APPENDIX F: COMMANDER'S INTENT AND ALTERNATIVES EVALUATION PROCESS PLAN SELECTION CRITERIA

APPENDIX F

COMMANDER'S INTENT FOR NOV PROJECT, ENVIRONMENTAL MITIGATION

Purpose: Provide compensatory mitigation for unavoidable losses to fish and wildlife, wetlands and bottomland hardwood habitat consistent with relevant laws and policies.

Desired End State: Successfully mitigate for all unavoidable impacts associated with construction of the NFL NOV Project in a manner that is environmentally responsible, within the available budget, and timely. Implement the NFL NOV Project and associated compensatory mitigation plan(s) within the available and allocated appropriations.

Key Tasks:

1. Develop and implement compensatory mitigation plan(s) for unavoidable habitat losses associated with construction of the NFL NOV alignment.
2. Collaboratively engage Federal and State resource agencies and other stakeholders in the planning process, and draw from lessons learned during implementation of the project(s) described in EA #543.
3. Evaluate Corps-constructed projects, areas identified in the 2017 Louisiana State Master Plan, and mitigation bank and In Lieu Fee (ILF) credits consistent with relevant laws, guidance, and policies.
4. Compensatory mitigation project(s) will be:
    1) undertaken concurrent with the construction of authorized project levee reaches and features, or as quickly as possible thereafter;
    2) located within the same watershed that the impacts occur and where the mitigation is most likely to successfully replace lost functions and services or within the service area of a mitigation bank or ILF program that has been authorized to mitigate for impacts occurring in the Project's watershed; and
    3) self-sustaining once ecological success criteria are met to the maximum extent practicable.
5. Develop a fully integrated Project Management Plan (PMP) with a STRATCOM that effectively communicates the mitigation requirement for the NFL NOV Project, develop visualization means to effectively communicate the plan to the public, and keep internal USACE and external stakeholders engaged and updated.

AEP PLAN SELECTION CRITERIA

In brief, plan selection criteria reflect project goals. For instance, if the mission is to buy a car, goals may be to have a low start-up and operating cost. This scenario would have the criteria of retail cost and gas mileage. Note that constraints are not considered criteria (i.e. the retail cost of the car must be under $20K) because alternatives cannot be compared based on this information. Selection criteria vary widely depending on the problem, and can even vary within the umbrella of Civil Works. But for the purposes of the Plaquemines New Orleans to Venice (NOV) non-Federal Levee (NFL) Environmental Mitigation, the Project Delivery Team (PDT) has identified the following plan selection criteria:

- Risk & Reliability
- Environmental
- Time
- Cost Effectiveness
- Other Cost Considerations
- Watershed & Ecological Site Considerations

1.0 **Risk & Reliability:** One of the Chief's 4 priorities is to "employ risk-based concepts in planning, design, construction, operations, and major maintenance." Analysis of alternatives with regard to their risk and reliability is a paradigm shift from deterministic methodologies (e.g. National Economic Development, Benefit/Cost ratios, etc.) to more statistical, probabilistic terms. Though the policy and even the science is still in its nascent stages, enough is usually known to begin making risk-informed decisions, at least qualitatively. An Alternative Evaluation Process (AEP) was conducted to determine the type of hurricane and storm damage risk reduction features that would be built in a given polder defined risk and reliability primarily in terms of flood risk. The environmental mitigation AEP process has adapted this definition to better capture the risk-based decisions to be made for mitigation projects, such as project sustainability.

Risk is defined as probability multiplied by consequences. An example of risk would be a calculation of the relative chance of saltwater intrusion during the 50-year period of analysis multiplied by magnitude of anticipated plant mortality. Actions can be implemented to reduce risk, but because risk can never be completely eliminated, *residual risk* will remain.

Reliability refers to the chance that a component of the system will fail to perform its intended purpose as a function of the forces placed upon it. Reliability is often displayed using a fragility curve which describes the probability of failure as a function of an applied force. Many separate system components can be combined in an event tree to represent the reliability of a system.

Since these two factors are similar, it is best to consider them as one criterion: Risk & Reliability. Moreover, PDTs are only expected to perform Risk & Reliability analysis qualitatively. It is unlikely that PDTs will have fragility curves or event trees when analyzing alternatives. Instead, PDTs should analyze alternatives comparatively. For example, "Alternative 1 is *much more* reliable than Alternative 2, but only *slightly more* reliable than Alternative 3."

The below risk and reliability subcriteria (see Table B-1.0) were applied to each mitigation alternative, and qualitative and quantitative data for each alternative under each of the subcriteria are provided in Appendix B.

Table B-1.0: Risk and Reliability Subcriteria

Issue	Explanation
Uncertainty Relative to Achieving Ecological Success/Potential Need for Adaptive Management (Contingency) Actions	Sources of *uncertainty relative to achieving ecological success* include: (1) incomplete understanding of the system (environmental or engineering) to be managed or restored (e.g. hydroperiod, water depth, water supply, substrate, nutrient levels, toxic compounds) (2) imprecise estimates of the outcomes of alternative management actions (e.g. proven methodology, project complexity). *Evaluation of Potential Need for Adaptive Management (Contingency) Actions:* (1) Is there sufficient flexibility within project design and operation to permit adjustments to management actions? (2) Is the system (or components) to be restored or managed well understood (e.g. hydrology and ecology) and are management outcomes accurately predictable? (3) Do participants generally agree on the most effective design and operation to achieve project goals and objectives? (4) Are the goals and objectives for restoration understood and agreed upon by all parties?
Uncertainty Relative to Implementability	Includes implementability issues that are not captured under other selection criteria. Implementability means that the alternative is feasible from technical, environmental, economic, financial, political, legal, institutional, and social perspectives. If it is not feasible due to any of these factors, then it cannot be implemented, and therefore is not acceptable. An infeasible plan should not be carried forward for further consideration. However, just because a plan is not the preferred plan of a non-Federal sponsor does not make it infeasible or unacceptable *ipso facto.*
Adaptability	Ability to expand (or otherwise adapt) the measure to achieve/maintain ecological success
Long-Term Sustainability of Project Benefits	For marsh: Measured by % emergent marsh remaining in TY50, as calculated for Variable 1 in the Marsh WVA model. For Forested Habitat: Measured by the Habitat Suitability Index Value at TY50, which incorporates the suitability index of all WVA variables in the WVA model.
Self-Sustainability of Project Once Ecological Success Criteria Linked to NCC are Achieved	(1) Does the project utilize active engineering features (e.g., pumps)? (2) Anticipated OMRR&R Activities (3) Relative difficulty of OMRR&R
Risk of Exposure to Stressors/ Reliability & Resiliency of Design	(1) To what stressors will a given alternative be exposed (e.g. sea level rise, subsidence, saltwater intrusion during storm or drought, long-term salinity shift, herbivory, invasive species,

	inundation from storm surge, damage from storm-induced wave action, runoff from adjacent property which could alter chemical or nutrient balance of soils, altered hydrologic regime which could change habitat type or stress vegetation, non-storm wave energy)? (2) How is the project, as designed, likely to perform relative to stressors and/or how well is the project expected to return to functionality after exposure to stressors?

2.0 **Environmental:** The National Environmental Policy Act (NEPA) and other environmental laws require federal agencies to consider environmental impacts in their decision-making, identify unavoidable environmental impacts, and make this information available to the public. All evaluated alternatives should be investigated with respect to environmental consequences. The NEPA document records this investigation. However, since a recommended alternative needs to be identified prior to the Environmental Assessment (EA) being released for public review and comment, the PDT must attempt to analyze impacts using preliminary information, for those resources which could be impacted to differing degrees by each of the alternatives, focusing only on noteworthy differences between the alternatives. Environmental metrics are displayed in a data matrix in the Environmental Appendix G of this EAR.

3.0 **Time:** The PDT must analyze the likely implementation schedules for mitigation alternatives. Time metrics account for engineering and design, real estate acquisition, construction, and period to project turn-over (i.e. notice of construction completion). Time metrics include:

- Estimated time to construction contract award (measured from TSP milestone) presented below in Table F-1.1.

Table F-1.1. Time to Contract Award

Project Alternative	Total Duration
NF NOV 05a.1 Swamp	3 years, 2 months
Combination of NF NOV 05a.1 and Mitigation Bank	3 years, 2 months
General Mitigation Bank	8 months
Big Branch Brackish Marsh	2 years
Fritchie Marsh Brackish Marsh	2 years
Coleman Brackish Marsh	3 years, 2 months
DNWR Main Pass 2 Brackish Marsh	3 years, 2 months
Combination #1 Corps Constructed Project, Mitigation Bank and/or ILF	Range would be indicated

- Estimated time to notice of construction completion (NCC) milestone (measured from TSP milestone) presented below in Table F-1.2.

Table F-1.2. Time to NCC	
Project Alternative	**Total Duration**
NF NOV 05a.1 Swamp	4 years, 10 months
Combination of NF NOV 05a.1 and Mitigation Bank	4 years, 10 months
Big Branch Brackish Marsh	3 years 7 months
Fritchie Marsh Brackish Marsh	3 years 7 months
Coleman Brackish Marsh	5 years, 1 month
DNWR Main Pass 2 Brackish Marsh	3 years, 11 months
Combination #1 Corps Constructed Project, Mitigation Bank and/or ILF	Range would be indicated

4.0 **Cost Effectiveness**: Cost effectiveness analysis seeks to answer the question: given an adequately described objective, what is the least-costly way of attaining the objective? An analysis of cost effectiveness (annualized life cycle cost per average annual habitat unit) is presented in the Economics Appendix I of this EAR.

5.0 **Other Cost Considerations:** In most cases, a contract's Current Working Estimate (CWE) is based on the Programmatic Cost Estimate (PCE), which includes the additional request for funds received in the President's Budget. PDTs should not expect additional appropriations. Therefore, alternatives' costs, excluding escalation and contingency, should not exceed the NOV NFL CWE. Life cycle costs are a consideration when evaluating alternatives, but should not drive plan selection. Cost calculations for NOV NFL projects should include construction, engineering and design, construction supervision and administration, Lands, Easements, Rights-of-Way, Relocations, and Disposal Areas (LERRDs), and Operation Maintenance Repair Replacement & Rehabilitation (OMRR&R). Monitoring and adaptive management costs should be added for mitigation projects. Cost containment is an important consideration and PDTs should not only analyze an alternative's ability to stay within CWE, but also determine the least-cost alternative. Cost metrics include Total Project Cost and Average Annual Cost (and components thereof) which are quantified in the Economics Appendix I of this EAR.

For alternative comparison purposes, minimal OMRR&R activities are assumed for both the WVA modeling and for cost development. These are limited to: monitoring, invasive/nuisance plant eradication, maintenance/replacement of weirs/dikes and culverts, and access road maintenance. Once the TSMP is identified, assumptions may be changed for the TSMP elements to include adaptive management, additional OMRR&R activities, major rehabilitation, etc. in order to sustain ecological success or to address uncertainty. These new assumptions would be reflected in the advanced project design, revised WVA modeling for the TSMP, and revised TSMP cost estimates.

6.0 **Watershed & Ecological Site Considerations:** The PDT has added this selection criterion to address unique factors that apply to environmental mitigation projects that were not addressed in the previously listed selection criteria. Guidance from 40 CFR Part 230 discusses consideration of a mitigation site's role in the larger landscape and other ecological conditions. The subcriteria described in 6.1 and 6.2 below aim to capture this guidance. These subcriteria are considered for each alternative, and

the outcome of this consideration is shown in the Watershed & Ecological Site Considerations data matrix in Attachment 3 of this Appendix.

6.1 Watershed Considerations/Significance within the Watershed:

- Consistency with watershed plans (e.g. Coast 2050, LCA, LaCPR, State Master Plan 2017). 40 CFR Part 230 Compensatory Mitigation for Losses of Aquatic Resources includes guidance regarding the siting of mitigation projects. This guidance directs that mitigation should consider existing watershed plans within the project area. Therefore, the selection criteria considers how a given alternative relates to existing watershed plans within the project area. The four watershed plans considered are Coast 2050, LCA, LaCPR, and the 2012 State Master Plan. Coast 2050 is a strategic plan for coastal Louisiana, sponsored by the Louisiana State Wetlands Conservation and Restoration Authority and the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Task Force. It was adopted in 1999. The Coast 2050 report evolved into the Louisiana Coastal Area (LCA) Ecosystem Restoration Plan of 2004. In 2007, the Corps of Engineers, in partnership with the State of Louisiana, developed a preliminary report entitled The Louisiana Coastal Protection and Restoration (LaCPR) Preliminary Technical Report, which identified a range of coastal restoration and flood control measures for South Louisiana. Also in 2007, the state officially adopted Louisiana's Comprehensive Master Plan for a Sustainable Coast, which complements the LaCPR report. The 2007 Master Plan was updated and adopted in 2012 and at the time of this report the 2017 Master Plan is under development. Mitigation measures have been coordinated with the Louisiana Coastal Protection and Restoration Authority to ensure consistency with the State Master Plan.
- Contiguous with or within resource managed area (i.e. Federal, state, private mitigation bank or other restoration projects considered under Future Without Project condition)
- Located in parish of impact by habitat-type
- Critical features
    - critical geomorphic structures for ecosystem stability (critical geomorphic structures in the coastal ecosystem are those above sea level that protect lower elevation features and in many instances represent the first line of defense against marine influences and tropical storm events (i.e. restoration or preservation of natural ridges, lake rims, land bridges, gulf shoreline barrier islands, barrier headlands, and Chenier ridges)
    - LaCPR critical landscape features for storm damage risk reduction identified in Figure 7-17, Louisiana Coastal Protection and Restoration Final Technical Report and Comment Addendum, August 2009
- Habitat Linkages (e.g. wildlife corridors)

6.2 Ecological Site Considerations not captured in WVA (see Attachment 1 for WVA variables and definitions):

- Fragmentation within site boundary (swamp and marsh alternatives only)
- Site habitat connectivity to larger surrounding project area considering future land use trends (swamp and marsh alternatives only)