



**US Army Corps
of Engineers®**
Seattle District

Notice of Preparation / Clean Water Act Public Notice

Environmental and Cultural
Resources Branch
P.O. Box 3755
Seattle, WA 98124-3755
ATTN: Bobbi Jo McClain

Public Notice Date: 6 February 2015
Expiration Date: 9 March 2015
Reference: EN-ER-15-01

Project Name: Desimone-Briscoe School Levee Rehabilitation, Tukwila, WA

Interested parties are hereby notified that the U.S. Army Corps of Engineers, Seattle District (Corps) plans to prepare, pursuant to the National Environmental Policy Act (NEPA), an environmental assessment (EA) for proposed levee repairs to the Desimone-Briscoe School Levee on the Green River near the City of Tukwila, King County, Washington.

AUTHORITY

The proposed levee repair is authorized by Public Law 84-99 (33 U.S. Code Section 701n). The Corps' rehabilitation and restoration work under this authority is limited to the repair of flood control works damaged or destroyed by floods. The statute authorizes rehabilitation to the condition and level of protection exhibited by the flood control work prior to the damaging event. King County Flood Control District is the non-Federal sponsor for the proposed action.

PROJECT LOCATION

The Desimone-Briscoe School levee was designed and constructed by non-Federal parties, and is operated and maintained by the King County Flood Control District. It is approximately 11,600 feet long and protects residential, commercial, and industrial property. The levee is one segment of a six segment system. From upstream to downstream, the system includes: Myers Golf Levee, Kent Shops-Narita Levee, Upper Russell Road Somes-Dolan Levee, Lower Russell Road-Holiday Kennel Levee, Boeing Levee, and Desimone-Briscoe School Levee. At the downstream end, the levee ties into WA-181 / West Valley Highway; the upstream end ties into Boeing Levee under the S 200th St. Bridge. The damaged project section is located on the right bank of the Green River near river mile 14.5 within the City of Tukwila, WA.

NEED

Damage to the Desimone-Briscoe School Levee was reported following a recent high water event on 10 March 2014 of 9,090 cubic feet per second at US Geological Survey gage 12113000, on the Green River near Auburn. The length of the flood damage is 300 linear feet. Scour at the toe of the structure has led to lost armoring, lost embankment material, and over-steepened unstable banks. The loss of scour protection has left the levee fill material directly exposed to flood flows, and has compromised the level of protection offered by the levee. A flood could scour the damaged section of the levee to the point where it would breach. It is conservative to assume that the only level of protection offered by the levee in its damaged condition is by the

natural ground behind it. Therefore, the estimated flood protection provided by the damaged Desimone-Briscoe School levee in its current condition is a two-year level of protection. This levee requires an emergency repair to ensure that it will remain safe and stable for future high water events.

The levee provides flood protection to approximately 7.65 square miles of highly developed warehousing, light industrial, retail, and residential land use. The proposed repair would restore the levee to its designed 100-year level of protection.

PURPOSE

The purpose of the project is to restore the 100-year level of flood protection in order to protect lives and property from subsequent flooding. In the current damaged condition, the levee offers two-year level of flood protection.

PROJECT HISTORY

Prior to the damaging flood event, the City of Kent had been pursuing a project to install a floodwall along the landward side of four reaches of the Desimone-Briscoe School Levee. The proposed Federal rehabilitation assistance action is co-located with a portion of Kent's work, known as Reach 1. Kent's previously planned floodwall is a steel sheetpile wall which was designed to reduce flood risk to the cities of Kent, Tukwila, and Renton. Kent has initiated construction on Reaches 2, 3 and 4 and has completed some components. The Corps' proposed Desimone-Briscoe School Levee Rehabilitation project would supplant a portion of Kent's project within Reach 1. The Federal project will complete its own environmental impacts assessment and compliance documentation for the portions of the effort which are the Federal action.

PROPOSED ACTIONS

Multiple alternatives for proposed work are being considered and are as follows:

a. No Action Alternative:

The No Action Alternative would leave the levee in its current damaged state. As a part of the No Action Alternative, the local sponsor would continue to construct their previously planned floodwall project within this reach. This floodwall is not considered to be a stand-alone flood control structure because the wall requires soil riverward and landward of the wall in order to maintain stability. Without some action to repair the damaged levee, the floodwall installation alone is not expected to fully restore the level of flood protection. This alternative would not meet the project goals due to the high likelihood of damage to protected infrastructure and homes during future flood events.

b. Waterward Slope Layback to Restore the 100-year Level of Protection:

This repair would reconstruct 585 feet of levee prism and establish a safe stable (2H:1V) armored slope and launchable toe. The 585-foot repair includes the 300 feet of damage with 285 feet of transition zones. The pre-damaged riverward slope was approximately 1.5H:2V. This steep slope was determined to be unstable at this location and was not adequate to meet the Corps' current design guidelines. The transition zones allow gentle, smooth transitions from the slope layback (2H:1V) to the over-steepened banks upstream

and downstream. But in this location, there is insufficient room for placement of an adequate toe and creation of the stable slope due to the proximity of infrastructure behind the levee. The Corps determined that this alternative would have necessitated encroachment on existing uses landward of the levee and was therefore determined to not be feasible. Further analysis of this alternative was not pursued.

c. Waterward Slope Layback with Retaining Wall to Restore the 100-year Level of Protection:

This alternative would be similar to the above alternative, with the addition of a retaining wall. A retaining wall on the landward slope would be used to reduce the encroachment of the levee on property behind the levee. The repair would restore the pre-flood 100-year level of protection while reducing the potential levee footprint, and restore armor to protect the structure from the eroding forces of the river flow. Slope protection would be achieved by rip rap with a mean particle size of 18 inches, with a toe entrenched to a potential estimated scour depth of 25 feet. Laying back the slope to 2H:1V would provide reliable flood protection by creating a stable armored slope. This is the Least-Cost Alternative.

Per Corps guidance (Engineering Regulation 500-1-1), a local sponsor can request an alternative that is different than the least cost alternative. Any increase in Federal cost resulting from the sponsor's preference of any alternative, other than the one that is least expensive to the Federal Government when all Federal costs are included, will be borne by the sponsor.

d. Locally Preferred Alternative:

The sponsor has requested a Locally Preferred Plan (LPP). The LPP consists of the Waterward Slope Layback with Retaining Wall Alternative (See option c above) with two variations: extension of the embankment work (190 feet) immediately upstream of the repair and substitution of a sheet pile floodwall for the retaining wall. The total project length would be 775 feet. The repair would include the above-mentioned repair of approximately 585 feet of levee toe and slope with the incorporated slope layback, launchable toe, upper slope bench, and an installed wall, plus the rebuilding of an additional 190 feet of existing levee toe and slope. The sponsor requested an LPP be considered because they are planning to continue the floodwall through this adjacent section and intend that the riverward portion of the section be fully integrated with the work that will be done to repair the damaged section of levee.

e. Non-Structural Alternative:

This alternative would relocate all existing structures, utilities and other infrastructure outside of the floodplain. The costs associated with this alternative are extremely high relative to the level of benefit, and this alternative was removed from further consideration.

The proposal being evaluated as the current preferred alternative is the LPP Alternative. The LPP Alternative would restore the levee to the designed level of protection. The proposed repair would include construction of 775 feet of levee toe, laying back the bank to a 2H:1V slope and

installation of 585 feet of floodwall on the landward shoulder of the crown. A portion of the upstream and downstream ends of the repair length would include transitions from the slope layback to the existing levee alignment to prevent scour at the tie-ins. The project would also require replacing the Green River Trail along the crown of the levee. See the attached draft designs for further detail. Construction is anticipated to occur in two phases: the floodwall installation would begin in February 2015 and would continue through May. The remainder of the work would occur in summer 2015. Summer construction duration is estimated at ten weeks.

Phase 1 of the Federal project would incorporate a portion of Kent's proposed landward floodwall as a way to minimize the landward encroachment caused by the setback design. The floodwall is not designed as a stand-alone wall as it requires the riverward levee and scour protection in order to be fully effective. The wall would be installed landward of the existing levee embankment and would consist of a steel sheet pile wall topped with a reinforced concrete cap beam and barrier. The space between the existing levee embankment and wall would be backfilled. The Phase 1 effort would begin in February, with a five-month construction period (Phase 1). The installation of the planned floodwall by the non-Federal sponsor will add tangible incremental protection to the public, for the interval of time until the conclusion of the typical flood season at the end of March. The sheet piles will be installed using vibratory equipment (with no impact hammers needed). The piles will be driven to depths of between 23 and 64 feet. The above-ground portion of the wall will range from 8 to 13 feet tall.

The Phase 2 work is proposed for summer 2015. The proposed toe and slope work of Phase 2 would include substantial in-water excavation. The work area would be isolated from the river for the excavation. A large amount of rock would be placed low on the slope in order to protect against potential scour depths. This rock would be placed so that it could launch into any riverward scour and continue to protect the toe of the levee. A 9-foot wide upper-slope bench would be included. The elevation of this bench is dictated by the volume of rock estimated to be necessary to address possible scour depths of 24 feet. This rock volume is substantial due to the circumstances of the location, specifically the severity of the bend in the river at the site. Slope protection would be achieved by rip rap with a mean particle size of 1.5 feet.

The slope layback will open channel capacity in this confined reach to slow velocities, particularly during higher flows. The crown of the levee would move up to 20 feet landward. Two planting lifts will be installed into the riverward face of the levee at or near ordinary high water. Planting lifts involve placing live cuttings into a layer of soil as the face of the structure. The willows are then covered by six more inches of soil. Levee armor is then placed onto the lift to continue the armored slope and a second lift is created in the same manner. Hooker's willows (*Salix hookeriana*), Sitka willows (*S. sitchensis*), and red-osier dogwood (*Cornus sericea*) will be spaced approximately every twelve inches in each lift. These species are considered shrubs which stay relatively small and bushy, with flexible stems. A total of 1092 shrubs will be placed within the 585-foot least cost project length. Pacific willows (*S. lasiandra*) and black cottonwood (*Populus trichocarpa*) will be also placed into both lifts, one stem every 15 feet. Pacific willow and cottonwood are both fast-growing, tall tree species. A total of 78 trees will be placed within the least-cost alternative repair length. Additional plantings will occur within the LPP length (355 shrubs and 25 trees) however these are not being considered as mitigation for the Federal action because they would be fully funded by the local sponsor. Above ordinary

high water, after construction is completed, a layer of topsoil will be placed onto the face of the riprap. This topsoil will be seeded with a native seed mix.

Established riparian vegetation, with time and maturity, is expected to ameliorate high river temperatures by providing shade to the channel and covering the riprap slopes. The plantings are also expected to provide organic input through leaf drop to provide food for juveniles, slow river current along the levee toe, provide refuge for juvenile fish during high flows, and provide additional wildlife habitat. The slope layback will also open channel capacity in this reach to slow velocities, particularly during higher flows.

Final selection of the preferred alternative and finalization of the design, including consideration of any recommendations from the impact analyses or the Endangered Species Act (ESA) consultation, will occur during the NEPA process and before construction activities on the toe and riverward slope. Best management practices would be utilized to minimize project impacts.

ANTICIPATED IMPACTS

The Corps' preliminary analyses of the principal effects of the proposed Locally Preferred Alternative are summarized below.

Wetlands: There are no wetlands at the project site and no impacts are expected.

Water Quality: The lower Green River in the project area is listed on the Washington Department of Ecology's (WDOE) list of impaired waters because state standards for temperature and dissolved oxygen have been exceeded (WDOE 2014). Maximum summer temperatures recorded at RM 12 in July and August were between 23 and 24°C with minimum temperatures of 15 to 16°C (NMFS 2009).

No impact to water quality is expected from the floodwall installation (Phase 1). During construction of the proposed toe and slope work (Phase 2), there may be minor water quality impacts such as a temporary and localized increase in turbidity. Repairs would occur in an active channel and require work in the water to construct the toe. The work would occur during a low flow period and the area will be isolated from the active channel using silt curtains, supersacks, or similar materials. Implementation of best management practices, such as regularly checking equipment for leaks or drips, fueling of vehicles away from the water, and having a spill kit onsite would also minimize the potential for water quality impacts.

The Federal action will require the removal of 17 trees on the landward side of the levee, ranging in size from a four-inch diameter hawthorn (*Crataegus douglasii*) to several 24-inch diameter London planetrees (*Platanus hispanica*). Although they are outside the direct riparian zone, these trees provide some shading and leaf litter to the river in this reach and these functions would be impacted with their removal. As described above, the proposed action includes lower bank plantings of 78 trees and 1092 shrubs to help offset these impacts. No long term negative effects to water quality are expected.

Biological Resources: The project site is an oversteepened bank with minimal vegetation on the outside of a bend in the Green River. The riverward face is dominated by herbaceous invasives

including blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*). The landward face includes numerous large London plane trees planted throughout the site with a mown grass understory. Landward of the levee is a parking area and business park within a commercial/light industrial zone of Tukwila. The levee crown is an asphalt trail that is a dead-end spur of the Green River Trail. The opposite bank is also an armored levee which includes anchored large woody debris.

The Green River contains spawning populations of Chinook, coho, pink, and chum salmon, and winter and summer steelhead. Small numbers of sockeye salmon are also found. Bull trout use the lower river for feeding and rearing. The project area contains limited rearing habitat for these species. No spawning occurs in the project area.

The following table lists threatened and endangered species potentially occurring within the project vicinity.

Species	Listing Status	Critical Habitat
Coastal/Puget Sound Bull Trout <i>Salvelinus confluentus</i>	Threatened	Designated
Puget Sound Chinook Salmon <i>Oncorhynchus tshawytscha</i>	Threatened	Designated
Puget Sound Steelhead <i>Oncorhynchus mykiss</i>	Threatened	Proposed

A biological assessment is being prepared pursuant to Sec. 7 of the Endangered Species Act to determine whether the proposed actions are likely to adversely affect these species or their designated critical habitat. Other listed species may also occur in King County but have no potential to be affected by the proposed project. The proposed project would have “no effect” on the following species and their designated critical habitat due to their sensitivities to human encroachment, lack of suitable habitat, or because their presence is so transitory that any temporal affects to these species from construction activities would not be perceived as unusual, cause disruption of behavior or lead to measurable reductions in their prey base. These species include the Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis*), gray wolf (*Canis lupis*), northern spotted owl (*Strix occidentalis*), yellow-billed cuckoo (*Coccyzus americanus*), southern resident killer whale (*Orcinus orca*), and Golden paintbrush (*Castilleja levisecta*). Marbled murrelet (*Brachyramphus marmoratus*) could transit the project area while travelling between nesting and feeding areas, however the additional noise and human presence is not expected to significantly increase the ambient conditions as the project area is in an urban commercial/light industrial community. Additionally, the loudest construction effort (the vibratory pile driving) would be expected to occur in February/March which is outside of the murrelet nesting season (1 April to 23 Sept). Murrelet behavior is not expected to be affected by the proposed construction and the proposed project would have “no effect” on marbled murrelet.

The Green River provides important foraging, migration and overwintering habitat for bull trout. The potential for bull trout presence during the in-water construction phase is low due to high water temperatures. Chinook and steelhead populations use the river reach in the project area for migrating and rearing. Chinook migrate upstream through the lower Green River to upstream spawning grounds from late June into early November, with large numbers entering the river by

July (Williams et al. 1975 *in* NMFS 2009, Kerwin and Nelson 2000 *in* NMFS 2009). Many early returning adult Chinook salmon hold in the lower river until approximately mid-September. As with bull trout, elevated water temperatures in August and early September likely result in blockage or delay of the upstream migration of adult Chinook salmon (NMFS 2009). Adult steelhead are present in the project area from January through May (NMFS 2009). Juvenile steelhead reside in fresh water year-round for two years prior to outmigrating. Some migrating/holding adult Chinook salmon and some juvenile steelhead could be in the project area during construction.

Salmonids may avoid the construction area due to noise, vibration, or potentially increased turbidity. However, these fish would have nearby alternative habitat available for the short construction period. The removal of vegetation could decrease the habitat value of the shoreline from the pre-damaged condition for terrestrial insects, could decrease organic inputs to the river, and would decrease local shading.

Incorporation of the layback would require the removal of 17 trees from the landward side of the levee, including several large London planetrees. The project would include planting trees and shrubs along the lower bank throughout the project length.

To limit fish impacts, the project would complete the in-water construction phase within the approved work window for this area. The work window for in-water work at this location, which avoids the most sensitive periods for fish, is 1 August to 31 August. Additionally, the work area would be isolated from the river to minimize water quality and fisheries impacts. Implementation of best management practices, such as regularly checking equipment for leaks or drips, fueling of vehicles away from the water, and having a spill kit onsite would also minimize the potential for impacts to fisheries. It is anticipated that there would be no significant adverse effects to critical habitat as the project proposes to repair an armored bank where a similar armored bank had existed prior to the flood damage. Incorporation of a slope layback and bank plantings at the site would be beneficial as they would reduce velocities, improve shading throughout the project reach, provide refuge habitat, and widen this narrow channel.

The Phase 1 construction is being proposed as an emergency measure to provide an incremental benefit to flood protection within the ongoing flood season. Coordination with resource agencies in was initiated in early December 2014 under Section 7 of the Endangered Species Act, pursuant to 50 CFR 402.05. This expedited consultation focused only on the impacts of the proposed Phase 1 work (floodwall installation and tree removal) with the understanding that a full consultation for the complete Federal action (including consideration of any impacts from both Phase 1 and Phase 2) would occur prior to the commencement of the Phase 2 construction.

When completed, this levee repair is not intended or expected to generate appreciable change in habitat conditions as compared with conditions pre-existing the flood event. Repair construction work may result in short-term impacts to fish and wildlife from noise, vibration, increased human presence, and removal of vegetation. Significant impacts to these resources are not expected.

Cultural Resources: The Corps is currently taking actions to identify historic properties that may be affected by the proposed action as required by Section 106 of the National Historic Preservation Act. The Corps is consulting with the Washington State Historic Preservation Officer, Indian tribes, and other consulting parties about the project and will complete identification and evaluation for historic properties as well as make agency findings of effect for Section 106 prior to approval of the proposed action. As of this time, the Corps has not identified any historic properties within the area of potential effect and does not anticipate that the proposed project would affect historic properties.

Air Quality: Construction vehicles and heavy equipment used during the proposed construction would temporarily and locally generate increased gasoline and diesel exhaust fumes. The small area of construction and the short duration of the work would limit the impact to air quality. The activity would constitute routine repair of an existing facility, generating an increase in direct emissions of a criteria pollutant or its precursors that would be clearly *de minimis*, and would therefore be exempted by 40 CFR Section 93.153(c)(2)(iv) from the conformity determination requirements. Emissions generated by the construction activity are expected to be minor, short-term, and well below the *de minimis* threshold. Unquantifiable but insignificant exacerbation of effects of CO2 emissions on global climate change would be anticipated.

Noise: Temporary increases in noise would occur as a result of both phases of the construction for the proposed action. The project area is largely surrounded by commercial and light industrial properties. Two residential properties exist within 1000 feet of the construction. Proposed work would be done from 7AM to 7 PM to limit noise impacts. Impact hammers would not be used to install sheetpile walls. Wildlife in this urban area is likely habituated to human activity and noise. No long-term change in noise levels would occur as a result of the project.

Traffic: Construction-related traffic may cause temporary increases to, and disruption of, local traffic. Flaggers and signs would be used, as needed, to safely move traffic around the construction site. No long-term change in traffic would occur as a result of the project.

The placement of the floodwall would occur within a parking lot. A number of parking stalls would be affected. Reorganizing the spaces would help to retain the largest number of spaces possible, however the overall number of spaces would be expected to permanently decrease.

Recreation: This crown of the levee within the project area is a dead-end spur of the Green River Trail. This trail is heavily used by walkers, joggers, cyclists, and other recreational enthusiasts. Both phases of construction would temporarily close this section of the trail and cause recreational activities to be routed around the area. Following completion of the construction the crown of the levee would be paved to restore the trail. The trail would reopen, though the section through the construction area will change visually with the removal of the landward trees.

Cumulative Effects: As mentioned above, the City of Kent is conducting a floodwall project along the landward side of three reaches (Reaches 2, 3, and 4) of levee in proximity to the proposed Corps' project area. Additionally, Kent is installing a longer length of floodwall at the

project site (designated as Reach 1 in Kent's designs) than the Federal action. At Reaches 2, 3, and 4, Kent's project involves the installation of the floodwall as well as riverward slope work above ordinary high water (OHW). Kent's riverward slope work includes a 6:1 sloped bench just above ordinary high water and a 2:1 sloped riverward face. Kent is including plantings on the riverward face of the levee as mitigation.

At this time, no other projects are known for this area. Cumulative effects will be analyzed and addressed, as required, pursuant to NEPA and ESA, in the development of the EA.

COMPLIANCE WITH OTHER LAWS AND REGULATIONS

The Corps will coordinate the proposed action with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service concerning effects of the proposed repair activities on threatened and endangered species and their critical habitat, pursuant to Sec. 7(a)(2) of the Endangered Species Act.

No significant unmitigated impact to Tribal Treaty Rights is expected as a result of the proposed activities. A tribal fishing site is located near the proposed action. The project team will continue to work with the Muckleshoot Indian Tribe to ensure that access to the fishing site is available throughout the construction periods and that the site's integrity will be preserved.

The Corps is consulting with the Washington State Historic Preservation Office, Indian tribes and other consulting parties about the project in accordance with Section 106 of the National Historic Preservation Act as implemented in the regulations at 36 C.F.R. Part 800.

The project would involve a discharge of fill material into waters of the United States that will be evaluated for substantive compliance with guidelines promulgated by the Environmental Protection Agency under authority of Section 404(b)(1) of the Clean Water Act. The project would include minor deviations to the pre-flood condition in that the repair would include a laid back slope, changing the profile below ordinary high water. The provisions of the regional conditions under Nationwide Permit 3 allow for minor deviations in the design for the repair and maintenance of existing structures pursuant to the Corps of Engineers' Clean Water Act Section 404(b)(1) permitting program. The Corps intends to apply by analogy the general Water Quality Certification issued by the Washington Department of Ecology for proposals meeting the criteria of NWP 3, in order to provide reasonable assurance of compliance with the Water Quality Standards of Washington, under Section 401 of the Clean Water Act.

EVALUATION

The Corps has made a preliminary determination that the environmental impacts of the proposed work can be adequately evaluated under the National Environmental Policy Act through preparation of an environmental assessment (EA). Preparation of an EA addressing potential environmental impacts associated with the levee rehabilitation project is currently underway.

Any person who has an interest that may be affected by the discharge of fill or dredged material contemplated under this proposal may request a public hearing. The request must be submitted in writing to the District Engineer within the comment period of this notice, and must clearly set forth the following: the interest that may be affected, the manner in which the interest may be

affected by this activity, and the particular reason for holding a public hearing regarding this activity.

The decision whether to conduct the project will be based on an evaluation of the probable impact on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered; among these are: conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people.

The Corps invites submission of comments on the environmental impact of the proposal. Comments will also be considered in determining whether it would be in the best public interest to proceed with the proposed project. The Corps will consider all submissions received before the expiration date of this notice. The nature or scope of the proposal may be changed upon consideration of the comments received. The Corps will initiate an Environmental Impact Statement (EIS), and afford all of the appropriate public participation opportunities attendant to an EIS, if significant effects on the quality of the human environment are identified and cannot be mitigated.

Submit comments to this office, Attn: Environmental and Cultural Resources Branch, no later than 30 days after the posting of this notice to ensure consideration. In addition to sending comments via mail to the above address, comments may be e-mailed to Ms. Bobbi Jo McClain, Project Biologist, at bobbi.j.mcclain@usace.army.mil. The Notice of Preparation can be found at the following website:

<http://www.nws.usace.army.mil/Missions/Environmental/EnvironmentalDocuments.aspx> under “*Desimone-Briscoe School Levee Rehabilitation.*” Requests for additional information should be directed to Ms. Bobbi Jo McClain at 206-764-6968 or at the above e-mail address.

REFERENCES

National Marine Fisheries Service (NMFS). 2009. Green River Levee Rehabilitation, Green River, 17110013 HUC, King County, Washington Endangered Species Act Section 7 Consultation Biological Opinion And Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation. NMFS Tracking Number 2008/05502.

Washington Department of Ecology (WDOE). 2014. Water Quality Assessment for Washington. Online at: <https://fortress.wa.gov/ecy/wqamapviewer/default.aspx?res=1396x785>. Accessed on 28 Dec 2014.

Designs and Photos:

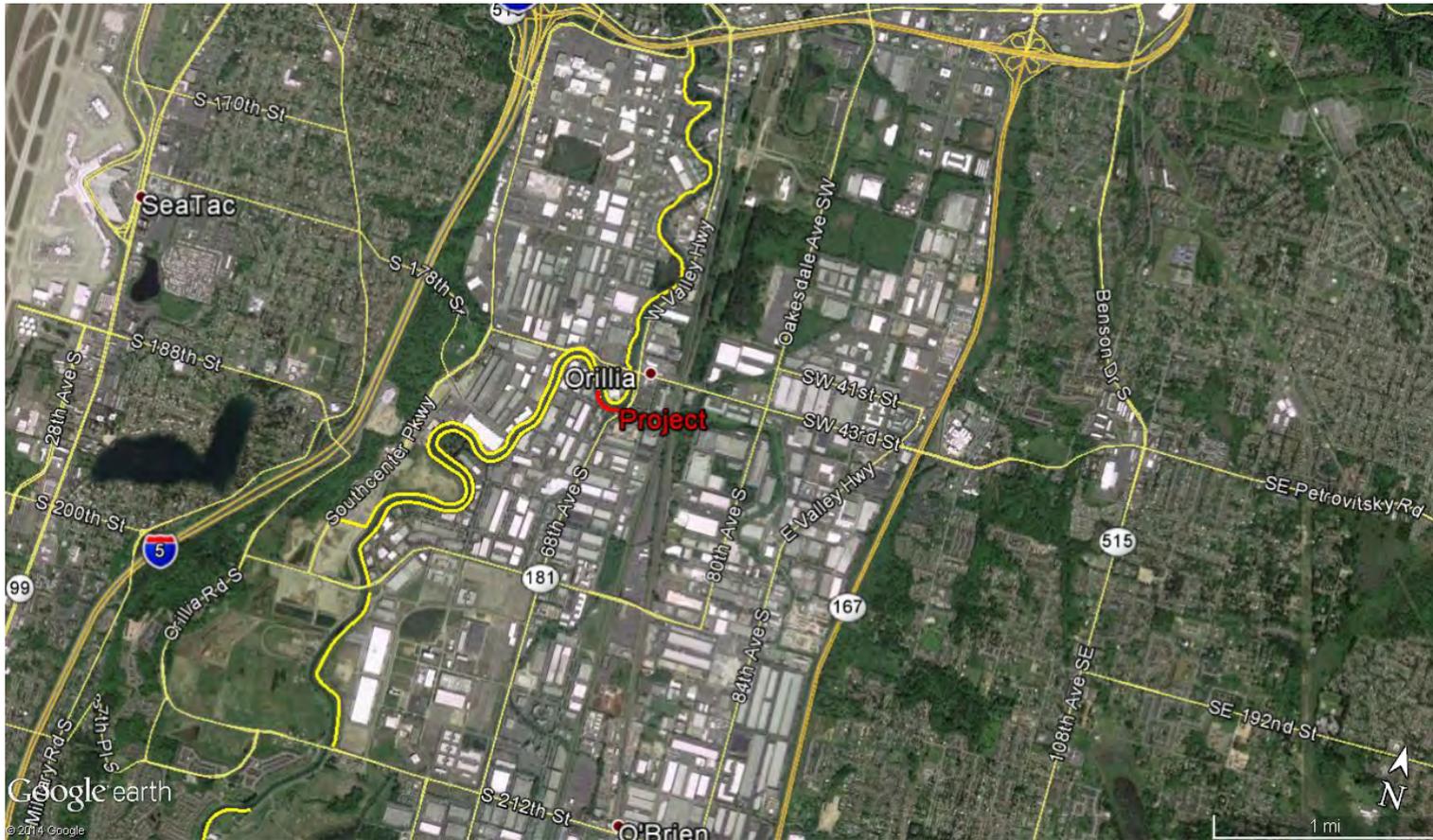


Figure 1. Overview of the project location. The bright yellow lines illustrate the levees in the area with the red line indicating the project site

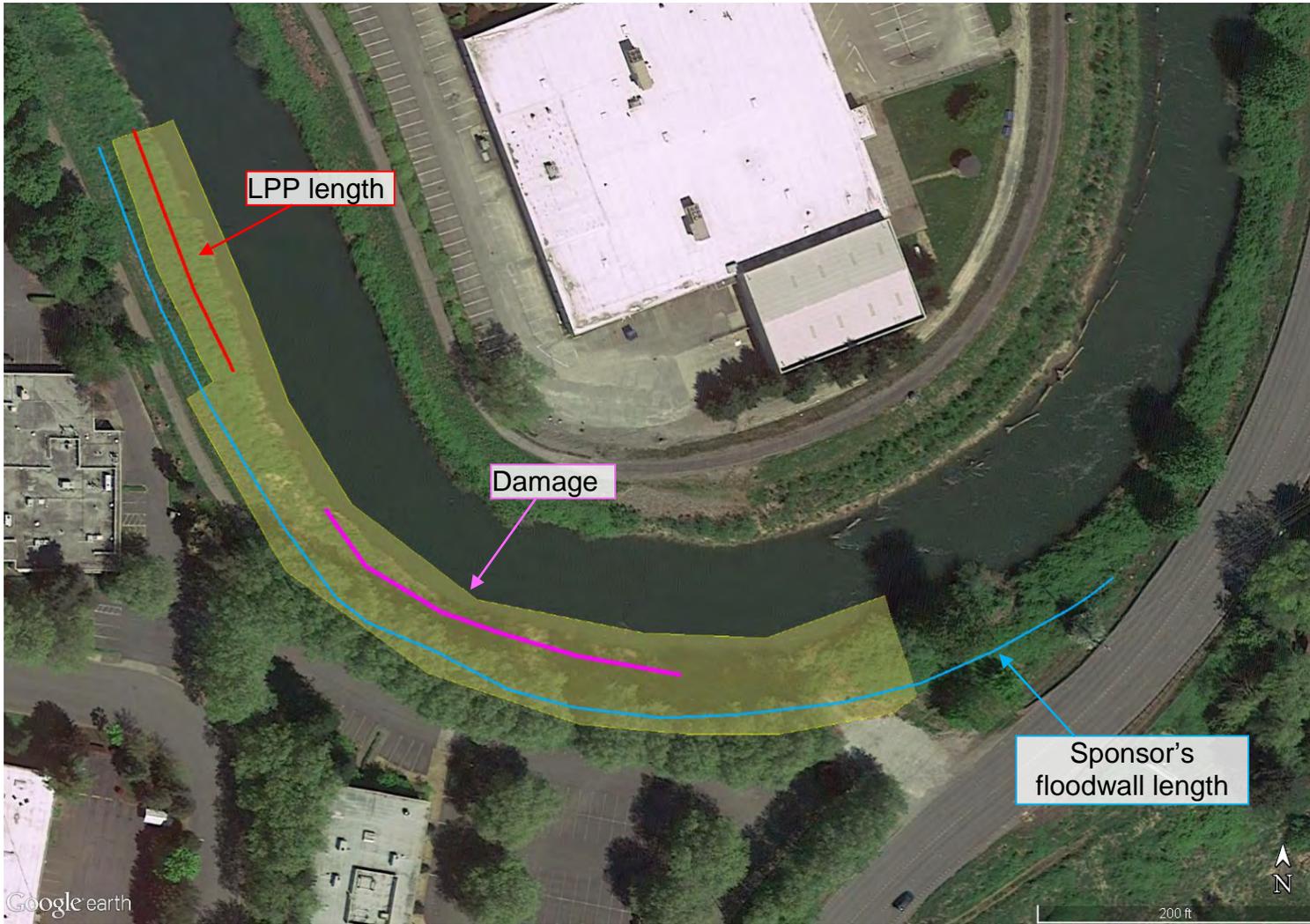


Figure 2. Proposed repair location details. The shaded area is the proposed Federal action.

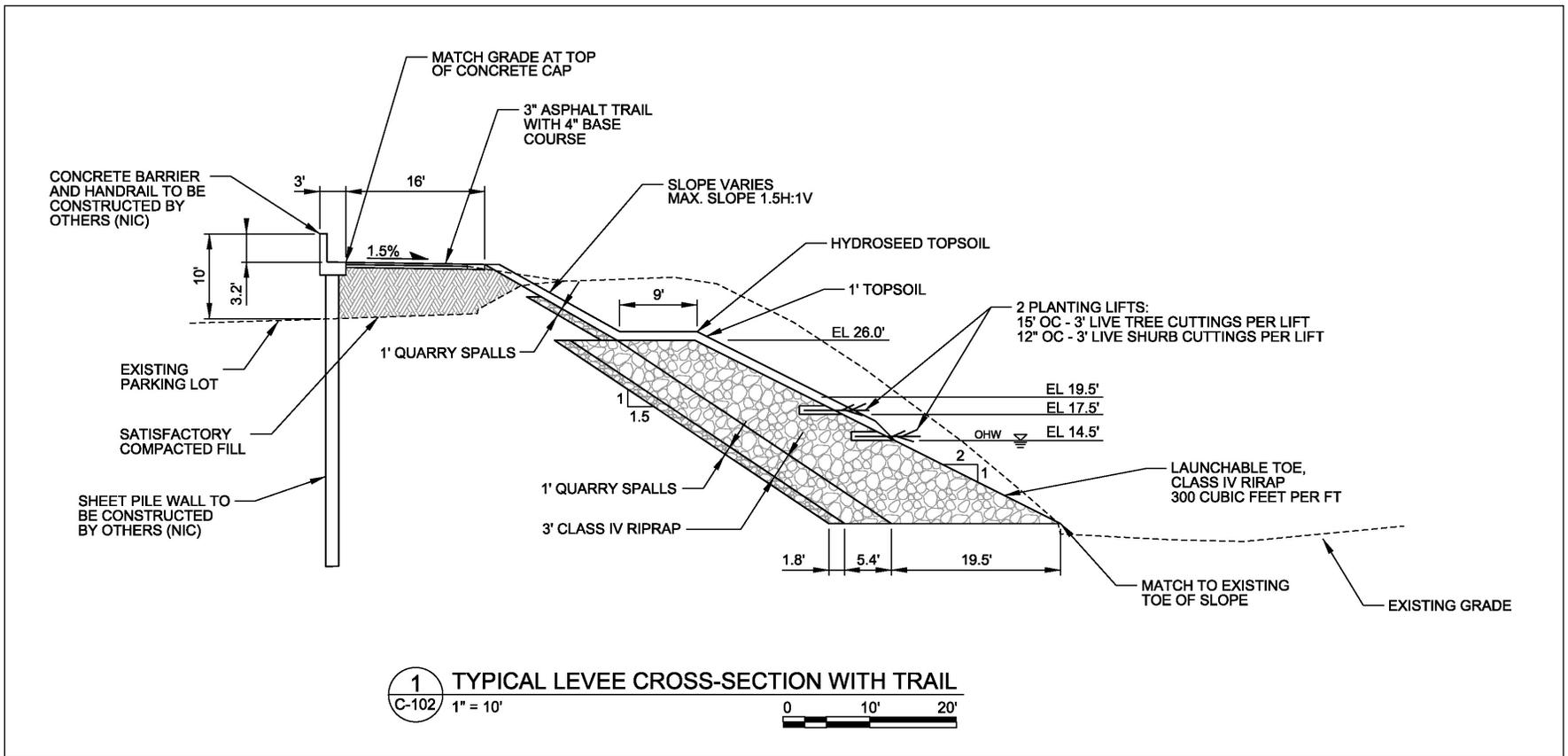


Figure 3. Typical cross section



Photo 1: Damaged section of levee, showing the riverward face



Photo 2: Damaged section of levee, showing the crown and backslope