

Heritage Wind Project Preliminary Inadvertent Return Plan

Heritage Wind, LLC

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Introduction

This Preliminary Inadvertent Return Contingency Plan (“Plan”) describes the procedures that Heritage Wind, LLC and its contractor will implement to avoid, minimize, and remediate potential environmental impacts that could result from an inadvertent return of drilling fluids or “frac-out” during horizontal directional drilling (HDD) operations associated with the proposed Heritage Wind Project.

Contact Information

| Entity | Contact Information |
|---|--|
| Heritage Wind LLC. Lead (Facility Manager): TBD | |
| NYSDEC Region 8 6274 East Avon-Lima Road Avon, NY 14414-9516 | NYS Spill Hotline: 1-800-457-7362 Region 8 Office: (585) 226-2426 |
| USACE, Buffalo District 1776 Niagara Street Buffalo, NY 14207 | 1-800-833-6390 |
| NYS Public Service Commission Empire State Plaza Agency Building 3 Albany, NY 12223-1350 | Public Affairs Office: (518) 474-7080 |

Purpose of the Plan

The purpose of the Plan is to:

1. Minimize the potential for a frac-out associated with HDD activities;
2. Provide for the timely detection of frac-outs;
3. Protect areas that are considered environmentally sensitive;
4. Ensure an organized, timely, and “minimum-impact” response in the event a frac-out and release of drilling mud occurs in or threatens an environmentally sensitive area;
5. Ensure that frac-outs, including spills/releases, are reported to the New York State Department of Environmental Conservation (NYSDEC) and the National Response Center (NRC), as necessary, and that documentation is completed; and
6. Provide clear direction as to how and where HDD drilling fluid and cuttings are to be disposed

This preliminary Plan serves as a basis to provide minimum requirements for a site-specific plan to be developed by the HDD contractor once that contractor has been selected. Copies of the final site-specific plan will be provided to interested state and federal regulatory agencies prior to commencement of HDD operations.

Project Description

The Heritage Wind Project, located in the Town of Barre, Orleans County, New York, proposes to install and operate up to 33 wind turbines for a total capacity of 200 MW. The project setting is approximately 5,500 acres of rural land in the Town of Barre. The Facility also includes approximately 35 miles of associated 34.5 kilovolt (kV) collection lines (below grade), 11 miles of access roads, permanent meteorological tower(s), one operation and maintenance (O&M) building, and temporary construction staging and laydown areas. To deliver electricity to the New York State power grid, the Applicant proposes to construct a collection substation which will “step-up” power to 115 kV line and the point of interconnection (POI) substation will interconnect with National Grid’s existing Lockport-Mortimer 115 kV transmission line.

Note: Before any drilling operations begin, all applicable erosion and sedimentation controls included in the Stormwater Pollution Prevention Plan (SWPPP) will be properly installed per the included drawings and specifications and inspected by the Environmental Inspector. The SWPPP, state and federal permit(s), landowner restriction list, and any other applicable documents must be carefully reviewed before any disturbance occurs. Please note that no increase in downstream turbidity or sedimentation is permitted, and that any water accumulated in the isolated work area is to be managed in such a manner that prevents a visible contrast in any streams below the work area.

Horizontal directional drilling is a pipeline/conduit installation method typically used to avoid disturbance of sensitive surface features, including water bodies and wetlands. There is, however, the potential for surface disturbance through an inadvertent drilling fluid release. Drilling fluid releases are typically caused by pressurization of the drill hole beyond the containment capability of the overburden soil material, which allows the drilling fluid to flow to the ground surface. Releases can also be caused by fractures in bedrock or other voids in the geologic strata that allow the fluid to surface even if down hole pressures are low.

The HDD process uses drilling fluid to remove the cuttings from the borehole, stabilize the borehole, and act as a coolant and lubricant during the drilling process. The fluid consists primarily of water and bentonite, naturally occurring clay, active clays, inert solids and water. Drilling fluid is not a hazardous material as it is composed of benign components; however, an inadvertent release will require mitigation measures to reduce the potential for impact to a water body or sensitive area.

Horizontal Directional Drilling Design

Trenching will be the primary method for installing the subsurface electrical transmission lines on the Facility Site. However, in certain environmentally sensitive areas, including streams or wetland crossings that cannot be avoided or further minimized, HDD may be utilized to avoid impact to surface water resource.

Preliminary bore plans and profiles have been developed for the HDDs based on upland contour mapping and desktop geotechnical assessment. A final inadvertent return will be prepared by Apex and/or its BOP contractor upon completion of final engineering and geotechnical analysis, prior the commencement of HDD installation.

Potential Receptors

Based on the preliminary design for the Heritage Wind Project, the Project includes several road crossings at upland (i.e. terrestrial) locations, and multiple potential crossings of State-regulated water resources¹. These are listed below.

Terrestrial/Road Crossings:

1. Eagle Harbor Rd
2. Gillette Road
3. Root Road
4. County Route 99 (West Barre Road)
5. State Route 98
6. Oak Orchard Road
7. Cushing Road
8. Puzzey Road
9. Delano Steele Road
10. Culver Road
11. East Barre Road
12. Mathes Road
13. State Route 21A (East Lee Road)

Water Resources and Sensitive Habitat:

1. Wetland AL-3
2. Wetland AL-12
3. Tributaries to Oak Orchard Creek, NYSDEC Class C Streams

Drilling Fluids

HDD operations will use drilling fluids to stabilize the bore hole, lubricate and cool the drilling process and flush drill cuttings from the bore hole. Drilling fluids would be used that are biocompatible with freshwater. The fluid will be a site-specific mixture of water, bentonite clay, and additives. The detailed HDD design plan will include the specifications for the chosen drilling fluids. Material Safety Data Sheets for fluid additives will be provided in the final site-specific plan. During HDD operations, an inadvertent return of drilling fluids may occur when the drilling fluids follow a path of least resistance through the overburden to the surface (land or water). Some minimal losses of drilling fluids can be expected within the subsurface materials voids or sediments; typically, these losses do not reach the surface. However, the bentonite mixture has a higher density than water which may pose a risk to benthic invertebrates, plants, and fish if it is discharged into areas that support these species. Despite the potential impacts of inadvertent return, the HDD construction method is much less intrusive than the traditional open-cut methods where water resources and potential habitat sustain direct disturbance.

¹ Precise locations and extents of trenchless technology crossings (i.e. HDD or jack and bore) are shown on the Preliminary Design Drawings.

Monitoring

Drilling activities will be monitored throughout the HDD operation to determine if an inadvertent release is occurring. Monitoring fluid volumes (circulation), fluid pressure, penetration rates, and fluid viscosity will help minimize the potential for a release and identify releases. Specific monitoring protocols based on the HDD design and procedures will be identified in the final site-specific plan.

Visual monitoring will occur at set distance intervals along the drilling path. A log will be kept which will include the inspector, time of monitoring event, and observations. The visual monitoring frequency will be increased if a significant loss of fluids is suspected.

Drilling activities will be monitored as appropriate by a qualified monitor and/or designee.

Notification Procedures

The intent of the notification procedure is to notify the appropriate agencies when a release occurs according to the regulatory requirements. Specific-agency personnel, contact information and timeframes will be provided in the final site-specific plan. Agencies to be notified may include but are not limited to:

1. New York State Department of Environmental Conservation (NYSDEC)
2. New York State Department of Public Service (NYS DPS)
3. United States Army Corps of Engineers, Buffalo District

Containment and Remediation

The contractor will address an inadvertent return immediately upon discovery. In the event of an inadvertent return, measures will be implemented to control, contain and clean up the release of drilling fluid and the affected area. Site-specific measures will be refined by Heritage Wind's HDD contractor as the HDD design is completed and included in the final site-specific plan.

If a frac-out is identified, all work will stop at the particular receptor, including the recycling of drilling mud/lubricant. Once work is stopped, the location and extent of the frac-out will be determined and the HDD contractor will be notified as well as the appropriate Heritage Wind representative. The HDD contractor will notify NYSDEC Region 8, as needed.

Containment can be achieved by sealing the leak point using loss control materials (LCMs). The use of LCMs is an industry standard for HDD projects to control the flow of fluids that inadvertently escape from the drill bore. LCMs are generally environmentally benign materials that slow or stop the release of fluid from the unintended opening of the HDD bore. Only environmentally friendly LCMs will be used for this project. The HDD contractor can provide safety data sheets (SDS) for LCMs prior to the start of drilling.

Generally, when an inadvertent return is identified, the HDD contractor will follow these minimum guidelines in preparing for corrective response actions:

1. Reduce or suspend drilling activities to determine the extent of release and implement corrective action;
2. Attempt to seal off the release to the surface from the borehole using approved LCMs;
3. Pull back the drill string allowing the fluids in the fracture to solidify
4. Determine the cause of the release and implement measures to minimize reoccurrence;

5. Containment equipment and personnel will be onsite during HDD operations; and
6. Depending on the amount of fluid released on land the area may be swept, shoveled, or mixed with sand and temporarily left in place to dry prior to proper disposal of the material. Appropriate erosion and sediment control measures will be used as needed to prevent drilling fluid from entering the lake or other resource.

Specific remediation steps will be determined based on the location of the inadvertent return.

If the inadvertent return is terrestrial:

1. Surround the area with straw bales, sandbags, or sediment fencing to contain the drilling mud/lubricant.
2. If the release is large enough to permit collection, drilling fluid will be collected and disposed of per the HDD Fluid/Cutting Disposal procedures mentioned in this document.
3. If the release is not large enough for collection, the drilling fluid will be diluted with fresh water and restored as necessary.
4. All disturbed areas associated with the project will be stabilized and restored per specifications outlined in the project SWPPP.

If the inadvertent return is in a water resource:

1. Monitor the inadvertent return for 4 hours to determine if the drilling mud congeals. Bentonite will usually harden, effectively sealing the frac-out location.
 - a. If the mud congeals, take no further action that would potentially suspend sediments in the water column.
 - b. If the mud does not congeal, the drilling fluid will be contained and removed by pumping, vacuuming, or by hand and disposed of per the HDD Fluid/Cutting Disposal procedures mentioned in this document.
 - c. If the fracture increases in size, a spill response team would be called in to contain and clean up the excess drilling fluid in the water. The spill response team contact information is mentioned in the Contact Information table above.
2. The Heritage Wind HDD contractor will consult with NYSDEC Region 8 and the Heritage Wind Facility Manager as necessary. Heritage Wind will also assess whether the frac-out must be reported to the NYSDEC Spill Hotline or other state or federal agencies. A written report summarizing the location of surface returns, estimated quantity of fluid, and summary of clean-up efforts shall be submitted to the NYSDEC Region 8 office in Avon, NY, at the postal address listed in the Contact Information table above.

Drilling Operation Controls/Adjustments

If an inadvertent return occurs, Heritage Wind LLC may order for drilling operations to reduce or cease to assess the extent of the release and to implement corrective actions. Once assessed, drilling may resume. If public health and safety are threatened, drilling fluid circulation pumps will be turned off. This measure will be taken as a last resort due to the potential for drill hole collapse resulting from loss of down-hole pressure.

After a drilling fluid seepage is contained, the Heritage HDD contractor will make every effort to determine the cause of the seepage. Once the cause has been determined, measures will be implemented to control the factors causing the seepage and minimize the chance of reoccurrence. Adjustments to the drilling technique or composition of the drilling fluid may be changed in order to minimize or prevent further releases. These are determined by the contractor, inspector, and drill operator and may include:

1. Thickening of drill fluid by increasing the bentonite content
2. Changing the drill rate
3. Changing the fluid pumping rate
4. Attempting a deeper direction drill.

Corrective measures will be developed by the contractor and Heritage Wind LLC and will be site and problem specific. In some cases, the corrective measure may involve a determination that the existing hole encountered a void, which may be bypassed with a slight change in the profile. Other cases may conclude that the existing hole encountered a zone of unsatisfactory soil material and that the hole may have to be abandoned. If a hole is abandoned, it will be filled with cuttings and drilling fluid.

Equipment on Site

The items listed below are recommended to contain and mitigate for inadvertent returns. It is further recommended that these materials be kept on-site or in close proximity to be easily accessed in the event of an inadvertent return. Additionally, for all projects, the Material Safety Data Sheet for the fluid being used must be on site at all times.

- Track excavators
- Leak free portable pumps
- Sandbags
- Plastic sheeting
- Filter sock/silt fence
- Stakes/lumber
- 55-gallon drums (modified for containment structures)
- Hay bales
- Spill kits
- Leak free hoses
- Hand tool

The heavy equipment provided by the drilling contractor (track excavators, pumps, etc.) shall be sufficient quality and quantity to handle any returns associated with the project.

HDD Fluid/Cutting Disposal

All residual directional drilling fluids and materials must be recycled or disposed of at an approved disposal facility according to regulatory requirements. Recovered materials may be collected in containers for temporary storage prior to removal from the site. The disposal facilities will be identified in the final site-specific plan.

A composite sample of the drilling fluids will be collected for analytical testing and completion of the Form U composite. Once the drilling fluids have passed the analytical testing and the Form U has been approved, drilling fluid will be disposed of at an approved disposal facility. Uncontaminated drill cuttings and drilling muds from drilling processes which utilize only air, water, or water-based drilling fluids are considered to be construction and demolition debris under 6 NYCRR Part 360 (Solid Waste) and can be disposed of at either construction and demolition (C&D) debris landfills or at municipal solid waste (MSW) landfills. Drill cuttings from drilling processes which utilize and oil-based mud or polymer-based mud containing mineral oil lubricant are considered contaminated and can only be disposed of at MSW landfills. Dewatered drilling muds including any oil-based mud or polymer-based mud containing mineral oil lubricant can only be disposed of at MSW landfills. If drilling fluid is found to be impacted/contaminated, the contractor will defer to Heritage Wind, LLC for disposal instructions.