

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 Supplement 33.a: West Bank and Vicinity – Mississippi River Levees Co-Located Levees, Plaquemines Parish and Orleans Parish, Louisiana

PROJECT DESCRIPTION.

The proposed action is located in Plaquemines and Orleans Parishes on the west bank of the Mississippi River and is part of the WBV Belle Chasse Polder, New Orleans, Louisiana. The levee construction project area extends from river mile 79.5 to 70 Above Head of Passes. The northern end (river mile 79.5) is situated near the U.S. Coast Guard Station and Tulane University Research Laboratories and the southern end (river mile 70) is approximately 525 feet south of the intersection of East St. Peter Street and the Mississippi River Levee at Oakville (Figure 1). Additional armoring work will be required for the entire Co-Located levee project area from river mile 85.5 to 70, and will be the only construction activity located within Orleans Parish.

The proposed construction activities will include earthen levees with a mix of floodside and protected side shifts and levee straddles that return to the standard levee design side slopes of 1 vertical on 3 to 4 horizontal, as well as floodwalls (T-walls) that would follow the existing MRL alignment. It is anticipated that as many as six contracts would be advertised for construction of the Resilient Features. They are characterized as follows:

WBV-MRL 1.2a – Oak Point to Oakville (a)

Contract reach 1.2a is at the southern end of the WBV-MRL co-located project. It begins just approximately a quarter of a mile downstream of river mile 71 and continues down river to river mile 70 where the WBV Eastern Tie-In project connects to the MRL. The contract reach begins in Plaquemines Parish at levee station 560+00 and extends downriver to station 610+00, consisting of 5,000 linear feet of levee.

A new concrete floodwall (T-wall) will be constructed along the entire length of the reach. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of +24.5 feet and will generally follow the centerline of the existing EAM levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative growth aside from mowed grass will be allowed. The existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on the floodside. If there is enough room a second access road will be built on the protected side of the T-wall along the crown of the levee. Three earthen ramps leading up to floodgates will be constructed along the protected and floodside slopes, two in the vicinity of Oakville Street and one approximately 733 linear feet upriver of the first two ramps. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2a and 1.2b will include an earthen levee shift from the floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2a and 1.2b transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover. At the downriver end of this contract reach, the newly constructed floodwall (T-wall) will tie into the existing Eastern Tie-in floodwall that intersects the existing MRL at river mile 70.

Four staging/work areas and three construction access easements have been designated along the proposed project corridor. Staging/work areas 1 and 2 are approximately 2 acres and 1 acre, and are located in an existing wreckage yard and abandoned concrete slab foundation upriver and downriver of an existing unnamed dirt road, respectively.

Staging/work area 3 is approximately 10 acres and is located in a heavily vegetated area slightly upriver from East Walker Road. Staging/work area 4 is approximately 2 acres and is situated in an existing grassy field slightly upriver from Oakville Street. Construction access easement 1 is located at the upriver end of the contract reach on an unnamed dirt road and is designated to provide temporary access to the levee site from LA Highway 23 (Hwy 23). Construction access easement 2 is located on Oakville Street and is also designated as a temporary access road between the proposed levee construction site and Hwy 23. The final construction access easement is located at the downriver end of the contract reach just south of the eastern tie-in floodwall that crosses Hwy 23 and will also be utilized as a temporary access road providing access to the levee from Hwy 23.

Construction of WBV-MRL 1.2a would require approximately 1 acre of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 9 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

WBV-MRL Reach 1.2b – Oak Point to Oakville (b)

Contract reach 1.2b begins just downstream of the Chevron Oronite Plant at river mile 72 then continues downriver to the Oakville community ending approximately a quarter of a mile downstream of river mile 71. The contract reach begins at levee station 510+00 and extends to station 560+00, consisting of 5,000 linear feet of levee.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, will be constructed. Beginning from the upriver end of this contract reach near the Chevron Oronite Plant, it is expected that approximately 900 linear feet of levee will be a floodside shift, which will then transition into a straddle of the existing levee alignment for approximately 500 linear feet. The straddle will transition into a protected side shift for approximately 900 linear feet then will shift back towards the floodside for the remaining 2,200 linear feet of the contract reach. The remaining segments of the contract reach will consist of transition zones, described in the paragraph below, between the WBV-MRL 1.2a and 2.2 contract reaches. Between the straddle and protected side levee alignment lengths, there may be a need to construct a protected side stability berm in order to stabilize the newly constructed levee. The protected side stability berm would be approximately 1,400 linear feet and may require the infilling of a 1 acre borrow pond that exists adjacent the existing MRL approximately 2,000 linear feet downriver of the Chevron Oronite Plant. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.5 feet. For the entire length of the contract reach, it is anticipated that 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. In addition, measuring from the existing MRL centerline, it is anticipated that approximately 150 feet of new right-of-way on the protected side will be required in the location of the protected side levee shift and stability berm. Within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located adjacent to and just downriver from the Chevron Oronite plant, approximately 600 and 2,900 linear feet, respectively. A third earthen ramp recently constructed on the floodside of the levee under the EAM contract will be maintained throughout the course of construction of the Resilient Features. The third ramp is located approximately 4,100 linear feet downriver of the Chevron Oronite plant.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2b and 1.2a is described above under the WBV-MRL 1.2a – Oak Point to Oakville (a) description. The transition zone between WBV-MRL 1.2b and 2.2 will include an earthen levee shift from the WBV-MRL 2.2 floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2b and 2.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Three staging/work area easements and three temporary construction access easements have been designated along the proposed project corridor. Staging/work area 1 is approximately 5 acres and is located in a heavily vegetated area at the upriver end of the contract reach adjacent to the Chevron Oronite Plant and Dockside Road. Staging/work area 2 is approximately 2 acres and is also located in a heavily vegetated area adjacent to the existing MRL just downriver from staging area 1. Staging/work area 3 is approximately 11 acres and is situated in an existing grassy field slightly downriver from staging area 2. Temporary construction access easement 1 is located at the upriver end of the contract reach immediately adjacent to the Chevron Oronite Plant and is designated to provide temporary access to the levee site from Hwy 23. Temporary construction access easement 2 is located on Dockside Road and is also designated as a temporary access road between the proposed levee construction site and Hwy 23. Temporary construction access easement 3,

approximately 10 acres, may be required along the protected side toe of the existing MRL for the entire length of the contract reach. It is anticipated that this linear corridor would allow construction equipment to traverse parallel to the existing levee as well as transport borrow material to the various levee segments.

Construction of WBV-MRL 1.2b would require approximately 3 acres of new ROW, would permanently fill approximately 1 acre of open water habitat, would require the clearing, grubbing, and fill of approximately 10 acres of forested wetlands and 16 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

WBV-MRL 2.2 – Oak Point (Chevron Oronite)

Contract reach 2.2 is the section of MRL adjacent to the Chevron Oronite Chemical Plant. It begins approximately at river mile 73 and continues downstream to river mile 72. The contract reach begins at station 443+00 and continues to station 510+00, consisting of 6,700 linear feet of levee.

A new concrete floodwall (T-wall) flood protection system will be constructed. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of 24.5 feet and will generally follow the centerline of the existing levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. The existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on the floodside. If there is enough room a second access road will be built on the protected side of the T-wall along the crown of the levee. Three earthen ramps leading up to floodgates will be constructed on the floodside and protected side slopes, one directly adjacent to the Chevron Oronite Plant and two approximately 2,300 and 2,700 linear feet upriver of the plant, respectively. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 1.2b and 2.2 is described above under the WBV-MRL 1.2b – Oak Point to Oakville (b) description. The transition zone between WBV-MRL 2.2 and 3.2 will include an earthen levee shift from the floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 1.2b and 2.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

One staging/work area easement and four temporary construction access easements have been designated along the proposed project corridor. Staging/work area 1 is approximately 17 acres and is located within a mixed use area consisting of several storage container sites, oil and natural gas equipment areas and lightly vegetated areas immediately adjacent to the Chevron Oronite Plant at the upriver end of the contract reach. The four temporary construction access easements are located immediately adjacent to and slightly upriver of staging area 1 and were previously designated under the EAM contract WBV-MRL 2.1 to provide temporary access to the levee site from Hwy 23.

Construction of WBV-MRL 2.2 would require approximately 2 acres of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 1 acre of non-wet forested habitat, and would temporarily impact approximately 6 acres of mowed marsh vegetation.

WBV-MRL 3.2 – Belle Chasse to Oak Point

Contract reach 3.2 begins approximately at river mile 75.75 just downstream of the Belle Chasse Ferry Landing and continues down river to the Chevron Oronite Plant ending at river mile 73. The contract begins at levee station 313+00 and extends to station 443+00 reach, consisting of 13,000 linear feet of levee.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, and a short section of T-wall will be constructed. Beginning from the upriver end of this contract reach near Belle Chasse Street, it is expected that approximately 9,500 linear feet of levee will be a floodside shift, which will then transition into a floodwall (T-wall) near Belle Chasse Launch Road and continue for approximately 600 linear feet. The floodwall (T-wall) will transition back into a floodside shift and continue for approximately 2,000 linear feet to the downriver end of the contract reach. The remaining segments of the contract reach will consist of transition zones, described in the paragraph below, between the WBV-MRL

2.2 and 4.2 contract reaches. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.0 feet. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located at the levee end of Sea Train Road and Belle Chasse Launch Road, respectively. These two earthen ramps will be maintained throughout the course of construction of the Resilient Features.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 3.2 and 2.2 is described above under the WBV-MRL 2.2 – Oak Point (Chevron Oronite) description. The transition zone between WBV-MRL 3.2 and 4.2 will include an earthen levee shift from the WBV-MRL 4.2 floodwall (T-wall) towards the floodside. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 3.2 and 4.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Five staging/work area easements and three temporary construction access easements have been designated along the proposed project corridor. Staging/work area 1 is approximately 2 acres and is located in a grassy area at the upriver end of the contract reach near Belle Chasse Street immediately adjacent to the existing protected side levee toe. Staging/work area 2 is approximately 8 acres and is located in a light to moderate vegetative corridor adjacent to the existing MRL just downriver from staging/work area 1. Staging/work area 3 is approximately 5 acres and is also situated in a light to moderate vegetative corridor beginning slightly downriver from staging/work area 2 and ending approximately 1,500 linear feet upriver of Belle Chasse Launch Road. Staging/work area 4 is approximately 2 acres and is located in a heavily vegetated area immediately adjacent to Belle Chasse Launch Road. Staging/work area 5 is less than 1 acre and is situated immediately adjacent to the existing MRL protected side toe. Temporary construction access easement 1 is located on an existing gravel road at the upriver end of the contract reach and was previously designated under the EAM contract WBV-MRL 3.1 to provide temporary access to the levee site from Hwy 23. The remaining two temporary construction access easements are located on Sea Train Road and Belle Chasse Launch Road.

Construction of WBV-MRL 3.2 would require approximately 5 acres of new ROW, would permanently fill approximately 1 acre of open water habitat, would require the clearing, grubbing, and fill of approximately 22 acres of forested wetlands and 7 acres of non-wet forested habitat, and would temporarily impact approximately 12 acres of mowed marsh vegetation.

WBV-MRL 4.2 – Oak Road to Belle Chasse

Contract reach 4.2 begins approximately at river mile 76.75 and continues to downstream of the Belle Chase Ferry Landing ending at just upstream of river mile 75.75. The contract reach begins at levee station 259+00 and continues to station 313+00, consisting of 5,400 linear feet levee.

A new concrete floodwall (T-wall) flood protection system will be constructed. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be removed from the top and side slopes of the existing levee and a new side slope of 1 vertical on 3 horizontal will be constructed. The new T-wall will have a final top elevation of 24.5 feet and will generally follow the centerline of the existing EAM levee. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. With areas where a protected side shift is required, right-of-way limits may be extended to a maximum of 340 feet measuring from the existing MRL centerline. In addition, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Roadway access for floodfighting and inspection purposes will be included and will run on top of the levee adjacent to the T-wall on the floodside. If there is enough room a second access road will be situated on the protected side of the T-wall on the crown of the levee. Four earthen ramps leading up to floodgates will be constructed on the floodside and protected side slopes of the levee. An additional ramp, previously constructed under the EAM contract, is currently located at the Belle Chasse-Scarsdale Ferry ramp. If required, an additional floodgate may be constructed at the Belle Chasse-Scarsdale Ferry ramp, but the location will otherwise remain undisturbed during the course of construction for the Resilient Features. The first earthen ramp will be located within the vicinity of the intersection of Main Street and Avenue M. The second and third ramps will be located at the levee end of East Cuevas Street. The fourth earthen ramp will be located approximately

1,500 linear feet downriver of the Belle Chasse-Scarsdale Ferry ramp. The gate widths will vary at each location, but will typically range from 24 feet to 60 feet wide. The gates will be either "swing" or "roller" type. A swing gate consists of a large fabricated steel panel, hinged on one side, and placed so that flood water pressure will push on the gate in the direction of its swing when in the closed position. A roller gate will also consist of a large fabricated steel panel placed on the flooded/river side of the wall, which slides/rolls into place. All gates will be constructed with the same general arrangement and dimensions as the T-Walls. Furthermore, all gates are equipped with rubber seals for controlling leaks.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 4.2 and 3.2 is described above under the WBV-MRL 3.2 – Belle Chasse to Oak Point description. The transition zone between WBV-MRL 4.2 and 5.2 will include an earthen levee shift from the current levee baseline towards the protected side. The tie-in detail is comprised of embedded sheetpile in the end of the T-wall reach, which will transition into the earthen levee section. This transition will be concrete armored to prevent erosion where the earthen levee begins and the new T-wall transition zone ends. The levee within the WBV-MRL 4.2 and 5.2 transition zone will slope down to the concrete armor until it is at the required design grade for the base slab cover.

Three staging/work area easements and two temporary construction access easements have been designated along the proposed project corridor. Staging/work area 1 is approximately 7 acres and is located within portions of lightly and heavily vegetated areas immediately upriver of Oak Road. Staging/work area 2 is approximately 4 acres is located between the protected side toe of the existing MRL and Main Street just downriver of Staging Area 1. Staging/work area 3 is less than 1 acre and is an existing staging area from the EAM contract reach WBV-MRL 4.1 located in a lightly vegetated area adjacent to the protected side toe of the MRL approximately 2,000 linear feet downriver of the Belle Chasse-Scarsdale Ferry. Temporary construction access easement 1 is located on an existing gravel road just upriver of the Plaquemines Parish Government complex near the Belle Chasse-Scarsdale Ferry and will provide temporary access to the levee site from Main Street. Temporary construction access easement 2 is located on an existing gravel road at the downriver end of the contract reach and was previously designated under the EAM contract WBV-MRL 3.1 to provide temporary access to the levee site from Hwy 23.

Construction of WBV-MRL 4.2 would require approximately 2 acres of new ROW, would require the clearing, grubbing, and fill of approximately 1 acre of forested wetlands and 3 acres of non-wet forested habitat, and would temporarily impact approximately 5 acres of mowed marsh vegetation.

WBV-MRL 5.2 – Coast Guard Facility to Oak Road

Contract reach 5.2 begins approximately at river mile 79.5 and continues downstream to river mile 76.75. The contract begins at levee station 74+00 and extends to station 259+00 consisting of 18,500 linear feet of levee.

An all-earthen levee alternative, consisting of floodside and protected side shift and straddle, will be constructed. Beginning from the upriver end of this contract reach within the Coast Guard Facility, it is expected that a straddle of the existing levee will be constructed for approximately 2,900 linear feet. Remaining within the Coast Guard Facility, the straddle will transition into a protected side shift, which will extend downriver for approximately 1,700 linear feet. After exiting the Coast Guard Facility and entering the upriver end of the Tulane University Research Laboratories property, the levee will transition from a protected side shift back into a straddle and extend approximately 6,400 linear feet downriver near F. Edward Hebert Boulevard. Just downriver of F. Edward Hebert Boulevard, the levee will then transition from a straddle into a floodside shift and extend downriver for approximately 4,200 linear feet. The levee will then transition from a floodside shift into a straddle for approximately 100 linear feet where it will then transition into a protected side shift for approximately 2,700 linear feet ending at the downriver limits of the contract reach near Oak Road. Under this contract reach, the previously described 700-foot long demonstration section of stabilized soil cap will be removed during the Resilient Features construction. The stabilized soil demonstration section will be degraded and the levee material will either be delivered to the Plaquemines Parish owned property on F. Edward Hebert Boulevard or disposed of by the contractor in a licensed landfill. The EAM levee currently has a side slope of 1 vertical on 2 horizontal, which is too steep to remain in place. As a result, earthen material will be added to the top and side slopes of the existing levee. The levee will likely have a 10-foot crown width and side slopes of 1 vertical on 5 horizontal on the floodside and 1 vertical on 3.5 horizontal on the protected side. The finished levee crown will be surfaced with a separator geotextile fabric and crushed limestone. The newly constructed earthen levee will have a final top elevation of 21.0 feet. For the entire length of the contract reach, it is anticipated that an additional 15 feet of new right-of-way will be required on the protected side of the existing MRL. The new right-of-way will include some ground disturbing actions during the course of construction, but will ultimately serve as a vegetation-free corridor wherein no large vegetative overgrowth aside from mowed grass will be allowed. Measuring from the existing MRL centerline, it is anticipated that within areas where a protected side levee shift is required that new right-of-way limits on the protected side may be extended out to a maximum of 340 feet in certain locations. Additionally, within areas where a floodside shift is required, the existing floodside vegetation-free corridor (maintenance corridor) limits may be extended to a minimum of 40 feet from the new floodside levee toe. Currently there are two earthen ramps that provide access from the crown of the levee to the floodside of the levee. The two existing ramps are located within the

Coast Guard facility at the upriver end of the project and near the intersection of F. Edward Hebert Boulevard and Main Street. These two earthen ramps will be maintained throughout the course of construction of the Resilient Features.

Transition zones are areas between the beginning and ending of each contract reach that allow each of the various proposed alternatives (i.e., all earthen levee and floodwall (T-wall)) to tie together thereby providing a consistent level of risk reduction along the entire project length. The transition zone between WBV-MRL contract reach 5.2 and 4.2 is described above under the WBV-MRL 4.2 – Oak Road to Belle Chasse description. The transition zone between WBV-MRL 5.2 and the existing MRL will include an earthen levee shift from the floodside back to the existing MRL centerline.

Four staging/work area easements and one temporary construction access easement have been designated along the proposed project corridor. Staging/work area 1 is approximately 16 acres and is located in both grassy and heavily vegetated areas beginning at the upriver end of the contract reach on the Coast Guard Facility traversing downriver immediately adjacent to the existing MRL protected side levee toe ending just upriver of F. Edward Hebert Boulevard. Staging/work area 2 is approximately 1 acre and is located in a grassy area adjacent to Main Street just downriver from F. Edward Hebert Boulevard. Staging/work area 3 is approximately 5 acres and is also situated in both a light to moderate vegetative corridor beginning slightly downriver from staging/work area 2 and ending just upriver of Parc Riverwoods Drive. Staging/work area 4 is approximately 37 acres and is located within portions of lightly and heavily vegetated areas immediately upriver of Oak Road. Temporary construction access easement 1 is located on F. Edward Hebert Boulevard and was previously designated under the EAM contract WBV-MRL 6.1 to provide temporary access to the levee site. Additional road access may be provided via Main Street and an existing berm at the protected side levee toe within the Coast Guard facility limits.

Construction of WBV-MRL 5.2 would require approximately 18 acres of new ROW, would require the clearing, grubbing, and fill of approximately 36 acres of forested wetlands and 35 acres of non-wet forested habitat, and would temporarily impact approximately 17 acres of mowed marsh vegetation.

Armoring

Armoring will be provided for critical areas of the Hurricane and Storm Damage Risk Reduction System (HSDRRS). An "Armoring Team" has been established of USACE employees, with the support of contractors, academic researchers, and other agencies to provide research and planning for the use of armoring against erosion and scour on the protected side of selected critical portions of levees and floodwalls in the HSDRRS. These critical areas include: transition points (where levees and floodwalls transition into any hardened feature such as other levees, floodwalls, pump stations, etc.), utility pipeline crossings, floodwall protected side slopes, and earthen levees that are exposed to wave and surge overtopping during a 500-year hurricane event. The Armoring Team will be guiding the design PDT in this process by providing an Armoring Manual for design guidance and criteria. This manual will be the basis for decisions on what should be armored and how armoring should take place. As previously stated, additional armoring work will be required for the entire Co-located levee project area from river mile 85.5 to 70, and will be the only construction activity located within Orleans Parish.

The Armoring Team defines resiliency as the capacity of the levee/floodwall to resist, without catastrophic failure, overtopping (wave and surge) caused by a storm which is greater than the design event. A Resilience Team has been formed to validate the Armoring Team's initial focus. MVN Engineering Division is leading the Resiliency effort to certify the practicality and applicability of using the 500-year storm event for armoring. The armoring methods to be implemented in the permanent design are anticipated to provide erosion protection such that the structure will be resilient to the 500-year event, or more defined as the ability of the structure to provide protection during events greater than the design event without catastrophic failure.

The following armoring methods are under consideration and the appropriate combination of methods will be applied throughout the earthen levee projects included in the HSDRRS:

- ACB – Articulated Concrete Blocks;
- ACB/HPTRM – The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a HPTRM (High Performance Turf Reinforcement Mattress);
- HPTRM;
- HPTRM/Grass – The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a surface with good grass cover only;
- Good grass cover.

The tentatively recommended alternative selected by the Armoring Team for the all-earthen levee reaches is the High Performance Turf Reinforcement Mat (HPTRM). The HPTRM shall either consist of nondegradable synthetic fibers, monofilaments, mesh and/or other elements processed into three dimensional matrix, not greater than 1/2" thick or shall be lofty woven polypropylene geosynthetic specially designed for erosion control applications on levees, steep slope and vegetated waterways. HPTRM will only be installed in the areas where a full levee section has been constructed. Installation of this material would require that existing turf be cleared and grubbed, a small layer of soil would then be

added as needed for leveling (6-inches plus or minus), the HPTRM would be laid on the bare soil and either sod will be placed directly atop the HPTRM, or a veneer of 2 to 3 inches of topsoil will be placed. All areas would be seeded, fertilized and mulched as described in the earlier sections of this IER Supplement.

The armoring required for floodwalls will be a hybrid of materials to accomplish the required level of armoring. For instance, the interim floodwall repairs curtailed the concrete splash pads midway down the levee slope. The Armoring Team suggests that these pads be extended down the entire slope of levee and be curtailed at the toe in order to eliminate a transition in a critical part of the levee section. Transitions have been a significant part of the Armoring Team's effort to date. The transitions from structures to floodwalls to sheet pile are being addressed with detailed design drawings and will be forwarded to the individual design PDTs to aid them in their site-specific designs. Pipeline crossings are also being identified by the Relocations Section in CEMVN. The Armoring Team is reviewing their detail drawings and requirements to include armoring features. These drawings will need additional review and will ultimately be forwarded to those utility owners that are responsible for the work.

Three staging/work area easements have been designated along the proposed project corridor. Staging/work area 1 is approximately 1 acre and is located in a mowed grassy area adjacent to the existing protected side levee toe along Patterson Road and was previously used as a staging area for the EAM contract reach WBV-MRL 7.1. Staging/work area 2 is approximately 1 acre and is located in a sparsely vegetated area along Patterson Road and was also previously used as a construction trailer site for EAM contract reach WBV-MRL 7.1. Staging/work area 3 is approximately 1 acre and is situated in an existing limestone stockpile site located on the floodside of the existing MRL at the eastern end of F. Edward Hebert Boulevard.

Construction of armoring above the WBV-MRL 5.2 contract reach, from approximately river mile 79.5 to 85.5, would require approximately 6 acres of new ROW, would require the clearing, grubbing, and fill of approximately 9 acres of non-wet forested habitat, and would temporarily impact approximately 24 acres of mowed marsh vegetation.

Windrowing – Concrete Slope Pavement

During construction of the Resilient Features, concrete slope paving material located on the existing MRL floodside slope will be demolished as a result of the proposed levee and floodwall construction activities. Windrowed concrete is typically needed to protect the bottom ribbon of new concrete slope pavement as well as newly placed fill material in the floodside toe trench from wave erosion when the river initially floods the batture during the spring high water season. The newly constructed concrete dike breaks the waves before they have a chance of eroding the fill placed in the toe trench which would lead to undermining of the newly placed slope pavement. Once the river rises and gets on the slope pavement there's little chance of waves undermining the slope pavement.

It is expected that this material would be broken into various sizes and shapes and hauled into the existing 40-foot vegetation free corridor (maintenance corridor) where it would be windrowed along the existing batture tree line. Construction equipment such as dozers, excavators and front end loaders would be used to push and stack the broken concrete material against the tree line forming a mound approximately 3-feet high by 9-feet wide. The broken concrete material would be windrowed in 500-foot segments with 9-foot gaps remaining between each segment. In areas where little to no batture is available, typically within the floodwall contract reaches, the broken concrete material would not be windrowed and would likely be disposed through previously described methods.

Windrowing concrete slope paving material, for all WBV-MRL contract reaches, would require fill of approximately 11 acres of forested wetlands.

Totals:

In total, construction of the project would require approximately 37 acres of new ROW, approximately 2 acres of open water habitat would be permanently filled, approximately 82 acres of forested wetlands and 80 acres of non-wet forested habitat would be cleared, grubbed, and filled or converted to open water and approximately 74 acres of mowed marsh habitat would be temporarily disturbed during construction. The earthen material for constructing the project will be obtained from either Government or contractor-furnished borrow areas that have been previously investigated for use in IERs 18, 19, 22, 23, 25, 26, 28, 29, 30, 31, 32, and 35. Table 1 presents the contract-reach specific material quantities for the all-earthen levee alternative and floodwall reaches as well as the materials necessary to replace the concrete slope pavement and finish the crown cap.

Typical equipment utilized to accomplish the work outlined above will include water trucks, diesel dump trucks, diesel hole cleaners/trenchers, diesel bore/drill rigs, diesel cement and mortar mixers, diesel cranes, diesel graders, diesel tractors/loaders/backhoes, diesel marsh buggies, diesel bull dozers, diesel front end loaders, diesel lifts, diesel pile drivers, diesel fork lifts, diesel generators, diesel tow boats, barges, diesel and gasoline powered skiffs.

Table 1
Construction Material Estimates

| Contract Reach | Length of Segment (Feet) | Clay Fill Material to Construct (Cubic Yards) ² | Concrete (T-wall Stab. Slab, Concrete Slope Pavement) (Cubic Yards) ² | Sheet Piling (Square Feet) ² | Pipe Pile (Linear Feet) ² | Crushed Limestone for New Crown (Cubic Yards) ² | Fertilize, Seeding and Mulching (Acres) ² | Construction Duration (Calendar Days) ¹ |
|----------------|--------------------------|--|--|---|--------------------------------------|--|--|--|
| 1.2a | 5,000 | 8,833 | 16,685 | 238,500 | 254,400 | 1,500 | 7 | 346 |
| 1.2b | 5,000 | 149,000 | 24,600 | N/A | N/A | 1,500 | 8 | 194 |
| 2.2 | 6,700 | 11,667 | 22,037 | 315,000 | 336,000 | 1,700 | 12 | 385 |
| 3.2 | 13,000 | 378,000 | 68,900 | N/A | N/A | 4,000 | 22 | 431 |
| 4.2 | 5,400 | 11,333 | 21,407 | 306,000 | 326,400 | 1,600 | 9 | 368 |
| 5.2 | 18,500 | 212,000 | 40,800 | N/A | N/A | 2,500 | 12 | 266 |
| Totals | 48,200 | 770,833 | 194,429 | 859,500 | 916,800 | 12,800 | 70 | 1,990 |

¹ Overall construction duration may be less as multiple areas could be constructed simultaneously.

² Quantities may increase/decrease as finalized designs are not complete.

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

Preliminary¹

Final²

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 and their habitat.

| | | |
|---|--|--|
| X | | |
|---|--|--|

- (2) Effect on the aquatic food web.
- (3) Effect on other wildlife (mammals, birds, reptiles, and amphibians).

| | | |
|--|---|--|
| | X | |
| | X | |

c. Special Aquatic Sites (Subpart E).

- (1) Sanctuaries and refuges.
- (2) Wetlands.
- (3) Mud flats.
- (4) Vegetated shallows.
- (5) Coral reefs.
- (6) Riffle and pool complexes.

| | | |
|---|---|---|
| X | | |
| | | X |
| X | | |
| | X | |
| X | | |
| X | | |

d. Human Use Characteristics (Subpart F).

- (1) Effects on municipal and private water supplies.
- (2) Recreational and commercial fisheries impacts.
- (3) Effects on water-related recreation.
- (4) Esthetic impacts.
- (5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.

| | | |
|---|---|--|
| | X | |
| | X | |
| | X | |
| | X | |
| X | | |

Remarks. Where a check is placed under the significant category, the preparer has an explanation below.

For 2.a.(1) Substrate Impacts. Approximately two acres of open water would be filled and approximately 82 acres of forested wetlands would be cleared, grubbed and filled or converted to open water. Placement of fill material would adversely affect immobile benthic organisms, as they would be smothered by the fill material. The substrate in these areas would be permanently changed due to project activities. However, these impacts would be practicably unavoidable. The project would mitigate for these substrate impacts. Compensatory mitigation for unavoidable impacts associated with IER Supplement #33.a and other proposed HSDRRS projects will be documented in forthcoming mitigation IERs, which are being written with all other IERs.

For 2. c.(2) Special Aquatic Sites - Wetlands.

A complete wetland delineation has not been conducted along the proposed route, so wetland impacts have been estimated by reviewing land elevation information, project plan sheets, aerial photography, review of photographs and notes taken during site inspections, and draft project area descriptions prepared for the Draft Individual Environmental Report Supplement 33.a. The selected alternatives for each WBV-MRL contract reach represent the least environmentally damaging alternative. An Alternatives Evaluation Process was completed for each contract reach wherein the Project Delivery Team selected each alternative based on various weighted factors including environmental considerations. Overall environmental impacts were reduced in contract reaches 1.2b, 2.2 and 4.2 through the selection of the floodwall (T-wall) alternative that utilized the existing levee ROW. Additional staging/work, stockpile, and construction access easements were, to the maximum extent practicable, designed to remain in previously developed areas. Compensatory mitigation for unavoidable impacts associated with IER Supplement #33.a and other proposed HSDRRS projects will be documented in forthcoming mitigation IERs, which are being written concurrently with all other IERs.

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 | |
| (8) Other sources: See references below | X |

*All material utilized for construction activities will be free of contaminants before being used for levee rebuilding projects. The material will come from different areas, either government furnished or contractor furnished. Separate IERs (IERs 18, 19, 22, 23, 25, 26, 28, 29, 30, 31, 32, and 35) are being or have been prepared to evaluate borrow areas and fill.

Appropriate references:

- a. LDEQ 2011a. *Chapter 11 Surface Water Quality Standards*. <http://www.deq.louisiana.gov/portal/LinkClick.aspx?link=planning%2fregs%2ftitle33%2f33v09.pdf&tabid=1674>.
- b. LDEQ 2011b. 2010 Louisiana Water quality Inventory: Integrated Report. <http://www.deq.state.la.us/portal/DIVISIONS/WaterPermits/WaterQualityStandardsAssessment/WaterQualityInventorySection305b/2010WaterQualityIntegratedReport.aspx>.
- c. NOAA 2008. *Screening Quick Reference Tables (SQuiRTs)*. http://response.restoration.noaa.gov/book_shelf/122_NEW-SQuiRTs.pdf.
- d. U.S. Coast Guard (USCG) 2011. National Response Center. www.nrc.uscg.mil/index.htm.
- e. U.S. Environmental Protection Agency (USEPA) 2011a. CERCLIS Database of Hazardous Waste Sites. www.epa.gov/superfund/sites/cursites/index.htm.
- f. USEPA 2011b. EnviroMapper for Water. <http://map24.epa.gov/emr/>.
- g. USEPA 2009a. *National Recommended Water Quality Criteria*. <http://water.epa.gov/scitech/swguidance/standards/current/index.cfm>.
- h. USEPA 2009b. *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material*. <http://www.epa.gov/owow/wetlands/pdf/40cfrPart230.pdf>.

A Phase I Environmental Site Assessment titled IER Supplement 33.a, West Bank and Vicinity and Mississippi River Levee Co-Located Levees Resilient Features, Plaquemines Parish, Louisiana was completed on November 15, 2011 and is incorporated herein by reference. The Phase I ESA concluded that the proposed right of way expansion and addition of staging areas to complete planned levee work would have a low probability of increasing exposure to Hazardous, Toxic, or Radioactive Waste.

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

Appropriate references: Same as 3.a. above.

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*

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.

¹Negative 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.

²Negative 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.

³If 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:

Name: Mark Lahare
Position: Environmental Protection Specialist
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 1/5/12

Name: Rodney Mach
Position: Chief Hydraulics and Hydrologic Engineering – North Section
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 1/4/12

b. This evaluation was reviewed by:

Name: Richard Boe 
Position: Coastal Environmental Compliance Section, Chief
Organization: U.S. Army Corps of Engineers, New Orleans District
Date: 6 Jan 12

Name:
Position:
Organization: U.S. Army Corps of Engineers, New Orleans District
Date:

8. Findings.

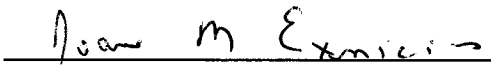
a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines X

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: 1/6/12


Chief, Environmental Planning Branch

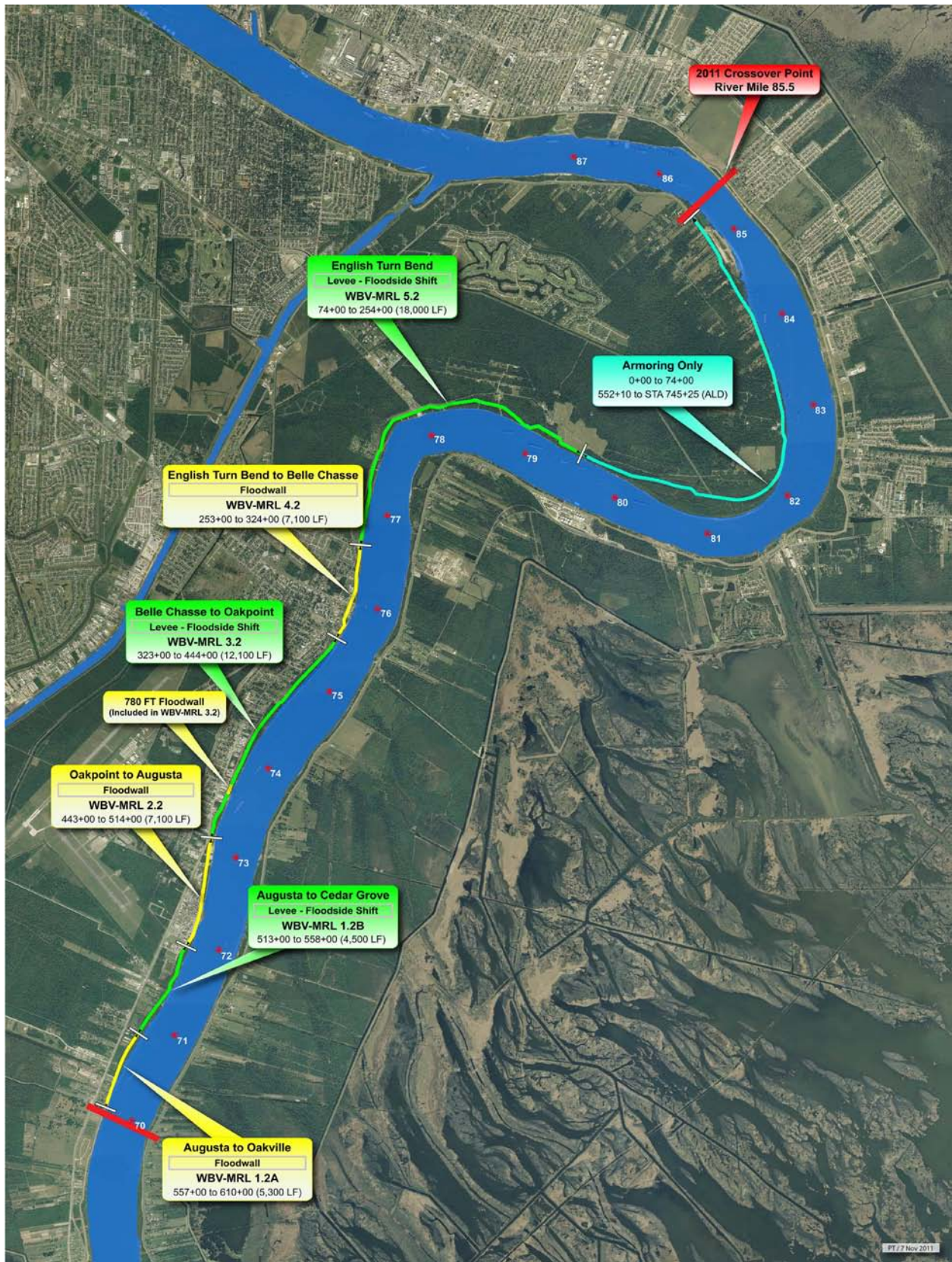


Figure 1