

BJC/OR-1919

**Floodplain and Wetland Assessment
for Expansion of the
Portal 5 Parking Lot at the
East Tennessee Technology Park,
Oak Ridge, Tennessee**

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**Floodplain and Wetland Assessment
for Expansion of the
Portal 5 Parking Lot at the
East Tennessee Technology Park
Oak Ridge, Tennessee**

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Prepared by
Pro2Serve® Professional Project Services, Inc.
Oak Ridge, Tennessee
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ACRONYMS

<i>CFR</i>	<i>Code of Federal Regulations</i>
D&D	decontamination and decommissioning
DUF ₆	depleted uranium hexafluoride
DOE	U. S. Department of Energy
ETTP	East Tennessee Technology Park
ORR	Oak Ridge Reservation
SWPPP	Storm Water Pollution Prevention Plan

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EXECUTIVE SUMMARY

The U. S. Department of Energy proposes to expand the existing parking lot area adjacent to Portal 5 at the East Tennessee Technology Park in Oak Ridge, Tennessee. A portion of the area is covered with gravel and currently is used to accommodate overflow parking. Overflow parking needs have increased recently as a result of the elimination of parking spaces to accommodate shipping needs for the transfer of depleted uranium hexafluoride cylinders to the Portsmouth and Paducah Gaseous Diffusion Plants and because of increased decommissioning and decontamination activity at the K-25/K-27 buildings. A majority of the new parking area would be located in the 100-year floodplain of Mitchell Branch, a small tributary of Poplar Creek. A small wetland, located in a vegetated buffer area along Mitchell Branch, would not be disturbed by the installation of the parking area. Impacts to wetland hydrology and biotic communities are expected to be negligible. No long-term adverse impact to the floodplain is expected.

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1. INTRODUCTION

This floodplain assessment has been prepared in accordance with 10 *Code of Federal Regulations (CFR)* 1022, “Compliance with Floodplain/Wetlands Environmental Review Requirements” for the purpose of fulfilling the U. S. Department of Energy’s (DOE’s) responsibilities under Executive Order 11988, *Floodplain Management*. Executive Order 11988 encourages measures to preserve and enhance the natural and beneficial functions of floodplains. It also requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative.

According to 10 *CFR* 1022, a floodplain is defined as the lowlands adjoining inland and coastal waters and relatively flat areas and flood prone areas of offshore islands, including, at a minimum, that area inundated by a 1% or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0%) floodplain. The critical action floodplain is defined as the 500-year (0.2%) floodplain.

In addition, 10 *CFR* 1022 seeks to provide early and adequate opportunities for public review of plans and proposals involving actions located in a floodplain and/or wetlands. This floodplain assessment serves to inform the public of proposed activities at the Oak Ridge Reservation (ORR) that have the potential to affect the floodplain on property currently controlled by DOE and to present measures or alternatives to the proposed action that will reduce or mitigate adverse effects. Information is presented on the following topics: project description, floodplain impacts, and alternatives. The 100-year flood was chosen as the criterion of evaluation for floodplain effects because no critical actions, as defined in 10 *CFR* 1022, would occur as a result of the proposed action.

DOE is currently transferring depleted uranium hexafluoride (DUF₆) to the Portsmouth and Paducah Gaseous Diffusion Plants and is escalating decontamination and decommissioning (D&D) efforts for the K-25/K-27 buildings at the East Tennessee Technology Park (ETTP) in Oak Ridge, Tennessee. A shipment staging area for DUF₆ cylinders was established in the parking area in the spring of 2004; this staging area eliminated approximately 100 parking spaces from an already overtaxed parking facility. Furthermore, expanded activities associated with D&D of the K-25/K-27 buildings have created additional parking demand. The proposed parking area would supply parking for approximately 444 vehicles. The parking area would be located on DOE property adjacent to an existing graveled parking area north of Portal 5 and east of Mitchell Branch. Poplar Creek Road traverses the proposed area immediately south of the intersection of Blair Road and Poplar Creek Road at ETTP in Oak Ridge, Tennessee. The proposed parking area is approximately 4.9 acres. Property corners are: N -23,108.14, E 53.99; N -23,740.16, W -35.72; N -23,806.43, E 72.09; N +23,119.66, and E 399.93 (Fig. 1). This assessment has been prepared in accordance with Executive Order 11988, *Floodplain Management*; Executive Order 11990, *Protection of Wetlands*; and with DOE guidance and policy (10 *CFR* 1022) for compliance with these executive orders.

2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The range of alternatives discussed in this assessment is limited to the proposed alternative and the no action alternative.

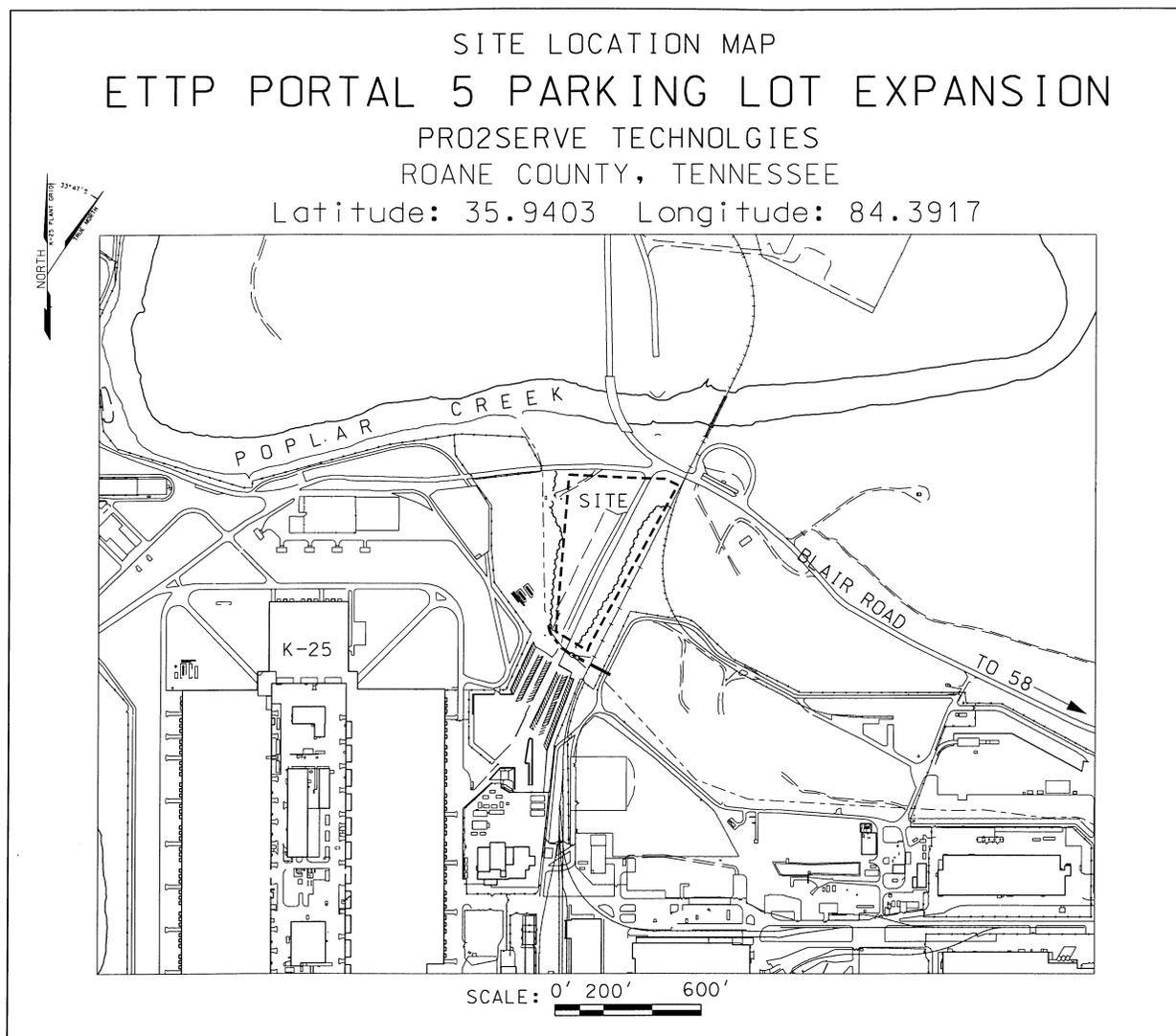


Fig. 1. Site location map.

2.1 PROPOSED ACTION

The proposed action seeks to grade 4.9 acres, place and compact a base layer, and place and compact either a paved or gravel layer to provide parking for employees working on the K-25/K-27 Buildings D&D Project. Standard construction techniques for managing storm water and runoff will be used. The entire area is located in the 100-year floodplain of Mitchell Branch and Poplar Creek, including the existing overflow parking area (Fig. 2).

This expansion would not extend into the identified wetland area along the sides of Mitchell Branch west of the construction site.

The project should generate minimal amounts of solid/sanitary waste and/or spoil materials. Discharge from storm water should be minimized through development and effective use of a Storm

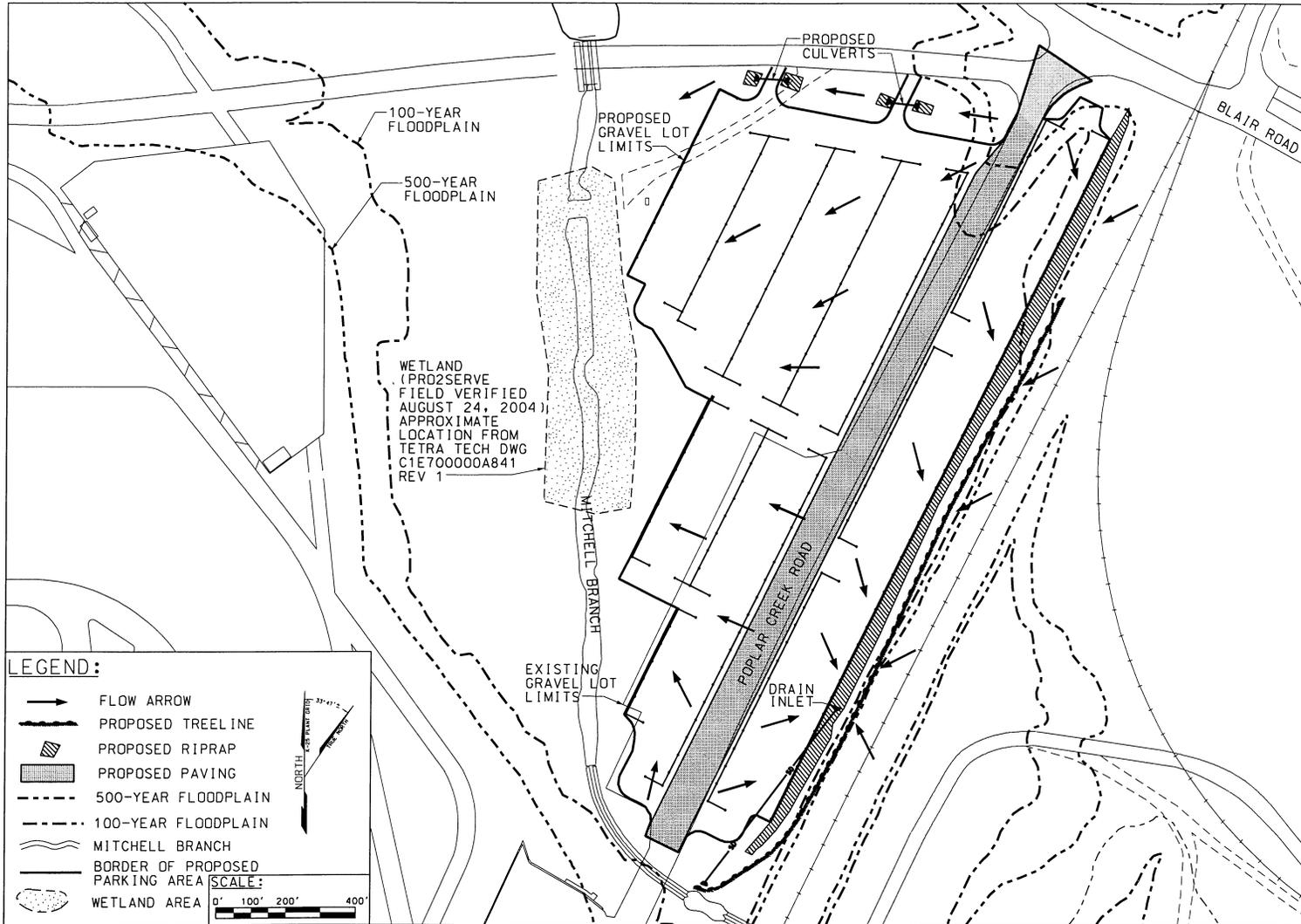


Fig. 2. Parking area detailed map showing parking spaces.

Water Pollution Prevention Plan (SWPPP). There should be no air emissions, no hazardous waste, and no recyclable materials generated as a result of implementation of this project. During construction, erosion controls would be installed downgradient from the construction area to prevent the transport of silt downstream by storm water flows. After construction is complete, surface water runoff to the west of Poplar Creek Road will be diffused over land flow into a grass buffer area along Mitchell Branch. To the east of Poplar Creek Road, runoff will flow along a riprapped swale towards a new drain inlet that will divert the flow under ground to Mitchell Branch. The diverted water will discharge to Mitchell Branch at the same location as an existing storm water drain. However, grading will be improved so that water entering the drain will flow from the north and south towards the drain inlet. Two culverts will be installed beneath parking lot access driveways south of Whittlesey Drive. There will be no significant changes in surface water flow directions and only a slight increase in peak runoff as a result of the construction.

The proposed parking area would remain in place at the site until shipments of DUF₆ being transferred to Portsmouth and Paducah are complete and until D&D activities for the K-25/K-27 area are complete.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, conditions would remain unchanged and a gravel or paved parking area would not be installed. The current parking configuration would continue and employees would continue to park indiscriminately in the partially graveled and grass-covered area, which creates increasingly unsafe conditions. Standing water would continue to occur in areas with insufficient drainage. No expected change in the floodplain would be anticipated beyond those that are naturally occurring.

3. FLOODPLAINS AND WETLANDS DESCRIPTION

3.1 DESCRIPTION OF FLOODPLAINS

The 100-year floodplain of Mitchell Branch and Poplar Creek encompasses the entire proposed parking area expansion, which is relatively flat and extends to the base of the paved portion of the existing Portal 5 Parking Area. The 100-year flood elevation in the vicinity of the proposed parking lot expansion is approximately 230.6 m (756.5 ft) above mean sea level. A single White Ash (*Fraxinus americana* L.) is located in the grass-covered area proposed for parking lot expansion and must be removed. The area to be disturbed is approximately 4.9 acres and will be stabilized and converted into a gravel or paved parking area. The soils groups defined for the area north of Highway 95 and south of Poplar Creek consist of the Fullerton-Claiborne-Bodine soil profile with each soil being a Group B. Group B soils are defined as having moderate infiltration rates when thoroughly wet and consist chiefly of moderately deep or deep, moderately well- or well-drained soils that have moderately fine to moderately coarse texture. These soils have a moderate rate of water transmission. The dominant vegetation along Mitchell Branch, in the area proposed for parking lot expansion, consists of grasses, predominantly a mowed field of Tall Fescue (*Festuca arundinacea* Scrib.). A narrow strip of riparian forest community is immediately adjacent to the Mitchell Branch with typical floodplain species for the area including Sycamore (*Platanus occidentalis* L.), Boxelder (*Acer negundo* L.), Slippery Elm (*Ulmus rubra* Muhl.) and Black Willow (*Salix nigra* Marsh).

3.2 DESCRIPTION OF WETLANDS

Cunningham and Pounds (1991) conducted surveys of wetlands on ORR in 1990. Wetlands occurring on ORR were identified using National Wetlands Inventory maps and confirmed through field surveys. Ninety wetland areas were identified on the reservation. This was followed by a 1994 survey, *Wetland Survey of Selected Areas in the K-25 Site Area of Responsibility* (ORNL/TM-13033). This survey used methods identified in the 1987 *Wetlands Delineation Manual* (Y-87-1) from the U.S. Army Corps of Engineers and the 1979 *Classification of Wetlands and Deepwater Habitat of the United States* (FWS/OBS-79/31) from the U.S. Fish and Wildlife Service. The defined the wetland as occurring in the narrow margin between low, steep sideslopes and the stream channel of Mitchell Branch. The wetland is described as discontinuous, with intermittent sections of non-wetland patches. No additional survey activities were conducted and no additional coordination with the Corps of Engineers took place.

The small wetland area between the proposed parking lot and Mitchell Branch was identified on a previous drawing referenced on [Fig. 3](#). This small wetland area is identified as a jurisdictional wetland. The protection of this wetland is addressed as a best management practice at this construction site. The presence of the wetland and its extent was field verified in August 2004 (Pro2Serve).

4. ANTICIPATED IMPACTS TO FLOODPLAINS AND WETLANDS

This chapter discusses the negative and positive, direct and indirect, and long- and short-term effects of the proposed action on the floodplain and/or wetland, as required under 10 *CFR* 1022.13(a)(2). This chapter includes impacts on the natural and beneficial floodplain and wetland values appropriate to the location under evaluation. In addition, the effects of a proposed floodplain action on lives and property are evaluated. For the action proposed near the wetland, the effects on the survival, quality, and function of the wetland are evaluated.

4.1 IMPACTS TO FLOODPLAINS

4.1.1 Impacts of the Proposed Action

Negative Impacts—No long-term negative direct or indirect impacts to the beneficial values of the 100-year floodplain of Mitchell Branch would be expected under the proposed action.

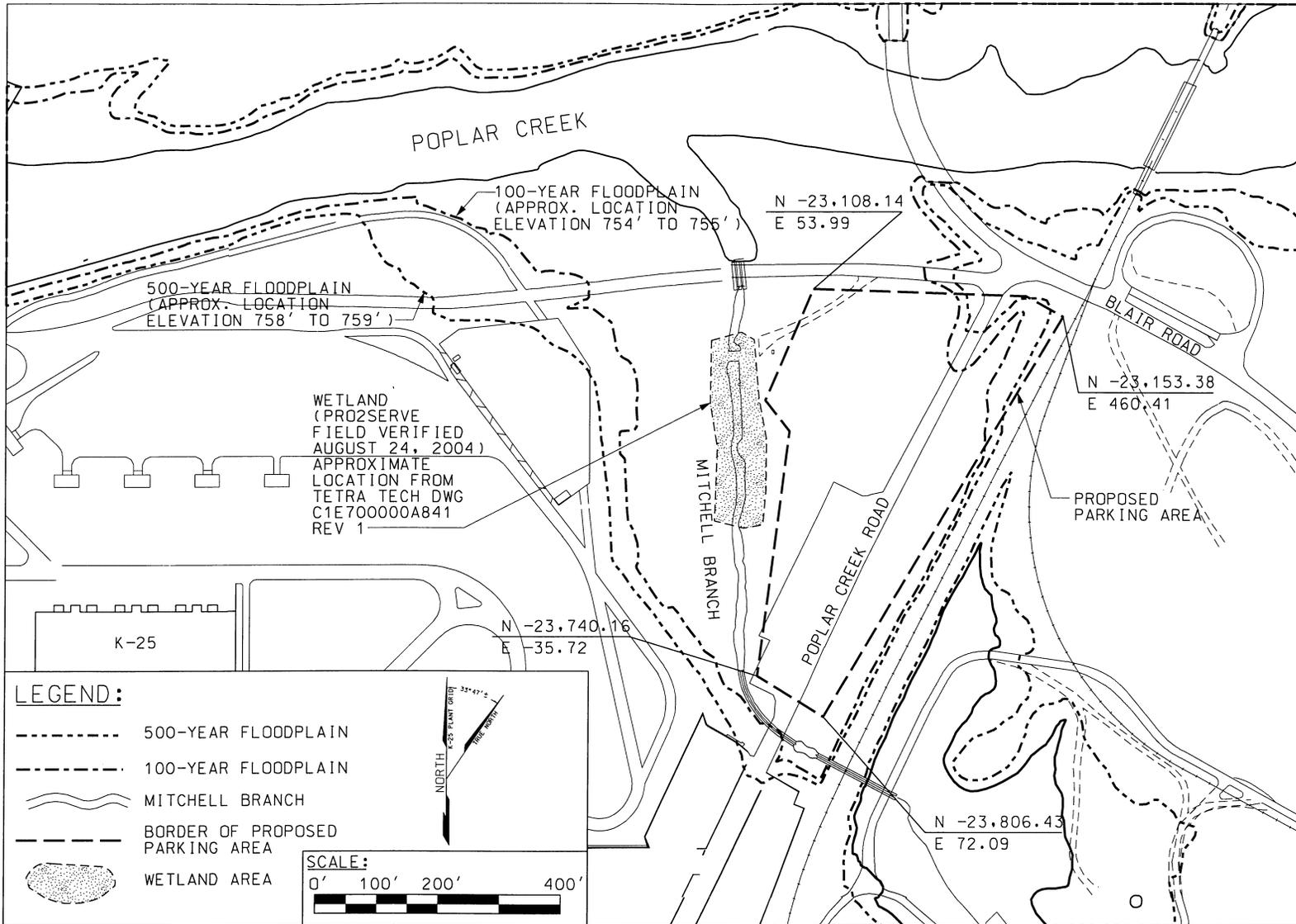


Fig. 3. Location of 100-year floodplain and wetland areas.

Short-term direct impacts to the floodplain would result from the temporary disturbance of the area during construction of the parking lot; however, sediment and erosion controls such as silt fencing and silt dikes would prevent disturbance to adjacent areas of the floodplain and would protect Mitchell Branch from the influx of silt contained in runoff. The gravel or paved surface of the parking area would be the only permanent aboveground structure constructed within the floodplain. Thus, minimal change in flood storage capacity would occur. Runoff coefficients for pre- and post-development conditions were estimated using rational method coefficients for a 2-year storm event, which yield 0.64 for pre-development and 0.70 for post-development conditions. The difference in the runoff coefficients is minimal and will produce only a slight increase in the peak runoff from the area.

Positive Impacts—Installation of the parking area would control parking of vehicles and eliminate damage to the grass-covered area resulting from parking. Direct benefits would include elimination of ruts and reduction of silt generated from vehicles becoming stuck in the grass-covered area following storm events. The final parking lot will be graded such that water west of Poplar Creek Road will flow onto a grass buffer area as diffuse flow before entering Mitchell Branch. A new surface water storm inlet will be placed east of Poplar Creek Road and grading will be improved to allow all runoff east of the site to flow towards the inlet. This will replace an old surface water storm inlet that was poorly placed to divert runoff in this area. The parking lot is designed to maintain the same direction and type of surface water discharge as under the No Action Alternative.

In terms of effects on lives and property, there will be less damage to personal, contractor, and government vehicles that get stuck in mud at the existing parking area. There also will be less damage to shoes and clothing and decreased potential for personal injury from walking on unstable surfaces. Two to 3 months of work is estimated for engineering and paving contractors to construct the parking lot.

4.1.2 Impacts of the No Action Alternative

Under the No Action alternative, additional parking would not be provided for K-25/K-27 D&D workers and overflow parking on the grass-covered area would continue in an uncontrolled manner. Continued uncontrolled parking in the area likely would degrade the grass cover through the creation of ruts and associated silt production. No impacts to the flood storage capacity of the Mitchell Branch 100-year floodplain would be expected under the No Action Alternative. No impacts to the floodplain are expected beyond those that are naturally occurring or incurred by non-DOE activities.

4.2 IMPACTS TO WETLANDS

4.2.1 Impacts of the Proposed Action

Negative Impacts—Construction of the parking lot will not have a direct short- or long-term impact on the wetland because the lot is located outside the wetland. Preparation and construction activities will have no indirect long-term negative impact on survival, quality, and function of the small wetland area adjacent to the proposed site. Changes in groundwater hydrology in the immediate vicinity should result in minimal direct and indirect impacts following completion of the project. Therefore, hydrologic characteristics, including the frequency and duration of flooding, within the portion of the small wetland adjacent to Mitchell Branch are expected to remain similar to historical conditions and wetland functions are expected to remain unchanged. Short-term negative indirect impacts from construction are minimized by the provisions in the SWPPP.

Positive Impacts—Long-term, there will be a positive impact due to less area of disturbed soil that can erode in Mitchell Branch. This will provide both a short- and long-term indirect benefit to survival, quality, and function of the small wetland.

4.2.2 Impacts of the No Action Alternative

Under the No Action Alternative, alluvial soils adjacent to Mitchell Branch would remain undisturbed. Groundwater characteristics and wetland hydrology would remain unchanged. No impacts to the wetland area would be expected beyond those that are naturally occurring or incurred by non-DOE activities.

5. CONCLUSIONS

The proposed action would not result in adverse impacts to the Mitchell Branch 100-year floodplain or the small wetland area adjacent to the floodplain. Temporary disturbance within the floodplain would cease following completion of construction activities for expansion of the Portal 5 parking lot. Impacts to the hydrologic characteristics of the small wetland area adjacent to Mitchell Branch are expected to be negligible.

6. REFERENCES

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