

Attachment E

Lake Street Gas Main Installation Project
Haverhill, MA
Notice of Intent

NATIONAL GRID'S BEST MANAGEMENT PRACTICES
IR CONTINGENCY PLAN

SUBJECT

Access, Maintenance and Construction
Best Management Practices

Reference

EP No. 3 - Natural Resource
Protection (Chapter 6)

BMP PICTURE

STRAW WATTLE – SHALLOW SLOPE ($\leq 4:1$)
(ALTERNATE STAKING)

ALTERNATE STAKING INSTALLATION NOTES:

1. ON SHALLOW SLOPES ($\leq 4:1$), STRAW WATTLE MAY BE SECURED WITH 18–24" HARDWOOD STAKES DRIVEN AGAINST THE SIDES OF THE WATTLE INSTEAD OF THROUGH. STAKES SHALL ALTERNATE SIDES, AND BE SPACED 3–4' MAX.
2. TWINE SHALL BE TIED FROM STAKE TO STAKE, CRISS-CROSSING THE STRAW WATTLE. TIE TWINE TO STAKES BELOW THE HEIGHT OF THE WATTLE.

* DETAIL AND PICTURE PROVIDED BY TENSAR NORTH AMERICAN GREEN
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SEC-5
STRAW WATTLE * (2 OF 2)

SUBJECT

Access, Maintenance and Construction
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Protection (Chapter 6)

BMP**Definition**

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

**NOTE:**

1. PICTURE DEPICTS STRAW MULCH APPLICATION (FROM MULCH SPREADER) ON STEEP SLOPE WITH AN IMPROVED DRAINAGE SWALE.
2. COORDINATE MULCH MATERIALS AND RATES WITH NATIONAL GRID ENVIRONMENTAL SCIENTIST.

* BMP INFORMATION FROM "NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL (AUGUST, 2005)." INFORMATION OBTAINED VIA WEBSITE: <http://www.dec.ny.gov/chemical/29086.html>
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SEC-9

MULCH MATERIALS, RATES AND
USES (FROM NY) *

SUBJECT

Access, Maintenance and Construction
Best Management Practices

Reference

EP No. 3 - Natural Resource
Protection (Chapter 6)

UPLAND ROW RESTORATION MIX – GENERALSpecies Composition Options:

- Andropogon gerardii; Niagra Big Bluestem
- Schizachyrium scoparium; Little Bluestem
- Elymus Canadensis; Canada Wild Rye
- Elymus virginicus; Virginia Wildrye
- Lolium multiflorum; Annual Ryegrass
- Sorghastrum nutans; Indiangrass
- Chamaecrista fasciculata; Partridge Pea
- Desmodium canadense; Showy Tick Trefoil
- Heliopsis helianthoides; Ox-Eye Sunflower
- Panicum virgatum; Switchgrass
- Rudbeckia hirta; Black Eyed Susan
- Poa palustris; Fowl Bluegrass
- Agrostis perennans; Upland Bentgrass
- Agrostis alba; Redtop
- Festuca rubra; Red Fescue
- Lotus corniculatus; Birds-Foot Trefoil
- Chrysanthemum leucanthem; Ox-Eye Daisy
- Aster novae-angliae; New England Aster

Example Seed Mixes:

1. Native Upland wildlife forage and Cover Meadow Mix – Ernst Conservation Seeds (ERNMX-123)
2. Eastern Ecotype Native Grass Mix– Ernst Conservation Seeds (ERNMX-177)
3. New England Native Warm Season Grass Mix – New England Wetland Plants, Inc.
4. New England Logging Road Mix – New England Wetland Plants, Inc.
5. Northeast Upland Wildflower/Restoration Erosion Mix – Southern Tier Consulting (STCMX-2)

UPLAND ROW RESTORATION MIX – DRY/ROCKY SITESSpecies Composition Options:

- Festuca rubra; Red Fescue
- Schizachyrium scoparium; Little Bluestem
- Elymus Canadensis; Canada Wild Rye
- Bouteloua gracilis; Blue Grama
- Lolium multiflorum; Annual Ryegrass
- Lolium perenne; Perennial Ryegrass
- Agrostis scabra; Rough Bentgrass
- Agrostis perennans; Upland Bentgrass
- Sorghastrum nutans; Indiangrass

Example Seed Mixes:

1. New England Erosion Control/ Restoration Mix for Dry Sites – New England Wetland Plants, Inc.
2. Ernst Conservation Seeds and similar companies can create a custom seed mix matching the composition above (with site specific additions if necessary).

SUBJECT

Access, Maintenance and Construction
Best Management Practices

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EP No. 3 - Natural Resource
Protection (Chapter 6)

WETLAND ROW RESTORATION MIXSpecies Composition Options:

- Agrostis stolonifera; Creeping Bentgrass
- Poa trivialis; Rough Bluegrass
- Alopecurus arundinaceus; Creeping Meadow Foxtail
- Lolium multiflorum; Annual Ryegrass
- Festuca rubra; Creeping Red Fescue
- Elymus virginicus; Virginia Wildrye
- Schizachyrium scoparium; Little Bluestem
- Andropogon gerardii; Niagra Big Bluestem
- Carex vulpinoidea; Fox sedge
- Panicum virgatum; Switchgrass
- Agrostis scabra; Rough Bentgrass
- Aster novae-angliae; New England Aster
- Eupatorium perfoliatum; Boneset
- Euthamia graminifolia; Grass Leaved Goldenrod
- Scirpus atrovirens; Green Bulrush
- Verbena hastata; Blue Vervain
- Juncus effusus; Soft Rush
- Scirpus cyperinus; Wool Grass
- Panicum clandestinum; Deertongue

Example Seed Mixes

1. New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites – New England Wetland Plants, Inc.
2. Northeast Wetland Grass Seed Mix – Southern Tier Consulting (STCMX-7)
3. Ernst Conservation Seeds and similar companies can create a custom seed mix matching the composition above (with site specific additions if necessary).

GERNERAL NOTES:

1. Seed mixes described herein are intended to cover a variety of typical new england landscapes. However, site specific seed mixes will need to be evaluated in coastal or mountainous regions.
2. Seed mixes described herein are intended for general ROW restoration. Site specific wetland seed mixes may be required by local, state and/or federal regulators for certain impacts to wetlands.
3. All seed mixes are to be approved by National Grid Environmental Scientist prior to construction and must conform with all project permits.
4. Seedbed preparation and maintenance as well as temporary erosion and sediment controls are crucial to the establishment of newly seeded areas. Coordinate with National Grid Environmental Scientist on seed bed preparation and maintenance as well as temporary erosion and sediment controls prior to construction.

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SEC-11

SEEDING OPTIONS -
WETLAND SEED MIX

SUBJECT

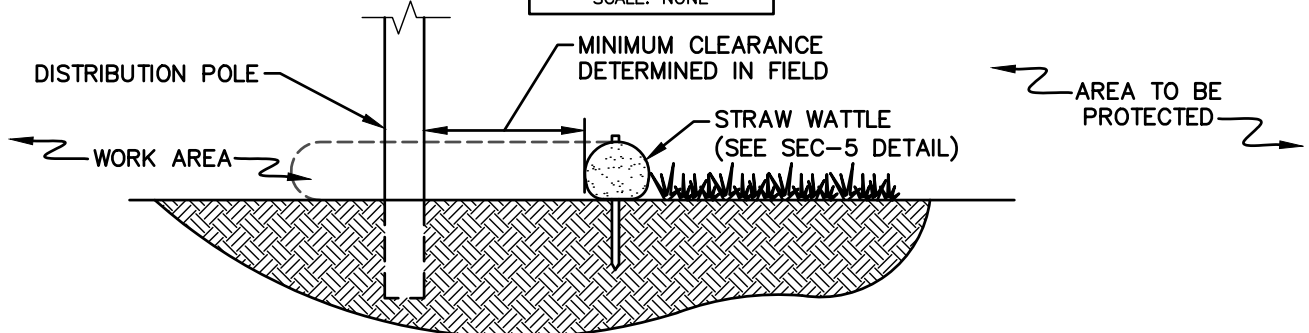
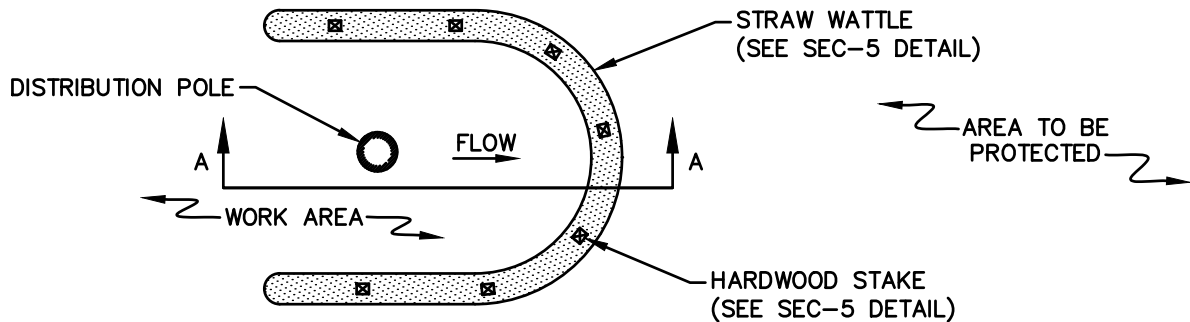
Access, Maintenance and Construction
Best Management Practices

Reference

EP No. 3 - Natural Resource
Protection (Chapter 6)

BMP DETAIL

SCALE: NONE

SECTION A-APLANNOTES

1. PRODUCT TO BE STRAW WATTLE OR APPROVED EQUAL BY NATIONAL GRID ENVIRONMENTAL SCIENTIST (SEE SEC-5 BMP DETAIL).
2. STRAW BALE BARRIER PER SEC-1 BMP DETAIL TO BE AN AVAILABLE ALTERNATE DEPENDING ON SITE CONDITIONS AT THE DIRECTION OF NATIONAL GRID ENVIRONMENTAL SCIENTIST (SEE FIGURE 2).
3. MINIMUM CLEARANCE BETWEEN POLE AND EROSION CONTROL TO BE DETERMINED BY CONDITIONS OF POLE INSTALLATION/REPLACEMENT WORK AND ASSOCIATED DISTURBANCE.

BMP PICTURE

FIGURE 1: TYP. STRAW WATTLE APPLICATION



FIGURE 2: ALT. STRAW BALE APPLICATION

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SEC-12
**DISTRIBUTION POLE
SEDIMENT CONTROL**

SUBJECT

Access, Maintenance and Construction
Best Management Practices

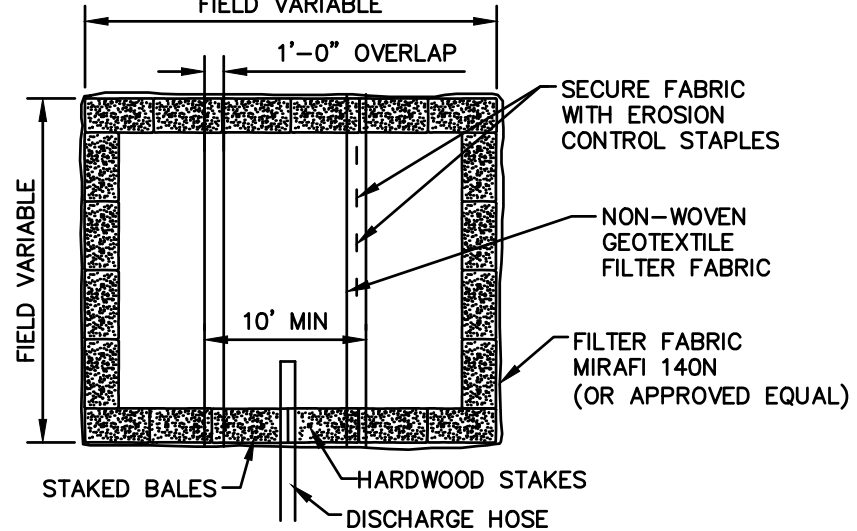
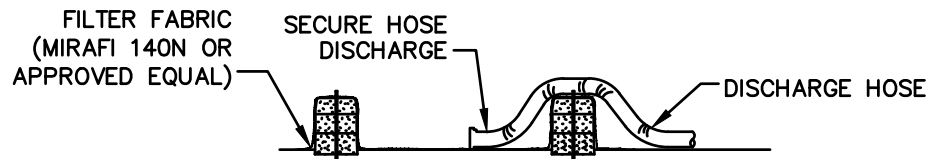
Reference

EP No. 3 - Natural Resource
Protection (Chapter 6)

BMP DETAIL

SCALE: NONE

FIELD VARIABLE

PLAN VIEWCROSS-SECTIONNOTES:

1. NUMBER OF BALES MAY VARY DEPENDING ON SITE CONDITIONS,
2. THE BASIN TO BE SIZED TO PREVENT DISCHARGE WATER FROM OVERTOPPING BASIN.
3. KEEP AS FAR FROM WETLANDS AS PRACTICAL.
4. CLEAN AND REMOVE AS SOON AS DEWATERING IS COMPLETE.

BMP PICTURE**APPROVED BY: VICE PRESIDENT, ENVIRONMENTAL SERVICES**

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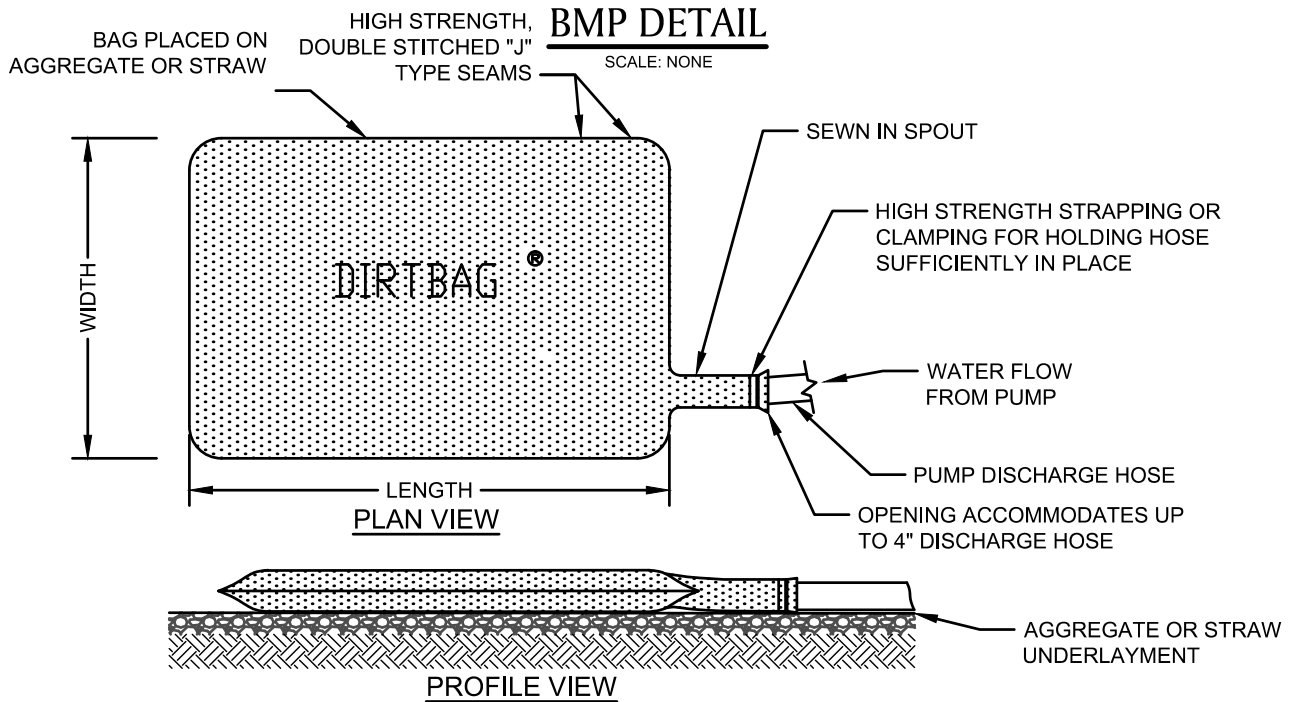
AA-10
DEWATERING BASIN
(SMALL SCALE)

SUBJECT

Access, Maintenance and Construction
Best Management Practices

Reference

EP No. 3 - Natural Resource
Protection (Chapter 6)

**NOTE:**

ONCE PUMPING COMMENCES, THE DIRT BAG SHALL BE MONITORED FREQUENTLY TO ASSURE THAT THE CONNECTIONS ARE SECURELY FASTENED AND THE RATE OF WATER DELIVERY TO THE STRUCTURE IS LOW ENOUGH TO PREVENT UNFILTERED WATER FROM FLOWING FROM THE HOSE CONNECTIONS OR BAG.

BMP PICTURE

* PICTURE AND DETAIL PROVIDED BY ACF ENVIRONMENTAL

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AA-12
DIRTBAG *

HDD Overview and Contingency Plan Purpose

HDD is a method of creating a crossing path beneath a surface without intruding directly on that surface area, compared to conventional open-cut trenching methods where the surface feature(s) would otherwise sustain direct disturbance. HDD uses specific drilling equipment capable of boring a drill path at a shallow inclined angle into the subsurface, and steering the borehole at depth beneath a surface feature(s), such as a stream, roadway, railroad, or combination of these features, and re-emerging within an excavation pit on the other side of the designated surface area. Once the borehole is created, it is successively reamed by larger bits until the borehole is wide enough for pre-assembled pipeline to be pulled through the borehole. Pipeline segments are connected to the two ends of the HDD segment once it has been successfully pulled back through the HDD borehole.

HDD drilling requires specialized drilling equipment to allow shallow-angled entry of a drill bit, steering and remote telemetry tracking of the drill head and advancing the drill string by addition of successive segments of drill pipe until a pre-determined exit point is reached. HDD requires drill “mud” to be pumped down the drill string through the head of the drill bit. Drill mud is required for several critical functions:

- It cools the drill head and string as it grinds through soil and/or rock;
- It helps to lubricate and support the borehole side-walls while the bit and drill string pass through;
- It provides a fluid to carry rock and soil cuttings in suspension from the drill path face back to the point of entry so the cuttings can be cleared from the HDD borehole path; and
- It assists in stabilizing an open bore hole, by exerting positive pressure on the borehole wall and through the buildup of a wall cake, also produces a bridging mechanism to hold soil particles in place.

The drill mud must be maintained under pressure within the borehole in order to carry out all of these functions.

HDD crossings are specifically designed to follow a pre-determined path to carry the boring at depths below the surface area being crossed so as to avoid disturbance of the surface area and create a borehole of sufficient diameter and configuration to allow the conduit to pass through the completed borehole smoothly from end to end once the HDD is completed.

Despite specific engineering design of an HDD crossing, it is possible to unexpectedly lose circulation of the drill mud. Lost circulation may be signified by unexpected drop of the desired pressure of the drill mud, failure of it to return to the borehole entry point, or change in other monitored conditions during HDD drilling. A “inadvertent return” is the condition where drilling mud is inadvertently

released through the soil stratigraphy or fractured bedrock and travels to the surface. Because drill mud must be maintained under pressure the potential for an inadvertent return tends to be greatest where the HDD drill path is near the entry or exit points of the drill. Other features, such as unexpected geologic fractures or material may also provide pathways for loss of pressure and circulation that could lead to inadvertent returns at other points along an HDD drill path.

Drilling muds consist largely of a bentonite clay-water mixture, sometimes with non-toxic polymer additives to maintain specific viscosity, density or other properties. Bentonite is a naturally occurring type of clay, is non-toxic and commonly used in farming practices.

The purpose of this Contingency Plan is to:

- Minimize the potential for an inadvertent return associated with HDD activities
- Provide for the timely detection of lost drilling mud circulation and the inadvertent return(s) that may result
- Protect areas that are considered environmentally sensitive (streams, wetlands, other ecological resources, cultural resources)
- Ensure and establish organized, timely, and “minimum-impact” response procedures to address loss of circulation and inadvertent return loss and the proposed clean-up of the event.
- Provide for notifications to the applicable parties and regulatory agencies, in the event an inadvertent drilling mud loss occurs.

Measures to be deployed as part of this contingency plan include site inspection, proper training of the contractor and construction personnel, development of response procedures, deployment of containment materials ahead of drilling and at locations to allow timely and minimum impact use of the materials, and implementation of appropriate clean up procedures. These measures are described in detail below.

Site Personnel Responsibilities

National Grid has overall responsibility for implementing this contingency plan. National Grid will be familiar with the aspects of the HDD drilling and plan for the project, the contents of this contingency plan and the conditions of approval under which the activity is permitted to take place. National Grid will provide a copy of this plan to its construction personnel involved with performance of and potential response to the HDD crossing. National Grid will ensure that workers are properly trained and familiar with the necessary procedures for response to an inadvertent return, prior to initiation of drilling operations. National Grid will provide the anticipated schedule of HDD operations around protected streams, rivers, wetlands, cultural resource sites and other features (non- road, structure or railroad bores) to the site inspector responsible for monitoring environmental compliance (“Environmental Inspector” or “EI”).

Monitoring of HDD operations by National Grid will include the following parameters in order to evaluate and detect potential loss of circulation or inadvertent return during drilling operations:

- Monitor the direction, progress and telemetry of the drill head and drill string along the designed HDD drill path.
- Monitor the condition and character of soil & rock cuttings emerging from the borehole for consistency with geologic conditions anticipated along the drill path.
- Monitor drill mud pressure for unexpected changes (particularly decreases in pressure) as the borehole is advanced.
- Perform visual monitoring of the ground surface along the drill path for signs of inadvertent return (unexpected expansion cracks or emergence of drill mud)

Field crews will provide timely notifications and responses to observed inadvertent returns in accordance with procedures identified in the contingency plan.

Notifications

Upon indication of a potential loss of circulation, National Grid shall notify the drill foreman & appropriate drilling personnel to temporarily suspend drilling operations until verification can be made that an inadvertent return has not occurred. If it is determined that an inadvertent return has occurred, the drilling procedure will be discontinued until clean-up and repair has been successfully implemented and Owner has authorized drilling to commence.

National Grid shall also notify its response personnel to implement containment and response procedures summarized below.

National Grid and the host utility will have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. National Grid and/or the Construction supervisor are responsible for promptly notifying the host utility of the inadvertent return, and coordinating personnel to oversee proper clean-up and disposal of recovered material. The host utility will be on the ROW, available during drilling operations to consult with HDD personnel and conduct inspections. The host utility will inspect the drilling operation (e.g., monitoring HDD drill path during pilot hole operations) for the purpose of identifying signs of inadvertent return and will coordinate with the Construction supervisor to implement the appropriate measures to address an inadvertent return. Should an inadvertent return occur, the host utility will evaluate the situation and location, and will determine the appropriate level of response to the incident based on the guidelines contained in this contingency plan. To the extent practicable, the host utility will consult with Owner before determining the appropriate level of response to the incident.

Training

Prior to the start of construction, the Construction supervisor and EI will verify that the construction field crew members receive the following site-specific training:

- review provisions of the contingency plan, equipment maintenance and site-specific permit and monitoring requirements;
- review location of sensitive environmental resources at the site and relevant permit conditions, including any cultural resource site locations, avoidance or restriction measures;
- review inspection procedures for inadvertent return prevention and be familiar with containment equipment and materials;
- review contractor/crew obligations to temporarily suspend forward progress of the drilling upon first evidence of the occurrence of lost circulation and potential inadvertent return, and to report any observed inadvertent returns to the EI;
- review operation of inadvertent return control equipment and the location of inadvertent return control materials, as necessary and appropriate; and
- review protocols for reporting observed inadvertent returns and project team communication with appropriate regulatory agencies.

Pre-Construction Considerations:

Prior to construction, environmental and cultural resources will be protected by implementing the following measures:

- Environmental, biological and cultural surveys, clearances and applicable permitting for proposed HDD and associated workspace(s) will have been completed prior to commencing drilling operations in order to minimize potential impacts to resources.
- Where present, sensitive resources within the construction right-of-way (CROW) will be flagged for avoidance, restricted activity locations, and construction limits will be clearly marked.
- Barriers (straw bales or sedimentation fences) will be erected between the bore site and nearby sensitive resources within or bounding the edge of the CROW prior to drilling, as appropriate, to prevent the potential for released material to reach resources nearby.
- On-site briefings will be conducted for the workers to ensure they have received site specific training for the HDD drilling operations and contingencies for drilling fluid inadvertent return procedures and clean-up.
- Ensure that all field personnel understand their responsibility for timely reporting of inadvertent returns.

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- Maintaining necessary response equipment on-site or at a readily accessible location(s) and in good working order.

The drilling entry and exit areas will be clearly marked, surrounded by construction fencing and silt fencing to minimize the potential for on-site migration of drilling mud. Access and egress locations will be designated and clearly marked.

The primary areas of concern for inadvertent returns typically occur near the entrance and exit points where the drill bit and leading parts of the drill string is at depths of less than 20 feet deep. The likelihood of inadvertent return decreases as the depth of the pipe increases.

Inadvertent Return Contingency Response Plan

If an inadvertent return is suspected:

- National Grid will temporarily suspend all HDD drilling operations immediately upon a substantive lack of drilling fluid return or a drop in back pressure in the drilling pipe or other indications of potential inadvertent return occurrence.
- Pipeline construction personnel tasked with the observation of the directional drill path shall be dispatched to walk the alignment and visually monitor the area for inadvertent drilling fluid release and report back any findings.

If an inadvertent return is identified:

- All work stops, including the recycling of drilling mud/lubricant. The pressure of water above the pipe will keep excess mud from escaping through the fracture. Drilling operations will be suspended if the release poses a threat to human health and safety or the environment.
- Owner shall be notified of the findings and release location and in return will contact the appropriate concerned parties and regulatory agencies as necessary.
- Determine the location and extent of the inadvertent return. The host utility will document the size, impact and conditions of the release with notes and photographs.
- Immediately contain the inadvertent drilling fluid return to minimize further migration of drilling fluids/slurry mixture across the surrounding area by use of hay bales, sand bags, or silt fencing to surround and contain the drilling mud.
- Direction from the Environmental Inspector shall be followed for clean-up and mitigation requirements.
- Remove the drilling fluids and restore the site to pre-existing conditions. Clean-up work will be performed by hand if a vacuum truck cannot access the release area. The clean-up shall be to

the maximum extent possible. All waste and collected materials will be disposed of at an approved location or recycled to the return pit.

- The host utility shall document the conditions of the cleaned up area with photographs.
- If the release area is not accessible, Owner will consult with the landowner(s) regarding next appropriate action, including leaving the drilling mud in place to avoid potential damage from vehicles entering the area or safety concerns to personnel.
- Once excess drilling mud is removed, the area will be seeded and/or replanted using species similar to those in the adjacent area, or allowed to re-grow from existing vegetation at the direction of National Grid

Containment Materials

At a minimum, the following containment, response, and clean-up equipment will be available in sufficient quantities proximate to the HDD site, during all drilling operations at the time such crossing occurs:

- straw bales/hay bales and 2 stakes per bale (min.);
- weighted sediment logs, sand/gravel bags;
- silt fence;
- erosion control blankets;
- plastic sheeting;
- turbidity barriers;
- shovels, pails, drums;
- push brooms;
- squeegees;
- pumps with sufficient hoses;
- mud storage tanks; and
- vacuum truck on 24-hour call, with 1 hour response time.

Photographs of inadvertent drilling fluid return shall be taken to document the size, location and clean-up procedures of any inadvertent return occurrence.

- If drilling mud congeals, take no other action that would potentially suspend sediments in the water column. Monitor the inadvertent return for at least 2 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the inadvertent return location).

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- If drilling mud does not congeal, erect isolation/containment environment (underwater boom and curtain).
 - If the fracture becomes excessively large, 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.
 - If the spill affects an area that is vegetated, the area will be seeded and/or replanted using species similar to those in the adjacent area or allowed to re-grow from existing vegetation at the direction of National Grid.
 - Revegetated areas will be monitored to confirm revegetation is successful.
 - After inadvertent return is stabilized and any required removal is completed, the host utility shall document post-cleanup conditions with photographs and prepare inadvertent return incident report describing time, place, actions taken to remediate the inadvertent return and measures implemented to prevent recurrence.

Response Close-Out

- Drilling mud will be cleaned up by hand using hand shovels, buckets and soft bristled brooms as possible without causing damage to existing vegetation. Fresh water washes will be employed if deemed beneficial and feasible.
- The recovered drilling fluid will either be recycled to the return pit or hauled to an approved facility for disposal. No recovered drilling fluids will be discharged into streams, storm drains or any other water source. Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner permission, and mitigation requirements. These materials will not be disposed on or buried in agricultural lands without landowner permission. Other construction materials and wastes shall be recycled, or disposed of, as appropriate.
- All inadvertent return excavation and clean-up sites will be returned to pre-project contours using clean fill, as necessary.
- All containment measures (fiber rolls, straw bale, etc.) will be removed, unless otherwise specified by the host utility.
- Containment structures will be pumped out and the ground surface scraped to bare topsoil without causing undue loss of topsoil or ancillary damage to existing and adjacent vegetation. Bare soil will be seeded and stabilized with mulch or erosion blankets as

applicable. Material will be collected in containers for temporary storage prior to removal from the site.

Construction Re-start

For releases not requiring external notification, drilling may continue, if 100 percent containment is achieved through the use of a leak stopping compound or redirection of the bore and the clean-up crew remains at the inadvertent return location until directed by the host utility that the HDD operations have stabilized and release potential has subsided.

If the release poses a threat to human health and safety or the environment, drilling operations will not recommence until conditions have been adequately addressed. For releases requiring external notification to applicable agencies, construction activities will not restart without prior approval from Owner.

Prior to restart, National Grid shall evaluate the current drill profile (e.g., drill pressures, pump volume rates, drilling mud consistency) to identify means to prevent further inadvertent return events.

Crossing Alternatives

During construction of the HDD, should there be an inadvertent return, the measures in this plan will be employed to respond. If necessary, before determining HDD construction infeasible, alternate drill path profiles may be developed to modify approach in response to site specific drilling conditions or to avoid further inadvertent return conditions.