The following short form 404(b)(1) evaluation follows the format designed by the Office of the Chief of Engineers, (OCE). As a measure to avoid unnecessary paperwork and to streamline regulation procedures while fulfilling the spirit and intent of environmental statutes, New Orleans District is using this format for all proposed project elements requiring 404 evaluation, but involving no adverse significant impacts.

**PROJECT TITLE**. IER #13, West Bank Vicinity Hero Canal Levee and Eastern Terminus, Plaquemines Parishes, Louisiana

**PROJECT DESCRIPTION**. The Project Delivery Team (PDT) evaluated many factors in deciding upon the most feasible method to accomplish the project's levee system improvements. These factors included criteria such as engineering effectiveness, economic efficiency, and environmental and social acceptability. Two significant parameters considered are the use of existing right-of-way (ROW) and innovative design as much as practicable. By incorporating these concepts into the design in the early stages, environmental consequences could be avoided or minimized to the greatest extent possible. Other significant factors considered are maximizing reliability of the system and minimizing impacts to the environment and social systems. The selection of the proposed action, Alternative 1, is the result of internal meetings and field investigations to determine the most feasible action, taking into account consideration of all applicable factors and related parameters.

The proposed action for the existing Federal levee north of the Hero Canal is expansion on the protected side to avoid environmental impacts to the Hero Canal and adjacent riparian vegetation. For the section near Oakville, Alternative 1 would leave the vicinity of the existing Hero Canal Levee just west of the Industrial Pipe Inc. Landfill proceeding southward across the Hero Canal. A new 56-foot wide gate, approximately 70 cubic feet per second (cfs) pump station, and adjacent T-walls would be used for flood protection within the canal and would connect the existing Hero Canal Levee System on the north side to a new marsh levee on the south side of the canal. The new earthen marsh levee would continue south for 1,000 – 2,000 feet, then turn east along the south side of the landfill for 1,000 – 2,000 feet, crossing marsh until it would intersect with an existing Non-Federal levee system. This alternative would propose to construct approximately 300 – 1,000 feet with new earthen levee, then turn and continue 1,000 – 2,000 feet east to LA 23. An approximately 150 cfs pump station would be built at the point where the Non-Federal levee meets the new levee, emptying into the Oakville Canal. Further east, floodwall would be used at the approach to, and the crossing of, the LA 23 highway.

Three options for crossing four-lane LA 23 were evaluated. The option chosen for the proposed action (and all other alignments) consists of floodwall and vehicular/railroad gates across LA 23 and the New Orleans and Gulf Coast Railway Company Railroad (NOGCR) track. An emergency bypass road would serve vehicular traffic when the gates are closed.

After the gates and floodwalls there would be a transition back into a new levee section which would continue east until intersecting with the existing MRL. Deep soil mixing could be considered where appropriate on the section eastward to the MRL in order to reduce ROW.

Oakville, businesses in the vicinity of Walker Road and LA 23, and the Industrial Pipe, Inc. Landfill would be afforded 100-year LORR by these improvements.

Implementation of the proposed action would directly impact 50-120 acres of wetland habitat. The proposed action would primarily impact bottomland hardwood forest (impounded and tidal) and cypress-tupelo swamp habitats. The majority of the wetland impacts would occur south of Hero Canal due to the construction of the levees and floodwalls. Wetland impacts are minimized along the remaining sections of the alternative by utilizing levee lifts and protected side shifts where possible, particularly to avoid additional impacts to the residential and business areas.

Operation and Maintenance (O&M) of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS) would have minimal impact on the significant resources in the area. Levees would be periodically mowed and herbicides might be used (on a very limited basis) around control structures. The floodwalls and levees would be annually inspected and repaired, as needed, to bring them up to design standards. This includes adding subsequent lifts of

earthen material to levees in order to address subsidence. All activities would be conducted within the established ROW and within previously disturbed areas. Temporary and localized maintenance-related effects (e.g., noise, air emissions, increased traffic, temporary erosion and sedimentation, etc.) might occur during operation and maintenance work.

Table 1 summarizes the features, design elevations, and other data for the proposed action. Any blank quantities would be filled in before the draft is released.

*Existing Hero Canal Levee Improvements.* Only one alternative has been considered in detail for bringing the existing levee north of the Hero Canal up to 100-year Level of Risk Reduction (LORR). This is a protected-side shift, with all toe-to-toe growth occurring on the protected side of the existing levee. The reason for using protected side construction is that there is ample undeveloped land on the protected side and construction would incur only minor environmental impact. Only one residential structure would be impacted and require relocation.

The existing Hero Canal Levee includes a 10-foot wide crown with 1:3 side slopes on flood side and 1:4 on protected side set below the currently authorized elevation. The proposed action consists of raising the top of the levee elevation to equal a 100-year elevation (approximately 14-16 feet), with a 10-foot wide crown with 1:3 side slopes on flood side and 1:4 on protected side, with improvements on the protected side. Approximately 19,000 feet of levee would be improved in this section of the project.

Originally, the options of straddle, flood side construction, and protected side construction were considered. Flood side construction impacts were obvious. The existing Hero Canal Levee is built near water's edge, leaving little or no land area for levee expansion. Straddle or flood side shift construction would require enlarging the levee into the Hero Canal. Typically this is accomplished by placing enough fill at the toe of the existing grade proceeding out into the open water with a "mud wave" until the desired ground surface elevation is achieved. Preliminary calculations of flood side expansion of a levee from 10 to approximately 14 feet to 16 feet NAVD88 indicate that the toe of the existing levee would be expanded at least 40 feet into the canal. The mud wave might push existing vegetation out an addition 70 feet into the channel. Obviously, the impacts to the wetlands adjacent to the channel and to the open water would be considerable in a small water body like the Hero Canal. These impacts would be avoided by building on the protected side, which is currently in fields, pasture and small wood plots. Also, improvements on the protected side allow for better opportunities in the future for increased protection in this area.

**TABLE 1. IER 13 Proposed Action Details**

| Alternative Section | Design Elevations* (ft) | Approximate Length (ft) | Descriptions |
|---|---|---|---|
| Hero Canal Levee | 14-16 | 19,000' Levee | Existing Levee Upgrade |
| Hero Canal Crossing | 14 - 16 | 56 Gate (70 cfs Pump Station), 250 – 500 ft floodwall | Gate Pump Station Two Monoliths |
| Marsh Levee | 14-16 | 2,420' Levee | New Levee in Cypress Swamp |
| Pump Station and South Levee | 14-16 | 1,750-1,850' Levee, 1,018' T Wall (150 cfs Pump Station) | Rebuild of Parish Levee, New Pump Station |
| LA 23 Crossing | 14 | 700-1,850 ft T-Wall | Design Speed 60 mph on Bridge |
| NOGCR Crossing | 14 | 20' Swing Gate T-Wall | Swing Gate/Transition T-Wall |
| Gates | At Grade | North/South 1-Lane Roads 20-30 ft | Two Vehicular Gates at T-Wall |
| RR to MRL Levee | 14-16 | 600-700 ft Levee | New Levee |
| Bypass Road | - | 3,000 ft | Emergency Use |

** Includes initial HSDRRS elevation plus likely settlement to the 2057 design year.*

*Levees South of the Hero Canal.* For levee design south of the Hero Canal, global instability was first checked by Spencer's Method using SLOP/W Versions 2004 or 2007 program created by GeoStudio. Different levee construction was considered, according to instability needs, including unreinforced levees with and without stability berms, levees using deep soil mixing, and levees with geotextile-reinforcement and stability berms. Generally the design levee section has a crown approximately 10 feet wide and slopes of 4:1. If stability berms were added, these would extend outward on 20: 1 or shallower slopes in order to meet the required design safety factors. Geotextile reinforced earthen levee would be used from station 100+00 to station 135+20 for environmental impact relief. No deep soil mixing or unreinforced levees would be used south of Hero Canal.

*Navigation Gate.* A 56-foot gate for navigation on the Hero Canal would be required as part of Alignment 1 to block backwaters when it is closed. The top of the gate would be at elevation 14-16 feet, with the bottom at elevation -10 feet to -12 feet. The structure would be a cantilever space frame supported by a hinge assembly at one end.

The flood gate would allow navigation in the canal primarily to the facilities but also for recreation activities such as fishing and boating. Prior to final design, additional investigation could be made to optimize the size of the gate; it may be possible to reduce the opening width and consequently the cost while still allowing the necessary activities to occur. The gate would not have any valves to allow water levels to equalize and would be opened only when the flood waters have receded and the water level is approximately equal on both sides of the gate.

Monolith concrete structures would be intended to enclose and support the steel gate. The structure foundations

would be slabs founded on concrete square piles due to the very weak soil in the project area. Both vertical and battered piles would be used to resist the water pressure from either the direct (flooded) side or the reverse side. On top of the walls would be a walkway. A project goal of not interrupting traffic in the canal for more than one month would determine the method of construction.

*LA 23 T-Wall Crossing and Bypass Road.* The LA 23 crossing would consist of T-Wall, two vehicular gates, a railroad gate, and a bypass road to provide emergency access.

The proposed plan consists of constructing highway vehicular floodgate(s) across Highway 23, one railroad floodgate, and floodwalls connecting the gates to one another and to the adjacent levees. To allow for emergency traffic, an emergency bypass roadway that ramps up to the Mississippi River Levee and back to Highway 23 would be installed. Note that all dimensions shown herein are approximate and are based on preliminary design.

Each highway floodgate would provide an opening across each pair of travel lanes on Highway 23 (to accommodate the design roadway and requisite guardrails). The railroad floodgate would be constructed immediately to the east of the northbound access road, across the New Orleans and Gulf Coast Railroad track. The railroad floodgate would then give way to a transition floodwall that terminates in the adjacent full levee section. On the western end, floodwall would be constructed around the perimeter of the Captain Larry's parking lot where it would transition to a full levee section that would continue westward. During a storm event, the floodgates would all be closed and traffic would be detoured to the emergency bypass roadway.

Since Highway 23 is the primary means of ingress and egress into lower Plaquemines Parish, and as such is considered a Hurricane Evacuation Route, this plan provides an emergency bypass roadway, which would begin just south of the proposed floodgates, proceed east to the Mississippi River Levee where it would turn north approximately 915 feet, and ramp back down to tie into the existing East Oakville St. for the return to Highway 23. Traffic control measures such as temporary Jersey Barriers or guardrail and police presence would need to be taken when the gates are closed to minimize the impact to public safety.

*Railroad Crossing.* The floodgate would be designed to provide an opening for the NOGCR crossing and to provide protection in the closed position. Both the railroad gate and the vehicular gates would be designed within existing highway and railroad ROW, if possible.

*Pump Stations.* The Hero Canal Pump Station would be a relatively small pumping station incorporated into the sector gates requiring approximately 70 cfs capacity. However, due to the important service that this station provides and for reliability reasons, two pumps, each having a minimum capacity equal to two-thirds of the total or 15,000 gpm, were selected. Each of these pumps would be able to pump 15,000 to 18,500 gpm at the prevailing total dynamic load range of 10 to 18 feet. The general design and dimensions of the pump station would be in accordance with the USACE Mechanical and Electrical Design of Pumping Stations, Engineering Manual (EM) 1110-2-3105, November 1999.

The Oakville Pump Station would serve a drainage area approximately 109 acres in size and be located at the Oakville Canal. The area is currently in low density residential, industrial (quarries) and open space land use. Alternative 1 requires a pump station estimated at approximately 150 cfs. The general design and dimensions of the pump station would be in accordance with the USACE Mechanical and Electrical Design of Pumping Stations, EM 1110-2-3105.

Typical equipment utilized to accomplish the work outlined above would include water trucks, dump trucks, hole cleaners\trenchers, bore/drill rigs, cement and mortar mixers, cranes, graders, tractors/loaders/backhoes, bull dozers, front end loaders, aerial lifts, pile drivers, fork lift, generators and, marine vessels and barges.

| 1. Review of Compliance (§230.10 (a)-(d)). | Preliminary[1] | | Final[2] | |
|---|---|---|---|---|
| A review of this project indicates that: | | | | |
| a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for environmental assessment alternative); | YES | NO* | YES | NO |
| b. The activity does not appear to: (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act; (2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and (3) violate requirements of any Federally designated marine sanctuary (if no, see section 2b and check responses from resource and water quality certifying agencies); | YES | NO* | YES | NO |
| c. The activity would not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values (if no, see section 2); | YES | NO* | YES | NO |
| d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5). | YES | NO* | YES | NO |

| 2. Technical Evaluation Factors (Subparts C-F). | N/A | Not Significant | Significant* |
|---|---|---|---|
| a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C). | | | |
| (1) Substrate impacts. | | | X |
| (2) Suspended particulates/turbidity impacts. | | X | |
| (3) Water column impacts. | | X | |
| (4) Alteration of current patterns and water circulation. | | X | |
| (5) Alteration of normal water fluctuations/ hydroperiod. | | X | |
| (6) Alteration of salinity gradients. | | X | |
| b. Biological Characteristics of the Aquatic Ecosystem (Subpart D). | | | |
| (1) Effect on threatened/endangered species and their habitat. | X | | |
| (2) Effect on the aquatic food web. | | X | |
| (3) Effect on other wildlife (mammals, birds, reptiles, and amphibians). | | X | |
| c. Special Aquatic Sites (Subpart E). | | | |
| (1) Sanctuaries and refuges. | X | | |
| (2) Wetlands. | | | X |
| (3) Mud flats. | X | | |
| (4) Vegetated shallows. | X | | |
| (5) Coral reefs. | X | | |
| (6) Riffle and pool complexes. | X | | |
| d. Human Use Characteristics (Subpart F). | | | |
| (1) Effects on municipal and private water supplies. | X | | |
| (2) Recreational and commercial fisheries impacts. | | X | |
| (3) Effects on water-related recreation. | X | | |
| (4) Esthetic impacts. | | X | |
| (5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves. | X | | |

Remarks. Where a check is placed under the significant category, the preparer has attached explanation. Implementation of the preferred alternative would directly impact 19 and 13 acres of wet and hydrologically-altered (i.e., non-wet) bottomland hardwood habitat, respectively. Approximately 39 acres of swamp habitat would also be directly impacted. According to the USFWS Habitat Assessment Methodology (HAM) and Wetland Value Assessment (WVA) analyses, the preferred alternative would result in the direct loss of 18.39 and 28.27 average annual habitat units (AAHUs), of bottomland hardwood forest and swamp, respectively. Mitigation for unavoidable losses of wet and non-wet bottomland hardwood and swamp habitat caused by project features will be evaluated through a complementary comprehensive mitigation IER.

3. Evaluation of Dredged or Fill Material (Subpart G).[3]

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.

| | |
|---|---|
| (1) Physical characteristics | X |
| (2) Hydrography in relation to known or anticipated sources of contaminants | X |
| (3) Results from previous testing of the material or similar material in the vicinity of the project | X |
| (4) Known, significant sources of persistent pesticides from land runoff or percolation | |
| (5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances | X |
| (6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources | X |
| (7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities | X |
| (8) Other sources (specify) | |

Appropriate references: See attached memo

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria.

YES NO*

4. Disposal Site Delineation (§230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

| | |
|---|---|
| (1) Depth of water at disposal site | X |
| (2) Current velocity, direction, and variability at disposal site | X |
| (3) Degree of turbulence | X |
| (4) Water column stratification | X |
| (5) Discharge vessel speed and direction | |
| (6) Rate of discharge | |
| (7) Dredged material characteristics (constituents, amount, and type of material, settling velocities) | X |
| (8) Number of discharges per unit of time | |
| (9) Other factors affecting rates and patterns of mixing (specify) | |

Appropriate references: See attached memo

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES NO*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of the recommendations of §230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES NO*

Actions taken: See attached memo

6. Factual Determination (§230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above). YES NO*

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5). YES NO*

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5) YES NO*

d. Contaminant availability (review sections 2a, 3, and 4). YES NO*

e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5). YES NO*

f. Disposal site (review sections 2, 4, and 5). YES NO*

g. Cumulative impact on the aquatic ecosystem. YES NO*

h. Secondary impacts on the aquatic ecosystem. YES NO*

*A negative, significant, or unknown response indicates that the project may not be in compliance with the Section 404(b)(1) Guidelines.

[1]Negative responses to three or more of the compliance criteria at this stage indicates that the proposed projects may not be evaluated using this "short form procedure". Care should be used in assessing pertinent portions of the technical information of items 2a-d, before completing the final review of compliance.

[2]Negative responses to one of the compliance criteria at this stage indicates that the proposed project does not comply with the guidelines. If the economics of navigation and anchorage of Section 404(b)(2) are to be evaluated in the decision-making process, the "short form" evaluation process is inappropriate.

[3]If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

a. This evaluation was prepared by:

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Position: Environmental Engineer
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 2/17/09

Name: Getrisc Coulson
Position: Environment Manager
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 2/05/2009

b. This evaluation was reviewed by:

Name: Rodney Mach
Position: Environmental Engineer
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 2/17/09

Name: Gib Owen
Position: Chief, Ecological Planning and Restoration Section
Organization: US Army Corps of Engineers, New Orleans District
Date: 3/28/2009

8. Findings.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines .....**YES___**

b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions .....**YES_ _**

c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

(1) There is a less damaging practicable alternative .....**NO___**
(2) The proposed discharge will result in significant degradation of the aquatic ecosystem .....**NO___**
(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem .....**NO___**

Date: _____ _____

Joan Exnicios
Acting Chief, Environmental Planning and Compliance Branch