



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

408 Permission Section

PUBLIC NOTICE

**CATEGORICAL PERMISSION FOR SECTION 408 REQUESTS
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT**

PUBLIC NOTICE COMMENT PERIOD:

Begins: December 11, 2023

Ends: January 10, 2024

AUTHORITY: The authority to grant permission for temporary or permanent use, occupation, or alteration of any U.S. Army Corps of Engineers (USACE) civil works project is contained in Section 14 of the Rivers and Harbors Act of 1899, as amended, codified at 33 U.S.C. § 408 (“Section 408”). Section 408 authorizes the Secretary of the Army, on the recommendation of the Chief of Engineers, to grant permission for the alteration or occupation or use of a USACE project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project. The Secretary of Army’s authority under Section 408 has been delegated to the USACE, Chief of Engineers. The USACE Chief of Engineers has further delegated the authority to the USACE, Directorate of Civil Works, Division and District Commanders, and supervisory Division Chiefs depending upon the nature of the activity.

INTRODUCTION: There are numerous USACE civil works projects within the boundaries of the South Pacific Division, Sacramento District. These projects have been federally authorized by the U.S. Congress and subsequently turned over to a non-federal sponsor to operate and maintain. Projects include flood risk reduction projects such as levees and channels located in both rural and urban areas. The Sacramento District receives requests, through the non-federal sponsors, from private, public, tribal, and other federal entities (requesters) to alter USACE federally authorized civil works projects (“USACE projects”) pursuant to Section 408.

When the Sacramento District receives a request to alter a USACE project, the district follows a review process outlined by Engineering Circular (EC) 1165-2-220, *Policy and Procedural Guidance for Processing Requests to Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408*. To simplify the review process, EC 1165-2-220 states that USACE districts can develop categorical permissions (CPs) to expedite and streamline the review and decisions of Section 408 requests that are similar in nature and that have similar impacts to the USACE project and environment.

The Sacramento District receives a large number of Section 408 requests for minor alterations to USACE projects each year. The majority of these requests are for relatively minor alterations of the levee or channel, such as installation of irrigation

pipes, horizontal directional drilling for the placement of utility lines, and private recreational boat docks. Many of the project descriptions for proposed alterations are similar and the effects tend to be minor or negligible. With the goal of simplifying the review process for minor alterations, the Sacramento District established a CP in January 2019, with a duration of 5 years (valid through January 15, 2024). During its implementation, the Sacramento District was able to validate over 50% of the completed reviews under the CP. The review timeline for requests validated under the CP were found to be approximately 25% faster than reviews completed under the standard process. The Sacramento District proposes to reestablish the CP review process to maintain and improve efficiencies in the Section 408 review process of requests for minor alterations to USACE projects within the civil works boundaries of the district given the success of the CP established in 2019. Minor revisions to the alteration descriptions have been made based on information observed over the 5 year period of the categorical permissions established in January 2019.

ALTERNATIVES: The decision options are: 1) No Action Alternative: continue with the standard review process of reviewing and making decisions on Section 408 requests, as described in EC 1165-2-220, or 2) Preferred Alternative: approve a CP review process to cover potential alterations that are similar in nature and have similar impacts.

SCOPE OF THE DECISION: The Sacramento District's area of responsibility covers a wide geographic area and includes portions of the states of Arizona, California, Colorado, Idaho, Nevada, Oregon, Utah, and Wyoming. The geographic scope of the decision to be made is limited to federal USACE projects under the responsibility of the Sacramento District. Federal projects within the Sacramento District are located in California, Colorado, Nevada, and Utah (Attachment 1). The decision would only apply to the Sacramento District and would not apply to any other USACE districts. The decision would apply to federal levees, channels, flood walls, ecosystem restoration, recreation, and navigation features. The temporal scope of the decision to be made is for 10 years; after 10 years the decision would be reevaluated and may be renewed or revised, if appropriate.

PROPOSED CATEGORICAL PERMISSION: The proposed CP would encompass a list of potential alterations that are similar in nature and would have similar, minor impacts. If an environmental assessment (EA) or environmental impact statement (EIS) is needed for the National Environmental Policy Act (NEPA) documentation of a proposed alteration, then the proposed CP would not apply and the Section 408 request would be reviewed and a decision made following the standard review process described in EC 1165-2-220.

For the categorical permission to apply, a Section 408 request must be designed and constructed in accordance with specified conditions, as outlined within the CP. Proposed alterations would be required to minimize disturbance to surrounding vegetation, return disturbed areas to pre-alteration conditions, remove spoils, control storm water runoff and erosion, and not exceed federal *de minimis* general conformity applicability rates of criteria air pollutants or precursors, per 40 CFR 93.153(b)(1) or (2).

The proposed categorical permission would encompass 25 alteration types which are summarized below and described in detail in Attachment 2.

1. Agriculture and Landscaping
2. Borings, Levees Explorations, and Instrumentation
3. Borrow Sites
4. Bridges
5. Buildings and Similar Structures
6. Ditches and Canals
7. Docks
8. Environmental Restoration
9. Erosion Control
10. Fences, Gates, and Signage
11. Dry Utility Pipes
12. Fish Screens
13. Gravity Pipes and Culverts
14. Horizontal Directional Drilling (HDD)
15. Landside Pump Stations
16. Pressurized Pipes
17. Research and Monitoring
18. Retaining Walls
19. Seepage and Stability Berms
20. Stairs and Handrails
21. Swimming Pools
22. Trails, Roads, and Access Ramps
23. Utility Poles and Towers
24. Water Supply Pump Stations
25. Wells

ENVIRONMENTAL IMPACTS OF PROPOSED ACTION: The Sacramento District proposes to implement a CP that, in accordance with EC 1165-2-220, would streamline the review process for Section 408 requests for minor alterations to USACE projects. The Sacramento District has determined that, in compliance with NEPA, a programmatic EA will be prepared. As the implementation of the categorical permission would not involve any on-the-ground work, there are no anticipated direct effects to environmental resources resulting from the programmatic decision at hand. Although the categorical permission would be for a variety of alteration types that individually could result in impacts to resources, it is important to note that the decision to be made on the CP would not authorize any specific Section 408 requests or any on-the-ground work. If the proposed CP is approved, future Section 408 requests would be individually reviewed to determine if they fit under the CP.

Under the proposed CP, each individual Section 408 request would be evaluated on a case-by-case basis for compliance with all applicable environmental laws. Additionally, adequacy of the existing NEPA documentation (a programmatic EA for the CP) would be verified for each individual Section 408 request. If the existing NEPA documentation

is not adequate, a separate NEPA analysis would be conducted. Section 408 requests for alterations that are not described in the CP (see descriptions above), or that do not adhere to the specified conditions of the CP, would be evaluated using the standard review process for an individual request as described in EC 1165-2-220.

Although the decision on whether to implement the proposed CP would not have direct impacts on resources, the types of alterations described under the proposed CP have the potential to impact a number of different resources. Resources that could potentially be affected by these types of alterations include aesthetics, air quality, cultural resources, fish and wildlife, floodplains, invasive species, noise, recreation, threatened and endangered species, transportation/traffic, vegetation, water quality, and wetlands. It is expected that the effects associated with the types of alterations covered by the CP described above would be minor or negligible. If a proposed alteration is determined to involve more than minor impacts or would not meet the parameters identified in the project description, the CP would not apply and a categorical exclusion, EA, or EIS would be prepared, as appropriate.

Under the proposed CP, the Sacramento District would continue to individually evaluate each Section 408 request on a case-by-case basis for potential effects to threatened and endangered species (and their designated critical habitat) listed under the federal Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*) and, as appropriate, conduct consultation pursuant to Section 7 of the ESA with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS). The Sacramento District would also continue to individually evaluate each Section 408 request for potential adverse effects to Essential Fish Habitat (EFH). If adverse effects to EFH are anticipated, the Sacramento District would consult with NMFS pursuant to the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended (16 U.S.C. 1801 *et seq.*).

Under the proposed CP the Sacramento District would continue to individually evaluate each Section 408 request on a case-by-case basis for the potential to affect cultural resources and, when there is the potential for effects, conduct consultation with the appropriate State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. 306108 *et seq.*). When a proposed alteration has the potential to affect cultural resources, the Sacramento District would coordinate, and consult as appropriate, with potentially interested Native American tribes.

PUBLIC INVOLVEMENT: The purpose of this notice is to solicit comments from the public; federal, state, and local agencies and officials; tribes; and other interested parties regarding the proposed Section 408 Categorical Permission. Comments received within 30 days of publication of this notice will be used in the evaluation of potential impacts of the proposed action on important resources.

SUBMITTING COMMENTS: Written comments, referencing “Section 408 Categorical Permission” must be submitted by email or mail to the office listed below on or before January 10, 2024.

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US Army Corps of Engineers, Sacramento District
1325 J Street, Room 1460
Sacramento, California 95814-2922
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Attachments:

- 1) Sacramento District boundary and USACE federal project location maps
- 2) Categorical Permission Alteration Descriptions

ATTACHMENT 1

Sacramento District (SPK) Boundary



Figure 1. Map showing the USACE Sacramento District civil works boundary.

Levees & Channels within the SPK Boundary

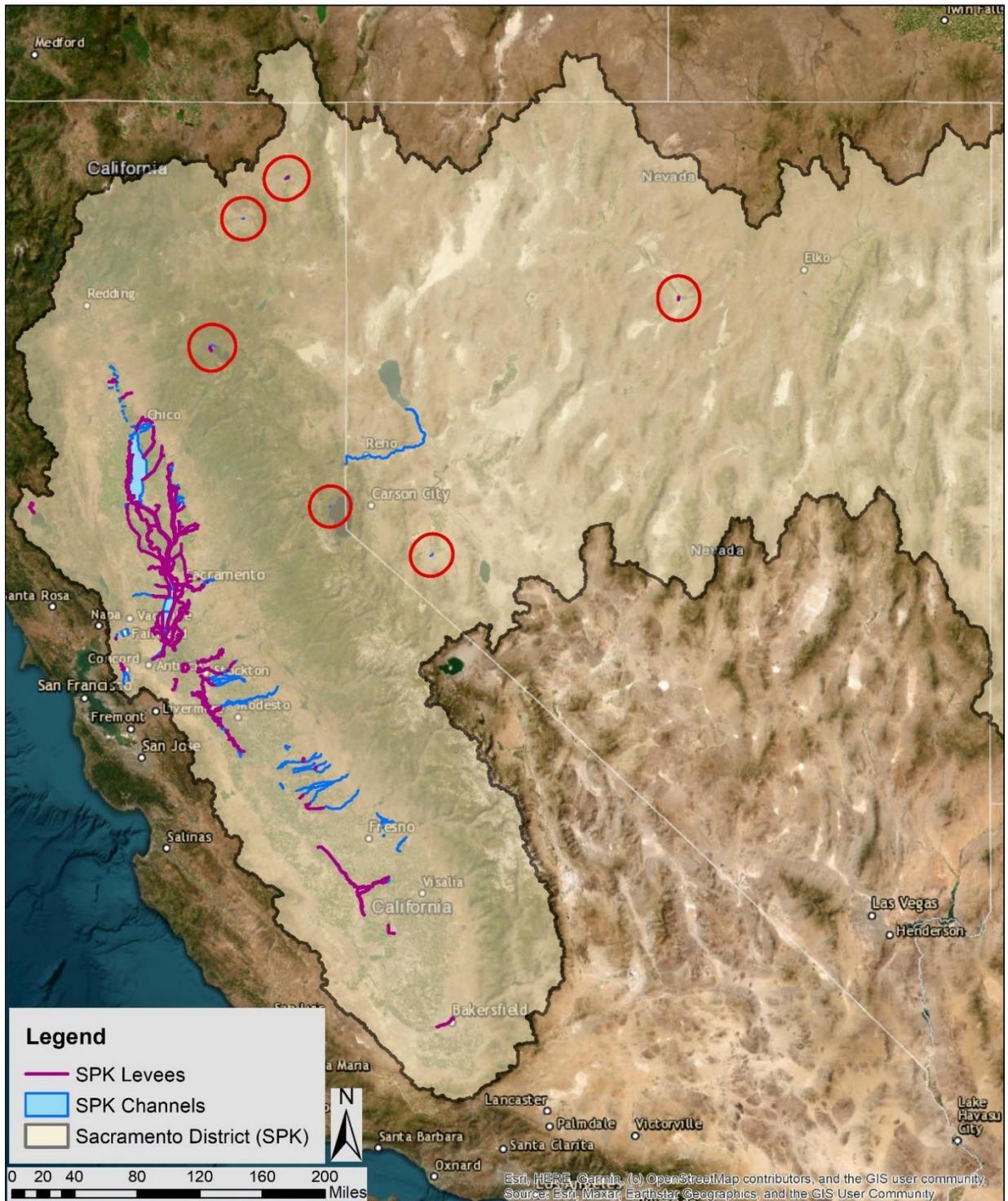


Figure 2. Map showing the jurisdictional Levees and Channels within the USACE Sacramento District civil works boundary in the states of California and Nevada. The red circles serve the purpose of clarifying federal project location(s).

Levees & Channels within the SPK Boundary

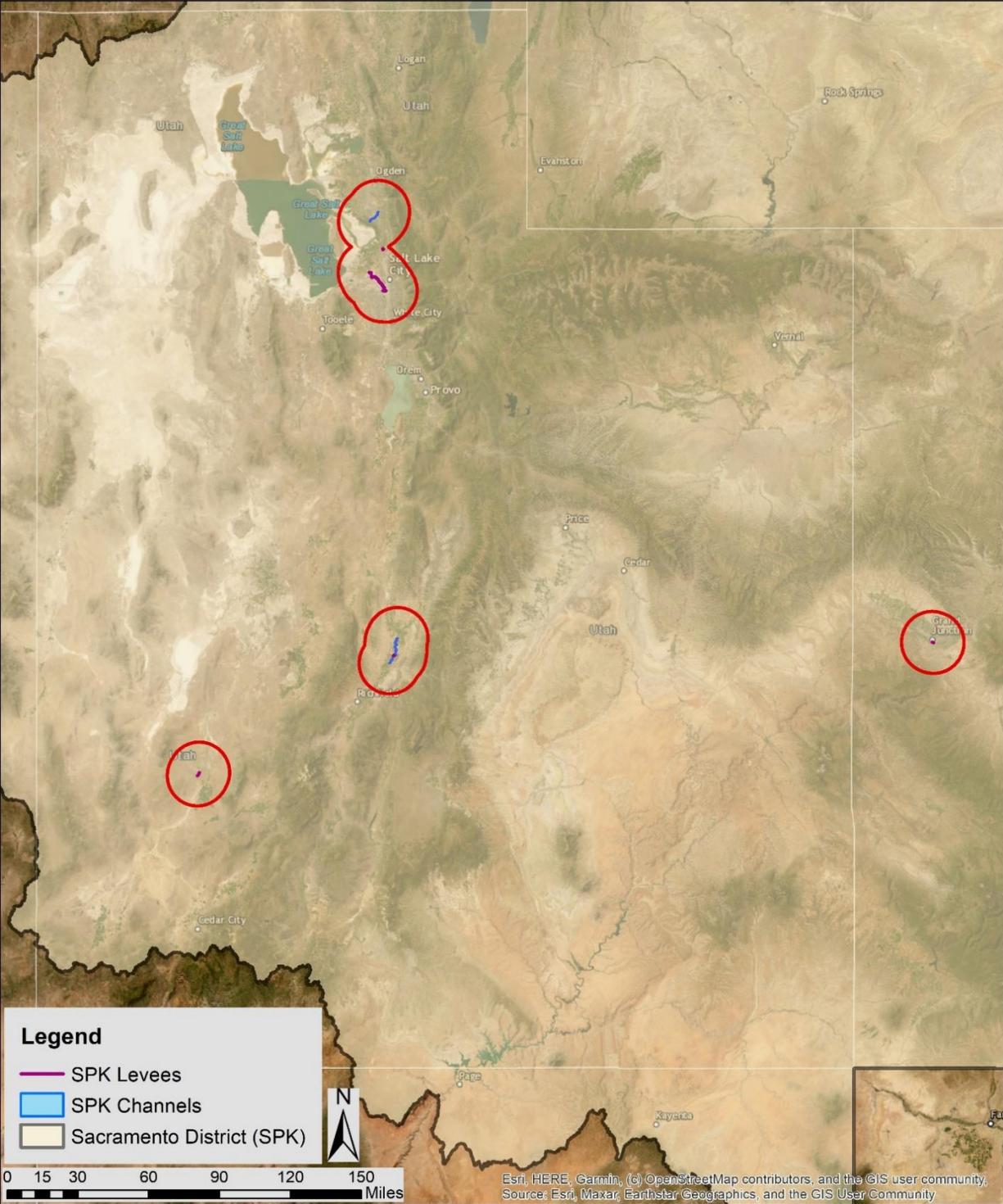


Figure 3. Map showing the jurisdictional Levees and Channels within the USACE Sacramento District civil works boundary in the states of Utah and Colorado. The red circles serve the purpose of clarifying federal project location(s).

ATTACHMENT 2



**U.S. Army Corps
of Engineers**
Sacramento District

CATEGORICAL PERMISSION ALTERATION DESCRIPTIONS

CATEGORICAL PERMISSION FOR SECTION 408 REQUESTS SACRAMENTO DISTRICT

December 2023
Prepared by:
U.S. Army Corps of Engineers
Sacramento District
408 Permission Section
1325 J Street
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1. AGRICULTURE AND LANDSCAPING

The categorical permission covers a variety of standard agricultural activities including, but not limited to, orchard installation and cultivation, planting and cultivation of row crops, animal grazing, installation of temporary or permanent irrigation lines, and landscaping associated with existing buildings or structures. The total area of disturbance per proposed alteration must not exceed 350 acres in size. The categorical permission coverage is limited to work in land previously used for agriculture (fallow fields, row crops, etc.) and does not cover conversion of native habitat to cultivated land.

Grazing is not allowed during periods of prolonged rain. No structures, sheds, or troughs are allowed on the levee or within 15 feet of the levee toe. No livestock are permitted to be penned or corralled on the levee. Grazing practices must be discontinued if there is excessive damage to the levee.

Native grasses (maximum 12-inch height) are acceptable on levees from a flood risk management perspective. Orchards, flower gardens, and vegetable gardens are not permitted within 15 feet of the levee toes.

The U.S. Army Corps of Engineers (USACE) may request that non-compliant vegetation as well as all roots greater than a half inch in diameter be removed from the levee easement. Holes caused by removal of vegetation must be backfilled with suitable material and compacted in 4- to 6-inch lifts to at least the same density as the adjacent undisturbed soil.

2. BORINGS, LEVEE EXPLORATIONS AND INSTRUMENTATION

The categorical permission covers geotechnical and similar borings, exploratory activities, as well as instrumentation. Work may be conducted within the levee embankment, adjacent to the levee toe, and/or in the floodway. Borings and levee explorations include, but are not limited to, conventional geotechnical borings, cone penetration testing, hydrovac excavation, potholing, trenching, and cultural inventories. Instrumentation such as piezometer or inclinometer installation, and associated equipment used to monitor or test the levee and/or floodway is included in this alteration.

Borings in the levee embankment and/or the levee foundation will require a Drilling and Invasive Program Plan (DIPP) in accordance with ER 1110-1-1807 *Drilling and Invasive Activities at Dams and Levees*, as part of the technical review of the proposed alteration.

All drilling should be designed to minimize the need for drilling fluid in the levee embankment and/or the levee foundation, reducing the possibility of damage. The requester must discontinue drilling and place grout or bentonite seals in all open borings, trenches, and other excavations if the river approaches flood monitoring stage, or the water levels are predicted to exceed the elevation of the landside toe. Drilling or other explorations should not begin if the river is approaching flood monitoring stage, or the water levels are predicted to exceed the elevation of the landside toe. The requester

must keep borehole sealing materials and equipment at the site before drilling begins, in preparation for unexpected river stage increases.

Open boreholes and excavations cannot be left unattended for more than 24 hours and all open boreholes should be sealed before leaving the construction site at the end of a work week.

Boreholes that are awaiting backfill should be covered to prevent entry by small animals.

The requester must verify that drilling equipment will not disrupt overhead wires.

3. BORROW AREAS

The categorical permission may cover borrow areas excavated in the floodway. Such proposals would require a geotechnical investigation to determine if the proposed borrow activity would increase seepage beneath the levee or expose soils susceptible to erosion. Special geotechnical requirements may apply to borrow areas proposed near a bridge, riverbank, pipeline or cable crossing beneath the channel, or a water control structure (e.g., a weir).

The minimum distance of the borrow area to the levee toe is 300 feet. Borrow sites authorized under this categorical permission may not exceed 5 acres in size. A geotechnical investigation is required before initiating any borrow activity within the federal project easement.

If the borrow material will be used to build or modify a levee, the borrow area should be cleared and grubbed of ruderal vegetation to the extent needed to obtain fill material free of inappropriate matter including any type of vegetation. The proposed borrow area must not contain riparian habitat or woody vegetation. The borrow site must be revegetated with native species or returned to the previous use after material is removed.

Waterside borrow areas must be designed to fill slowly on a rising river and drain fully on a falling river. The borrow area must have side slopes of 3H:1V or flatter and a bottom that is sloped to drain away from the levee in a downstream direction. No ponding is permitted at the levee toe.

Excavation depth is determined by factors such as (1) depth to groundwater, (2) location of undesirable borrow material, (3) preservation of an adequate thickness of impervious layer, and (4) environmental considerations. An impervious layer of the thickness determined by geotechnical analysis shall be left at the bottom of the borrow area in locations where the seepage gradients are potentially of concern.

Areas that contain soils exhibiting hazardous or toxic characteristics, even if naturally occurring, must not be used for borrow material. Areas where known historic or cultural resources are located must not be used for borrow.

Borrow areas should be located far enough away from the channel to prevent migration of water into the borrow area.

Borrow-related materials and equipment must not be stored:

- On the levee or within 15 feet of the waterside or landside levee toe
- In a way that could destabilize the riverbank
- Within the river flowage area during flood season
- In a way that could impede access to the levee

Levee patrolling, operation, maintenance, and flood-fighting take precedence over borrow-related hauling operations.

4. BRIDGES

The categorical permission covers alterations that include new construction, replacement, or modification of vehicle, pedestrian, or railroad bridges, and actions that are similar in nature. Construction, modification, or rehabilitation may occur on the approach to the bridge. The total area of disturbance must not exceed 5 acres for new bridges or expansions to lanes of traffic or 15 acres for replacement or repair of existing bridges.

Bridge design, construction and use must not compromise the structural integrity of the levee or conveyance of the adjacent river channel. Drainage from the bridge must be directed away from the levee and channel bank. Adequate bank protection must be placed upstream, downstream, and under the bridge.

The area in and around the construction site must be kept clear to prevent erosion and/or a reduction in channel capacity.

The requester must prepare a scour analysis if bridge piers are proposed in the channel. The requester must prepare a slope stability analysis for review by the USACE for any modification(s) to the levee. Excavation of the levee crown that causes depression(s) is prohibited.

Piers and pile bents must be parallel to channel flow.

No pile driving is allowed in the levee, but piles may be auger cast/cast-in-drilled-hole to the bottom of the impervious layer.

Analysis of debris loading is required for piers and piles. Bents and piers may be equipped with debris deflectors.

Survey control point(s) installed along the levee crown prior to construction may be necessary. These would be used for monitoring levee elevation and cross section. The requester must repair any changes to the levee crown elevation or cross section.

Necessary bridge maintenance includes, but is not limited to, debris removal and inspections. Maintenance activities cannot impede access to the flood risk management project. Damage to a bridge that threatens channel capacity must be repaired or removed prior to the next flood season.

All utilities that are being relocated and/or attached to the bridge should be described clearly within the plans and project description.

A seepage analysis may be required for alterations that include removal of material from the levee prism, addition of material to the levee embankment, or installation of piles or piers in the levee embankment or within 15 feet of either levee toe.

If a bridge is planned for replacement, the existing structure must be completely removed and disposed of outside the floodway and levee easement. When an existing bridge is to be widened, the new bridge piers and bents should be installed in line with existing piers and bents.

Design drawings for bridges proposed on federal project levees should show the full levee cross sections of both existing and as-built levees, including the as-built and existing levee crown, embankment, and landside and waterside toes. Drawings should be provided to show any temporary falsework or trestle plans.

5. BUILDINGS AND STRUCTURES

This categorical permission covers the construction, and modification of buildings or other structures such as, solar arrays, artwork, patios, and decks, along with associated work, such as minor landscaping, within the federal project easement. The maximum area of disturbance must not exceed 5 acres. Structures must be constructed in previously disturbed areas, structures must not convert native habitat. New buildings and similar structures authorized under this categorical permission must not be used for human habitation. Modifications to existing buildings can be allowed so long as the habitable area of the structure is not increased.

New buildings within the levee embankment are not included in this categorical permission. For buildings outside the levee embankment, but within 300 feet of the levee (typically on the waterside of the levee), the requester should complete a geotechnical analysis that includes slope stability and seepage analyses to ensure that the proposed building does not pose a serious risk to the levee. If a geotechnical investigation is not possible, the following rule of thumb may be appropriate: add 10 feet of lateral distance from the levee toe for each foot of excavation. That is, at 10 feet from the toe, excavation is limited to one foot; 20 feet from the toe, two feet deep, and so on. A geotechnical analysis is not needed if the structure is constructed on fill.

If an existing building or structure is damaged, due to any cause, cumulatively to more than 50% of its market value, the building or structure may not be reconstructed or replaced without the approval of the non-federal sponsor. If a damaged building or structure is not repaired or replaced, the entire building or structure, including all

associated appurtenances, must be completely removed within a reasonable period of time and the area restored so that there is no interference with the flood risk management project's function, operation, inspection, or flood-fighting.

The non-federal sponsor should be notified about removal of a structure that is within the levee easement. Following removal, the area must be restored to pre-building conditions by filling any hole(s) with compacted material similar to the adjacent soil. Any damage to the federal civil works project caused by removal of the building must be repaired by the requester.

6. DITCHES AND CANALS

The categorical permission covers the construction, modification, and filling of ditches and canals that meet certain terms and conditions. All ditches must be located outside the projected levee embankment. Ditches and/or canals may be a maximum length of 1000 linear feet. The requester should prepare a geotechnical analysis including seepage (through and underseepage) analysis and stability analysis to determine an appropriate location and depth proposed for the ditch. The design and construction of ditches or canals Levees must not impair project levees ability to meet requirements of EM 1110-2-1913 *Design and Construction of Levees*.

The requester must take every precaution to avoid puncturing the impervious layer during construction. If this is not possible, the ditch must be lined with concrete. The concrete should be placed on a drainage layer (meeting filter criteria in EM 1110-2-1913 and EM 1110-2-1901) to prevent it from cracking due to uplift. Weep holes should be added to the concrete lining to relieve any pressure buildup. Other accommodations may be necessary to prevent damage to the levee from underseepage.

Drainage ditches must be maintained to ensure that the ditch is not obscured by heavy vegetation growth or sedimentation. Ditches must be cleared at regular intervals to restore the original channel design, grade, and cross section. Concrete-lined canals should be routinely inspected for worn joint seals and damage to the concrete or weep holes to ensure they are functioning as designed.

If a ditch is to be filled, the area must be restored by filling the depression in 6- to 8-inch lifts with compacted material similar to the adjacent soil. The requester is responsible for repairing any damage to the levee caused by removal of the ditch.

7. DOCKS

The proposed categorical permission would cover landing structures, gangways, the floating dock structure, small amounts of riprap, and debris booms associated with boat docks. The maximum dock size (including gangway, floating platform, and any associated covers), for both replacement of existing structures and new structures, is 2000 square feet. No part of the floating platform or pilings may penetrate into the levee or be within 15 feet of the waterside levee toe. Gangway supports may be located within the levee embankment.

The dock anchoring must be sufficient to prevent the dock from floating into the channel during high water.

Pilings must be a minimum of two feet taller than the levee crown so the dock doesn't float off its pilings during a high-water event. Pilings can go as deep as needed provided they do not penetrate the projected levee. For pilings that are expected to penetrate the impervious layer, a geotechnical seepage analysis should be prepared to determine whether the risks can be mitigated. If a geotechnical investigation or analysis is not possible, piles must be cast in drilled holes against firm undisturbed soil. If possible, pilings should not be positioned skewed to the flow.

Pilings must be made of inert, non-reactive material. Materials coated with creosote are prohibited and any chemically treated material must be coated with an impact-resistant, biologically inert substance. Decking material must be made of metal grating, plastic, or other non-reactive (e.g., epoxy, wood) product; flotation devices must be of materials that will not disintegrate, such as plastic or closed cell foam encapsulated sun-resistant polyethylene.

If the dock design includes gangway supports proposed to penetrate more than 12 inches into the levee embankment or foundation, a seepage and stability analysis must be completed. This analysis must demonstrate that the footings will not have a negative effect on the levee.

Grated gangways are recommended because they allow easy visual inspection of the levee.

The requester should demonstrate that the dock design will prevent debris from accumulating at the dock. Possible ways to prevent the accumulation of debris include adding a debris deflector or removing the gangway during flood season. After each period of high water, all debris caught by the boat dock must be removed and disposed of outside the limits of the federal project easement.

If material must be added to the levee crown (e.g., to cover a concrete footing), the added material must be sloped at a ratio of 10H:1V horizontal to vertical, in the upstream/downstream direction to prevent a "speed bump" effect and facilitate vehicle access.

In the event that levee or bank erosion injurious to the levee occurs at or adjacent to the dock, the eroded area must be repaired with adequate bank protection to prevent further erosion.

Any damage caused to the levee by removal or modification of a dock must be repaired as part of the removal or construction process.

8. ENVIRONMENTAL RESTORATION

The categorical permission for environmental restoration covers a variety of restoration activities, including, but not limited to, planting of native vegetation (grasses, forbs, shrubs, and/or trees), placement of spawning gravels in active stream channels and adjacent floodways, restoration and enhancement of ponds, stream channels, and wetlands. Stream and wetland restoration activities may include installation, modification, or replacement of small, non-federal water control structures (e.g., dikes and berms), modification of stream beds and/or banks, among other activities. Any plantings on or near a levee embankment must meet the standards outlined in EP 1110-2-18, *Guidelines For Landscape Planting And Vegetation Management At Levees, Floodwalls, Embankment Dams, And Appurtenant Structures*. The total area of restoration must not exceed 500 acres in size or the total length of channel restoration must not exceed 5000 linear feet.

9. EROSION CONTROL

The categorical permission covers a variety of erosion control activities including bank stabilization, erosion control features, and actions that are similar in nature. Alterations proposed for erosion control should be designed to withstand the velocity and stresses created by the flow of water at the Design Water Surface Elevation DWSE. The maximum length of construction is 2000 linear feet of bank. Rock slope protection (e.g., riprap) is the most common type of erosion control; however, other types of erosion control and bank stabilization methods and materials may be used.

The following list illustrates some of the factors that must be taken into consideration when determining the rock type and quality for proposed erosion control:

- Asphalt and other petroleum-based products, floatable and refuse material must not be used for erosion control on a levee or within a floodway.
- Riprap should be sound and durable, free from cracks, seams, shale parting, and soil material. The rocks should be blocky and angular and be relatively free from thin slab-like pieces. Deleterious substances which include soft, friable particles, gravels (3 inches and smaller), inappropriate materials, such as vegetation, and other foreign matter should not exceed 5% of the total material placed for erosion control.
- Riprap should be obtained from appropriate sources.
- Other types of erosion control, such as bioengineering, may be considered.

The following list illustrates some of the factors that must be taken into consideration regarding the method for placing riprap:

- Rocks should be placed to full layer thickness measured normal to the slope by any method that will avoid segregation by rock size and avoid displacing the underlying material.
- The finished revetment should be free of pockets of small or large rocks. Larger rocks should be well distributed throughout.
- All rocks should be contained reasonably well within the riprap layer to provide maximum resistance against erosion.
- Abrupt bank line changes should be avoided.

- Rocks must not be grouted.

If erosion control is intended for the invert of the channel, the final profile of the material should be identical to the profile of the adjacent channel invert.

When needed to stabilize underlying soils, proper bedding should be provided under the riprap. Vegetation and other organic material must be removed before placing bedding. Geotextiles should not be used as filter layers; instead, a minimum 6-inch layer of sand-sized aggregate should be used.

Maintenance of erosion control is required when:

- Minor rock displacement or degradation is threatening the integrity of the erosion protection.
- Significant displacement is exposing the bedding or seriously degrading the rocks.
- Erosion control material has been displaced by vegetation.
- Vegetation is interfering with inspection of the erosion control.

10. FENCES, GATES, AND SIGNAGE

The categorical permission covers the installation, modification, and replacement of fences, gates, and signage, and similar activities located within the federal project easement.

If a fence is approved in the levee easement the following requirements apply:

- Fences must be constructed of durable, see-through materials (e.g., chain link, wrought iron, barbed wire) to ensure adequate levee visibility.
- Where appropriate, fences must include gates for access.
- All fences, including all pertinent features, on the waterside must be completely removable.
- Requests to install removable fences in critical levee areas will be considered by the USACE on a case by case basis.
- Non-removable fences located on the waterside are not permitted under this CP within 300 feet of the levee toe.

Gates must be wide enough to allow personnel, equipment, and/or vehicle access where appropriate. In general, swing gates are preferred to rolling gates.

The USACE, non-federal sponsor, and local maintaining agency must be given keys to all gates that lead to the floodway, levee ramps, levee toes, and the levee crown.

When required by the USACE, non-federal sponsor, or the local maintaining agency, gates must remain open for levee inspections, maintenance, construction, high water patrol, and flood-fighting.

After each period of high water, all debris caught by fences must be cleared and disposed of outside the limits of the federal project easement.

11. DRY UTILITY CONDUITS

The categorical permission covers the installation, modification, and replacement of dry utility conduits, such as fiber optic cables, subject to certain terms and conditions. The total area of disturbance must not exceed 5 acres. Utility conduits should be designed to prevent (1) flotation from uplift, (2) scour or erosion, (3) damage from debris on the waterside, particularly during flood flows, (4) leakage, (5) seepage along proposed conduits, (6) corrosion, and (7) damage from vehicular loads.

All new fiber optic, electrical and other dry utility conduits installed by open trench methods must go up and over the design water surface elevation (DWSE).

Conduits installed through the levee should be as close to right angles to the levee centerline as practicable.

All conduits and related structures that cross the levee foundation at a depth less than or equal to two times the height of the levee should be analyzed for uplift; conduits crossing the levee surface must be designed to counteract buoyant forces at the DWSE.

Conduit location and orientation must be clearly marked in the field so they can be easily identified for flood fighting crews or maintenance (e.g., electrical conduits).

No plastic conduits (HDPE, PVC, etc.) are allowed in the levee embankment or its foundation unless they are embedded in concrete, or CLSM, or encased in a steel conduit with the annular space completely grouted.

Backfill under and around (to 1 foot over) the proposed conduit must be Controlled Low-Strength Material (CLSM). Conduits that pass above the DWSE must have 2 feet of cover (low permeability or CLSM) to prevent damage by vehicles and equipment. Cover material on the levee crown must be placed at a ratio of 10H:1V, in the upstream/downstream direction of the levee. Conduits on the sides of the levee should be covered with a minimum of 1 foot of low permeability material, compacted in 4- to 6-inch lifts or CLSM to protect them from debris during high water (waterside) or to keep them from interfering with or being damaged by operations or maintenance of the levee (landside). Fill must be free of deleterious materials and construction debris and placed in 4- to 6-inch-thick loose lifts and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between 0 and +3 percent of optimum moisture content obtained from ASTM D1557. At the sponsor and levee maintaining agency's discretion, conduits on the levee slopes may be left exposed.

Only suitable material must be used as levee fill materials. Fill must be free from: roots and other organic matter, contaminated hazardous or toxic material, trash, debris, and frozen materials. Satisfactory fill material must have a plasticity index between 8 and 40,

have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 2-inch sieve.

Conduits located within or beneath a levee must have watertight joints that can accommodate movement.

If a chemical or electrochemical reaction is expected, the conduit and conduit couplings must be protected.

The preferred method for abandoning conduits that pass through or over a levee is complete removal. If removal is not feasible, the conduits and other structures may be filled with a cement/bentonite-based grout or flowable fill. The grout needs to be sufficiently fluid so that it can be pumped to completely fill the conduit leaving no voids. Abandonment of pipes must be conducted in accordance with EM-1110-2-2902.

12. FISH SCREENS

The categorical permission covers fish screens, including drums, plates, cylindrical, cones, or other designs proposed for installation, modification, or replacement on water intake pipes. Associated facilities, such as maintenance structures, walkways, and supports, may be installed, modified, or replaced as well. The area of disturbance for fish screen support facilities must not exceed 5 acres.

When possible, fish screens should be positioned in the floodway in a fashion that results in a sweeping, eddy-free flow capable of moving fish and debris along and past the facility under all flow conditions.

Screens should be durable such that no individual component will detach from the structure or substructure of the screen during high water events.

Screens must be equipped with a manual or automatic apparatus to remove sediment and debris. With either type of apparatus, screens should be periodically cleared of accumulated debris which must be disposed of outside the limits of the project easement.

If heavy debris loading is anticipated, a trash rack should be installed in front of the screen. Screens must be designed in a way to prevent them from being hazardous to recreational activities (e.g., boating, swimming) in the vicinity of the screens.

If piles must be placed in the levee or the river bank near the levee to support the fish screen structure and/or pipes, those piles must be auger cast to the bottom of the impervious layer in the levee foundation. Beyond that point, piles may be driven.

If screens are proposed for installation on existing intake pipes, the pipes must be inspected to ensure that they are in good condition prior to retrofitting.

Maintenance requirements will vary depending on the type of equipment installed, but generally will include:

- Inspection of the screen and associated structure(s) for corrosion, wear, or other deterioration
- Maintenance of mechanical components and seals, with repair or replacement, as needed.
- Checking the screen cleaning system for effectiveness
- Debris and sedimentation removal
- Inspection of the area around the screen for erosion and scour

13. GRAVITY PIPES AND CULVERTS

The categorical permission covers the installation, modification, and replacement of gravity pipes and culverts that comply with certain terms and conditions. The total area of disturbance, including staging and access areas, must not exceed 5 acres.

Generally, cast-in-place reinforced concrete pipes are preferable for gravity lines where considerable settlement is expected. No plastic pipes are allowed in the levee embankment or its foundation unless they are embedded in concrete, Controlled Low-Strength Material (CLSM), or encased in a steel conduit with the annular space completely grouted.

Backfill under and around (to 1 foot over) the proposed pipe must be CLSM.

Suitable material must be used as levee fill materials. Fill must be free from: roots and other organic matter, contaminated hazardous or toxic material, trash, debris, and frozen materials. Satisfactory fill material must have a plasticity index between 8 and 40, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 2-inch sieve.

Fill must be free of deleterious materials and construction debris and placed in 4- to 6-inch-thick loose lifts and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between 0 and +3 percent of optimum moisture content obtained from ASTM D1557.

Pipe joints must have sufficient flexibility to adjust under expected settlement and stretching of the pipe. Pipes should be designed to counteract uplift of the empty pipe at the design high water stage. If a chemical or electrochemical reaction is expected, the pipe and pipe couplings must be protected.

All new and existing gravity-flowing culverts passing completely through the levee must have a flap gate on the waterside end with provisions for positive closure (slide gate or sluice gate). The slide gate or sluice gate should be housed in a gatewell at the waterside edge of the levee crown to provide access. If a gatewell or vault is included in the design, all internal joints between discontinuous structural components must be

sealed against water intrusion and the entry and exit orifices for the pipe must be sealed against water intrusion.

Internal inspections must occur to ensure the pipes are in good condition. Video inspection of the internal condition of the pipe or pressure testing should be undertaken at least once every five years. Valves and gates should be periodically inspected and tested to ensure they are functioning properly. If the inspection indicates corrosion, alignment sag or heave, or separation at joints, corrective action must be taken as soon as possible. In most cases, once a pipe begins to oval or flatten at the crown or has lost more than 5% of its original interior height, it should be replaced. For existing pipes, recent inspections should be submitted as part of the 408 permission request.

Periodically, debris must be removed and corrosion or other damage on trash screens repaired.

If maintenance indicates that pipe replacement is necessary, all replacement parts must be of equivalent or better quality than those to be replaced. All repairs must restore pipes and associated equipment to the standards of the original design, or better.

Pipes running parallel to flood risk management projects should be located at least 15 feet beyond the levee toes and outside of a 1H to 1V projected plane from the levee toe.

14. HORIZONTAL DIRECTIONAL DRILLING (HDD)

The categorical permission covers the installation of pipes installed via Horizontal Directional Drilling (HDD). In general, the entry and exit points of the HDD pipe should be located no less than 300 feet from the landside toe of the levee. The pipeline should pass no less than 50 feet vertically beneath the levee's landside toe. If the top of the pipe is less than 50 feet beneath the current channel invert, a scour analysis is required. This analysis must show that the maximum scour depth will not expose the buried pipe. The total area of disturbance must not exceed 15 acres.

Detailed subsurface investigations should be performed along the proposed directional drilling alignment to determine soil stratigraphy. Pertinent information may also be obtained from the design documents of the flood risk management project.

Other information necessary for USACE review may include:

- Drilling and Invasive Program Plan.
- Pipe material (e.g., concrete, steel), length, diameter, wall thickness.
- Proposed method for monitoring drilling fluids.
- Proposed method for monitoring ground surface movement (settlement or heave) caused by the drilling operation.

The pumping rate, pressure at the drill rig, pressure in the annular space behind the drill bit and viscosity of drilling fluid must be monitored during drilling. In addition, as appropriate, density during the pilot bore, back reaming, and/or pipe installation stages must be monitored. Drilling mud pressure in the borehole should not exceed levels that

can be supported by the levee foundation soils to prevent heaving or hydraulic fracturing of the soil.

Positive closure devices must be included on pipes that carry liquids and gasses and also penetrate the foundation of the levee.

A contingency plan must be submitted with the permit application and, at a minimum, include instructions for the following:

- How to contain, clean up, and repair areas subject to spills of drilling or hydraulic fluids.
- How, when, and to whom to forward evidence of impending danger to the flood risk management project.
- Who is responsible for monitoring the river stage.
- Whom to contact for all other levee-related emergency notifications.

The requester is responsible for the restoration of a levee damaged by hydrofracturing process or any other aspect of the directional drilling operation. Plans for restoration or repair work must be approved before the work begins.

If a drill hole beneath a levee must be abandoned, the hole should be backfilled in accordance with all appropriate technical guidance.

15. LANDSIDE PUMP STATIONS

The categorical permission covers the installation, modification, and replacement of landside pump stations and associated facilities that comply with certain terms and conditions, particularly current USACE standards. Pipes that pass over, under, or through the levee are not included within this alteration description. Disturbance associated with the pump station is limited to 5 acres.

Whenever possible, pump stations should be located outside the levee easement. Requests to install a pump station within 15 feet of the levee toe must be accompanied by a geotechnical analysis that includes a seepage analysis. The site layout should provide adequate access for maintenance vehicles to refill fuel tanks and service/replace pumps, generators, etc.

Wet wells must be designed to avoid hydraulic uplift and inlet and outlet ditches must be designed to avoid causing an underseepage threat to the levee.

All flows to the landside pump station should be screened before they reach the pump(s). Trash racks (which must be regularly cleared of debris) are the preferred method of screening.

The operation and maintenance of the pump station should ensure that (1) the pump continues to function properly and (2) that it does not pose a threat to the levee.

16. PRESSURIZED PIPES

The categorical permission covers the installation, modification, and replacement of pressurized pipes that comply with certain terms and conditions. Particularly, all pressurized pipes must be designed and installed in accordance with current USACE standards. The total area of disturbance, including staging and access areas, must not exceed 5 acres. Pressurized pipes must also be designed to prevent, (1) flotation from uplift, (2) scour or erosion, (3) damage from debris on the waterside, particularly during flood flows, (4) leakage, (5) seepage along proposed pipes, (6) corrosion, and (7) damage from vehicular loads.

All new pressurized pipes should go up and over the levee DWSE. Pressurized pipes passing over or within the freeboard zone of a levee (i.e., above the levee DWSE), should be made of metal, preferably ductile iron or coated steel, suitable for use with flexible couplings.

Proposed pipes must be backfilled under and around (to 1 foot over) using Controlled Low-Strength Material (CLSM). Pipes that pass above the DWSE must have 2 feet of cover (low permeability or CLSM) to prevent damage by vehicles and equipment. Cover material on the levee crown must be placed at a ratio of 10H:1V, in the upstream/downstream direction of the levee. Pipes on the sides of the levee should be covered with a minimum of 1 foot of low permeability material, compacted in 4- to 6-inch lifts or CLSM to protect them from debris during high water (waterside) or to keep them from interfering with or being damaged by operations or maintenance of the levee (landside). Fill must be free of deleterious materials and construction debris and placed in 4- to 6-inch-thick loose lifts and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between 0 and +3 percent of optimum moisture content obtained from ASTM D1557. At the sponsor and levee maintaining agency's discretion, pipes on the levee slopes may be left exposed.

Only suitable material must be used as levee fill materials. Fill must be free from: roots and other organic matter, contaminated hazardous or toxic material, trash, debris, and frozen materials. Satisfactory fill material must have a plasticity index between 8 and 40, have a liquid limit less than 45, a minimum fines content of 20%, and 100% passing the 2-inch sieve.

Pressurized pipes terminating in the channel require a positive closure device on the waterside that is accessible from the levee crown. Pressurized pipes transporting product completely across or through the federal project easement require positive closure devices located landward of any levees and channel. The positive closure device shall be located within one mile on both sides of the federal project. If the invert of the pipe is over the levee crown, the combination of a pump station on the waterside and a siphon breaker is considered an appropriate means of closure. Pipes located within or beneath a levee must have watertight joints that can accommodate movements resulting from settlement.

If a gatewell or vault is included in the design, all internal joints between discontinuous structural components must be sealed against water intrusion and the entry and exit orifices for the pipe must be sealed against water intrusion.

All pressurized pipes that cross the levee foundation at a depth less than or equal to two times the height of the levee should be evaluated for uplift. Pipes crossing the surface of the levee must be designed to counteract buoyancy forces of an empty pipe, with water at the DWSE.

Pressurized pipelines running parallel to flood risk management projects should be located at least 15 feet beyond the levee toes and outside of a 1H to 1V projected plane from the levee toe. Pipe location and orientation must be clearly marked in the field so they can be easily identified for flood fighting crews.

If appropriate, the requester should prepare an excavation plan demonstrating the effects of excavation on the stability of the embankments.

The site layout should provide adequate access for maintenance vehicles to refill fuel tanks and service/replace pumps, generators, etc. Pressurized pipes must also allow easy access for rapid closure in the event of leakage or rupture.

No plastic pipes (HDPE, PVC, etc.) are allowed in the levee embankment or its foundation unless they are embedded in concrete, CLSM, or encased in a steel conduit with the annular space completely grouted.

If an electrochemical or chemical reaction between the substratum or groundwater and pipe materials is expected, the pipe and pipe couplings must be protected (EM 1110-2-2902).

After installation of pressurized pipes, the requester must demonstrate 0% pipe leakage in pipes in the levee. Pipes must be pressure tested to industry standards. Pipes must be regularly inspected, including the interior, if possible, looking for signs of maintenance issues. If an inspection indicates corrosion, alignment sag or heave, or separation at joints, corrective action must be taken as soon as possible to avoid failure. Pipe valves must be periodically inspected and pressure tested to ensure that they are functioning properly. Pressure tests must show no significant loss in pressure. Leaks and other deficiencies must be addressed as soon as possible. All replacement parts must be of equivalent or better quality than those being replaced. Results should be submitted to the non-federal sponsor.

The preferred method for abandoning pipes that pass through or over a levee is complete removal. If removal is not feasible, the pipes and other structures may be filled with a cement/bentonite-based grout or flowable fill. The grout needs to be sufficiently fluid so that it can be pumped to completely fill the pipe leaving no voids. Abandonment of pipes must be conducted in accordance with EM-1110-2-2902.

Pipes running parallel to flood risk management projects should be located at least 15 feet beyond the levee toes and outside of a 1H to 1V projected plane from the levee toe.

17. RESEARCH AND MONITORING

The categorical permission covers the installation, operation, and replacement of scientific devices whose purpose is to measure and record data, including staff gauges, tide and current gauges, meteorological stations, water quality and chemical and biological observation devices. Piezometer installation is not covered under this alteration description. See Alteration Description 2: Borings, Levee Explorations, and Instrumentation for piezometers.

Also covered by the categorical permission are sonar, seismic, and other acoustic surveys, including installation, operation, replacement, and removal of equipment. Monitoring and exploration for natural resources are included. Fish and wildlife harvesting, enhancement, and study activities are covered, including fyke and screw fish traps, electrofishing, and netting.

All installation and operation should be designed to minimize adverse effects to the federal project and environment. For example, floating measuring devices must be securely anchored or tethered; deployment should be for the shortest time possible to achieve the desired goal; for longer term projects/research, regular inspections are necessary to ensure that the device(s) remain serviceable and intact. A device inspection schedule and a plan for navigational aids must be provided.

Upon completion of monitoring, the measuring device(s) and any associated structures and equipment (e.g., foundations, anchors, buoys, and lines) must be removed and the site restored to pre-alteration conditions.

To prevent damage to the levees, heavy equipment (e.g., backhoes) required for research and monitoring activities is not allowed on levees when heavy rainfall has occurred or if the levee is saturated.

The requester must verify that monitoring devices and associated equipment would not disrupt overhead wires or interfere with the public's access to navigation and/or recreation.

18. RETAINING WALLS

The categorical permission covers the construction, modification/repair, and replacement of retaining walls, subject to certain terms and conditions. Retaining walls within the levee embankment and toe must:

- Be constructed of reinforced concrete or equivalent durable material.
- Ensure proper drainage.
- Have a foundation adequate to prevent slides.
- Meet USACE requirements for stability (EM 1110-2-2502, EM 1110-2-2503, EM 1110-2-2504) demonstrated by appropriate modeling (including overturning, sliding, shear failure, global slope stability failure, and soil bearing capacity).

- Be designed by a licensed civil engineer regardless of height.

Retaining walls must not reduce the existing design flow capacity or the flowage area; if the intended wall is near the waterside or landside levee toe, a detailed geotechnical evaluation may be required.

Existing retaining walls that do not meet the above requirements may need to be removed. If a determination cannot be made of the impact of an existing retaining wall on the levee by visual inspection alone, a detailed geotechnical evaluation may be required.

Any excavation of the levee for installation of the retaining wall must be backfilled with material similar to the adjacent levee in 4- to 6-inch lifts and compacted to at least the same density as the adjacent undisturbed embankment or underlying foundation.

Upon recognition of signs that the retaining wall has become unstable, repairs must be undertaken as soon as possible. If the requester wishes to remove a retaining wall, the requester should contact the non-federal sponsor for information on removal and backfilling any excavation.

19. SEEPAGE AND STABILITY BERMS

The categorical permission covers the construction, modification, and replacement of seepage and stability berms within the easement of the federal project. The total area of disturbance must not exceed 10 acres. The construction site should be cleared and grubbed to a sufficient depth to remove vegetation, roots, and soil containing roots. This material must be removed from the easement area and must not be used as fill. The resulting ground surface in the area(s) where the berm is to be located should be scarified to a depth of at least six inches or the full depth of shrinkage cracks, whichever is deeper. If soft or yielding soils are encountered during subgrade preparation, they should be scarified, moisture-conditioned, and compacted or removed by excavation to expose firm, competent soil.

Berms must be constructed of material that is as permeable as, or more permeable, than the adjacent existing ground and designed in accordance with USACE standards. Seepage and stability berms may be drained or undrained. Both berm types must be constructed at a 2% minimum slope to drain surface water away from the berm and the levee.

Proper maintenance of berms is necessary to ensure continued competency of the berm and associated levee. For example, after each high water event, berms must be inspected for cracks, depressions, settlement, and other problems in need of repair. The design grade of the berm must be maintained to ensure proper drainage and seepage/stability control. Visibility of and accessibility to the berm must be ensured by maintaining grass and other vegetation at a height of 12 inches or less. Removal of material from the berm (e.g., by agricultural activities) that may reduce the berm's ability to function as designed is prohibited. Nearby vegetation should be regularly controlled

(e.g., trees with roots that may interfere with a berm's function; blown over trees can remove a section of the berm). Filter layers, when present, must be retained intact during repairs.

20. STAIRS AND HANDRAILS

The categorical permission covers the installation, modification, and replacement of stairs and handrails that comply with certain terms and conditions.

For stairs located on the levee embankment or within 15 feet of the levee toe, the following conditions apply:

- Stairs must be made of concrete, rock, brick, or other sufficiently durable inorganic materials. Wooden or wood-based products must not be used.
- Waterside stairs must be built into the levee, flush with the slope to avoid creating eddy currents in the adjoining channel. The profile of the stairs must not protrude above the face of the slope.
- Handrails are not allowed on the waterside levee slope or on the levee crown.
- No part of the stairs or its foundation may extend deeper than 12 inches into the levee.

21. SWIMMING POOLS

The categorical permission covers the installation, modification, and replacement of swimming pools and associated support facilities (e.g., plumbing, pool patios), subject to certain terms and conditions. The total area of disturbance associated with the proposed alteration must not exceed 1 acre.

For pools within 300 feet of the levee embankment, the requester should provide a geotechnical analysis to ensure that the pool would not pose a serious risk to the levee. A slope stability analysis and seepage analysis for both through-seepage and underseepage are also necessary. If a geotechnical investigation, slope stability or seepage analysis are not possible, the following rule of thumb is recommended: add 10 feet of lateral distance from the levee toe for each foot of depth. That is, the pool can be no deeper than 1 foot, 10 feet from the toe; 2 feet deep, 20 feet from the toe, and so on. To be conservative, use the pool's deepest depth in the calculation.

For existing in-ground landside swimming pools built within the easement area, a geotechnical analysis is required to determine whether the risks can be mitigated or whether the pool must be removed. Pools should remain full to minimize the potential for buckling and slope failure.

Above-ground pools must not be built in the levee easement area because they can obstruct levee operations, maintenance, and flood-fighting activities.

During construction of new in-ground pools, every precaution must be taken to avoid puncturing the impervious layer which could facilitate seepage and lead to sand boils and potential levee instability.

For swimming pool removal, the non-federal sponsor must be contacted for information about removal. The area must then be restored to pre-alteration conditions, including repair of any damage to the levee.

22. TRAILS, ROADS, AND RAMPS

The categorical permission covers the installation, modification, and replacement of trails, roads, access ramps, and associated signage, lighting, etc., within the federal project easement. In preparation for construction of roads or trails, the levee crown should not be excavated beyond minimal stripping. The stripped crown should be proof rolled to check for imperfections before placing aggregate for the trail or road subbase. If excessive rutting occurs, that part of the trail must be removed and replaced with suitable material from an appropriate borrow location. To facilitate construction, all vegetation must be removed from the levee crown to a width two feet beyond the intended trail/road width. The total area of disturbance for ramps must not exceed 5 acres in size and the total length of trails/roads must not exceed 5 miles.

Generally roads and trails are topped with asphalt, but other surfaces may be acceptable. For roads or trails on the levee crown, the structural section must consist of a minimum of 4 inches of aggregate base beneath 2 inches of asphalt concrete pavement, or equivalent. The crown must have a minimum 1.5% transverse slope to drain surface water away from the levee crown. Water must not be allowed to pond at or near the levee.

Roads, trails, and ramps should resist levee loading or heave and be cost-effective to maintain. They should be appropriate for all intended uses by bicyclists, pedestrians, people in wheelchairs, maintenance, flood-fighting vehicles, etc. They must be able to withstand the weight of the heaviest piece of operation, maintenance or flood-fighting equipment expected to be used on the levee.

Pavement must not cover or conceal any structures necessary for operation or maintenance of the federal project (e.g., survey monuments, valves, relief wells). If covering these components is unavoidable, approved casings must be used to allow access.

Ramps that extend from the levee toe to the levee crown should be keyed into the existing levee to create a continuous well-integrated soil mass. Ramps must be designed to drain water away from the levee embankment. All areas that are keyed in should match the slope of the embankment and consist of approved material compacted to 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE preferred method), or alternately, 90% of the maximum density at moistures between 0 and +3 percent of optimum moisture content obtained from ASTM D1557. Loose-lift thickness should be limited to 6 inches for all work on the levee.

23. UTILITY POLES AND TOWERS

The categorical permission covers the installation, modification, and replacement of utility poles and towers that meet certain terms and conditions. A maximum of 5 acres of disturbance may be associated with utility poles/towers within the project easement. The alteration should be designed to place the poles at least 15 feet away from toe of the levee or berm. When there is no alternative to placing a pole within the levee embankment, requesters must submit a seepage and stability analysis for USACE review that supports the request. The analysis should include boring logs of the area adjacent to the proposed pole location identifying the stratigraphy.

In order to avoid vibration that can cause cracking, new poles within the levee embankment and within 15 feet of the levee toe must be installed in pre-drilled holes. After installation, the entire hole should be filled with a cement-bentonite grout slurry. The slurry should fill the hole to the surrounding ground surface. When poles are removed the holes must be backfilled with concrete or Controlled Low-Strength Material (CLSM). Alternatively, the upper 2 feet may be compacted soil. Soil should be mounded immediately adjacent to the pole to direct the water away from the pole. Guy wires should be anchored with concrete. Exceptions and alternate pole installation techniques may be approved by USACE under some circumstances, but only after appropriate engineering review.

In general, 25 feet is the minimum vertical clearance allowed between the levee crown and the lowest point of the proposed utility wire crossing.

During regular levee maintenance, ensure that:

- Poles near the levee do not deteriorate and create holes in the impervious layer.
- Poles near the levee do not lean or fall over and cause utility lines or poles to interfere with levee inspections, operations, maintenance, or flood-fighting.
- The bases of the poles are kept clear of debris.
- Any necessary supports or anchors are maintained to prevent overturning by wind or water.
- Needed repairs are completed as soon as possible.

24. WATER SUPPLY PUMP STATIONS

The categorical permission covers the installation, modification, and replacement of water supply pump stations and associated facilities. Pipes that pass over, under, or through the levee are not included within this alteration description. The total area of disturbance must not exceed 5 acres.

A geotechnical report that includes a seepage and stability analysis may be required. Positive closure devices are required and must be accessible from the waterside hinge point.

Operation and maintenance of the pump station should ensure that (a) the pump continues to function properly and (b) it does not pose a threat to the levee.

25. WELLS

The categorical permission covers the installation of wells that comply with certain terms and conditions. Specifically, wells must not be installed within 300 feet of the landside levee toe. Wells must not be installed within 15 feet of the waterside levee toe.

Any structures and fencing at well sites within the floodway should not impact the hydraulic functioning of the floodway. The location and design of wells must not interfere with access or with routine operation and maintenance of the levee and channel.

Abandoned wells in the project easement must be completely grouted and sealed following procedures established by local, state, and federal regulatory agencies to eliminate physical hazards and detrimental effects to the flood risk management system. Primary sealing materials consist of cement or cement-bentonite grout placed from the bottom upward.