



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 60267  
NEW ORLEANS, LOUISIANA 70160-0267

NOV 04 2008

Planning, Programs, and  
Project Management Division  
Environmental Planning  
and Compliance Branch

Mr. Lawrence E. Starfield  
Deputy Regional Administrator  
Environmental Protection Agency  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202-2733

Dear Mr. Starfield:

The purpose of this letter is to request modification of the Environmental Protection Agency (EPA) Bayou aux Carpes 404 (c) Final Determination issued October 16, 1985. The US Army Corps of Engineers (Corps) requests that the EPA consider approving a modification that would allow the Corps to construct a segment of the West Bank and Vicinity Hurricane Protection Project / Hurricane and Storm Damage Risk Reduction System (HSDRRS) along the northeastern property boundary. The intent of the Corps proposed action is to reduce risk to the citizens of Greater New Orleans Metropolitan area by building a more resilient and reliable storm damage and risk reduction system. We can accomplish this by constructing an improved storm surge barrier system around the Bayou aux Carpes site, crossing the Gulf Intracoastal Waterway (GIWW) with a floodgate(s)/pumping station structure, and then tying into the existing Hero Canal Federal levee (GIWW West Closure Complex (GIWW WCC) alternative, see enclosed map and floodwall cross section).

The Corps has been working closely with EPA and other federal and state resource agency staff for several months to come up with the least environmentally damaging alternative that lowers the risk of storm surge damage to the greatest number of people in the area. It is our determination that the proposed action, GIWW WCC is the best alternative to provide the greatest level of risk reduction while minimizing environmental impacts. The Corps intends to make a final decision in the upcoming months concerning this project by circulating a draft of Individual Environmental Report (IER) # 12 and a Clean Water Act Section 404 (b) (1) public notice for a 30-day public comment period. Upon completion of the 30-day comment period, the Corps will review all comments received along with the data and analysis discussed in the IER in order to make a decision on the proposed action. The Corps will not make a decision on this portion of the proposed action until the EPA makes a determination on a modification to the Bayou aux Carpes 404 (c).

The proposed alternative would require the construction of a floodwall and earthen berm along the eastern boundary of the 404 (c) site. To construct this alternative the Corps would need to impact an area within the 404 (c) area no greater than 4,200 LF by 100 LF. This action would impact no greater than 9.6 acres along the west bank of the GIWW within the Bayou aux Carpes 404 (c) area. Please refer to the enclosed documentation that describes in detail the:

- a. Need to modify the original HSDRRS alignment;
- b. Need to modify the Bayou aux Carpes 404 (c) Final Determination;
- c. Measures taken to ensure the avoidance and/or minimization of all adverse impacts to the Bayou aux Carpes 404 (c) area;
- d. Planning and design considerations to avoid additional impacts from any reasonable foreseeable future flood protection measures (i.e., the Louisiana Coastal Protection and Restoration (LACPR) Study);
- e. Plans for adequate site specific mitigation for all unavoidable adverse impacts to the Bayou aux Carpes 404 (c) area;
- f. Review of projected wetland impacts as per Corps 404 (b)(1) guidelines and the EPA 404 (b)(1) and 404 (c) procedures found in 40 CFR Parts 230 & 231; and
- g. Draft Path Forward with GIWW WCC.

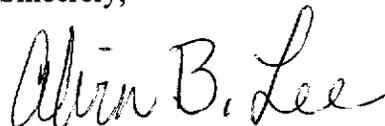
Summarizing the above attachments: The Corps has determined that the GIWW WCC alternative, which alters the current system alignment, is the government's proposed action for this segment of the HSDRRS because this alternative would provide the most reliable, time sensitive and cost effective solution with the least adverse environmental impacts. Though this alternative would impact the Bayou aux Carpes 404 (c) area, the Corps agrees that final design efforts would utilize all feasible engineering and construction practices to reduce impacts to these nationally significant wetlands. In order to minimize the footprint of the surge barrier component to no greater than 4,200 LF by 100 LF along the western side of the GIWW within the Bayou aux Carpes 404 (c) area, the Corps agrees to investigate and utilize innovative techniques to design and build a structure that incorporates a floodwall and earthen berm rather than an earthen levee. The Corps would also locate the GIWW floodgate(s) as close to the Harvey and Algiers Canals confluence as engineeringly feasible in order to minimize impacts to the 404 (c) area. To further ensure the minimization of adverse impacts within the 404 (c) area, construction of the floodwall and earthen berm / access road would occur from the GIWW side of the construction area. In addition, project feature augmentations, such as allowing Old Estelle effluent into the 404 (c) area by gapping the spoil bank and removing the shell plug at Bayou aux Carpes, are being studied and would be incorporated as project features if the results of the

environmental studies demonstrate that this proposed action would augment the Corps actions to minimize effects to the 404 (c) wetland habitat. Additional project feature augmentations, such as the gapping of other canal banks in the 404 (c) area are also being studied and would be incorporated into the project if it is found that the features further minimize impacts as a result of the Corps proposed action. The Corps agrees that mitigation for all unavoidable adverse impacts to the Bayou aux Carpes 404 (c) area would occur within the Bayou aux Carpes 404 (c) area and/or Jean Lafitte National and Historical Park. Mitigation projects would be designed and implemented concurrently with the design and construction of the floodwall and earthen berm / access road. Full mitigation within this unique environment may require mitigation in addition to acres indicated by the Wetland Value Assessment. The Corps further agrees to work in collaboration with the interagency team to monitor the area to ensure mitigation is successful in reaching its targeted goal and to utilize adaptive management efforts to ensure the project feature augmentations are assisting to minimize adverse impact within the 404 (c) area. The total funding required for the entire HSDRRS, \$16.8 billion, has been appropriated by Congress. This funding includes funds for the design and construction of all HSDRRS mitigation measures. The Corps would ensure that all impacts due to upgrading structures currently outlining the Bayou aux Carpes 404 (c) area would occur on the protected side and would not impact the 404 (c) area. Lastly, the GIWW WCC proposed action, would have the greatest adaptability to accommodate an enlargement associated with future system upgrades, i.e., LACPR.

We recognize the significance of this request and greatly appreciate the cooperation the EPA has shown in working with the Corps in our efforts to construct the most reliable hurricane risk reduction system possible.

If you have any questions or concerns please contact Mr. Gib Owen by E-mail: [gib.a.owen@usace.army.mil](mailto:gib.a.owen@usace.army.mil) or by phone at (504) 862-1337.

Sincerely,



Alvin B. Lee  
Colonel, US Army  
District Commander

Enclosure

See page 4 for list of copies furnished.

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Protection Authority - West Bank  
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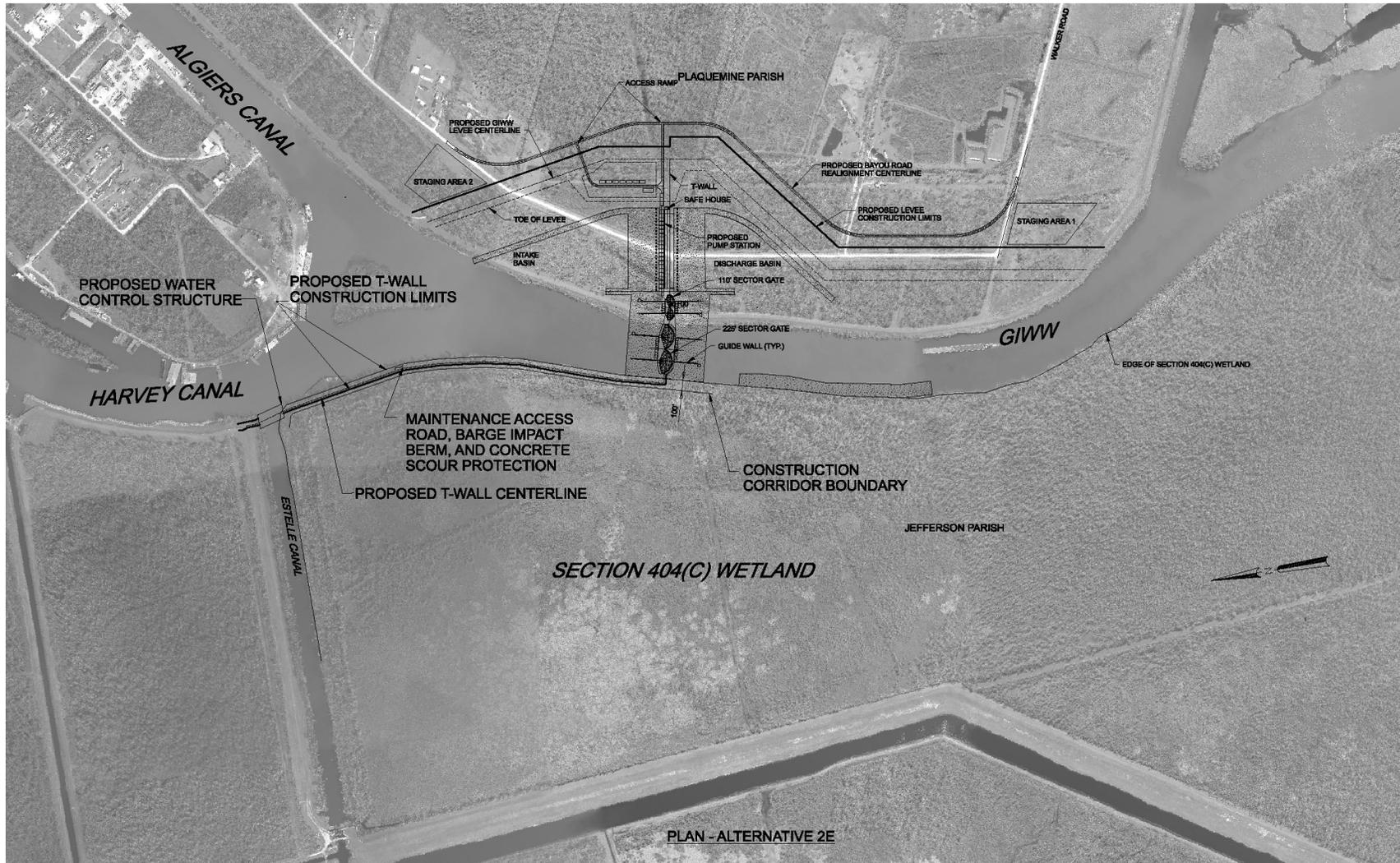
Mr. Jerry Spohrer  
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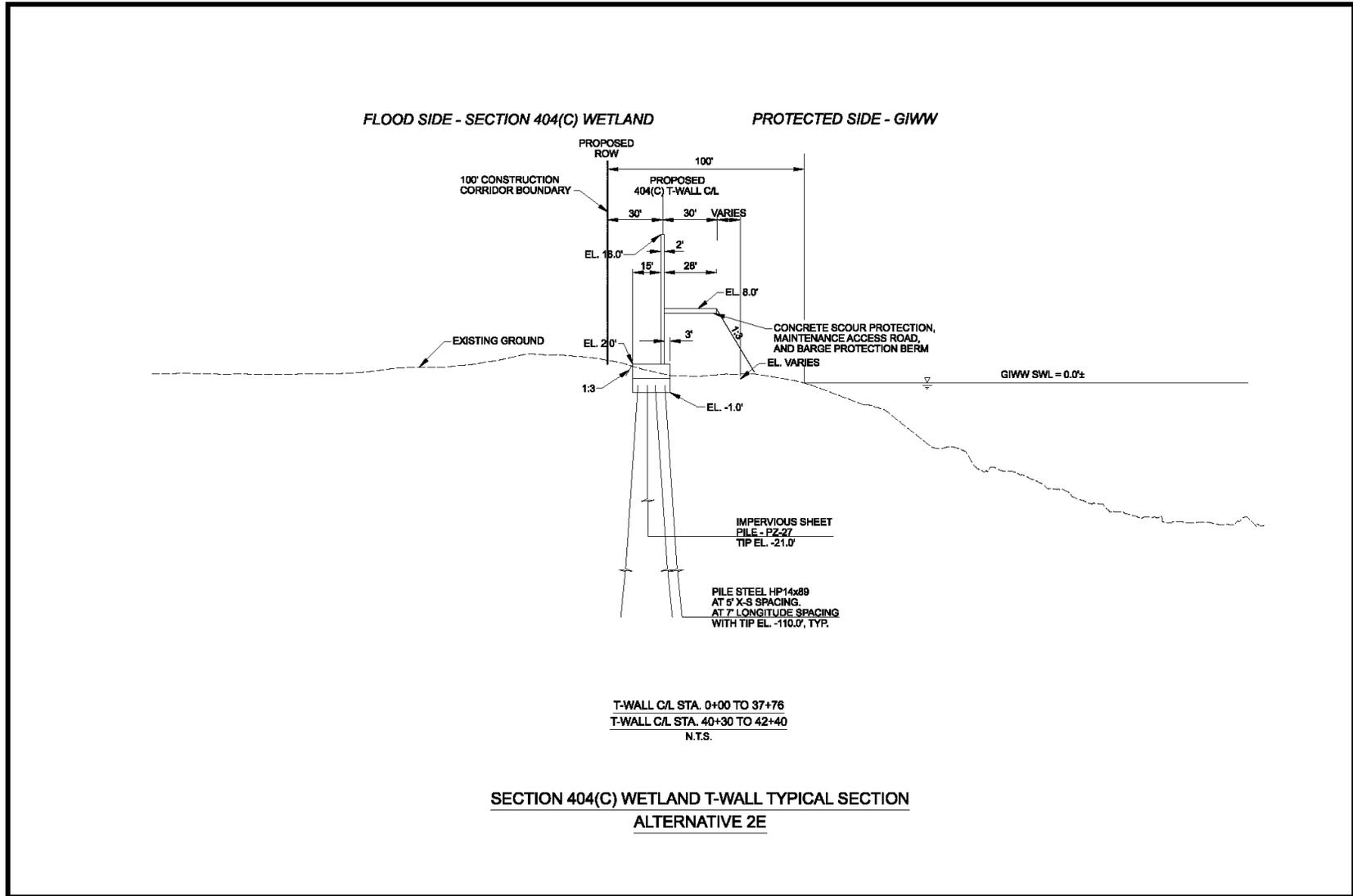
# CURRENT PROPOSED SITE PLAN

- LOCATION OF STRUCTURES WITHIN 404(C) AREA WOULD REMAIN AS SHOWN. MAXIMUM AREA OF IMPACT WOULD BE 100' WIDE BY 4200' LONG (9.6 acres).
- ORIENTATION OF PUMP STATION, GATE(S), BYPASS CHANNEL AND LEVEE ON EAST SIDE OF GIWW ARE NOT FINAL AND COULD CHANGE AS DESIGN PROGRESSES.



# TYPICAL PROPOSED 404(C) WALL SECTION

(FINAL DESIGN WOULD BE COMPLETED IN PARTNERSHIP WITH EPA AND NPS)



**a) The need to modify the current hurricane system alignment.**

The US Army Corps of Engineers (Corps) has been studying the current HSDRRS alignment, and based upon factors associated with system reliability has determined that in order to provide the greatest risk reduction, certain segments of the system must follow an improved alignment. The proposed new alignment for this project, GIWW WCC alternative, would significantly reduce risk to nearly 286,000 people living on the West bank of the Mississippi River. By removing 27 miles of parallel protection from the primary line of defense, this more streamlined surge barrier reduces the number of potential failure points in the system, increases quality control and certainty of subsurface conditions during construction, and minimizes human impacts since the existing footprint of the current system would not be widened to 100 year level of protection (LOP). This is a critical lesson learned from Hurricane Katrina in 2005. Catastrophic failure due to breaching along the 17<sup>th</sup> Street and London Avenue Outfall canals and the Inner Harbor Navigational Canal (IHNC) occurred because expanses of parallel protection were an inadequate risk reduction measure for such complex and challenging environments (USACE 2008). The structures may have been designed and constructed properly; however, there was an overall failure to incorporate new technologies and new risk reduction measures into the previous risk reduction system (USACE 2008). Hurricane Katrina brought many issues to the forefront. A major issue that surfaced was extensive reaches of levee, floodwall and floodgates provide numerous possible points of failure within the system and reduce the ability to maintain strict quality control. Hurricane Katrina also demonstrated that structures need to be resilient and must be constructed with the ability to reduce risk while withstanding system overtopping. The structures must still hold back the majority of the storm front, while some water may overtop the structure. In addition, having multiple lines of defense, such as a second barrier behind the initial surge barrier, i.e., the existing line of defense at pre Katrina authorized elevations, would even further ensure risk reduction within an area.

The Corps Project Delivery Team (PDT) identified all possible alignments in the area. All the alternatives were then evaluated according to various criteria, and all non-reasonable alternatives, i.e., those alternatives with overwhelming engineering challenges, were eliminated. In general, assessing all possible alignments demonstrated two things: system reliability increases as the actual length of the surge barrier decreases (deeming a further south, more streamlined alignment as most reliable) and this further southern alignment, which offers the most system reliability and protection, proposes to impact the Bayou aux Carpes 404 (c) area. There were five surviving alternatives brought forward from a preliminary alternative evaluation process conducted in early 2007. Two of those five alternatives were further analyzed and then eliminated due to non-constructability. The three surviving alternatives were then brought forward and further evaluated according to system reliability, environmental impacts, schedule and cost. These three surviving alternatives and the evaluation process were presented to EPA staff along with other Federal and state resource agencies to solicit input. In collaboration with the EPA and NPS, the Corps PDT revisited a previous alternative from the original proposed southern alignment that would maintain system reliability and additionally would minimize adverse environmental impacts. This fourth alternative was

evaluated against the same four criteria, was presented to the Federal and state resource agencies and local stakeholders, and was brought forward as the government's proposed action. Listed below are the proposed action and three other alternatives.

**The Proposed Action - The GIWW WCC alternative** would consist of the Corps along with its non-Federal partner, the State of Louisiana, constructing a floodwall and earthen / concrete barrier with an access road around the northern portion of the Bayou aux Carpes 404 (c) area. The barrier would run from the v-line levee situated west of the Bayou aux Carpes 404 (c) area to the Old Estelle pump station, west to east along the northern bank of the Old Estelle discharge canal, down the western bank of the GIWW within the Bayou aux Carpes 404 (c) area to a point where the alignment would cross the GIWW to the east bank to tie in with a levee being planned for construction along the northern side of the Hero Canal (see proposed action schematic below). Previously existing levee structures would be upgraded and/or replaced with floodwall to 14' / 16', the height specified for 100 year LOP, while a new floodwall with an earthen berm would be constructed along the western bank of the GIWW within the Bayou aux Carpes 404 (c) area. The new floodwall and earthen berm within the Bayou aux Carpes 404 (c) area would be no greater than 4,200 linear feet (LF) in length, no greater than 100 LF in width and 16' in height. Other features of the system include a navigation gate(s) system at the GIWW that would be 150 to 350 foot wide to allow for navigation and current reduction. Storm gates would be built to an elevation of 16'. The pump station would have a capacity between 20,000 and 25,000 cubic feet per second (cfs) to accommodate existing storm water discharges from the local parishes' drainage system. A by-pass channel would be built on the east bank of the GIWW to allow navigation on the GIWW during construction of the permanent gate structure. The existing Enterprise Gas pipeline would be relocated by directional drilling a new pipeline under the proposed bypass channel, the GIWW and the 404 (c) area. By directional drilling the pipeline under the 404 (c) area, the Corps not only avoids impacts to the area, but minimizes future impacts associated with maintaining the pipeline right-of-way across the area. These engineering specifics are the most current but are only preliminary and cannot be finalized without further investigation. Soil borings from the Bayou aux Carpes 404 (c) area are required to gather geotechnical specifics and give an indication of the actual floodwall and earthen berm footprint. The Corps submitted a letter on August 12, 2008 to EPA Region 6 and NPS requesting right-of-entry (ROE) within the Bayou aux Carpes 404 (c) area to conduct field surveys and obtain soil borings. Both the EPA and NPS responded quickly to the request granting ROE to begin the necessary data collection. The clearing to obtain boring samples occurred on October 6, 2008.

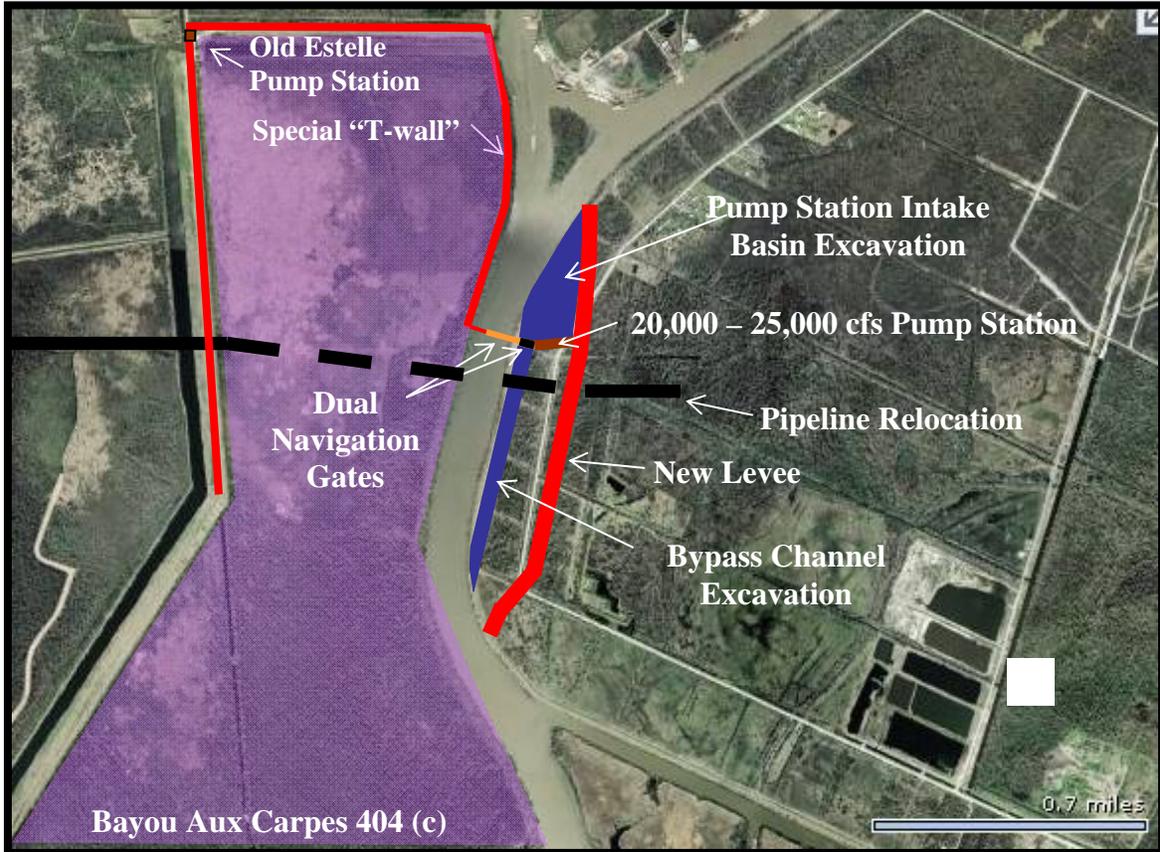


Figure1. Conceptual GIWW West Closure Complex alternative schematic.

When the GIWW WCC alternative was evaluated with respect to system reliability, adverse environmental impacts, time and cost, it was determined the construction of this alternative alignment would dramatically increase system reliability. This proposed action reduces the primary line of defense by 36% and would be comparable in system reliability to GIWW A alternative, the other southern alignment, but would be much more reliable than the Algiers Gate or Parallel Protection alternatives (see alternative descriptions below). The GIWW WCC alternative would have the fewest adverse environmental impacts. Even though proposing to impact the Bayou aux Carpes 404 (c) area, this proposed alignment would minimize all direct and indirect adverse impacts to both the natural and human environments (see item 3 below). In addition, the proposed action would have a surge barrier in place, with reduced pumping capacity, by 2011, and would be more economical to construct than the AG or PP alternatives. See the alternative comparison tables below for specific details on system reliability, environment and schedule.

The GIWW A alternative is similar to the proposed action described above, but utilizes different levee and floodwall alignments. A navigable floodgate would be constructed in the GIWW approximately 1 mile south of the confluence of the Harvey and Algiers canals. The details regarding the navigable floodgate are identical to those described for the proposed action (GIWW WCC). The overall structure would include the floodgates,

pumping station, and by-pass channel as previously described. A new 3,000-foot long tidal exchange structure would be constructed west of the navigable floodgate across the EPA Bayou aux Carpes 404 (c) area to the V-Line Levee. The tidal exchange structure floodwall would be designed to utilize the smallest construction footprint possible to minimize environmental impacts. Gates in the wall would be constructed at specified locations in an effort to maintain the natural hydrology of the area. The floodwall would also be designed to facilitate the passage of wildlife. The navigable floodgate and tidal exchange structure would be constructed to the 100-year LOP 16'. The specific tie-in locations of the GIWW A alternative to other HSDRRS (IER #13 and #14) project elements would provide 100-year LOP to the study area without raising the parallel protection above that currently authorized along the Harvey and Algiers Canal Reaches.

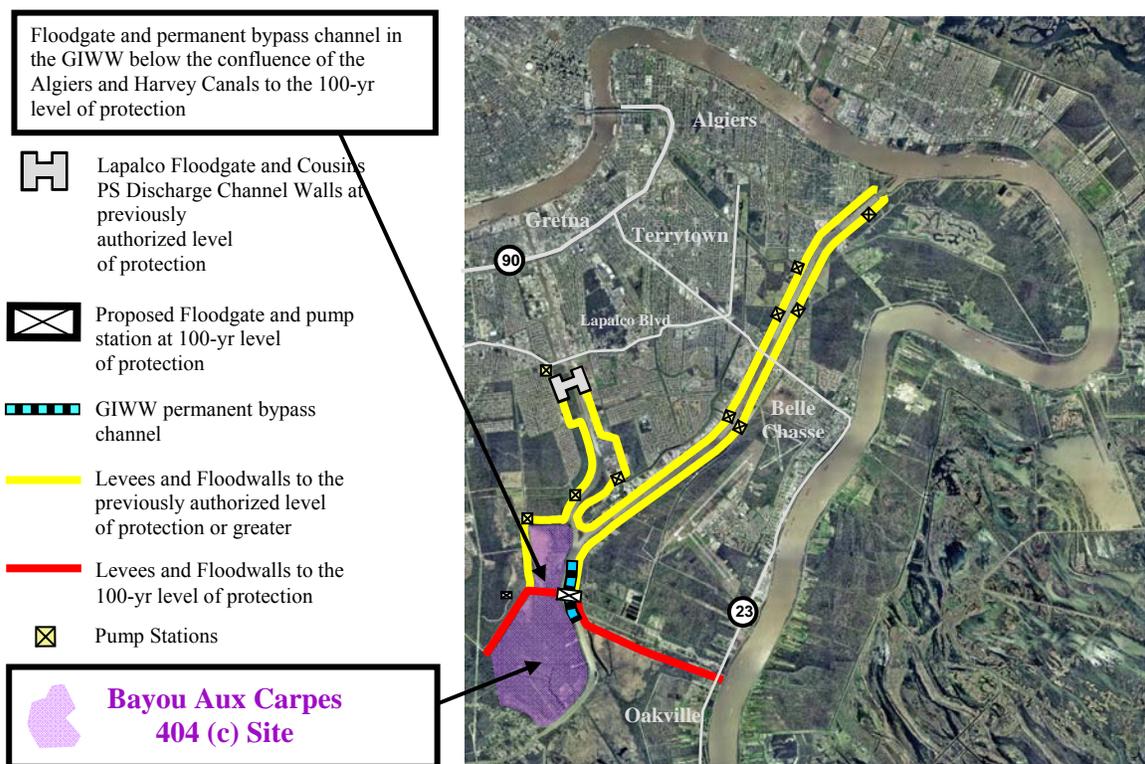


Figure 2. Conceptual GIWW A alternative schematic.

When the GIWW A alternative was evaluated with respect to system reliability, adverse environmental impacts, time and cost, the GIWW A alternative had comparable system reliability, schedule and cost to the proposed action (GIWW WCC); however, the adverse environmental impacts for the GIWW A alternative would be much greater than the proposed action. Though both alternatives would impact the Bayou aux Carpes 404 (c) area, the tidal exchange structure floodwall in GIWW A proposes to bifurcate the Bayou aux Carpes 404 (c) area and would result in irreparable direct and indirect impacts to the unique area (i.e., potential degradation or loss of flotant marsh located in the northern region of the 404 (c) area). In addition, this GIWW A alternative could preclude the possibility of including a portion of the Bayou aux Carpes 404 (c) area in the adjacent

Jean Lafitte National and Historical Park, where as the proposed action would create a more manageable situation for the NPS. While the GIWW WCC alternative also proposes a floodwall structure within the 404 (c) area, construction would be confined to a narrow footprint within a previously disturbed spoil bank along the west bank of the GIWW. The GIWW A alternative would also have a surge barrier in place, with reduced pumping capacity, by 2011, and would be much more economic to construct than the AG or PP alternatives. See the alternative comparison tables below for specific details on system reliability, environment and schedule.

The Algiers Gate alternative would require the construction of a navigable floodgate located on the Algiers Canal and major levee and floodwall improvements along the Harvey Canal, GIWW, and V-Line Levee. The AG alternative would include a 150-foot to 300-foot navigable floodgate located on the Algiers Canal, just above the confluence with the Harvey Canal. This navigable floodgate would require a permanent pumping station (approximately 20,000 cfs) adjacent to the gate, providing 100-year LOP along the Algiers Canal. Levee extending from the gate and pump station would need to be raised to 100-year LOP (14.0 feet). These improvements would tie into additional levee and floodwall improvements within the GIWW and Harvey Canal Reaches. Levees and floodwalls would be raised to 14.0 feet along both banks of the Harvey Canal, sections of the GIWW, and sections of the V-Line Levee. Levee improvements would specifically occur in two main locations. Existing levee on the eastern side of the GIWW would be raised from the navigable floodgate on the Algiers Canal to the Hero Canal Levee. In addition, existing levee on the west bank of the Harvey Canal would be raised from Lapalco Blvd. to the Estelle Pump Station Outfall Canal, west to the Estelle Pump Station, and continuing south along the V-Line Levee. Floodwall would be built to 14.0 feet on the east bank of the Harvey Canal from Lapalco Blvd. south to the GIWW. Floodwall would be used in this area in order to minimize impacts to existing development. These floodwall improvements along the Harvey Canal are currently being constructed under previous authorization. The proposed levee and floodwall improvements would require major modifications to the Harvey Canal Floodgate at Lapalco Blvd. and the Cousins Pump Station discharge channel. Fronting protection to the 100-year LOP would also be required at the Cousins Pump Station and all pump stations south of Lapalco Boulevard on the Harvey Canal, to prevent inundation of the existing pumps. These additional improvements would provide the desired 100-year LOP in coordination with levee tie-ins to additional HSDRRS projects (IER #13 and #14).

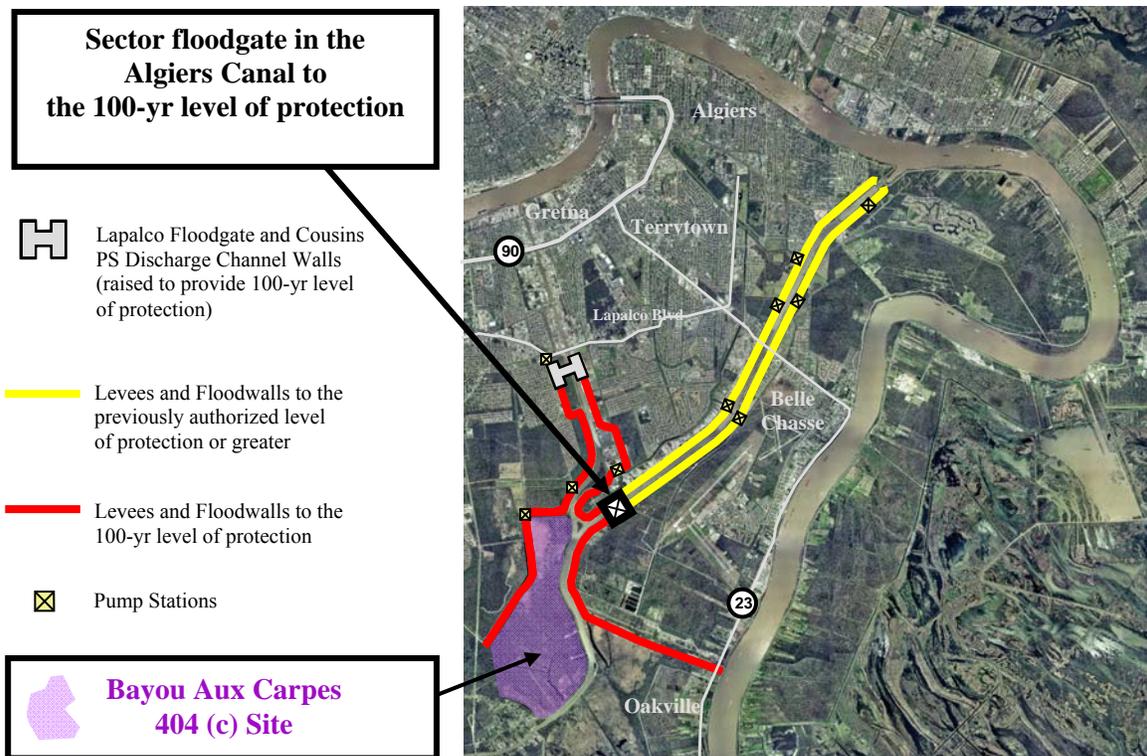


Figure 3. Conceptual Algiers Gate alternative schematic.

When the AG alternative was evaluated for system reliability, adverse environmental impacts, schedule and cost, it was determined this alternative would be less reliable than the proposed action (GIWW WCC) and GIWW A alternative but more reliable than the PP alternative. The AG alternative would reduce the primary line of defense by 18 miles. Though this alternative proposes to reduce the extent of parallel protection in the system along the Algiers Canal, there would still be areas with parallel protection serving as the primary line of defense along the Harvey Canal industrial reach. In addition, the line of parallel protection along the Harvey Canal industrial reach is situated behind the businesses and would not serve as a flood barrier to those industrial areas. The proposed action (GIWW WCC) would create a primary line of defense that would also reduce risk to those industrial areas and prevent flooding of the businesses. Construction of the proposed action would place the existing floodwalls and levees along the Harvey and Algiers canals as the secondary line of defense in the event of canal flooding due to system over topping. In addition, upgrading levee stretches west of the Harvey Canal would greatly increase the levee footprint and would impact both the human and natural environment. Adverse environmental impacts for this alternative would be greater than those of the proposed action (GIWW WCC). See the alternative comparison tables below for specific details on system reliability, environment and schedule.

The Parallel Protection alternative uses only improvements to existing levees and floodwalls along the GIWW, Harvey and Algiers Canal to achieve 100-year LOP. This alternative is similar to the AG alternative along the GIWW and Harvey Canal; however, there is no navigable floodgate built on the Algiers Canal. Instead, 100-year LOP is achieved along the

Algiers Canal by raising levees and floodwalls. Levee would be raised to 14.0 feet along the V-Line Levee to the Estelle Pump Station, continuing along the Estelle Outfall Canal, and finally running north along the western bank of the Harvey Canal to Lapalco Blvd. Major modifications to the Cousins pump station discharge walls and the Lapalco floodgate would be required. On the opposite side of the Harvey Canal (east bank), floodwall would be raised to 14.0 feet from Lapalco Blvd. to the Algiers Canal. The existing levees and floodwalls on both banks of the Algiers Canal would be modified from Hero cut to the Algiers Locks. Elevations of the levee and floodwall improvements along the Algiers Canal would range from 14.0 to 16.0 feet. Improvements to existing flood protection structures would consist of:

- Raising existing levees (which will require the acquisition of additional rights-of-way and the removal of numerous dwellings, apartment complexes, electrical transmission towers, modifying the bridge supporting piers for two vehicle bridges and one railroad bridge crossing the canal, degrading the existing levees, installing a high strength geotextile at elevation 0.0 and rebuilding the levee to the 100-year LOP);
- Constructing and modifying existing floodwalls; and
- Constructing floodwalls and floodgates on existing levees.

The construction options utilized throughout the Algiers Canal reach would be highly dependent upon localized land use and constructability. In addition to the levee and floodwall improvements, the PP alternative would require elevation modifications and flood protection tie-ins to all pump stations along the Harvey and Algiers Canals, the Algiers Locks, the Lapalco Sector Gate and the Estelle Pump Station. Some of these modifications have already occurred, or are currently under construction as part of a pre-Katrina authorized action. These modifications, and the PP alternative levee and floodwall modifications, would provide 100-year LOP in coordination with levee tie-ins with additional HSDRRS projects (IER #13 and #14).

Belle Chasse Tunnel - The existing lanes of south-bound LA 23 at Belle Chasse travel through a tunnel under the Algiers Canal; this complicates raising the LOP in that area. The tunnel structure is probably inadequate to support higher water loads that would be associated with the 100-year LOP. Two options have been identified:

- Locate the line of protection away from the canal to points beyond the tunnel entrances. This would require flood closure gates across the highway at each end of the tunnel. This plan would result in flooding of the tunnel during periods of high water, and it might even be necessary to require flooding of the tunnel to prevent structural damage from high water pressure.
- Abandon the tunnel and reroute the highway to a new high-level bridge. This plan would also require relocating the roadway and the addition of ramps to the bridge, and might require backfilling the tunnel for structural security.

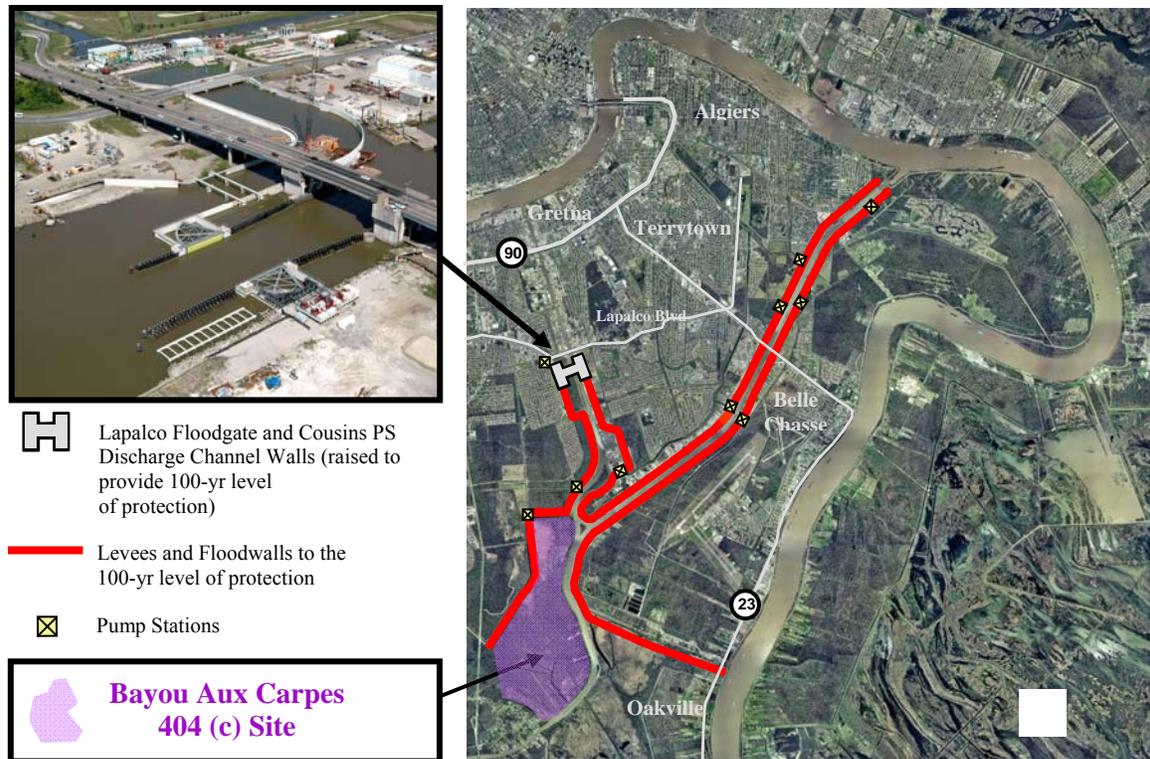


Figure 4. Conceptual Parallel Protection alternative schematic.

When the PP alternative was evaluated with respect to system reliability, adverse environmental impacts, schedule and cost, it was determined this alternative would have the lowest system reliability, have the most adverse socioeconomic impacts, have significant environmental impacts, require the most time to construct and be least economic. This alternative that keeps the approximately 27 miles of existing risk reduction system as the primary line of defense would be the least reliable because this alignment contains numerous potential failure points. In addition to reduced reliability, upgrading the current alignment would require large scale residential and commercial relocations and would have serious environmental implications (i.e. HTRW issues). See the alternative comparison tables below for specific details on system reliability, environment and schedule.

### Alternative Comparison Tables

The tables below demonstrate alternative comparisons for three criteria: risk and reliability, environment, and schedule. The criteria were broken out into multiple “sub-criteria” for a more thorough comparison among alternatives. Specific cost comparison information was excluded as it cannot be disclosed at this time.

## RISK & RELIABILITY COMPARISON

		GIWW WCC	GIWW A	AG	PP
<b>Reliability</b>	Storm load exposure	Approximately 3 miles of storm frontage	Approximately 1 mile of storm frontage	Approximately 9 miles of storm frontage	Approximately 27 miles of storm frontage
	Overtopping frequency	Overtopping frequency more than GIWW A alternative but less than AG alternative	Lowest overtopping frequency because it has least lineal exposure and 2' superiority over 100-yr water elevations along entire storm front	Overtopping frequency more than GIWW WCC alternative but less than PP alternative	Highest frequency of overtopping because it has greatest lineal exposure and least superiority over 100-yr water elevations
	Overtopping volume	Overtopping volume more than GIWW A alternative but less than AG alternative	Lowest overtopping volume because it has the highest superiority over 100-yr elevations and shortest frontage	Overtopping volume more than GIWW WCC alternative but less than PP alternative	Highest overtopping volume because it has no superiority over 100-yr elevations and longest frontage
	Non-storm load exposure	More storm load exposure than GIWW A alternative but less than AG alternative	Least lineal exposure to non-storm loads. Not susceptible to vegetation and wildlife encroachment. Protection is perpendicular to the navigation, possibly affecting frequency or severity of collisions	Significantly more storm load exposure than GIWW WCC alternative but less than PP alternative	Greatest lineal exposure to non-storm loads. Earthen levees are susceptible to vegetation and wildlife encroachment. Protection is parallel to the navigation, possibly affecting frequency or severity of collisions
	Value to terrorists	Less value to terrorists than GIWW A alternative, but more than AG alternative	High because HPS features are concentrated in terms of location and value, but easier to monitor and defend	Less value to terrorists than GIWW WCC alternative, but more than PP alternative	Low because HPS features are distributed by location and value, but harder to monitor and defend
	Resistance to explosive devices	Lower resistance to man-portable explosives and more accessible to larger devices	Lower resistance to man-portable explosives and more accessible to larger devices	Lower resistance to man-portable explosives and more accessible to larger devices	High resistance to man-portable devices; vulnerability to larger devices is low because access would be difficult
	Transitions (levee-to-floodwall, floodwall-to-floodgate, etc)	Approximately 10	Least number of transitions approximately 6	Approximately 60	Highest number, approximately 90
	Compartmentalization	Creates 2 <sup>nd</sup> largest storm water storage subbasin	Creates the largest storm water storage subbasin	Creates smallest storm water storage subbasin	No new sub-compartments created
	Foundations	Same as GIWW A alternative, except for some levee reaches, in which case see PP alternative	Pile foundations are engineered	Same as GIWW A alternative, except for some levee reaches, in which case see PP alternative	Levee foundations would be non-engineered unless geo-textile or soil cement design alternatives are adopted; any T-wall foundations would be engineered
	Complexity	High; largest number of new HPS features, though many separate levee reaches are eliminated	High; largest number of new HPS features, though many separate levee reaches are eliminated	High; though lower than GIWW WCC and GIWW A alternatives	Low; largest number of reaches, but no new HPS features created
Interdependency of features	8-9 pump stations upstream dependent on the new pump station	9 pump stations upstream become dependent on the new pump station	7 pump stations upstream depend on new pump station	No new dependencies	
Redundancy	Pumping capacity is	Pumping capacity is	Pumping capacity is	No redundancy	

		supplied by 4 sets of 4 independently powered pumps; 2 generators provide redundant backup power supply to each set of pumps	supplied by 4 sets of 4 independently powered pumps; 2 generators provide redundant backup power supply to each set of pumps	supplied by 3 sets of 3 independently powered pumps; 2 generators provide redundant backup power supply to each set of pumps	
	Active vs. Passive control	Pump station and gates must be staffed before, during, and after a storm event; 1 additional pump station (Old Estelle) must be staffed	Pump station and gates must be staffed before, during, and after a storm event	Pump station and gates must be staffed before, during, and after a storm event; 30 flood gates and 4 pump stations must be operated	Levees are generally considered passive flood protection, but there are 47 floodgates, 33 sluice gates, and 19 butterfly valves that must be manually operated
	Operation & Maintenance	Most expensive	Most expensive	Less expensive than GIWW WCC and GIWW A alternatives, but significantly more than PP alternative	Least expensive
	Inspections and maintenance	More rigorous inspections	More rigorous inspections	More rigorous inspections	Less rigorous; only visual inspection of levee and floodwalls
	Quality control	Pre-fabricated components have added layers of quality control prior to placements and must satisfy industry standards; however, any specialized test procedures and resources required for these features may be a liability	Pre-fabricated components have added layers of quality control prior to placements and must satisfy industry standards; however, any specialized test procedures and resources required for these features may be a liability	Pre-fabricated components have added layers of quality control prior to placements and must satisfy industry standards; however, any specialized test procedures and resources required for these features may be a liability	Greatest opportunity for non-compliance with construction specifications; Quality during placement and compaction of earthen levees and floodwalls would vary over space and time
	Utility dependence	Pump stations and gates will require connection to utility grids	Pump stations and gates will require connection to utility grids	Pump stations and gates will require connection to utility grids	No connection to utility grids required
	Reliability Team Assessment (relative scoring)	7(extrapolated)	8	3	0
<b>Risk</b>	Hurricane seasons under construction	3	3	3	5
	Redundancy of system	Most redundant	Most redundant	Redundancy on Algiers Canal; no redundancy on Harvey Canal	No redundancy
	Uncertainty in subsurface conditions	More uncertain than GIWW A alternative, Less uncertain than AG alternative	Least uncertain	More uncertain than GIWW WCC alternative, Less uncertain than PP alternative	Most uncertain
	Barge impact causing catastrophic failure	Least susceptible	Least susceptible	More susceptible than GIWW WCC and GIWW A alternatives, but less than PP alternative	Most susceptible

**ENVIRONMENTAL COMPARISON**

	<b>GIWW WCC</b>	<b>GIWW A</b>	<b>AG</b>	<b>PP</b>
Total Wetlands and Non-wetlands Uplands Resources (Unavoidable Impacts)	<p><b>Direct Impacts:</b> 9.6 acres of Nationally significant 404 c area wetlands + 223.3 acres of direct impacts to BLH + 8.9 acres of swamp (not in 404 (c)) = <b>232.2. Total acres of wetland</b></p> <p><b>Indirect impacts:</b> -Minimal -Minimal impact to floatant marsh</p> <p><b>Other Details:</b> -Possible project feature augmentation by discharging Estelle PS storm water effluent into 404 (c) area (dependent on study and coordination with EPA and rest of Interagency team to minimize impacts to the 404 (c) area as a result of the Government's action. Could be engineered to allow storm water flow on 404 (c) area to better maintain the fresh/salt water regime -May return 20 acres of land currently on the protected side of levee to the flood side as part of the bypass navigation channel. Habitat could be restored to bottomland hardwood forest. -Wall along GIWW would prevent industrial debris and effluent from flowing into 404 (c) area.</p>	<p><b>Direct Impacts:</b> 5.1 acres of Nationally significant 404 (c) area wetlands + 112 acres (not in 404 (c)) = <b>117.1 Total acres of wetlands</b></p> <p><b>Indirect impacts:</b> -Bifurcation of the 404 (c) area alters wildlife migration and ground water flow -Impoundment of northern 519 acres of floatant marsh and the potential total loss of floatant marsh and degradation within the 404 (c)</p> <p><b>Other Details:</b> -Floodwall would be designed to allow drainage and exchange of surface water during non-storm conditions -The wall would be designed and built to control outflow of flooded marsh -This alternative may return 20 acres of wetlands to the flood side</p>	<p><b>Direct Impacts:</b> 161 acres of wetlands + 150 acres of BLH = <b>311 Total acres of wetland</b></p> <p><b>Indirect impacts:</b> -Minimal indirect impacts</p> <p><b>Other Details:</b> -Storm surge reduction by marsh and floatant -May return ~10 acres to flood side</p>	<p><b>Direct Impacts:</b> 150 acres of BLH + 50 acres BLH = <b>200 Total acres of wetlands</b></p> <p><b>Indirect impacts:</b> -Minimal indirect impacts</p> <p><b>Other Details:</b> - Storm surge reduction by marsh and floatant</p>
Socioeconomic/Human Resources	<p>-Relocation of 1 business and 1 pipeline (Enterprise Gas pipeline) -Harvey canal businesses would included in the protection</p>	<p>-Relocation of 1 business -Bisecting 404 (c) degrades recreational use of area and potentially impacts hunting, bird watching, canoeing, kayaking, photography and commercial uses (swamp tours, etc.), though gates crossing the 404 c could accommodate the recreational use -Harvey canal businesses would be included in the protection</p>	<p>-Relocation of 13 residences and 3-4 businesses</p>	<p>-Relocation of 70 residences, 600 apartments, and 55 businesses</p>

Other: HTRW, borrow, air quality, noise quality, cultural, and aesthetics	-Minimal HTRW issues -keeps HTRW out of 404 c area -possible impacts due to borrow transport (likely barge in borrow to reduce impacts (3.5 M cy)) -Air quality medium impacts	-Minimal HTRW issues -minimal environmental impact due to borrow transport (250K cy) -minimal air quality issues	-Minimal HTRW issues on Harvey reaches (surge into area would pick up industrial debris, etc.) -possible Impacts due to borrow Transport (likely barge in borrow to reduce impacts (4.5 M cy)) -Air quality medium impacts	-Potential significant HTRW issues on Harvey reaches (surge into area would pick up industrial debris, etc.); landfills on Algiers reaches -Cultural issues: Antebellum homes -Impacts due to borrow Transport (9.54M cy) -Air quality high impacts
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### TIME COMPARISON

	GIWW WCC	GIWW A	AG	PP
Construction Completion Date	MAR 2013	MAR 2013	AUG 2013	JUN 2013
100-year “wall of protection” completion date. Full pumping capacity would not be in place until Construction Completion date	JUN 2011	JUN 2011	JUN 2011	JUN 2013
Possible time slips due to real estate, relocations, environmental proceedings and litigation	Action within 404 (c) area, and relocation issues	Action within 404 (c) area and relocation issue Acquisition of property	Real estate and relocations issues	Real estate and relocation issues

### Summary

The proposed action, GIWW WCC alternative proposes to alter the original system alignment and construct a streamlined surge barrier. The alternative would consist of 3 miles of levee and floodwall that would reduce the primary line of defense by 36%, a navigation gate(s) structure, a 20,000 -25,000 cfs pump station, 10 transition points, and a bypass channel. The existing protection at the approximate elevation 8.5’ would become the secondary line of protection during a storm event. Construction of this alternative would directly impact a total of 232.2 total acres of wetlands (9.6 acres of nationally significant 404 (c) wetlands), would have minimal indirect impacts to wetlands, and would have minimal socioeconomic impacts. Borrow requirement would be approximately 250,000 cubic yards (cy).

The GIWW A alternative also proposes to alter the original system alignment to construct a streamlined surge barrier. This alternative would consist of less than 1 mile (0.9 mi) of levee and floodwall that would reduce the primary line of defense by 41%, a navigation gate(s) structure, an approximately 20,000 -25,000 cfs pump station, 6 transition points, and a bypass channel. The existing protection at the approximate elevation 8.5’ would become the secondary line of protection during an event. This

alternative would directly impact 117.1 acres of wetland (5.1 acres of nationally significant 404 (c) wetlands) would bifurcate the 404 (c) area and have potentially significant, irreparable direct and indirect impacts to the northern impounded region (alter ground water flow, alter animal migration, potentially degrade float marsh, etc.) However, this alternative would have minimal socioeconomic impacts (i.e., residential or commercial relocations.) Borrow requirement would be approximately 3.5 M cy.

The AG alternative proposes to keep parallel protection along the Harvey Canal but build a gate at Algiers Canal to reduce the primary line of defense by 24%. This alternative would consist of 9 miles of floodwall (4 miles) and levee (5 miles), fronting protection at 4 pump stations, retrofitting the Lapalco Sector Gate, 30 floodgates on Harvey Canal, and 12 transition points. The existing protection at approximate elevation 8.5' behind the Algiers Canal gate would serve as secondary protection during an event. This alternative would impact 311 acres of wetlands, 13 residences, and 3-4 businesses. Borrow requirement would be approximately 4.5 M cy

The PP alternative proposes to keep the original alignment, approximately 27 miles of levee and floodwall, 47 floodgates on Algiers (17) and Harvey canals (30), approximately 90 transitions, 33 sluice gate structures, 19 butterfly valves, fronting protection and backflow suppression at 9 pump stations, retrofitting the Lapalco Sector Gate, and secure the Belle Chasse tunnel. This alternative would have no secondary line of defense during an event, would impact 200 acres of wetlands, 70 residents, 600 apartments and 55 businesses. Borrow requirement would be approximately 9.4 M cy.

### **Government's Proposed Action**

The Corps has determined that the GIWW WCC alternative, which alters the current system alignment, is the government's proposed action for this segment of the HSDRRS because this alternative would provide the most reliable, time sensitive and cost effective solution with the least adverse environmental impacts.

**b) The need to modify the Bayou aux Carpes 404 (c) Final Determination and why this modification is in the public's interest.**

After rigorous investigation of all possible alternatives and close collaboration with the EPA, other Federal and state resource agencies, and local stakeholders, the Corps has brought forward the GIWW WCC alternative as the proposed action. Though possible to design, engineer and construct all four previously discussed alternatives, the proposed action would provide the most system reliability and maximum risk reduction with the least adverse environmental impacts; therefore, the GIWW WCC alternative has been identified as the proposed action.

Since the alternative that would provide the most reliable, least risk, time sensitive and cost effective solution with the least adverse environmental impacts would require constructing a floodwall along the western bank of the GIWW within the Bayou aux Carpes 404 (c) area, the Corps requests a modification to the Bayou aux Carpes 404 (c) Final Determination.

The proposed action would serve the national public interest because it would significantly reduce the risk during a 100 year storm event for nearly 286,000 people, nearly 80,000 residences, and over 3,000 businesses on the West Bank of the Mississippi River. Given the lessons learned from Hurricane Katrina, it is in the national interests for the Federal government to wisely invest in the alternative that provides the lowest risk and is the least environmentally damaging. The hurricane system in New Orleans is only as good as the sum of its parts. By ensuring that all the parts are selected and constructed to the highest standards possible, the nation would benefit due to lower risk to the system and lower potential for catastrophic losses. The system, when completed, will provide the citizens of the area the opportunity to participate in the National Flood Insurance Program. Certification of the system to meet flood insurance standards is an issue critical to the full economic recovery of the area. Pre-Hurricane Katrina assets for the area at risk were valued at nearly 22 billion dollars. The GIWW WCC alternative would provide a more streamlined barrier system that would not only reduce the length of the hurricane system but would also create a primary and secondary line of defense during a storm event. The proposed action also builds upon the Federal mandate to avoid and minimize environmental impacts by reducing overall impacts to wetlands, bottomland hardwoods and people. The GIWW WCC alternative eliminates the need to relocate businesses and residents along the Algiers and Harvey canals that would be required if the Corps were to construct either the AG or PP alternatives. The construction of this proposed action would be a tremendous step forward for the nation in providing the 1% LOP congressionally authorized and demonstrates the Corps' drive to incorporate current, more adequate risk reductions measures into the system.

There are also overwhelming benefits to the overall economy of the nation from constructing this alternative. The proposed action serves the public interest of the nation as stated above by reducing risk for the City of New Orleans, but this alternative also provides for a more resilient Port of New Orleans.

The Port of New Orleans is the fifth largest port in the United States based on cargo handled, is the second largest in Louisiana after the Port of South Louisiana, and is the 12<sup>th</sup> largest in the United States for value of cargo. The Port of New Orleans handles approximately 84 million short tons of cargo a year, where as the Port of South Louisiana handles approximately 199 million short tons a year. The two Louisiana ports combined form the largest port system in the world by bulk tonnage, and the world's fourth largest by annual volume handled. The Port of New Orleans is a major transshipment point for steel, rubber and coffee. It is the largest port in the United States for rubber imports. Approximately 6,000 ships from nearly 60 nations dock at the Port of New Orleans annually. The chief exports are grain and other foods from the Midwestern United States and petroleum products. The leading imports include rubber, chemicals, cocoa beans, coffee, and petroleum. The port handles more trade with Latin America than does any other United States gateway, including Miami. In addition, the rail system is a major component in cargo transport, and the Port of New Orleans is the only seaport in the US with access to six class one rail roads (Port of New Orleans 2008).

New Orleans is also a busy port for barges. The Mississippi River and the Gulf Intracoastal Waterway (GIWW) in the New Orleans area are used to transport approximately 50,000 barges a year. Within the port, cargo (commodity) is transferred from barges to rail and overland transport for distribution across the country. In addition to shipping commerce, the Port of New Orleans is considered one of the nation's premier cruise ports. It handles nearly 700,000 cruise passengers a year (Port of New Orleans 2008).

Besides serving local interests and reducing risk to local residences and business for the purpose of public safety and securing the local economy, the construction of this proposed alignment (GIWW WCC alternative) would also serve the national interest and reduce risk for the Port of New Orleans, a cornerstone of the national economy.

**c) Planning and design efforts that have been incorporated into the proposed action to minimize impacts to the 404 (c) area.**

The Corps proposes to employ several measures to reduce the impacts to the Bayou aux Carpes 404 (c) area.

1. The GIWW WCC alternative: The first measure employed was the derivation of the GIWW WCC alternative. Based on a system reliability study of the West bank and vicinity HSDRRS, the Corps had initially proposed the GIWW A alternative; however, after collaborating with EPA, National Park Service staff and other Federal and state resource agencies, the GIWW WCC alternative was derived to minimize adverse direct and indirect impacts to the Bayou aux Carpes 404 (c) area. The GIWW WCC alternative, which would maintain system reliability while minimizing adverse environmental impacts, was accepted by the Corps and brought forward as the proposed action. As described in the alternative comparison above, the GIWW WCC alternative limits adverse impacts to the 404

- (c) by building a structure with a narrow footprint (floodwall and earthen berm) on a previously disturbed area along the west bank of the GIWW.
2. Innovative techniques to build a floodwall along a navigable water way: The segment of the WBV HSDRRS 100 year LOP proposed within the Bayou aux Carpes 404 (c) area would be constructed as a floodwall in lieu of an earthen levee in order to ensure that the most reliable, least damaging alternative is in place. A floodwall can be built on a much smaller footprint than an earthen levee. The Corps recognizes that there are certain risks associated with placing a floodwall along a navigable waterway, but to minimize the footprint of this surge barrier component within the Bayou aux Carpes 404 (c) area, the Corps will investigate and utilize innovative techniques to design and build a structure with the narrowest footprint possible.
  3. Construction via water based equipment: The floodwall would be constructed within the 100' right-of-way. No additional construction easements would be required for wall construction.
  4. GIWW Gate location: The Corps proposes to move the gate on the GIWW as far north as practical to further reduce impacts. However, it is understood that the GIWW is a Federal navigation channel that is of national significance which requires that design of this structure be such that safety of users of the system be a paramount design consideration.
  5. Project features: The Corps also believes that it is feasible to complete alterations to existing project features to minimize adverse impacts that could potentially occur as a result of the construction of the GIWW WCC alternative along 4,200 LF of the eastern shoreline of the Bayou aux Carpes 404 (c) area. Another feature would be the redirection of the Old Estelle pump station storm water effluent into the 404 (c) area to introduce additional nutrients and fresh water into the system. Additionally, under the proposed action, the Corps would create gaps in several existing canals in the southern end of the 404 (c) area to promote improved hydrology within the 404 (c) area. Specifically, the shell plug at Bayou des Familles as well as plugs along other canals would be removed if study results demonstrate a positive benefit in minimizing the environmental impacts to the area can be achieved. All actions would be fully coordinated with EPA and the interagency team. Studies are underway at the Corps Engineering Research and Development Center (ERDC) in Vicksburg, Mississippi to determine the best possible design to allow for maximized benefit of this work in the Bayou aux Carpes 404 (c) area. Hydrology studies are ongoing and are expected to be completed by 17 October 2008. Environmental surveys are underway to determine the appropriate areas for the proposed spoil bank gapping within the Old Estelle discharge canal and for the removal of plugs in Bayou des Familles and other canals. In addition, the surveys will determine the appropriate water flow velocities within the 404 (c) when creating the gaps and removing canal plugs, and the appropriate nutrient loading levels. These studies will be integrated

into the efforts of the Interagency resource team that was formed early in the analysis phase to ensure that the national interest placed on the Bayou aux Carpes site meets the wisest and best use of the area.

**d) Planning and design considerations that have been taken to avoid additional impacts from any reasonably foreseeable future flood protection measures (i.e. the Louisiana Area Coastal Protection and Restoration (LACPR) Study) when designing hurricane protection to prevent further impacts to the 404 (c) area.**

In 2007, Congress authorized the Corps to conduct a study to be known as the Louisiana Coastal Protection and Restoration (LACPR) to determine viable projects to be considered for providing a higher level of risk reduction (Category 5) and coastal restoration for southern Louisiana. The Corps is not authorized by Congress to incorporate adaptations for LACPR when planning and designing the 1 percent risk reduction projects; however, the Corps is carefully considering the impacts that could occur if Congress authorized a larger project.

Of the alternatives investigated to reduce risk during a 100 year storm event, the GIWW WCC alternative (the proposed action) has the greatest adaptability to accommodate an enlargement. The Corps proposes that the upgrade to the floodwall and earthen berm be constructed via water access as currently proposed. In addition, all upgrades to levee and floodwall stretches that border the eastern and northern side of the 404 (c) area would be shifted to the protected side of the risk reduction system and would not impact the 404 (c) area. It is also not likely that a Category 5 upgrade to the risk reduction system would require movement of the navigation gate(s) structure.

The GIWW A alternative which would bisect the 404 (c) area would require additional construction impacts to cross the 404 (c) area, potentially compounding the ecological and hydrologic impacts to the area.

If the Algiers Gate alternative were constructed it would require further upgrades to the Harvey Canal and levees west of Harvey Canal, which would result in more business relocations, leaves Harvey Canal business on the flood side of the protection system, and has more direct environmental impacts. This would pose serious design considerations and costs given the length of the system (45,720 LF or 9 miles), the instability of the western side of the Harvey Canal, and the amount of upgrades to floodgates and pump stations required to reach the prescribed elevations.

The Parallel Protection alternative poses even more serious design and cost issues. Upgrading approximately 27 miles of the risk reduction system would include the upgrades and impacts listed above for the Harvey Canal and upgrades for all of the levees, floodwalls, and floodgates along the Algiers Canal, and the Belle Chasse tunnel. If upgrading the current alignment along the Algiers and Harvey canals for the 1 percent storm risk reduction system requires the relocation of approximately 700 people and 55

businesses, upgrading the system for a Category 5 system would potentially directly impact 1,000s of people and hundreds of businesses.

**e) Detailed plan for adequate site specific mitigation of unavoidable adverse impacts to the 404 (c) area, at a level commensurate with the significance of an action impacting wetlands with in a 404 (c) area.**

The Corps agrees that mitigation for unavoidable impacts to the unique and nationally significant Bayou aux Carpes 404 (c) wetlands would be determined in partnership with the EPA and NPS and that mitigation would occur within the 404 (c) area and/or the adjacent Jean Lafitte National Historic Park and Preserve. Mitigation projects proposed by EPA, NPS and other members of the Interagency team consist of spoil bank gapping of drill hole areas within the 404 (c) area, and tallow tree control projects within the Bayou aux Carpes 404 (c) area and the National Park. The Interagency team is committed to continue to investigate reasonable alternatives as the Corps moves forward with finalizing a construction alternative for the GIWW West Closure Complex. Once field surveys are conducted, and refined habitat units of impact are defined, mitigation projects can be explored and designs can be developed and submitted to the Interagency team for review. Once a decision is made by the Corps on the governments action for reducing risk in the Harvey and Algiers Canal area, mitigation projects would be fully developed. The Corps proposes to implement any required mitigation projects within the 404 (c) area concurrently with the design and construction of the floodwall and earthen berm / access road.

Currently a feasibility level analysis of the mitigation options is underway. A draft Wetlands Value Assessment (WVA) coordinated by US Fish and Wildlife Service has been provided to the Interagency team for comments. The Corps agrees that all impacts calculated by this WVA process will be fully mitigated. Even any unavoidable impacts to the Bayou aux Carpes area as a result of the investigative surveys and borings would be included in the final mitigation plan for the project. The Corps acknowledges the significance of the 404 (c) wetlands and agrees full mitigation for adverse impacts within this unique area may require mitigation in addition to the direct impacts calculated by the WVA to fully compensate for the impacts associated with constructing the Government's proposed action. Monitoring of the mitigation implemented would be conducted in collaboration with the EPA, the NPS, and other Federal and state resource agency partners. If monitoring reveals any issues, changes would be investigated and implemented to ensure full mitigation.

The Corps in partnership with the non Federal sponsor, the state of Louisiana, the EPA and NPS would closely monitor mitigation efforts within the 404 (c) area throughout the life of the project (50 years) to ensure the benefits of the mitigation projects.

The HSDRRS project is fully authorized and funded at 16.3 billion. This funding includes sufficient amounts to complete the design and construction of any identified mitigation measures.

**f) A review of projected wetland impacts as per the Corps 404 (b)(1) guidelines, and EPA 404 (b)(1) and 404 (c) procedures found in 40 CFR Parts 230 & 231.**

The Corps is preparing a Clean Water Act, Section 404 evaluation using standard methods and analysis practices. This evaluation will be coordinated with Federal and state resource agencies before being published for a 30-day public review period. The evaluation will follow the guidelines and procedures of 404 (b)(1) and 404 (c) as found in 40 CFR Parts 230 & 231.

A draft of the Corps 404 (b)(1) evaluation that would be available during the 30-day public comment period is provided below.

## SECTION 404 (b)(1) EVALUATION

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

### **PROJECT TITLE: IER #12: WBV, GIWW, Algiers and Harvey Canals Hurricane Protection Alternatives**

#### **PROJECT DESCRIPTION.**

The proposed action, GIWW West Closure Complex (WCC), includes construction of a navigation/current reduction flow structure and gate in the Gulf Intracoastal Waterway (GIWW) south of the confluence of the Algiers and Harvey Canals and upstream of the Hero Canal, along with an adjacent pumping station and a by-pass canal. Upgrading of existing levees and/or construction of new levee structures will be required for 3 miles; approximately 4200 linear feet (LF) of floodwall construction along the west side of the GIWW, 3700 LF of floodwall improvements from the Harvey Canal to Old Estelle pump station, and 5700 LF of improvements along the V-line levee. This will result in approximately 3 miles of levee improvements or construction for this alternative.

Features of the system along the east side of the GIWW include a 150-to-300 foot gate and a 100-to-200 foot gate built to a protection elevation of 16 feet or greater, tied to the nearest flood protection levee. A pumping station of at least 20,000 cubic feet per second (cfs) will provide 100-year discharge and positive backwater prevention. The bypass channel will be used in the event of the closure of the primary closure structure. The adjacent 404 (c) area will be affected by the levee construction on the western side of the GIWW.

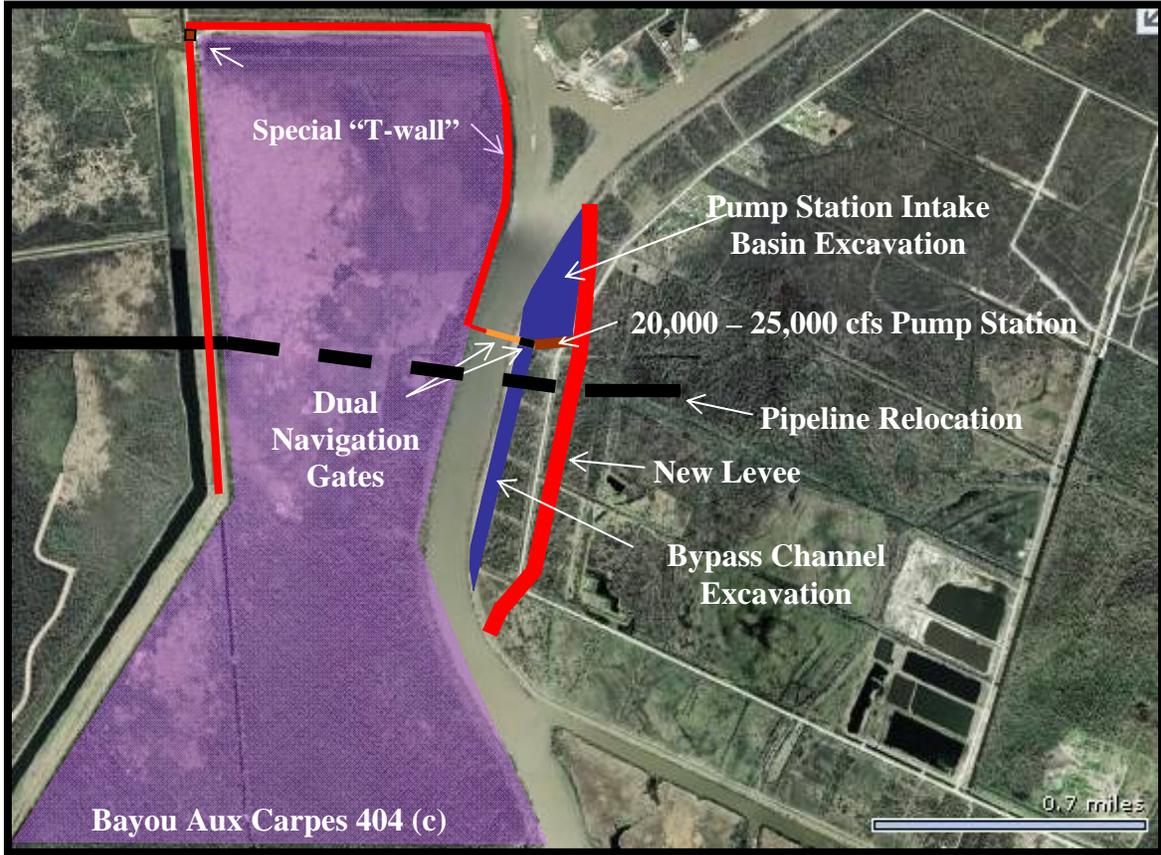
The current levee and floodwall system providing parallel protection for the GIWW, Algiers, and Harvey Canals is 27 miles long and will provide secondary protection to 8.5 feet NAVD.

The new levee design will require approximately 986,000 cubic yards of earthen material and 120,000 cubic yards of stone to construct.

The WCC alternative provides 100-year protection based upon improvements, enhancements, and construction confined to the GIWW reach in concert with tie-ins to improvement to the Hero Canal Levee (IER #13) and the Pipeline Canal Levee (IER #14).

Typical equipment utilized to accomplish the work outlined above will 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.

**FIGURE 1: IER 12**



1. Review of Compliance (230.10 (a)-(d)).

Preliminary<sup>1</sup>

Final<sup>2</sup>

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 will 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.
- (2) Suspended particulates/turbidity impacts.
- (3) Water column impacts.
- (4) Alteration of current patterns and water circulation.
- (5) Alteration of normal water fluctuations/hydroperiod.
- (6) Alteration of salinity gradients.

	X	
	X	
	X	
	X	
	X	
X		

b. Biological Characteristics of the Aquatic Ecosystem (Subpart D).

- (1) Effect on threatened/endangered species
- (2) Effect on the aquatic food web.

	X	
	X	

2. Technical Evaluation Factors (Subparts C-F).

	N/A	Not Significant	Significant*
(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, preparer has attached explanation below.

Implementation of the proposed action will directly impact approximately 232.2 acres of wetland habitat. All wetland impacts will occur adjacent to sections of pre-existing ROW within the GIWW reach. The proposed action will primarily impact bottomland hardwood forest, cypress-tupelo swamp and marsh wetland habitats. The majority of the wetland impacts will occur on the eastern side of the GIWW due to the construction of the gate and bypass channel. Wetland impacts are minimized along the remaining sections of the alternative by utilizing floodwall and protected side shifts where necessary, particularly to avoid additional impacts to the EPA 404 (c) area. Among the wetlands potentially impacted by the proposed action, a total of 71 acres of forested wetland habitat will be impacted, specifically requiring in-kind mitigation. Approximately 9.6 acres of wetland impacts within the GIWW reach would potentially occur within the EPA Bayou Aux Carpes 404 (c) site.

3. Evaluation of Dredged or Fill Material (Subpart G).<sup>3</sup>

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

(1) Physical characteristics	<u>Yes</u>
(2) Hydrography in relation to known or anticipated sources of contaminants .....	<u>No*</u>
(3) Results from previous testing of the material or similar material in the vicinity of the project	<u>Yes</u>
(4) Known, significant sources of persistent pesticides from land runoff or percolation	<u>No*</u>
(5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances	<u>No*</u>
(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources	<u>No*</u>

3. Evaluation of Dredged or Fill Material (Subpart G).<sup>3</sup>

(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

No\*

(8) Other sources (specify)

No\*

\* All fill material will be free from contaminants before use in levee construction projects. The fill will come from multiple sources but will all meet minimal physical and chemical criteria being evaluated separate IERs.

Appropriate references:

1. Environmental Regulatory Code, Part IX. Water Quality Regulation, Louisiana Department of Environmental Quality, 1994, 3<sup>rd</sup> Edition.
2. State of Louisiana Water Quality Management Plan, Volume 5, Part B – Water Quality Inventory, Louisiana Department of Environmental Quality, Office of Water Resources, 1994.
3. Sector Gate South, Final Assessment Report, GIWW, Algiers and Harvey Canal and Highpoint Shooting Range, AEROSTAR Environmental Services, July 2008

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 .....	<u>Yes</u>
(2) Current velocity, direction, and variability at disposal site .....	<u>No</u>
(3) Degree of turbulence .....	<u>Yes</u>
(4) Water column stratification .....	<u>No</u>
(5) Discharge vessel speed and direction .....	<u>NA</u>
(6) Rate of discharge .....	<u>Yes</u>
(7) Dredged material characteristics (constituents, amount, and type of material, settling velocities) .....	<u>Yes</u>
(8) Number of discharges per unit of time .....	<u>No</u>
(9) Other factors affecting rates and patterns of mixing (specify) .....	<u>No</u>

Appropriate references:

Same as 3(a).

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: A number of actions will minimize the adverse effects of the proposed actions.

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

The material must meet certain criteria to be used in levee construction, and will be similar to material used in the original levee work.

According to the Corps, all material will be free from contaminants before use in levee rebuilding projects. The fill may come from many different areas being evaluated in separate IERs. Qualified contractors using the appropriate equipment to minimize impacts to wetland areas will place all material.

The new footprint of the levee was designed to minimize wetland impacts by utilizing existing ROW and non-wetland areas whenever feasible. Best Management Practices will be utilized during the placement of the fill to minimize runoff and turbidity.

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 (adverse) environmental effects of the proposed discharge as related to:

- |   |                              |                              |
|---|------------------------------|------------------------------|
| a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above). | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5).   | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5)               | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| d. Contaminant availability (review sections 2a, 3, and 4).                         | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5).   | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| f. Disposal site (review sections 2, 4, and 5).                                     | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| g. Cumulative impact on the aquatic ecosystem.                                      | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |
| h. Secondary impacts on the aquatic ecosystem.                                      | <input type="checkbox"/> YES | <input type="checkbox"/> NO* |

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

<sup>1</sup> A negative response to three or more of the compliance criteria at this stage indicates that the proposed project 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.

<sup>2</sup> A negative response 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.

<sup>3</sup> If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

Evaluation prepared by:

Position: Robert H. Boudet, Senior Project Manager, AEROSTAR Environmental Services

Date: October 10, 2008

Evaluation reviewed by:

Position: Getrisc Coulson Environmental Manager, Ecological Planning and Restoration Section CEMVN

Position: Gib A. Owen, Chief, Ecological Planning and Restoration Section, CEMVN

Date:

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 .....

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 .....

(2) The proposed discharge will result in significant degradation of the aquatic ecosystem .....

(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem .....

\_\_\_\_\_  
Date

Elizabeth Wiggins  
Chief, Environmental Planning  
and Compliance Branch

In addition, below is a path ahead for this project, the GIWW West Closure Complex – Individual Environmental Report 12. Since the project being proposed is a Federal action, it is in the public’s best interest to present all of the information concurrently. Thus it is in the government’s best interest to simultaneously publish for 30 day public review the draft Individual Environmental Report, the Corps Clean Water Act 404 (b)(1) public notice, and the EPA notice of consideration of a modification to the Bayou aux Carpes 404 (c) Final Determination. Additionally, given the Administration’s commitment to expedite the construction of the HSDRRS and the Corps’ stated goal of having the system in place by 2011, the simultaneous publishing of the government’s proposal is in the public’s best interest and is critical for moving this project towards completion.

**g) Draft Path Forward with GIWW WCC**

Task	Duration	Start Date	Remarks
Colonel Lee Approved Proposed Action		7/10/2008	
Briefed Corps TFH Director		7/24/2008	
Briefed Corps MVD Commander		7/30/2008	
Briefed Corps HQ		8/13/2008	
Corps Submitted CZM, WQ, T&E, etc.		8/18/2008	
Public Meeting (IER 12,13,14)		8/21/2008	
Briefed Corps ASA		9/16/2008	
EPA Briefed HQ Level		9/30/2008	
NGO Quarterly Meeting		10/7/2008	
Submit Formal Request to EPA for Modification of 404 (c) Final Determination		11/4/08	
EPA Completeness Review		11/4/08	Review of Corps' Request for Modification Document
Complete Draft IER 12 and 404 (b)(1) Public Notice		TBD	EPA will get draft IER 12 to review before it goes out for public comments
IER 12 Public Review - Start	30	12/4/08	
IER 12 Clean Water Act Section 404 (b)(1) Public Notice public review	30	12/4/08	
EPA notice in Federal Register: Proposed modification; Request for comments to the proposed action; Notice for a public hearing regarding the proposed action	30	12/4/08	Concurrent Tasks
Corps Review Public Comments	7	1/3/09	Possibility for an addendum and second 30-day public review period if substantive comments received.
Joint Corps/EPA public hearing on proposed action		1/5/09	
EPA review of public comments on proposed action (with Corps support)	7	1/5/09	
Final IER and Clean Water Act Section 404 (b)(1) staffed for approval	7	1/10/09	IER 12 Decision Record routed for Commanders approval <sup>1</sup> (assumes no substantive comment) COL Lee signs Final IER 12 anytime after 1/11/09
EPA R6 sends all supporting documentation to EPA HQ	7	1/12/09	
EPA lists modification in Fed Reg.	1	1/19/09	
Final Modification Determination	30	1/19/09	Effective 30 days after publication (2/18/09)
Signing of Clean Water Act 404 (b)(1)	0	2/19/09	Approved by Chief PM-R

<sup>1</sup> Approval of IER 12 Decision Record allows Corps to proceed with approval of Project Description Document (Internal Corps Document) and a Project Partnering Agreement with the non-Federal Sponsor (State of Louisiana – CPRA). 404 (b)(1) not signed by Corps until EPA modification is approved and published.

## Literature Cited

US Army Corps of Engineers (USACE). 2008. Performance Evaluation of the New Orleans and Southeast Louisiana Hurricane Protection System. Final Report of the Interagency Performance Evaluation Task Force (IPET). Volume 1-Executive Summary and Overview. June.

Port of New Orleans. 2008. "Port of New Orleans Overview." Accessed 15 September, 2008 from [http://www.portno.com/pno\\_pages/about\\_overview.htm](http://www.portno.com/pno_pages/about_overview.htm).