Bluestone Wind Project
Inadvertent Return Plan

Bluestone Wind, LLC
2021

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Preliminary Inadvertent Return Plan

Introduction

This Preliminary Inadvertent Return Plan ("Plan") addresses the potential inadvertent return or "frac-out" of drilling lubricant (bentonite) during horizontal directional drilling (HDD) activities proposed for the Bluestone Wind Project, Broome County, New York.

Contact Information

Entity	Contact Information
Bluestone Wind, LLC (Lead)	Jim Mulvale 416-662-1437 jim.mulvale@northlandpower.com
U.S. Army Corps of Engineers, Buffalo District Office	Mr. Harold Keppner 716-879-4120 harold.t.keppner@usace.army.mil
New York State Department of Environmental Conservation, Region 7 (Permits)	1285 Fischer Avenue Cortland, NY 13045 607-753-3095
New York State Department of Environmental Conservation (Spills)	NYS Spill Hotline: 1-800-457-7362

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.

Description

The HDD process generally includes three distinct phases beginning with the drilling of the pilot hole from the entrance to exit location. The second phase entails reaming of the pilot hole to a diameter sufficiently large to accept the collection line conduit. Finally, the conduit is pulled into place within the enlarged hole. Normally this process is conducted continuously 24 hours a day, from start to finish, because the risk of HDD problems increases dramatically if the work is interrupted. The greatest risks are compromised hole integrity,

inadvertent returns, and the conduit becoming lodged during pull back. To minimize these risks and be prepared to handle them should they occur, the contractor will work 24 hours a day using two (2) shifts with each shift working 12 hours per day. This gives the contractor the greatest chance of maintaining the integrity of the hole and successfully pulling the conduit into place while minimizing the risks of inadvertent returns.

The HDD procedure uses a drilling fluid to remove the cuttings from the borehole, stabilize the borehole, and act as a coolant and lubricant during the drilling process. Bentonite slurry, a fine clay material, is the lubricant normally used. Although bentonite is non-toxic and commonly used in farming practices, it is denser than water and tends to collect at the bottom of creeks and waterways, thus posing a risk to benthic invertebrates, aquatic plants, and fish and their eggs if discharged to waterways that support these aquatic species. As a result, frac-out or inadvertent return of drilling lubricant, is a potential concern where HDD is used for constructing pipelines in the vicinity of water resources and/or sensitive habitats. However, even when the potential impacts of inadvertent return are factored in, the HDD construction method is much less intrusive than the traditional open-cut trench method where water resources and potential habitats sustain direct soil disturbance.

Inadvertent returns primarily occur within approximately 150 feet of the entrance and exit points of the HDD segment, where the drilling equipment is at depths of less than 20 feet. The likelihood of inadvertent return decreases as the depth of the pipe increases.

Potential Receptors

Based on the preliminary design for the Bluestone Wind Project, the Project includes several road crossings at upland (i.e., terrestrial) locations, and sixteen crossings of waters of the United States (WOTUS).[1] These are listed below:

Terrestrial/Road Crossings

1. Loomis Hill Road
2. Shaver Hill Road
3. Miller Road
4. Bryce Road
5. Pazzelli Road (two locations)
6. Willam Law Road (three locations)
7. Rector Road

Pipeline Crossings

1. Bluestone Pipeline (two locations)

[1]Locations and extents of trenchless technology crossings (i.e., HDD or jack and bore) of sensitive resources are shown in the Wetland Impact Drawings (Figure 2). Several of the crossings include multiple resources.

Water Resources and Sensitive Habitats

1. Fly Creek (i.e., Stream JJ), a NYSDEC Class B(t) stream
2. Oquaga Creek (i.e., Stream M), a NYSDEC Class C stream
3. Marsh Creek (i.e., Stream 4E), a NYSDEC Class C(t) stream
4. Marsh Creek tributaries (i.e., Streams CCC, OOO, and PPP)
5. Tarbell Brook (i.e., Stream EE), a NYSDEC Class C(t) stream
6. Stream II
7. Stream LLL
8. Stream MMM
9. Wetland CCC
10. Wetland GG
11. Wetland HH
12. Wetland J
13. Wetland JJ
14. Wetland JJJ
15. Wetland KK
16. Wetland LL
17. Wetland MM
18. Wetland M
19. Wetland N
20. Wetland Z
21. Wetland 4A
22. Wetland 4E
23. Wetland 4J

Monitoring and Inadvertent Return Minimization Measures

Prior to the initiation of HDD activities, sensitive habitats and waterways will be protected by implementing the following measures:

- A pedestrian survey will be conducted of the drilling entry and exit areas, surrounding work areas, and the drilling route (to the extent that it is accessible) to ensure that there are no sensitive biological resources present on the surface;
- As appropriate, the construction limit will be clearly marked, and the drilling entry and exit areas, including the access and egress to these areas, will be clearly marked with the goal of protecting environmentally sensitive areas, such as habitats and waterways;
- Barriers (straw bales or sediment fences, etc.) specified in the Project Stormwater Pollution Prevention Plan (SWPPP) will be erected to prevent material associated with a potential inadvertent return from moving off-site;
- As part of the environmental awareness training required for all construction workers, information will be provided to identify and locate sensitive resources at the Site;
- All field personnel will be instructed on their responsibility to report frac-outs immediately to the

construction manager and appropriate Bluestone-affiliated worker;
- Necessary response equipment will be maintained on-site or at a readily accessible location in good working order;
- Fill will not be placed in water resources, waterway or drainage swales unless proper permits (i.e., Clean Water Act Section 401 and/or 404, NYSDEC Article 15 and/or 24) have been obtained from the appropriate federal and/or State agencies. (Note: All drainages that have been identified on the project plans as being crossed with an auger bore or HDD have not been permitted for the placement of fill material below the ordinary high-water mark); and
- Drilling activities will be monitored as appropriate by a qualified monitor and/or designee ("Environmental Monitor").

The drill contractor will monitor pressure readings during drilling and immediately advise the Environmental Monitor and/or designee if pressure readings fall and the potential for occurrence of a frac-out increases. The Environmental Monitor assigned to the Project will coordinate with the drilling contractor to monitor the HDD and look for observable frac-out conditions or lowered pressure readings on the drilling equipment.

Site-specific Measures to Prevent Inadvertent Returns

Geo-technical data – Geotechnical borings will be drilled near the conduit alignment to determine the soil types and depth the conduit should be placed. These borings will be located off the conduit alignment to prevent drilling mud from escaping through the borings. The borings will be filled with cement grout when complete.

Guidance system monitoring – As part of the HDD method, a guidance system will be required to monitor the location of the drill head beneath the soil and water surface. The guidance system requires that coils of wire (the size of a home extension cord) be placed on the soil surface/or waterway bottom in an exact alignment on either side of the pipeline drill hole. The exact alignment will be surveyed by a team of 2-3 people. Small amounts of vegetation (i.e., tree branches and vines) may be disturbed and/or removed within a 2 to 3-foot swath during the survey process to obtain a line of sight for the surveyors. The Environmental Monitor and/or designee will walk in front of the survey team to assess the potential for active nests or other wildlife usage. Surveyor stakes will be placed strategically along the alignment to anchor the wires. This surveyor path will also be accessed throughout the drilling operation to monitor the alignment for frac-outs. No trees greater than three inches in diameter will be removed in connection with these activities.

Pressure monitoring – Throughout the HDD process, the drill operator will continuously monitor the pressure of the drilling fluid and the return of the fluid. This will allow the operator to determine whether fluid is being lost to the surrounding soils. If pressure decreases, the Environmental Monitor and/or designee will inspect the alignment for drilling mud exiting to the soil surface. If a drilling mud is found, the Environmental Monitor will notify the drill operator, who will then implement the Contingency Response Plan (described below). Once the drilling mud is contained, the drilling may resume.

Altering drilling methods – During the period when the HDD is passing under water resources and/or sensitive habitats, the operator may alter its drilling method based on the conditions encountered. The alteration may include a method referred to as "sizing," whereby the drill bit is moved slowly forward and back to better keep track of any potential fracture location.

Contingency Response Plan

The drilling contractor will be directed to implement the following measures if an inadvertent return or frac-out occurs during HDD:

Once a Frac-out is Identified:

- Stop all work, including the recycling of drilling mud/lubricant. The pressure of water above the pipe keeps excess mud from escaping through the fracture.
- Determine the location and extent of the frac-out.
- Immediately notify the construction supervisor and the appropriate Bluestone Wind representative.
- The Bluestone Wind representative will contact the applicable agency and landowner representatives.

If the Frac-out is in an Upland Area:

- It is anticipated that the following response procedures will generally be followed. However, these may be modified, as appropriate, based on consultation with applicable agency representatives and/or the property owner.
    - Surround the area with straw bales, sandbags, or sediment fencing to contain the drilling mud.
    - If the amount of drilling fluids released allows for collection, use a mobile vacuum truck to pump the drilling mud from the contained area and recycle it.
    - If the amount of drilling fluids released is not enough to allow practical collection, dilute the affected area with freshwater and allow it to dry and dissipate naturally.
    - If the amount of surface return exceeds that which can be collected using small pumps, suspend drilling operations until surface volumes can be brought under control.

Once a response is implemented, the area will be returned to pre-existing conditions, in coordination with the landowner.

If Frac-out is in a Wetland or Water Body:

- Bluestone Wind representatives will immediately notify the USACE contact identified in in the introduction of this document. This immediate notification will include the following information: the time and location of the occurrence, the type of material and the estimated volume released, the corrective measures being implemented and an estimated timeline for which corrective actions will be required to address the release. Bluestone Wind representatives will also consult with NYSDEC and NYSDPS staff and/or the property owner, as appropriate.

- Within 24 hours the following information will be provided to the USACE: a USGS location map depicting the inadvertent return location, a description of the regulated water of the U.S. (type, quality, extent of watershed potentially affected), a characterization of the extent of the resource directly affected, report corrective actions already taken, photographs of the affected area, and an identification of any known USACE or other authorizations needed to perform corrective actions.
- Within 48 hours, a monitoring report summarizing the location of surface returns, estimated quantity of fluids, and a summary of cleanup efforts, as applicable, will be submitted to NYSDEC and NYSDPC.
- Drilling operations must be suspended if the surface returns pose a threat to the resource or to public health and safety. Assess whether the frac-out must be reported to the NYSDEC Spill Hotline or other State or federal agencies.
- Monitor frac-out for 4 hours to determine if the drilling mud congeals. Bentonite will usually harden, effectively sealing the frac-out location.
    - If drilling mud congeals, take no other action that would potentially suspend sediments in the water column.
    - If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain).
    - If the fracture becomes excessively large,[2] a spill response team would be called in to contain and clean up excess drilling mud in the water. Phone numbers of spill response teams in the area will be on site.
    - Removal of released fluids from environmentally sensitive areas will take place only if the removal does not cause additional adverse impacts to the resource. Prior to the removal of fluids from environmentally sensitive areas, NYSDPS and NYSDEC staff will be notified and consulted.

After the frac-out is stabilized and any required removal is completed, the drilling contractor will make every effort to determine the cause of the frac-out and will implement any modifications needed to minimize or prevent further releases. The drilling contractor will document post-cleanup conditions with photographs and prepare a frac-out incident report describing time, place, actions taken to remediate frac-out and measures implemented to prevent recurrence. Incident reports will be provided to the NYSDEC and any appropriate agencies as part of project compliance not more than 30 days after the incident.

On-Site Equipment

The following equipment be on-site during HDD to contain an inadvertent return. Also, for all HDD projects, the SDS for the fluid being used must be on-site.

[2] The HDD's proposed by the Applicant across the project site vary substantially in their scope. An "excessively large" inadvertent return (IR) is one that cannot be managed with the equipment, materials, and personnel deployed to a specific Horizontal Directional Drilling (HDD) operation. This definition is site dependent.
For example, an "excessively large" IR at a small HDD operation might be able to be easily handled by the equipment, materials, and personnel present at a larger HDD operation.

- Track excavators
- Leak free portable pumps
- Sandbags
- Plastic sheeting
- 55-gallon drums with bottoms cut out
- Straw bales
- Spill kits
- Leak-free hoses
- Vacuum truck (may not be on-site, but should be readily available if needed)
- Filter sock, sediment fencing, etc.

HDD Drilling Fluid/Cutting Disposal

All residual directional drill material must be disposed of at a properly certified facility or location in accordance with all applicable laws and regulations. A composite sample of the drilling fluids will be collected for analytical testing. If the drilling fluids pass the analytical testing, drilling fluid will be disposed of at an approved disposal facility. If drilling fluid is found to be impacted/contaminated, the contractor will defer to Bluestone Wind for disposal instructions. Uncontaminated drill cuttings and drilling muds from drilling processes which utilize only air, water, or water-based drilling fluids are considered 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 oil-based mud or polymer-based mud containing mineral oil lubricant are considered contaminated and can only be disposed of at MSW landfills that are permitted to accept such materials. Dewatered drilling mud containing oil-based mud or polymer-based mud containing mineral oil lubricant can only be disposed of at MSW landfills.