

**APPENDIX B**

**SECTION 404(b) CLEAN WATER ACT EVALUATION**

**MODIFICATIONS OF THE C-111 SOUTH DADE NORTH AND SOUTH  
DETENTION AREAS AND ASSOCIATED FEATURES**

**SOUTH DADE, FLORIDA**

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**SECTION 404(b) CLEAN WATER ACT EVALUATION**  
**ENVIRONMENTAL ASSESSMENT**  
**CANAL 111 (C-111) SOUTH DADE COUNTY, FLORIDA**

I. Project Description

a. Location. The Canal 111 (C-111) Basin is located in southern Florida. The area of focus is located in southeastern Dade County. See Figure 1 in the Environmental Assessment (EA) for the project location.

b. General Description

Authority and Purpose. The C-111 project was constructed as part of the ENP – South Dade Conveyance Canals Project Authorized by the FCA of 1968 (Public Law (PL) 90-483). This Act authorized modifications to the existing Central and Southern Florida (C&SF) Project as previously authorized by the FCAs of 1948 (PL 80-858) and 1962 (PL 87-874). Further modifications to the C-111 were authorized as an addition to the C&SF project in the Water Resources Development Act (WRDA) of 1996 (PL 104-303) to protect the natural values associated with the ENP, while maintaining the existing level of flood protection within the C-111 basin east of Levee 31N (L-31N) and C-111.

The U.S. Army Corps of Engineers (Corps) seeks to improve undesirable resource conditions in Taylor Slough, the eastern panhandle of ENP, Manatee Bay, and Barnes Sound, while maintaining flood mitigation within the C-111 basin as described in the Corps' 1994 Final Integrated General Reevaluation Report (GRR) and Environmental Impact Statement (EIS), Canal 111, South Dade County, Florida (C-111 GRR/EIS). Features of the authorized plan that resulted from the C-111 GRR/EIS have been adjusted in the years since completion of the C-111 GRR/EIS. Certain alterations were previously documented in the Corps' 2002 Final EIS and 2007 Final Supplemental EIS for the Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (IOP). The intent of the present report is to propose and evaluate changes not previously recorded, and to document recommendations and rationale for connecting C-111 SD to Modified Water Deliveries Project 8.5 Square Mile Area (8.5 SMA), thereby providing additional outlet for the 8.5 SMA Detention Cell during high rainfall periods. The EA describes the construction of water-guiding berms within the 8.5 SMA Detention Cell, NDA and SDA, along the center of the 8.5 SMA Detention Cell and along a western alignment in the NDA and SDA, in order to create a continuous hydraulic ridge on lands adjacent to ENP and inhibit seepage of groundwater out of ENP.

General Description of Dredged or Fill Material

(1) General Characteristics of Material.

The North Detention Area (NDA) and the 8.5 SMA detention cell are both prior converted agricultural land sites, which have previously been scraped down to the caprock/consolidated soils (Miami/oolitic limestone). The internal berms to be built within the NDA and the 8.5 SMA detention cell will consist of limestone previously excavated from the original L-31N canal template. The South Detention Area (SDA) footprint for the internal flowway berm will be

scraped to caprock and the internal berm will be built of limestone excavated from the original L31N canal template. Within the SDA footprint there is a mix of prior converted cropland (created by rockplowing) and former Everglades National Park (ENP) wetlands. The former ENP lands were never rockplowed but their functional wetland values (significantly reduced hydroperiods) have been negatively impacted by draining prior to construction of the SDA. The existing former agricultural surface soils were created by rockplowing the limestone surface to create a soil matrix for agricultural use. Rockplowing is a method in which heavy equipment rips the surface layer of limestone into fragments. The loose surface soils created by rockplowing contain fines, clays and limited vegetation, in addition to the limestone component.

All berms have a 1:3 slope.

(2) Approximate Quantity of Material (cubic yards):

Within Prior converted cropland:

- L-318 (2.7-3.0 ft high above grade) berm within the NDA) – 38,000 CY FILL
- Richmond Dr Overpass connecting to L-357W - 4.4 acres footprint
- L-360W and L-360E flowway berms (~2.5 ft above grade) within the 8.5 SMA detention area – 9,000 CY fill (previously scraped to caprock but now considered wetlands)
- L-321 (SDA north/south) and Proposed berms(not yet named ), ~ 3.5-4 ft above grade, running east/west in the SDA, routing S332B and S332C discharges to the western flowway - 20,000 CY fill (footprint previously scraped to caprock within prior converted wetlands)

Within prior converted cropland and remnant everglades (not rockplowed but previously over-drained and disturbed):

- L-321 (berm within the SDA, 2.8-3.0 ft above grade) – total fill 47,000 CY with approximately 27,900 CY in former ENP wetlands)
  - L-321 (2-3 ft high berm within the SDA) - 14.5 acres total, 8.6 acres in former ENP wetlands) 30 k CY fill
- Fill material to be scraped up from the project area footprint - approximately 20,000 CY total; 8,000 CY will be scraped up from the former ENP wetlands within the SDA
- L-318 (2-3 ft above grade berm within the NDA) - 12 acres, 87,000 CY
- L-357W Richmond Dr Overpass - .07 acres wetlands

(3) Source of Material.

The material used to construct all levees and berms will be limestone material excavated from the L31N canal footprint stored in various stockpile areas.

Description of the Proposed Discharge Site

(1) Location (map). The scraped material obtained from the berm/levee construction footprint will be stockpiled within the project area in an existing upland fill storage area.

(2) Size (acres). The net construction footprint of the berms will be approximately 40 acres.

(3) Type of Site (confined, unconfined, open water). The NDA berm construction sites are unconfined, previously farmed areas that were formerly open Everglades rocky prairie that has been under flood protection since the late 1960s. In extreme weather conditions, occurring infrequently (not on a yearly basis), there may be standing surface water in these areas under flood protection for brief intervals (hours to a few days). The berm construction sites in the SDA and within the 8.5 detention area are within confined detention areas (since ~2007) with depths that have reached a maximum of approximately 2ft during the wet season due to pumping and rainfall. The duration of standing water in these confined areas has lasted from a few days to several weeks continuously. All of the Richmond Drive overpass will be constructed within the previously rockplowed agricultural areas except for .07 acres of wetlands. All of the 2-4ft high berms will be constructed on former agricultural lands except for approximately 40 acres of relatively unimpacted (never farmed or rockplowed) wetland that will be scraped to caprock within the SDA to allow placement of clean limestone to create a 2-3 ft elevation (above grade) flowway berm. The storage sites for the excess fill will be within existing stockpile areas. The 8.5 SMA Detention Cell flowway berms will effect approximately 8 acres of wetland vegetation.

(4) Type(s) of Habitat. The habitat in the NDA, the SDA, the 8.5SMA detention cell, and S-357W construction footprint (with exception of approx 20 acres in the SDA) is rocky glades/marl prairie converted to agriculture by rockplowing and drainage (flood protection project area). Some of the SDA berm footprint area and all of the 8.5 SMA detention area construction will occur in formerly rockplowed areas previously scraped to caprock, which have now revegetated and rehydrated to be classified as freshwater marsh wetlands. These wetland impacts are taken into consideration in the Uniform Mitigation and Monitoring Assessment (UMAM) report.

Rockplowing removes all native vegetation and creates a soil matrix that can be used for commercial agriculture. Vegetation in the rocky glades is primarily comprised of thinly scattered sawgrass (*Cladium jamaicensis*), spikerush (*Eleocharis cellulosa*), and beakrushes (*Rhynchospora* spp.) on marl soils in association with muhly (*Muhlenbergia* sp.) prairies. The NDA is being currently being scraped to caprock (expected to be finished in 2016) to remove exotic vegetation and create a larger detention area. The internal flowway berms within the NDA will be built directly after scraped to caprock and therefore, the habitat will not contain vegetation at the time of construction. It is expected to revegetated with native vegetation with wetland hydrologic functions.

(5) Timing and Duration of Discharge. The project is expected to take 1-2 years, with some of the construction activity preferably conducted in the dry season. Once the internal berms are completed and operations ensue, if the internal flowways within the 8.5 SMA, NDA, and SDA reach 2 ft depth, water will discharge over the overflow weirs into the eastern portion of the detention areas.

c. Description of Disposal Method: The scraped material from the rockplowed areas will have the vegetation removed to the maximum extent practical. The vegetation will either be burned onsite or transported to an approved landfill. The excess fill will be stored in existing project footprint stockpile areas. The existing stockpile areas are within the flood protection influence of the L31N canal and are located on former agricultural lands. Any trash (weed barrier

material, irrigation piping, etc.) separated from the scraped soils will be transported by truck to an authorized landfill.

## II. Factual Determinations (Section 230.11)

### a. Physical Substrate Determinations

(1) Substrate Elevation and Slope. The ground elevation is between five and seven feet, NGVD, and there is almost no slope.

(2) Sediment Type. The substrate at the construction site is limestone rock overlain with marl soil.

(3) Dredged/Fill Material Movement. There will be no appreciable movement of material. It will rest on limestone rock.

(4) Physical Effects on Benthos. All benthos in the fill site will be covered.

(5) Other Effects. Upon completion of construction, the levees would effectively create areas of uplands. The levee surfaces will be mowed on a routine basis to prevent woody vegetation.

(6) Actions Taken to Minimize Impacts (Subpart H). Precautions to confine the fill to the desired roadway-levee alignment will be taken. Existing access roads would be used.

### b. Water Circulation, Fluctuation and Salinity Determinations

(1) Water. Water would flow into the closed detention areas from the existing S-332B pump station (NDA) and the S-332C pump station (SDA).

(a) Salinity. The area is fresh water, and this condition would remain unchanged.

(b) Water Chemistry. No changes would occur.

(c) Clarity. During construction, turbidity would be generated in the very slowly-to nonmoving standing surface water during periods of high rainfall. After construction completion, water clarity would be similar to prior conditions.

(d) Color. No changes would occur.

(e) Odor. No changes would occur.

(f) Taste. No changes would occur.

(g) Dissolved Gas Levels. The material is essentially clean soil; there would be moderate biochemical oxygen demand, and no change in dissolved gases.

(2) Current Patterns and Circulation.

(a) Current Patterns and Flow. Gravity-driven surface water flow is from west to east, generally. The surface water now flows very slowly in a southeasterly direction in the area where the berms will be constructed, except when the S-332B pump is operating. More surface and ground water is expected to be retained within Everglades National Park (ENP) due to the new levees and detention-retention area. The new features would also prevent surface and ground water from flowing in a southeast direction, creating a hydraulic ridge to reduce seepage from ENP. The majority of water flow in this area (excluding the L31N canal) is subsurface.

(b) Velocity. The velocity is essentially zero when the pumps are off. Very slow velocities in the majority of the detention areas when the pumps are on except at the immediate vicinity of the pump discharge points. For the overflow weirs, during overflow conditions (internal berms discharging to the main internal cells) velocities expected to be less than 1 ft/sec.

(c) Stratification. None.

(d) Hydrologic Regime. The area is characterized by a historic average hydroperiod of six to seven months, but the hydroperiod now is apparently shorter.

(3) Normal Water Level Fluctuations. Zero to a maximum of almost two ft depth in the S-8.5 SMA, NDA, and SDA.

(4) Salinity Gradients. None.

(5) Actions That Will Be Taken to Minimize Impacts (Subpart H): Precautions to confine the fill to the desired berm-levee alignment will be taken. Existing access roads would be used.

#### c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Turbidity would be temporary and limited to the time of construction. The berms will be constructed using rather coarse materials (clean crushed limestone) and fill material with a low organic content, hence very low quantities of suspendable material. There will be no interaction with surface water as the L-31N canal is too remote to be impacted by this activity. This construction activity will be either contained within existing levees or temporary barrier cloth emplacements.

(2) Effects on Chemical and Physical Properties of the Water Column. N/A

(a) Light Penetration. Temporary attenuation during construction. No restrictions are expected upon project completion.

(b) Dissolved Oxygen. No BOD; light attenuation effects would be short and negligible, therefore there would be no effect on Dissolved Oxygen.

(c) Toxic Metals and Organics. None.

(d) Pathogens. None.

(e) Aesthetics. Few observers frequent the area, therefore there would be no effect.

(f) Others as Appropriate. None.

(3) Effects on Biota. No aquatic biota is expected to change, as the lands both inside and outside the flowway berms will be dry during part of an average year.

(a) Primary Production, Photosynthesis. No effect because light attenuation from very briefly suspended particulates would be negligible.

(b) Suspension/Filter Feeders. Those confined to water in solution holes of the limestone or unable to move would be covered with the fill. Effects on the biological communities would be negligible.

(c) Sight Feeders. Same as b.

(4) Actions taken to Minimize Impacts (Subpart H). Precautions to confine the fill to the desired berm-levee alignment will be taken. Existing access roads would be used.

d. Contaminant Determinations. None present.

e. Aquatic Ecosystem and Organism Determinations (Subpart G)

(1) Effects on Plankton. Only in areas where permanent wetlands occur would there be any effect on plankton. With the exception of plankton covered by fill, there would be no effect.

(2) Effects on Benthos. See above. No significant benthic organisms are expected to be present with the exception of benthos covered by the fill immediately under the berms, there would be no effect.

(3) Effects on Nekton. None.

(4) Effects on Aquatic Food Web. None.

(5) Effects on Special Aquatic Sites. The construction area is adjacent to ENP. The intent of the project is to help create conditions closer to the historic environmental conditions than those that currently exist.

(a) Sanctuaries and Refuges. As stated above.

(b) Wetlands. Wetland functions and form would be restored to some degree as a result of the project.

(c) Mud Flats. None.

(d) Vegetated Shallows. These are the marl prairies described above. Historic, more natural conditions would be restored to the extent possible.

(e) Coral Reefs. None.

(f) Riffle and Pool Complexes. None.

(6) Threatened and Endangered Species. Consultation with the United States Fish and Wildlife Service is ongoing and will be completed prior to the signing of a FONSI.

(7) Other Wildlife. Wading birds would benefit from significant restoration efforts.

(8) Actions to Minimize Impacts. Precautions to confine the fill to the desired roadway-levee alignment will be taken. Existing access roads would be used.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. There is no mixing zone because no surface water is available for this project.

(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard). All standards will be complied with, unless a variance should be required for unforeseen reasons. A Section 401 water quality certification will be sought from the State of Florida.

(3) Potential Effects on Human Use Characteristics. Non-consumptive uses, such as bird watching, would be enhanced within ENP.

(a) Municipal and Private Water Supply. No effect.

(b) Recreational and Commercial Fisheries. The project would not change flows downstream in C-111. Building the flowways will allow future Operational Plans more flexibility and provide some relief from adverse flooding in the southwest corner of the 8.5 SMA. However, this is a construction only project.

(c) Water Related Recreation. Little to no effect.

(d) Aesthetics. Small temporary effect, due to few observers.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The project is intended to restore ecological values to the southeastern portion of ENP by creating a more effective hydraulic ridge to inhibit ground water seepage out of ENP.

(f) Determination of Cumulative Effects on the Aquatic Ecosystem. To the extent that the project for Modified Water Deliveries (MWD) to ENP is implemented successfully, MWD should

interact synergistically with this project to provide significant restoration of ecological integrity to the southeast Everglades.

(g) Determination of Secondary Effects on the Aquatic Ecosystem. All benefits to flora and fauna would be secondary, in that the direct effects would be hydrological, but the secondary effects would be ecological and beneficial.

### III. Finding of Compliance or Non-Compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. The alternative that will be selected from an array of practicable alternatives will be that which best meets the study objectives. It is probable that no practicable alternative is possible that will not involve discharge of fill into waters of the United States.

c. The discharge of fill materials would not cause or contribute to, after consideration of disposal site dilution and dispersion, violation of any Florida water quality standards. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The placement of fill material would not jeopardize the continued existence of any species listed as threatened or endangered under the Endangered Species Act of 1973, as amended. Approximately 480 acres of land currently designated as Critical Habitat for the CSSS is adjacent to the project area. The hydraulic ridge is critically located on the west side of the Detention Areas and could potentially increase the hydroperiod or water level within the ENP, improving sparrow habitat.

e. The placement of fill materials would not result in significant adverse effects on human health and welfare, municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, wetlands, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity; productivity and stability; and recreational, aesthetics, and economic values will not occur.

f. Appropriate steps to maximize positive impacts on aquatic systems will be included in plans for the recommended plan.