wetlands – Vegetation cover will consist of plants identified in Tables ____ through ____ “Proposed Plantings”, should there be any discrepancies between Tables ____ through ____, the Permittee will submit a request for approval prior to plantings. The forested and herbaceous created wetlands will be constructed as detailed in Figures ____ through ____, should there be any discrepancies between Figures ____ through ____, the Permittee will submit a request for approval prior to construction. Note: FAC⁺ and wetter = plant species listed in the National Wetland Plant List at http://www.usace.army.mil/CECW/Documents/cecwo/reg/nwp/NWPL_announcement.pdf
- e. Forested and Herbaceous Created Wetlands - Manual or chemical treatment will be implemented if cogon grass (*Imperata cylindrica*) coverage exceeds five (5) percent within 300 feet of compensatory mitigation areas.
- f. Less than 5 percent cover of Category I and II invasive exotic plant species, pursuant to the 2005 list established by the Florida Exotic Pest Plant Council at <http://www.fleppc.org>, shall include the nuisance species primrose willow (*Ludwigia peruviana*), dogfennel (*Eupatorium capillifolium*), Bermudagrass (*Cynodon* sp.), torpedo grass (*Panicum repens*), and cattail (*Typha* sp.)
- g. Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the Peace River basin.

- h. The Permittee shall utilize the information submitted as the primary source of reference wetland information, although other wetlands located within the (applicable) basin may be used. Several wetlands of each community type to be created should be selected and submitted to the Corps of Engineers for review and approval. Additional stage and hydroperiod data shall be collected from the referenced wetlands. The Permittee shall submit a proposed sampling plan including vegetation and hydrology sampling methods, locations and sampling frequencies to the Corps of Engineers for approval within one year of permit issuance.

1.2 Forested and Herbaceous Preserved Wetlands

- a. The Permittee will maintain the baseline hydrology of the preserved wetlands consisting of x ac of forested wetlands and x ac of herbaceous wetlands throughout the life of the project and monitoring.
- b. The Permittee will maintain the WRAP scores or higher as detailed on Table ___ throughout the life of the project and monitoring periods. The Permittee will conduct a revised WRAP assessment every five (5) years. The Permittee will utilize the same version of WRAP used for all wetland baseline data and monitoring.
- c. The Permittee will implement manual or chemical treatment if cogon grass (*Imperata cylindrica*) coverage exceeds five (5) percent within 300 feet of Preserved Areas.
- d. Less than 5 percent cover of Category I and II invasive exotic plant species, pursuant to the 2005 list established by the Florida Exotic Pest Plant Council at <http://www.fleppc.org>, shall include the nuisance species primrose willow (*Ludwigia peruviana*), dogfennel (*Eupatorium capillifolium*), Bermudagrass (*Cynodon sp.*), torpedo grass (*Panicum repens*), and cattail (*Typha sp.*)

1.3 Forested Created Wetlands – x ac

- a. Bay Swamps (FLUCCS 611)
 - A minimum of 80 percent of the number of trees and 70 percent cover of the groundcover vegetation will consist of appropriate wetland species (i.e., FAC⁺ or wetter) and/or plants listed on Table ____.
 - Tree density will be equal to or greater than 400 trees per ac with trees equal to or greater than 12 feet in height consisting of at least five (5) tree species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.
 - Shrub density will be equal to or greater than 200 trees per ac with shrubs equal to or greater than four (4) feet in height consisting of at least five (5) shrub species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.
 - No single groundcover species will constitute greater than 30 percent relative cover.

- Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the Peace River basin.
 - Exotic and/or nuisance species will not exceed 10 percent relative cover in the tree canopy, shrub and groundcover.
- b. Mixed Wetland Hardwoods (FLUCCS 617)
- A minimum of 80 percent of the number of trees and 70 percent cover of the groundcover vegetation will consist of appropriate wetland species (i.e., FAC⁺ or wetter) and/or plants listed on Table ____.
 - Tree density will be equal to or greater than 400 trees per ac with trees equal to or greater than 12 feet in height consisting of at least five (5) tree species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.
 - Shrub density will be equal to or greater than 200 trees per ac with shrubs equal to or greater than four (4) feet in height consisting of at least five (5) shrub species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.
 - No single groundcover species will constitute greater than 30 percent relative cover.
 - Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the Peace River basin.
 - Exotic and/or nuisance species will not exceed 10 percent relative cover in the tree canopy, shrub and groundcover.
 - Prior to planting, the Permittee will submit a planting plan for approval which will include the location and density for Needle Palm (*Rhapidophyllum hystrix*).
- c. Wetland Mixed Hardwood (FLUCCS 630)
- A minimum of 80 percent of the number of trees and 70 percent cover of the groundcover vegetation will consist of appropriate wetland species (i.e., FAC⁺ or wetter) and/or plants listed on Table_____.
 - Tree density will be equal to or greater than 400 trees per ac with trees equal to or greater than 12 feet in height consisting of at least five (5) tree species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.

- Shrub density will be equal to or greater than 200 trees per ac with shrubs equal to or greater than four (4) feet in height consisting of at least five (5) shrub species listed in Table _____. The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____. Early successional species such as Carolina willow (*Salix caroliniana*), saltbush (*Baccharis halimifolia*), wax myrtle (*Myrica cerifera*) and elderberry (*Sambucus canadensis*) do not count toward meeting this requirement; however these species shall be included in the monitoring reports.
- No single groundcover species will constitute greater than 30 percent relative cover.
- Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the (applicable) basin.
- Exotic and/or nuisance species will not exceed 10 percent relative cover in the tree canopy, shrub and groundcover.

1.4 Herbaceous Created Wetlands – x ac

a. Freshwater Marsh (FLUCCS 641)

- A minimum of 80 percent of the herbaceous vegetation for each of the zones listed on Table _____ with at least 50% of this cover being plant species listed as FAC or wetter, be rooted for at least 12 months, and be reproducing naturally.
- No single species in any zone will constitute more than 30% of the total cover.
- The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table _____.
- No single groundcover species will constitute greater than 30 percent relative cover.
- Exotic and/or nuisance species will not exceed 10 percent relative cover in the tree canopy, shrub and groundcover.

b. Shrub Marsh (FLUCCS 6417)

- A minimum of 80 percent of the herbaceous vegetation for each of the zones listed on Table _____ with at least 50% of this cover being plant species listed as FAC or wetter, be rooted for at least 12 months, and be reproducing naturally.
- No single species in any zone will constitute more than 30% of the total cover.
- Early successional species such as Carolina willow (*Salix caroliniana*), saltbush (*Baccharis halimifolia*), wax myrtle (*Myrica cerifera*) and elderberry (*Sambucus canadensis*) do not count toward meeting this requirement; however these species will be included in the monitoring reports.

- The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table ____.
 - No single groundcover species will constitute greater than 30 percent relative cover.
 - Canopy and shrub measurements shall be limited to those indigenous species that contribute to the shrub, subcanopy, and canopy strata of the mature forested wetlands/floodplains in the Peace River basin.
 - Exotic and/or nuisance species will not exceed 10 percent relative cover in the tree canopy, shrub and groundcover.
- c. Wet Prairies (FLUCCS 643)
- A minimum of 80 percent of the herbaceous vegetation for each of the zones listed on Table ____ with at least 50% of this cover being plant species listed as FAC or wetter, be rooted for at least 12 months, and be reproducing naturally.
 - No single species in any zone will constitute more than 30% of the total cover.
 - The Permittee will request approval prior to planting from the Corps should the plantings deviate from Table ____.
 - No single groundcover species will constitute greater than 30 percent relative cover.
 - Ephemeral wetlands as defined on Table ____ are not included as part of the Federal Mitigation Plan and will not be evaluated as part of success of the mitigation plan.

2. STREAM PERFORMANCE STANDARDS

2.1 Stream Performance Standards: Based on the objectives of the stream mitigation plan, the Permittee must meet the objectives of the criteria listed within the ____ mitigation plan. The following performance standards must be met for a period of five consecutive years to be considered successful:

- a. The stream creation segments will contain a Rosgen Level II Class designation considering the sinuosity, stream slope, bankfull cross sectional area, average channel length, bankfull width, bankfull depth, approximate entrenchment ration, and curvature for all stream segments as indicated on Table _____. The Permittee will create Rosgen Type "C" and "E" streams as indicated in Appendix _____.
- b. The stream segments will function as natural and stable streams with an active floodplain in accordance with natural stream design parameters set forth in Appendix _____.
- c. Each stream segment will contain the standards set forth within Table _____. These standards require the following:
 - Each stream segment shall contain species richness and diversity within the range of the reference stream segments.

- Bankfull flow magnitude, frequency and depth shall be similar to the post-hydrological modeling results.
 - Each stream segment shall have a minimum FDEP visual habitat assessment score (HAS) of 86, with a minimum buffer width of 60 feet on each side and stable stream banks.
 - Each stream segment shall meet all Class III water quality standards.
- d. Each mining unit will contain an average FDEP HAS score of 105 prior to reconnection.
- e. The x acre stream buffer, comprised of x linear feet on each side of the created channel, shall contain at least 75% of planted species survival, and will be consistent with the plantings density and species presented in ____.

3. SUCCESS CRITERIA

The compensatory mitigation for each reclamation unit outlined in Special Condition ____ above may be determined to be successful when all of the performance standards defined below and in Tables ____ and ____ have been met.

3.1 Procedures

- a. The Permittee may request a determination of success when the reclamation unit has attained full success, as defined herein.
- b. The request for success determination will be supported by documentation that the implementation of the project has been in accordance with the plans herein. Any member of the Reviewing Agency Team (USACE, EPA, FWS, NMFS) will have the opportunity to schedule and conduct an on-site inspection of the mitigation area under review to verify that the criteria are met.
- c. Within sixty (60) days of receipt of the request, the Corps may notify the Permittee and Reviewing Agency Team members whether the compensatory mitigation is successful or is unsuccessful. If the mitigation is unsuccessful the Corps will identify those elements that do not meet the performance standards.

3.2 Final Success Criteria

The Reclamation Unit will be deemed successful when all of the criteria listed in Special Conditions ____ and ____ (Wetland and Streams) have been met after a period of at least one (1) full year without intervention in the form of artificial manipulation of water levels or replanting of desirable vegetation for each reclamation phase or mining unit for at least two (2) year consecutive period.

4. STREAM CREATION RELEASE

4.1 Stream Creation Release: The Permittee's responsibility to complete the required compensatory stream mitigation will not be considered fulfilled until the Permittee has demonstrated mitigation success and has received written verification from the Corps. A mitigation area which has been released will require no further monitoring or reporting by the Permittee; however the Permittee, Successors and subsequent Transferees remain perpetually responsible to ensure that the stream mitigation segments remain in a condition appropriate to offset the authorized impacts in accordance with the General Conditions, Special Conditions and the following specifics:

- a. The Permittee shall notify the Corps whenever the Permittee believes that the mitigation within each reclamation phase or mining unit is ready for release, but in no event earlier than five years after the mitigation is completed.
- b. If, at any time during the monitoring period, the Corps determines that the stream mitigation is successful, the Corps may terminate the monitoring period, and the Corps may release a portion of, or the entire stream segment.
- c. The final monitoring report shall include an assessment of the condition of the mitigation site following completion of the stream mitigation site monitoring. To ensure an objective evaluation, the Corps will require the applicant provide and finance an independent post-construction assessment. The assessment should include:
 - Summary of the original or modified stream mitigation goals and a discussion of the level of goal attainment.
 - Characterization of the planned stream construction including Rosgen stream classification, pattern, profile, dimension, and hydrologic regime.
 - An assessment (quantitative or qualitative) of functions and values performed by the site.
 - A calculation of the linear footage of streams on site determined by the presence of an ordinary high water mark; a scale drawing of stream reaches; and supporting data sheets.
 - A comparison of the area and extent of delineated streams in the stream mitigation area and extent of streams required in the mitigation plan (i.e., post construction survey).
 - Photographs of the stream mitigation sites taken from the same locations as the monitoring photographs.
 - A description of any significant problems and any solutions during construction and monitoring of the mitigation site(s).

Monitoring Requirements

1. COMPLIANCE MONITORING

- 1.1 The project was reviewed and evaluated by the Corps of Engineers, USEPA and USFWS. As a result of the process, the provision to ensure progress of the authorized work will be monitored by the Reviewing Agencies which includes the Corps of Engineers, USEPA and USFWS. An Annual Review by the Reviewing Agencies will evaluate the authorized work, schedule, monitoring program, reporting process, and other aspects of the authorized work. Any such revisions or refinements to the authorized work will require subsequent review by the Corps of Engineers in accordance with 33 CFR 325.7.
- a. The Permittee will submit to the Corps of Engineers a request to review the project thirty (30) days before the end of the first full calendar year and each subsequent calendar year thereafter, if applicable.
 - b. The Reviewing Agencies review will begin thirty (30) days after receipt of the Permittee's request and/or no later than March 31st of the first year and each subsequent calendar year thereafter, if applicable.
 - c. The Reviewing Agencies will review the file and will inspect the project site for compliance with the terms of the permit, including General, Special Conditions and Monitoring Requirements.
 - 1) If the Reviewing Agencies determine that the Permittee is not in compliance with the terms of the permit, until the Permittee is in compliance with the terms and conditions of the permit, the Permittee must not proceed with the next scheduled mine block as demonstrated on Map ____.
 - 2) As an element of the Annual Review, the Corps shall notify the Permittee of any deficiencies that may be noted and request a plan for remediation.

2. WETLAND MONITORING

- 2.1 General Monitoring Requirements
- a. The Permittee will perform a routine wetland delineation, to meet full performance standards, by verifying the total acreage of wetlands and waters achieved on site. Wetland areas will be staked for final inspection by the Corps. Property boundaries for the mitigation site will be marked as well. The delineation will be included/reported in the final monitoring report, if not before. It is recognized that the actual acreage of aquatic resources/wetland will vary from that in the plans; however, it will approach or exceed the acreage specified in the permit.
 - b. The Permittee will conduct an initial WRAP assessment and assessments every five (5) years on each preserved wetland within _____. The Permittee will utilize the same version of WRAP used for all wetland baseline data and monitoring.

- c. The Permittee will conduct annual WRAP assessments for ten (10) years on ALL created wetlands within Conservation Area _____. The assessments will continue annually in light of the mitigation area being released for success. The Permittee will utilize the same version of WRAP used for all wetland baseline data and monitoring.
- d. The Permittee will have representative monthly hydrological monitoring for all preserved wetlands. The monitoring will be conducted monthly until the expiration date of the permit. In the event, the permit is extended the Permittee will continue monitoring until the extended expiration date of the DA permit. Rainfall will be monitored at representative locations on the mine site and will be reported with all hydrological data.
- e. The Permittee will achieve the above performance standards as detailed in Special Condition ____ by the end of the 5-year monitoring period for each reclamation phase or mining unit which is detailed in Special Condition ____, with no maintenance during the 5th year of monitoring. In the event that the above performance standards have not been achieved the Permittee must undertake a remediation program approved by the Corps. The Corps reserves the right to fully evaluate, amend, approve or reject the proposed remediation plan. Additionally, the Corps may recommend that the Permittee develop an alternate compensatory mitigation proposal to fully offset the functional loss that occurred as a result of not meeting the performance standards within the prescribed timeframe.
- f. To show compliance with the performance standards the Permittee will complete the following for each reclamation phase or mining unit:
 - 1) Perform a time-zero monitoring event of the wetland mitigation area(s) within 60 days of completion of mitigation objectives.
 - 2) Submit the time-zero report to the Corps within 60 days of completion of the monitoring event.
 - 3) The report will include a paragraph depicting baseline conditions of the mitigation site(s) prior to initiation of the mitigation objectives and a detailed plan view drawing of all created, enhanced and/or restored mitigation areas.
 - 4) Perform annual monitoring of the wetland mitigation area(s) for a period of no less than five (5) years subsequent to completion of the mitigation objectives.
 - 5) Submit annual monitoring reports to the Corps within 60 days of completion of the monitoring event.
 - 6) Monitor the mitigation area(s) and submit annual monitoring reports to the Corps until released in accordance with Special Conditions ____ of this permit.

- g. Annual monitoring reports must follow the report format for assessing mitigation sites. The Applicant shall submit all documentation to the Corps on 8 ½ -inch X 11-inch paper, and include the following:
- 1) Project Overview (1-5 Pages)
 - i. Corps Permit Number
 - ii. Name and contact information of Permittee and Consultant
 - iii. Name of party responsible for conducting the monitoring and the date(s) the inspection(s) was conducted
 - iv. A summary paragraph defining the purpose for the approved project, acreage and type of aquatic resources impacted, and mitigation acreage and type of aquatic resources authorized to compensate for the aquatic impacts.
 - v. Written description on the location and any identifiable information to locate the site perimeter(s)
 - vi. Directions to the mitigation site (from a major highway).
 - vii. Dates compensatory mitigation commenced and/or was completed
 - viii. Short statement on whether the performance standards are being met
 - ix. Dates of any recent corrective or maintenance activities conducted since the previous report submission
 - x. Specific recommendations for any additional corrective or remedial actions
 - 2) Requirements (1-5 Pages): List the monitoring requirements and performance standards, as specified in the approved mitigation plan and special conditions of this permit, and evaluate whether the compensatory mitigation project site is successfully achieving the approved performance standards or trending towards success.
 - 3) Summary Data (maximum 15 pages): Data must be provided to substantiate the success and/or potential challenges associated with the compensatory mitigation project. Any photo documentation must be dated and clearly labeled with the direction from which the photo was taken, and be identified on the appropriate maps.
 - 4) Maps (maximum 15 pages): Maps must be provided to show the location of the compensatory mitigation site relative to other landscape features, habitat types, locations of photographic reference points, transects, sampling data points, and/or other features pertinent to the mitigation plan.

- 5) Conclusions (1-5 pages): A general statement must be included describing the conditions of the compensatory mitigation project. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Permittee, including a timetable, must be provided.
- h. If the compensatory mitigation fails to meet the performance standards at the end of 5 years after the initiation of mitigation activities have occurred for each reclamation phase or mining unit, the compensatory mitigation will be deemed unsuccessful. Within 60 days of notification by the Corps that the mitigation is unsuccessful, the Permittee shall submit to the Corps an alternate compensatory mitigation proposal to fully offset the functional loss that occurred as a result of the project. The alternate mitigation proposal may be required to include additional mitigation to compensate for the temporal loss of wetland function associated with the unsuccessful compensatory mitigation activities. The Corps reserves the right to fully evaluate, amend, approve or reject the alternate compensatory mitigation proposal. Within 120 days of Corps approval, the Permittee will complete the alternate compensatory mitigation proposal.
 - i. The Permittee's responsibility to complete the required compensatory mitigation will not be considered fulfilled until the Permittee has demonstrated mitigation success and has received written verification from the Corps. A mitigation area which has been released will require no further monitoring or reporting by the Permittee; however the Permittee, Successors and subsequent Transferees remain perpetually responsible to ensure that the mitigation area(s) remain in a condition appropriate to offset the authorized impacts in accordance with General Condition 2 of this permit.
 - j. The Permittee will notify the Corps of Engineers whenever the Permittee believes that the mitigation within each reclamation phase or mining unit is ready for release, but in no event earlier than one (1) year after the mitigation is completed.
 - k. The Permittee will submit annual narrative reports indicating the status of the project on or before the first day of March. The report will include the following information:
 - 1) Date permitted activity was begun or projected commencement date if work has not begun on-site;
 - 2) Brief description and extent of work (site preparation, mining, and restoration) completed since the previous report or since the permit was issued. Indicate on copies of the permit drawings those areas where work has been completed. This description shall include details on construction of berms, recharge ditches adjacent to unmined wetlands, clearing, wetland severance, muck removal, storage and placement, and completed earthwork and planting;

- 3) Brief description and extent of work (site preparation, mining, and restoration) anticipated in the next year. Indicate on copies of the permit drawings those areas where it is anticipated that work will be done.

2.2 Vegetation Monitoring

- a. Permanent straight line sampling transects will be established, plotted onto project drawings and a current aerial photograph of the site, across each proposed plant community of the mitigation site.
- b. Sufficient transects will be established to provide full representation of all plant communities within the site, which might include more than one of each type.
- c. Each transect will consist of a series of 1.0 square meter quadrants (no fewer than 10) at regular or random intervals (5-10m suggested interval). The number of quadrants depends on system complexity and the size of each plant community for which credit is sought. A rough guideline is 2 quadrants per ac in each plant community as a minimum.
- d. The plant sampling will be done in May/June and August/September each year following the initial planting, throughout the monitoring period.
- e. Data will be reported by plant community, and by transect. A total plant species list will be compiled over the entire site for which credit is sought. Data may be summarized by plant community for which credit is sought in monitoring reports, however, the full sampling data will be provided in an appendix to the annual monitoring report.
- f. Species dominance will be determined by calculating importance values, with at least the following two parameters: frequency and percent cover. Absolute percent aerial cover data will be reported, though the frequency and cover may be relative to calculate Importance Values (e.g., $RF + RC = IV$).

2.3 Hydrology Monitoring

- a. Within each plant community for which credit is sought, wetland hydrology will be independently demonstrated from data gathered from monitoring wells and/or piezometers placed throughout the mitigation site.
- b. The plans for well/piezometer placement will be approved by the Corps prior to approval of the mitigation. Monitoring data will be collected from the wells/piezometers at a minimum on a weekly basis throughout the growing season. Automated continuous water level recorders are encouraged, and should be downloaded monthly to avoid more significant loss of data in the event of vandalism or other failure. For the hydrology standard, the growing season is defined as April 15 - October 20.

3. STREAM MONITORING

3.1 Monitoring Reports: The Permittee will monitor the created streams and adjacent riparian buffer by submitting semi-annual reports commencing six months after each stream system has been created and thereafter until the created system has been successfully established. Monitoring of stream compensation sites will be conducted for a minimum of ten years and will be in accordance with the Conceptual Stream Mitigation Sequence, Table _____. Semi-annual monitoring will be required for a minimum of three years, followed by seven years of annual monitoring. If a stream segment is not trending toward success after the initial three year semi-annual monitoring period, the Corps may determine that semi-annual monitoring reporting will be extended until the stream segment demonstrates success. Monitoring will occur until the project has been demonstrated as a functionally mature, self-sustaining system which has demonstrated five consecutive years of successfully meeting the performance standards in the Mitigation Plan. The Permittee will be responsible for the monitoring program. The performance standards monitored will demonstrate if the stream mitigation is developing, has developed, or is unsuccessful. All reports will be mailed to the US Army Corps of Engineers, Jacksonville District, Enforcement Section, Post Office Box 4970 Jacksonville, Florida 32232-0019, the Environmental Protection Agency, Region 4, 61 Forsyth Street SW, Atlanta, GA, 30303 and the U.S. Fish & Wildlife Service, South Florida Field Office, 1339 20th Street, Vero Beach, FL 32960-3559.

To show compliance with the performance standards the Permittee shall complete the following for each reclamation phase or mining unit:

- a. Perform semi-annual monitoring of the stream mitigation area(s) for a period of no less than 10 years subsequent to completion of the mitigation objectives.
- b. Submit semi-annual monitoring reports to the Corps within 30 days of completion of the monitoring event.
- c. Monitor the stream mitigation area(s) and submit semi-annual monitoring reports to the Corps until released in accordance with the Special Conditions associated with this permit.

3.2 Stream Monitoring Report Guidelines: Semi-annual monitoring reports must follow the report format for assessing stream mitigation sites. The Permittee should submit all documentation to the Corps on 8 ½ -inch X 11-inch paper, and include the following:

- a. Project Overview:
 - 1) Corps Permit Number
 - 2) Name and contact information of Permittee and Consultant
 - 3) Name of party responsible for conducting the monitoring and the date(s) the inspection(s) was conducted
 - 4) Indication if stream segment is a Rosgen Type C or E
 - 5) Current HAS score

- 6) A summary paragraph defining the purpose for the approved project, the linear foot and type of aquatic resources impacted, and the mitigation linear foot and type of aquatic resources authorized to compensate for the aquatic impacts.
 - 7) Written description on the location and any identifiable information to locate the site perimeter(s)
 - 8) Directions to the mitigation site (from a major highway).
 - 9) Dates compensatory mitigation commenced and/or was completed
 - 10) Dates of any recent corrective or maintenance activities conducted since the previous report submission
- b. Requirements: List the monitoring requirements and performance standards, as specified in the stream mitigation plan and special conditions of this permit, and evaluate whether the compensatory stream mitigation project site is successfully achieving the approved performance standards or trending towards success. Please include the following specifics:
- 1) The Base Map.
 - 2) Time, dates and exact place of sampling or measurements;
 - 3) Names of individuals who collected data;
 - 4) Supporting documentation such as general observations relative to existing conditions, rainfall data, readings, calculations, and benchmark data;
 - 5) Photographs showing upstream and downstream views of the stream restoration and the buffers taken from each Monitoring Station.
 - 6) Each photograph must be labeled with the identity of the Monitoring Station, the photograph orientation, the date and time, and a brief description of the photograph.
 - 7) Description of stream type, pattern, sinuosity, entrenchment ratio, width/depth ratio, slope, profile, pool-riffle complex, floodplain interaction, and channel material.
 - 8) Physical stream measurements and photographs taken at each cross section to document the stability of the stream bed and banks.
 - 9) Location, profile and cross section of all structures and an evaluation of their function and stability.
 - 10) General habitat assessment including documentation of wildlife or signs of wildlife observed.
 - 11) Benthic macroinvertebrate sampling data and scores, if applicable

- 12) Vegetative data taken at each Monitoring Station specifying survival rate of planted woody and herbaceous species. Species composition (including all species present, as well as an indication of dominant species) for all planted surfaces must be documented.
 - 13) Documentation of all significant storm events and a description of those effects on the stream mitigation.
 - 14) Direct comparison of the stream mitigation to the Reference Stream in accordance with the project goals as identified in the Stream Restoration Plans and specific to the monitoring criteria listed herein.
 - 15) Outline corrective measures planned to remediate any area of the stream mitigation where the project goals have not been achieved (e.g., additional grading, planting, lowering structures, control and abate undesirable plant species, etc.).
 - 16) Summary of past monitoring report data and assessment of stream segment's overall trends. Summary must include cumulative index of past monitoring trends.
- c. Summary Data: Data must be provided to substantiate the success and/or potential challenges associated with the compensatory stream mitigation project. Any photo documentation must be dated and clearly labeled with the direction from which the photo was taken, and be identified on the appropriate maps.
 - d. Maps: Maps must be provided to show the location of the compensatory stream mitigation site relative to other landscape features, habitat types, locations of photographic reference points, cross-sections, transects, sampling data points, and/or other features pertinent to the mitigation plan.
 - e. Conclusions (1-5 pages): A general statement must be included describing the conditions of the compensatory stream mitigation project. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Permittee, including a timetable, must be provided.
- 3.3 Rain Gauge Installation: Each Section which contains created stream segments will have a rain gauge appropriately located and installed to collect and monitor daily rainfall data. The rain gauges will be used only until the subject stream reaches have experienced 5 bankfull rainfall events.
- 3.4 Bankfull Rainfall Event Monitoring: Monitoring after the first 5 bankfull rainfall events will be recorded within each proposed stream section. The Permittee shall submit data from rain gages to the Corps, EPA and FWS on a semi-annual basis. Post bankfull event, the Permittee shall provide a narrative for any adaptations or changes made to the subject stream reaches.

- 3.5 Monitoring for un-mined stream segments: Monitoring will be performed for all undisturbed stream segments located within the SFM-HC project site. Water table piezometers or staff gauges will be installed and datum surveyed during all phases of mining and reclamation within the SFM-HC project site. The Permittee will submit a map indicating the exact locations of the piezometers and quarterly data to the Corps, EPA and FWS on a semi-annual basis.

Adaptive Management

1. WETLAND ADAPTIVE MANAGEMENT PLAN

- 1.1 If the compensatory mitigation project cannot be constructed in accordance with the approved mitigation plans, the Permittee will notify the Jacksonville District. A significant modification of the compensatory mitigation project requires approval from the Jacksonville District.
- a. If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party shall notify the Jacksonville District as soon as possible. The Jacksonville District will evaluate and pursue measures to address deficiencies in the compensatory mitigation project. The Jacksonville District will consider whether the compensatory mitigation project is providing ecological benefits comparable to the original objectives of the compensatory mitigation project.
 - b. The Jacksonville District, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), will determine the appropriate measures. The measures may include site modifications, design changes, revisions to maintenance.
 - c. Requirements, and revised monitoring requirements. The measures shall be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.
 - d. Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. No other revisions to performance standards will be allowed except in the case of natural disasters.

2. STREAM ADAPTIVE MANAGEMENT

- 2.1 Performance Standards Contingency Plan: The Permittee will achieve the above performance standards by the end of 10-year monitoring period for each reclamation phase or mining unit, with no maintenance during the 10th year of monitoring. In the event that the above performance standards have not been achieved, the Permittee must undertake a remediation program approved by the Corps. The Corps reserves the right to fully evaluate, amend, approve or reject the proposed remediation plan. Additionally, the Corps may recommend that the Permittee develop an alternate compensatory stream mitigation proposal to fully offset the functional loss that occurred as a result of not meeting the performance standards within the prescribed timeframe.
- 2.2 Stream Mitigation Failure: The Permittee shall adhere to the following:
- a. If the compensatory stream mitigation does not adhere to the Conceptual Stream Mitigation Sequence, Table C-127, and fails to implement mitigation measures consistent with the time frames associated with the mitigation plan, the Corps may require an additional mitigation proposal to offset the functional time lag. In addition, the Corps may prevent the further release of mining units, until the stream mitigation failure has been resolved.
 - b. If the compensatory stream mitigation fails to meet the performance standards at the end of 10 years after the initiation of mitigation activities have occurred for each reclamation phase or mining unit, the compensatory stream mitigation will be deemed unsuccessful. Within 60 days of notification by the Corps that the mitigation is unsuccessful, the Permittee shall submit to the Corps an alternate compensatory mitigation proposal to fully offset the functional loss that occurred as a result of the project. The alternate mitigation proposal may be required to include additional mitigation to compensate for the temporal loss of stream function associated with the unsuccessful compensatory mitigation activities. The Corps reserves the right to fully evaluate, amend, approve or reject the alternate compensatory mitigation proposal. Within 120 days of Corps approval, the Permittee will complete the alternate compensatory mitigation proposal.
- 2.3 Modifications to Mitigation Schedule or Work: The Permittee must perform the proposed stream creation in accordance with the plans and schedule contained in the aforementioned stream mitigation proposal and documents. If, during construction, a need to modify the project design is identified, the Permittee must notify the Corps within 60 calendar days.