

## **Floodplain Statement of Findings**

### **Department of Energy Loan Guarantee to AES Energy Storage, LLC**

#### **Project Dyno Electric Grid Stability Advanced Battery Systems in Johnson City, NY**

**AGENCY:** U.S. Department of Energy, Loan Programs Office

**ACTION:** NEPA Categorical Exclusion

**SUMMARY:** In accordance with U.S. Department of Energy (DOE) regulations contained at 10 CFR 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, DOE has conducted a floodplain assessment that analyzed the potential impacts associated with the AES Energy Storage, LLC (AES) Project Dyno, 20MW energy storage system (Project) to be located in the Village of Union Town and Johnson City, New York. DOE, through its Loan Guarantee Program Office (LGPO), proposes to provide a Federal loan guarantee pursuant to Title XVII of the Energy Policy Act of 2005, to AES to support the construction and startup of the proposed facility. The purpose of DOE'S proposed action is to expedite the deployment of a new energy technology into commercial use in the U.S. and to reduce emissions of greenhouse gases and other air pollutants.

Project Dyno would provide ancillary services within the New York power market. The Project is composed of advanced lithium ion battery cells and power control technologies to store power to help maintain the stability of the electric power grid. The Project would be composed of ten fifty-three foot metal containers each housing bidirectional inverters and DC subsystems capable of 2MW of capacity. These units are connected through isolation transformers, switchgear, and step-up transformers to the high voltage system. The Project would be able to charge or discharge at up to 20MW in each instant up to a maximum of 5MW/h of energy in or out of the system. The Project is located at the site of an operating coal-fired power generating station in an area immediately adjacent to an existing electrical substation. The site will require modifications to install the concrete column foundations to support the energy storage units.

The Project area is approximately 0.57 acres (25,200 square feet) and the total area taken up by above-grade, concrete column foundations is about 800 square feet. The Project would be constructed within the 100-year floodplain according to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). The FIRM shows the 100-year floodplain elevation is 836 feet. All equipment installed as part of the Project would be supported on concrete columns at an elevation of 839 feet, 3 feet above the 100-year flood elevation. The Project is entirely on the shore side and downstream of existing switchyard equipment and fencing. The support columns for the battery containers will not cause any significant obstruction of the flood flow or changes in the flow patterns. Removing 800 square feet from the flood fringe will have a negligible effect on the flood storage volume. Additionally, the Project will not disturb an undeveloped area and makes use of a site already in service for large-scale electricity generation. Therefore, DOE concludes that no alternatives analysis is required.

The Town of Union Planning Board has approved a Special Permit for the project to develop in the floodplain. The Town permit meets the minimum standards under the National Flood Insurance Program under Local Law No. 8 (Flood Damage Prevention). Based on the floodplain assessment, which is incorporated here by reference, and approved Special Permit, DOE concludes that the Project would not cause any measurable rise to the Susquehanna River flood stages or flow velocities, nor cause any adverse effects to human health or property.

# **U.S. Department of Energy**

## **Loan Programs Office**

### **Floodplain Assessment for AES Energy Storage, LLC, Project Dyno Electric Grid Stability Advanced Battery Systems in Johnson City, New York**



**June 2010**

**Floodplain Assessment and Statement of Findings for AES Energy Storage, LLC Project  
Dyno Electric Grid Stability Advanced Battery Systems in Johnson City, New York**

**CONTENTS**

- 1.0 Introduction
- 2.0 Project Background
- 3.0 Floodplain Background
- 4.0 Location and Existing Conditions
- 5.0 Description of Work
- 6.0 Floodplain Effects
- 7.0 Alternatives
- 8.0 Conclusions

**FIGURES**

- Figure 1 Region Map with Flood Zone Overlay
- Figure 2 Site Layout

## **1.0 Introduction**

In accordance with U.S. Department of Energy (DOE) regulations contained at 10 CFR 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, DOE has established procedures to ensure that the potential impacts of any action it may take in a floodplain is evaluated. This policy was developed in response to Executive Order 11988-Floodplain Management (May 24, 1977). This executive order requires federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains.

## **2.0 Project Background**

Project Dyno is a 20MW energy storage system to be located in the Village of Union Town and Johnson City, New York, that would provide ancillary services within the New York power market. The project is composed of advanced lithium ion battery cells and power control technologies to store power to help maintain the stability of the electric power grid. Project Dyno would be composed of ten fifty-three foot metal containers each housing bidirectional inverters and DC subsystems capable of 2MW of capacity. These units are connected through isolation transformers, switchgear, and step-up transformers to the high voltage system. The project would be able to charge or discharge at up to 20MW in each instant up to a maximum of 5MW/h of energy in or out of the system.

## **3.0 Floodplain Background**

Floodplains are generally divided into two areas with different characteristics, the “flood fringe” and “flood way.” The flood fringe consists of the over-bank areas where water is stored during a flood event but is not flowing downstream with significant conveyance velocity. The flood way is the center of the flooded river section where water is flowing downstream and being conveyed with significant flow velocity.

Based on Federal and State of New York Floodplain Development and Flood Way Guidance, the following issues are of concern when building in the floodplain:

1. Within the flood way the primary concerns are blocking the flow of the flood water which may cause water upstream to raise and changing flow patterns causing erosion downstream.
2. Within the flood fringe the primary concern is removing flood water volume storage by filling which increases the needed storage upstream to prevent upstream elevations from rising.

#### **4.0 Location and Existing Conditions**

Project Dyno is located at the site of an operating coal-fired power generating station in the Village of Union Town and Johnson City, New York, immediately adjacent to an existing electrical substation. This site is owned and controlled by a separate subsidiary of the AES Corporation and will be leased to Project Dyno. The site will require modifications to install the concrete column foundations to support the energy storage units.

The Susquehanna River floodplain is approximately 1,100 feet wide both up and down stream of the plant. Several hundred feet upstream of the project there is a railroad crossing elevated on earth fill-over land and on a bridge over the normal river width. The earth fill constricts the horizontal upstream flow of the river to approximately 800 feet. Downstream there is a ridge and flood control dike that juts out into the floodplain approximately 200 feet further than the proposed project area. The extent of the flood fringe and the boundary between the flood fringe and flood way is generally controlled by horizontal restrictions such as the dike and the earth fill.

#### **5.0 Description of work**

The project area is approximately 0.57 acres (25,200 square feet) and the total area taken up by above-grade, concrete column foundations is about 800 square feet. The project would be constructed within the 100-year floodplain based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Map Panel (see Figure 1). The proposed location of the equipment is at the parking lot located in the upper center of Figure 2. The NW corner of the site would contain standard 4 MW modules consisting of two batteries and inverters, and a common isolation transformer and chiller. There are five modules that would make up the 20 MW installed capacity. The cables between the batteries and isolation transformer and output switchgear would be routed underground.

The 100-year floodplain elevation is 836 feet as noted on the FEMA Map Panel. All equipment installed as part of this project would be supported on concrete columns at an elevation of 839 feet, which is above the 100-year flood elevation. No fill/earth material would be added in the subject area that would reduce the flood storage capacity in the over-bank storage area. Proposed surfacing would be identical to the current conditions.

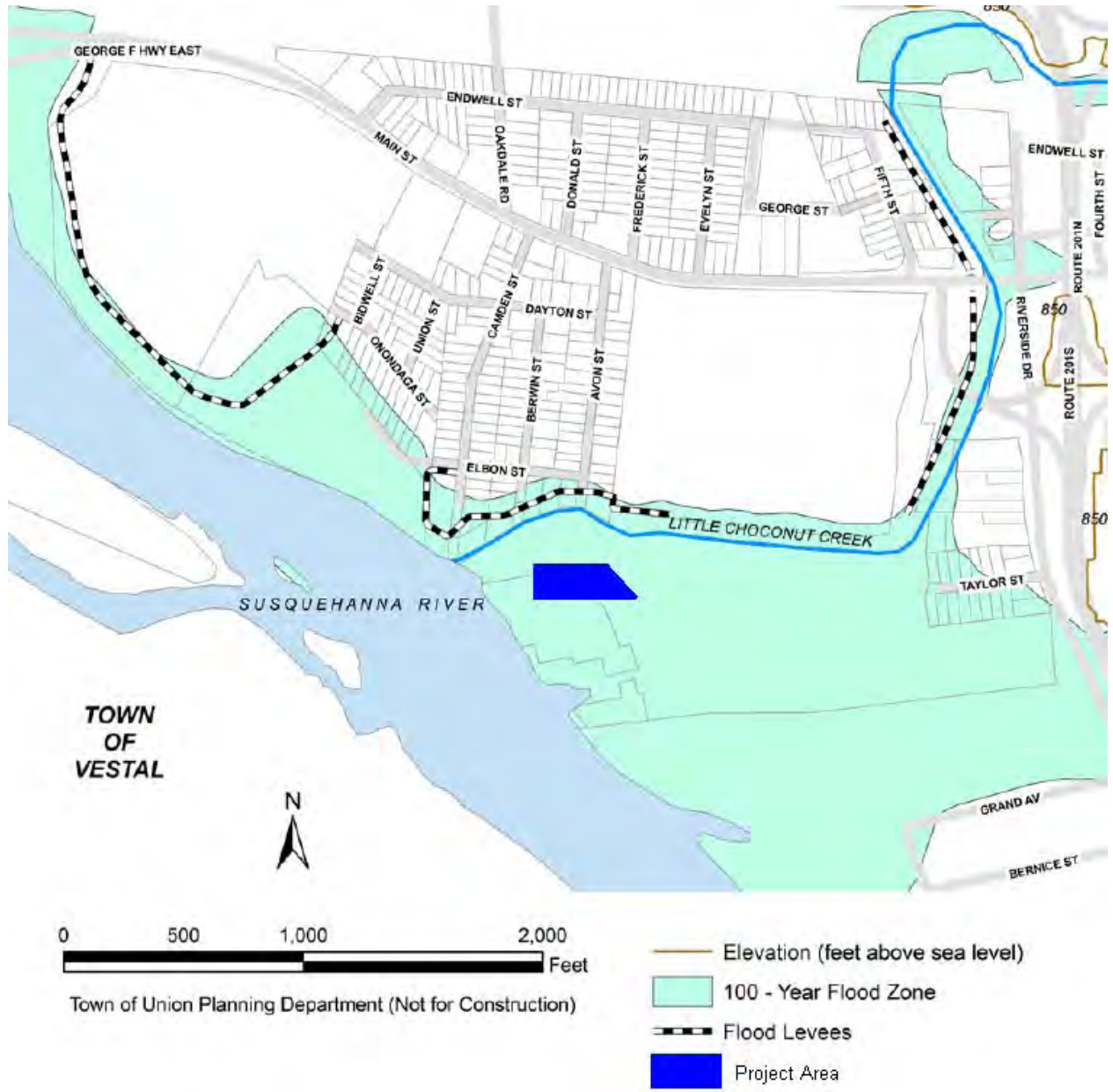


Figure 1: Region Map with Flood Zone Overlay

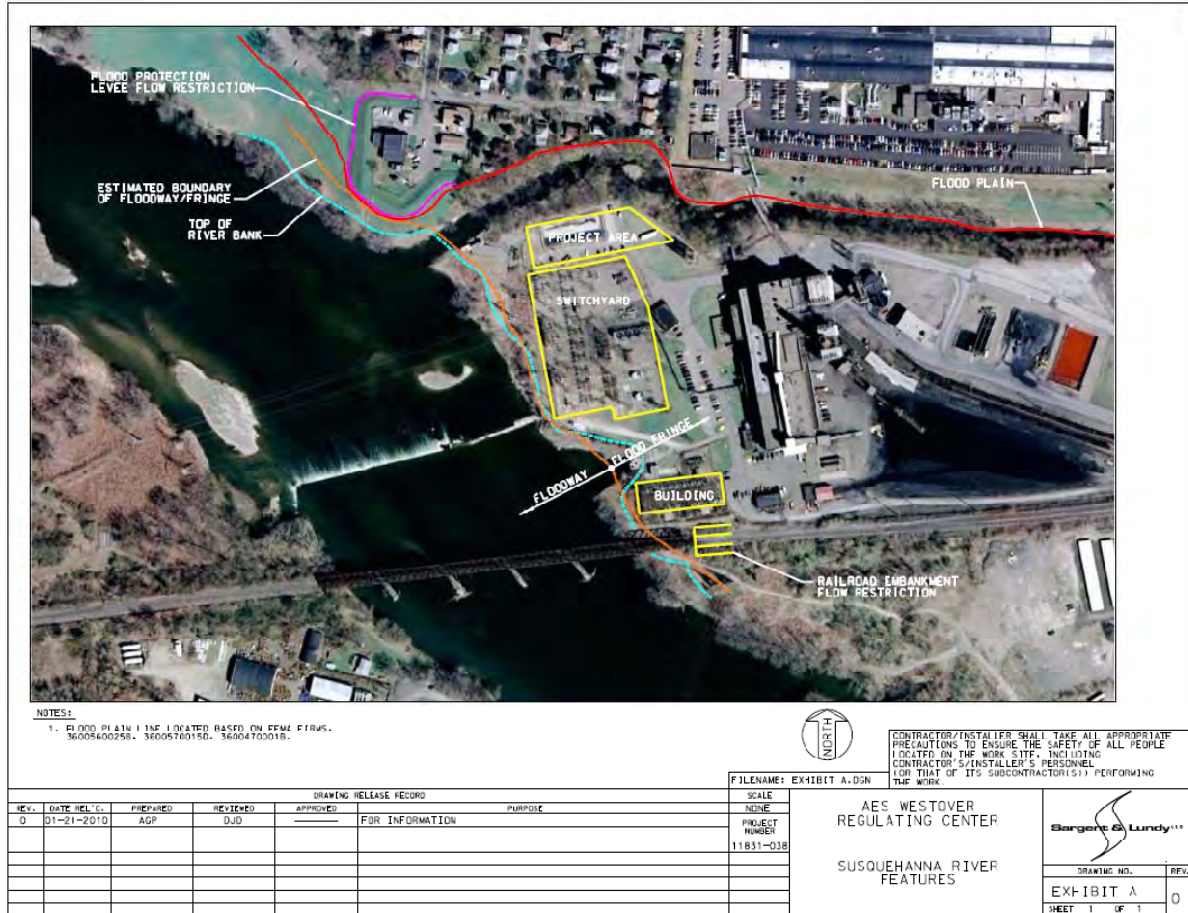


Figure 2: Site location and layout

6.0 Floodplain Effects

Figure 1 identifies the project location, railroad embankment, flood control levee, switchyard, flood elevation limit, power plant, and estimated boundary between the flood fringe and flood way. The boundary between the flood fringe and flood way is approximated based on site physical features and structures, topography along the river bank, local obstructions, and flow restrictions along the river. At the proposed plant location, the floodplain is approximately 1,100 feet wide both up and down stream of the plant. The railroad earth fill several hundred feet upstream of the plant constricts the horizontal upstream flow of the river to approximately 800 feet. As seen in Figure 1, the downstream flood control ridge/levee juts out into the floodplain approximately 200 feet further than the proposed project area. The boundary between the flood fringe and flood way is generally controlled by such horizontal restrictions.

The project is between the east bank railroad fill upstream and the downstream ridge/flood control levee and is entirely on the shore side of the flood fringe. As a result, no construction activities will take place in the flood way. No water conveyance obstructions will result from the project because it is in the flood fringe and will not pose any additional physical obstruction to

the flood way. The project is entirely on the shore side and downstream of existing switchyard equipment, fencing, and support columns for the battery containers and will not cause any additional obstruction of the flood flow or cause changes in the flow patterns. Removing 800 square feet from the flood fringe from elevation 835 feet to 839 feet will have a negligible effect on the flood storage volume.

Supporting this conclusion, on March 9, 2010, the Town of Union Planning Board approved a Special Permit to develop in the floodplain. The Town permit meets the minimum standards under the National Flood Insurance Program under Local Law No. 8 (Flood Damage Prevention).

## **7.0 Alternatives**

The project as posed would not result in adverse floodplain impacts because of its location in the flood fringe and the raising of the storage system. Additionally, the project will not disturb an undeveloped area and makes use of a site already in service for large-scale electricity services. Therefore, DOE concludes that no alternatives analysis is required.

## **8.0 Conclusions**

Based on the above summary of floodplain features, and existing and expected conditions resulting from Project Dyno, the DOE concludes that the project would not cause any measurable rise to the Susquehanna River flood stages or flow velocities, nor any adverse effects to human health or property.