

U.S. DEPARTMENT OF ENERGY



FLOODPLAIN ASSESSMENT FOR THE Pantex Renewable Energy Project Windfarm Electrical Feed to the North Main Substation



PANTEX PLANT * AMARILLO, TEXAS * MARCH 2023



Cover Photo: Playa 1 Floodplain with PREP Windfarm in the background

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1.0 ASSESSMENT OF IMPACT TO THE PLAYA 1 FLOODPLAINS

The Pantex Plant is a U.S. Department of Energy/ National Nuclear Security Administrations (USDOE/NNSA) owned facility managed by Consolidated Nuclear Security, LLC (CNS) under contract DE-NA0001942. The facility is located in Carson County, Texas.

The Pantex Renewable Energy Project (PREP) Windfarm Electrical Feed to the North Main Substation (NMS) project would result in impacts to the 100-year floodplain of Playa 1. These impacts would result from the installation of electrical transmission line poles south of Playa 1. The purpose of this project consists of providing a second power feed from the PREP to the NMS.

In accordance with the regulations contained in Title 10 of the Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, the U.S. Department of Energy National Nuclear Security Administration (USDOE/NNSA) has established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process. This policy was developed in response to Executive Order 11990—Protection of Wetlands (May 24, 1977), and Executive Order 11988—Floodplain Management (May 24, 1977). These executive orders require federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains and wetlands. Under USDOE/NNSA policy, a floodplain or wetlands assessment is required for any activities involving floodplains or wetlands.

This assessment examines how a USDOE/NNSA project to upgrade the PREP windfarm transmission lines would affect floodplains. The project is associated with the 100-year floodplain of Playa 1, located on USDOE/NNSA Pantex Plant property in Carson County, Texas (See Figure 1).

To assess the project's effects on the floodplains, information was gathered about the existing conditions and the activities to be associated with the project. This information was then used to predict and evaluate the positive and negative, direct and indirect, and long- and short-term effects.

This project would include the installation of seven power poles and two guy lines to help support the corner pole.

2.0 BACKGROUND AND HISTORY

The PREP windfarm was built in 2014 as a joint project with the U.S. Department of Energy (DOE) and Siemens as part of an energy savings performance contract. The windfarm consists of five 2.3MW wind turbines (numbered 6 through 10) that are located on the east side of FM2373. Each wind turbine has an output voltage of 690Vac, which is immediately stepped up to 34.5kV for distribution. From the wind turbines and step up transformers, the underground cabling (direct burial) runs west and south on the east side of FM2373 until it crosses under FM2373 to an overhead distribution line. The overhead line runs to the South Main Substation (SMS) where it is stepped down to 12.47kV. This project involves the installation of an additional overhead distribution line that would tie in directly with the NMS. The new overhead line will cross through the southern extent of the Playa 1 100-year floodplain and require the installation of seven new powerline poles within the floodplain.

3.0 DESCRIPTION OF WORK

This project would consist of installing no more than seven overhead powerline poles within the floodplain of Playa 1. The hole for each pole would be approximately 30 inches in diameter and 7.5-9.6 feet deep depending on the height of the pole. Additionally, two guy lines will be installed on the corner

pole and secured to the ground using anchors 10 inches in diameter that will be driven 14 feet into the ground. No additional items or equipment will be installed within the confines of the floodplain for this project.



Figure 1- Map of Impacted Playa 1 Floodplain Area

3.1 Physiography

Pantex Plant lies on the Southern High Plains (SHP) portion of the Great Plains at an average elevation of 3,500 feet. The surface of the SHP is nearly flat, but generally slopes southeastward at a rate of 8 to 10 feet per mile. The principal features of relief on the SHP are numerous shallow depressions called playas. These playas are internally drained, ephemeral, and were formed by the interaction of pedogenic, geomorphic, hydrochemical, and biologic processes contemporaneous with the deposition of the Blackwater Draw formation.

The climate in the area is classified as semiarid, and is characterized by hot summers and relatively cold winters. The average annual precipitation is 20.36 inches. 70 percent of the annual precipitation falls between April and September. The region is classified as windy, with wind speeds exceeding 7 miles/hour more than 95 percent of the year. The potential gross lake surface evaporation in the area is estimated to be about 270 percent of the annual precipitation, or approximately 70 inches per year (Bomar, 1995).

3.2 Existing Conditions

Playa 1 is located in the east-central portion of Pantex Plant. The areal extent of the 100-year floodplain is approximately 216 acres, which includes 79 acres of wetland (Herrera Environmental Consultants, 1996). The limit of the 100-year floodplain is delineated at an elevation of 3,521.5 feet above mean sea level (USACE, 1995).

3.3 Land Use

Current land use, in and adjacent to the Playa 1 floodplain project area, includes 92 acres of revegetated uplands (formerly cultivated areas), 38 acres of cultivated land, and 33 acres of industrial use land (wastewater treatment facility). The cultivated lands are managed by Texas Tech Research Farm under a Service Agreement between Consolidated Nuclear Security, LLC, USDOE/NNSA and Texas Tech University (TTU).

Land use within the 100-year floodplain at Playa 1 consists of 1 acre of cultivated ground, 39 acres of formerly cultivated ground (planted to native grasses), approximately 12 acres of industrial use land, and 164 acres of short-grass prairie.

3.4 Hydrogeologic Conditions

Playa 1 is an internally drained, closed basin that receives direct storm water runoff from a watershed of approximately 2,546 acres. The runoff is either from overland sheet flow or through channels and ditches that feed into the playa. Interaction between surface water and groundwater in the Pantex Plant area is limited to infiltration of direct precipitation and runoff, mainly through playas and ditches, to the perched and Ogallala aquifers.

3.5 Soils

The soils, in and adjacent to the Playa 1 floodplain and wetland, are in the Pullman-Randall soil association. At Playa 1, this association includes Pullman clay loams (PuA and PuB, respectively); Estacado clay loams (EsB); Pep clay loams (PeC); and Randall clays (Ra).

3.6 Flora

The upland area surrounding Playa 1 has vegetation typical of short-grass prairie in the area, which is dominated by buffalograss (*Buchloe dactyoides*), blue grama (*Bouteloua gracilis*), a large stand of natural sideoats grama (*Bouteloua curtipendula*), and plains prickly pear (*Opuntia macrorhiza*). Pullman and Estacado soils adjacent to Playa 1 also support managed cropland, commonly consisting of either sorghum or winter wheat. The upland areas at Pantex Plant are being managed based partly on the results of floristic surveys completed in 1993 and 1995 (BWXT Pantex 2007). The 1995 survey identified 52 species in the Pantex Plant uplands. There are no records of federally protected or candidate plant species occurring on Pantex Plant.

3.7 Fauna

The faunal diversity in and near the project areas at Playa 1 is typical of Pantex Plant and is consistent with species commonly found in the northern portions of the SHP. The different slopes, soil types, associated water regimes, and the influences of prairie dogs, where they occur, all influence vegetative diversity and structure. The resulting availability of natural, diverse habitats provides for needs of the various native wildlife species. No critical habitat for threatened or endangered species is located on the Pantex Plant or in Carson County (BWXT Pantex, 2007).

4.0 FLOODPLAIN IMPACTS, ALTERNATIVES, AND MITIGATION

The floodplain impacts of this project are those identified from the project description that would or could modify the existing conditions of the Playa 1 floodplain. The following project activities have been identified as potentially affecting the existing floodplain conditions:

- Installation of 7 overhead electrical line poles, and
- Restoring the temporarily impacted areas to original natural grade, and replanting with native grasses.

Floodplain impacts are evaluated as positive or negative, direct or indirect, and long-term or short-term. At Pantex Plant, playa wetlands and floodplains are managed as multiple-resource, sustainable ecosystems. Project effects that are consistent with this management goal are considered positive, and effects that are not consistent with this goal are considered negative. In addition, project effects that reduce the size of the managed ecosystems are considered negative, and effects that increase the size of these ecosystems are considered positive. The identification of indirect and direct effects indicates whether or not the impacts to the floodplain or wetland are subject to intervening circumstances. Long- and short-term effects are determined by the relative permanence of the action in the floodplain or wetland.

Installation of power poles, guy lines, and site restoration activities of this project have the potential to impact the floodplain at Playa 1. Approximately 0.007 acres of floodplain at Playa 1, less than 0.004 percent of the Playa 1 floodplain area, would be impacted by the installation activities of this project. The installation of the power poles and guy lines has the potential to displace approximately 0.0000368 acre inches of floodplain volume, which would raise the floodplain elevation less than 0.00000307 feet at Playa 1. Even this minor volumetric change would be defined as a negative, direct, and long-term effect on existing conditions. Storm water runoff may have the potential to erode denuded areas and transport sediments during installation and site restoration activities, which would have a negative, direct, and short-term effect on existing conditions in this floodplain. However, the addition of the powerpoles to the area would provide additional vertical structure to the habitat. This area is widely used by several different bird species. Due to the species richness of Playa 1, this habitat is a favored hunting ground for raptor species that both reside in the area and those that migrate through (Figure 2). The increase in vertical structure near Playa 1 would provide additional look out perches for raptors hunting in the area. The design specifications for powerpoles at Pantex were modified to incorporate raptor protection for each pole installed and would



Figure 2- Northern Harriers Hunting Over Playa 1

mitigate any hazards to raptors using these perches. Overall the addition of this vertical structure would be a positive, direct, and long-term impact to the habitat of the Playa 1 floodplain.

4.1 Effects of Floodplain Activities on Lives and Property

The impacts of the project's floodplain activities would not change conditions in ways that affect lives or property, either positively or negatively, directly or indirectly, in either the long- or short-term.

4.2 Alternatives

It was impossible to route the line out of the North Main Substation directly to the East as there was not sufficient clearance from the current 115 KV utility transmission line that comes into the NMS from the East.

The electrical distribution is first routed north out of the substation. When the line transitions to the east (north of the wastewater lagoons), the line intercepts the southwest part of the 100-year flood plain. It would be difficult to re-route this part of the line as there are wastewater lagoons and equipment to avoid just to the north of the lagoons. There is an existing distribution line that prevents enough right of way between the wastewater lagoons and the existing distribution line to route the line to the east of the existing line. The only possible route is to make a 45 degree angle at the northeast corner of the wastewater lagoons next to the existing line that feeds the wastewater lagoon equipment. With larger spans to cross the two existing lines would require the distribution structures to be taller and larger to make the span and sag clearance meet the electric code. This line could also interfere with the maintenance of the wastewater lagoons and pump equipment during maintenance activities. The larger structures, added guy wires, and higher stresses increase the costs and potential risk of failure of the equipment.

When the distribution line is going east, it encounters the southeast portion of the floodplain. One alternative would transition the line back south once it is to the east of the lined wastewater lagoons, and travel east until the line passes east of the floodplain and then transition it back north then east to route to the north of the current buildings. A main concern with this change would be that each time a distribution line makes a change in direction, larger poles are required with additional guy wires for stability. The guy wires pose safety concerns for plowing and mowing activities. These changes in direction also add additional stress on the wires and insulators that could pose a higher risk of failure.

4.3 Mitigation

Two negative effects in the Playa 1 floodplain have been identified: (1) the potential for erosion and sedimentation during installation and site restoration activities, and (2) the potential for displacing floodplain volume with the installation of the power poles. The negative effects of erosion and sedimentation would be minimized by engineering controls during construction and post-construction re-grading and revegetation of the areas temporarily disturbed by the installation activities. There is no mitigation for the displacement of volume in the floodplain, however the overall potential displacement of the floodplain volume is so small as to be negligible.

5.0 SUMMARY

In accordance with Title 10 of the CFR Part 1022, a Statement of Findings based on the information in this document will be published. The Statement of Findings will include a brief description of the proposed action and an explanation indicating why it is located in a floodplain, the alternatives

considered, a statement indicating if the action conforms to State and local floodplain requirements and a brief description of the steps to be taken to minimize potential harm within the floodplain. After publication, a 15-day comment period is required before implementing the proposed action.

6.0 REFERENCES

Bomar, George W. *Texas Weather* – 2nd ed., University of Texas Press, Austin. 1995.

BWXT Pantex, 2007. *Environmental Information Document – In Support of the National Environmental Policy Act Documents for U. S. Department of Energy/National Nuclear Security Administration Pantex Plant*, Amarillo, Texas, January.

Herrera Environmental Consultants, 1996. *Floodplains and Wetlands Assessment – Pantex Lake and Playas 1, 2, 3, and 4*, Herrera Environmental Consultants, Inc., 2200 Sixth Avenue, Suite 601, Seattle, Washington, April.

USACE, 1995. *Floodplain Delineation Report, Department of Energy Pantex Plant, Amarillo, Texas*, U.S. Army Corps of Engineers, Tulsa District, Floodplain Management Services Planning Division, P.O. Box 61, Tulsa, Oklahoma, January.

APPENDIX A- STATEMENT OF FINDINGS

**STATEMENT OF FINDINGS ON FINAL FLOODPLAIN ASSESSMENT FOR THE PANTEX
RENEWABLE ENERGY PROJECT WIND FARM ELECTRICAL FEED TO THE NORTH
MAIN SUBSTATION**

PROJECT DESCRIPTION

The Pantex Plant is a U.S. Department of Energy/ National Nuclear Security Administrations (USDOE/NNSA) owned facility managed by Consolidated Nuclear Security, LLC (CNS) under contract DE-NA0001942. The facility is located in Carson County, Texas.

The Pantex Renewable Energy Project (PREP) Wind Farm Electrical Feed to the North Main Substation (NMS) project would result in impacts to the 100-year floodplain of Playa 1. These impacts would result from the installation of electrical transmission line poles south of Playa 1. The purpose of this project consists of providing a second power feed from the PREP to the NMS.

DESCRIPTION OF WORK

This project would consist of installing no more than seven overhead power-line poles within the floodplain of Playa 1. The hole for each pole would be approximately 30 inches in diameter and 7.5-9.6 feet deep depending on the height of the pole. Additionally, two guy lines will be installed on the corner pole and secured to the ground using anchors 10 inches in diameter that will be driven 14 feet into the ground. No additional items or equipment will be installed within the confines of the floodplain for this project.

**FLOODPLAIN IMPACTS,
ALTERNATIVES, AND
MITIGATION**

The floodplain impacts of this project are those identified from the project description that would or could modify the existing conditions of the Playa 1

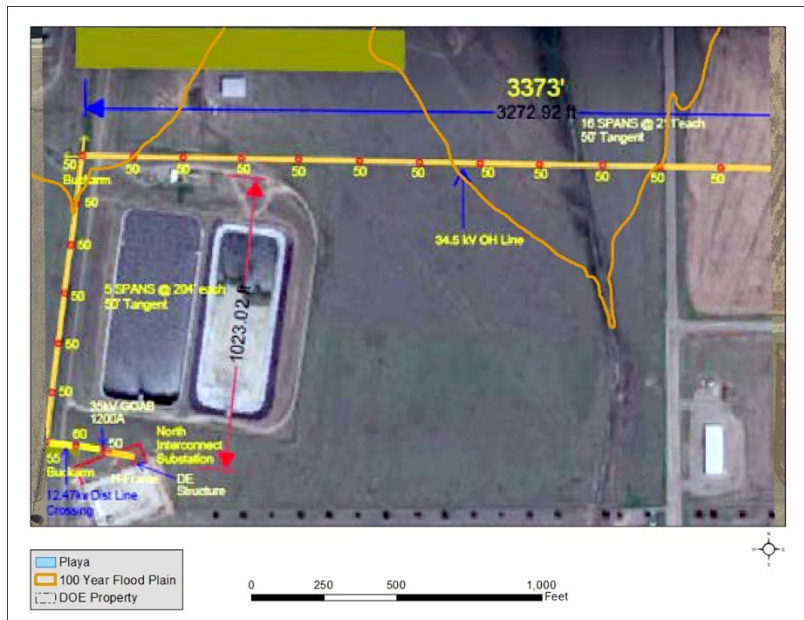


Figure- Map of impacted Playa 1 Floodplain Area

floodplain. The following project activities have been identified as potentially affecting the existing floodplain conditions:

- Installation of seven overhead electrical line poles, and
- Restoring the temporarily impacted areas to original natural grade, and replanting with native grasses.

Installation of power poles, guy lines, and site restoration activities of this project have the potential to impact the floodplain at Playa 1. Approximately 0.007 acres of floodplain at Playa 1, less than 0.004 percent of the Playa 1 floodplain area, would be impacted by the installation activities of this project. The installation of the power poles and guy lines has the potential to displace approximately 0.0000368 acre inches of floodplain volume, which would raise the floodplain elevation less than 0.00000307 feet at Playa 1. Even this minor volumetric change would be defined as a negative, direct, and long-term effect on existing conditions. Storm water runoff may have the potential to erode denuded areas and transport sediments during installation and site restoration activities, which would have a negative, direct, and short-term effect on existing conditions in this floodplain. However, the addition of the power poles to the area would provide additional vertical structure to the habitat. This area is widely used by several different bird species. Due to the species richness of Playa 1, this habitat is a favored hunting ground for raptor species that both reside in the area and those that migrate through. The increase in vertical structure near Playa 1 would provide additional look out perches for raptors hunting in the area. The design specifications for power poles at Pantex were modified to incorporate raptor protection for each pole installed and would mitigate any hazards to raptors using these perches. The addition of this vertical structure would be a positive, direct, and long-term impact to the habitat of the Playa 1 floodplain.

The impacts of the project's floodplain activities would not change conditions in ways that affect lives or property, either positively or negatively, directly or indirectly, in either the long- or short-term.

It was impossible to route the line out of the NMS directly to the East as there was not sufficient clearance from the current 115 KV utility transmission line that comes into the NMS from the East.

Two negative effects in the Playa 1 floodplain have been identified: (1) the potential for erosion and sedimentation during installation and site restoration activities, and (2) the potential for displacing floodplain volume with the installation of the power poles. The negative effects of erosion and sedimentation would be minimized by engineering controls during construction and post-construction re-grading and revegetation of the areas temporarily disturbed by the installation activities. There is no mitigation for the displacement of volume in the floodplain, however the overall potential displacement of the floodplain volume is so small as to be negligible.

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APPENDIX B- RESPONSE TO COMMENTS RECEIVED

No comments from the public or appropriate government agencies were received regarding this floodplain assessment during the required public notice period.