ROCKIES EXPRESS PIPELINE – EAST PROJECT

HORIZONTAL DIRECTIONAL DRILL CONTINGENCY AND FRAC OUT PLAN

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FRAC OUT PLAN

1.0 INTRODUCTION

In the HDD industry the term frac out is used to describe an inadvertent release of drill fluid resulting from the fluid escaping from an underground HDD borehole and risng to the surface above the borehole. The purpose of this document is to establish procedures for addressing potential impacts associated with a frac out of drilling fluid during the horizontal directional drill (HDD) process. In addition, this document establishes the criteria by which Rockies Express and appropriate agencies will determine when a proposed HDD is unsuccessful. The procedures and criteria described will generally apply to all HDD crossings on the project. Site specific variations for crossings with more specific requirements will be described elsewhere.

Rockies Express selected the HDD construction method to satisfy certain site-specific conditions for certain crossings.

The HDD installation technique is susceptible to difficulties caused by subsurface ground conditions. If the first attempt at installing a particular crossing by HDD is unsuccessful, an attempt will be made to select an alternate location and complete a successful drill. As an alternative, the crossing will be constructed using an open cut at the site of the original proposed crossing or at an alternate location as established during the permitting process for the crossing.

Rockies Express will provide on-site environmental and construction inspection during the HDD process to keep adequate documentation, daily progress reports, as-built information, etc.,. Rockies Express will describe the events leading up to an HDD failure and will submit this documentation to the appropriate agencies. Any alternative crossing method will not be implemented until Rockies Express has received approval from the appropriate agencies.

2.0 HDD PROCESS

Installation of an HDD crossing involves drilling an open borehole under an obstacle and the pulling a pipeline section into the borehole. There are three basic steps, or processes, that are executed in sequence: pilot hole, hole opening, and pullback. During all three processes drilling fluid is pumped into the borehole under pressure. This section addresses the HDD process.

2.1 Pilot Hole Process

The pilot hole is the first step in the HDD process. The pilot hole is drilled along a predetermined alignment and profile. The entry and exit points are located using traditional survey methods. The trajectory of the pilot hole is surveyed by two separate methods both of which employ a down hole survey tool referred to as a probe. The first method uses the earth's natural magnetic field as a reference while the second method uses a system known as TruTracker that uses a wire coil on the surface that creates a magnetic field. After each section

of the drill pipe has been drilled (approximately 30 feet), both methods of survey are used to calculate the pilot hole location.

The pilot hole process consists of drilling a small diameter hole along the pre-determined alignment and profile. The pilot hole is drilled using either a jetting assembly or a down hole mud motor connected to a tri-cone rotary bit. Drilling fluid is pumped downhole via the string of drill pipe. The flow of drilling fluid powers the mud motor or jetting assembly that cuts the rock strata or soil. The fluid then flows back to the surface along the annular space between the drill pipe and the inside of the pilot hole. As it does so, the fluid also lubricates the drill stem, suspends and carries the drilled cuttings to the surface, and forms a wall cake to keep the hole open.

Data obtained during the pilot hole process will aid the contractor in planning the details of subsequent phases of the installation. These data include the rate of penetration and the friction forces acting upon the drill string. More subjective data on the behavior of the drill string during the process is equally valuable.

2.2 Hole Opening Process

Once the pilot hole is complete the borehole diameter must be increased to allow it to accommodate the pipeline. Typically, the final borehole diameter is approximately 1-1/2 times the pipe diameter. The final borehole diameter is determined by the contractor and is dependent to a large degree on the length of the crossing and the types of geological formations through which the borehole passes.

The borehole diameter is typically increased in several increments or passes. There are two types of downhole tools that are used: fly cutters, used for most soil formations, and rock hole opening tools, used for very dense soil or rock formations.

Typically, the fly cutter or hole opening tool is attached to the drill pipe string that drilled the pilot hole and is then rotated and pulled back towards the drill rig from the entry point. A second drill rig or a track hoe is typically used to handle the drill pipe at the exit point.

For each hole opening pass, as the fly cutter or hole opening tool progresses along the crossing profile, drill pipe is added to the string behind it while drill pipe is removed from the string ahead of it. Doing so maintains a continuous string of drill pipe in the borehole over its entire length.

In soil formations, typically there will only be two or three hole opening passes. The first pass may be between a 24-inch- and a 30-inch-diameter fly cutter. Subsequent fly cutter passes will enlarge the hole to the desired diameter. Depending on the stability of the hole, the HDD contractor may use a barrel reamer, typically several inches smaller than the outside diameter of the final hole opening tool, and pull it through the hole immediately prior to pullback. This is typically referred to as a swab pass. The purpose of the swab pass is to ensure the establishment of a good drilling fluid wall cake, a clean hole, and a hole full of drilling fluid with the proper density.

In rock formations, there will be several passes starting typically with a 22-inch-diameter hole opening tool and increasing in steps of 6-inch to 12-inch increments until the desired diameter is achieved. The diameter of each reaming pass is typically determined by the contractor based on field conditions.

The drilling fluid serves continues to serve as a lubricant, facilitates the removal of cuttings, and stabilizes the borehole.

2.3 Pullback Process

The last step to complete a successful installation is the pullback of the prefabricated pipeline into the enlarged hole. A reinforced pull head is attached to the leading end of the pipe and to a swivel that is connected to a hole opener or fly cutter and the drill pipe. On the surface, the pipeline is supported with rollers as it is guided into the borehole.

Once in the borehole the large diameter pipeline will be very buoyant in the drill fluid that occupies the borehole. The buoyancy will push the pipeline to the top of the borehole with considerable force. This will result in the following:

- A dramatic increase in the friction between the side of the borehole and the pipe.
- The possibility that the leading edge of the pull head could dislodge a cobble or rock fragment, binding the pipeline and making it possible to move the pipeline in either direction.
- The possibility that the external coating could be damaged by sharp and/or protruding material and highly abrasive material (coarse sands).

The buoyant force will be counteracted by adding water to the pipeline to increase its weight. The amount of water will be controlled to make the pipe as close to neutrally buoyant, or weightless, as possible.

2.4 Drilling fluid

The drilling fluid (also referred to as drilling mud) is made up primarily of water and bentonite. The concentration of bentonite typically varies between 0.24lb/gal and 0.36 lb/gal. Bentonite is a naturally occurring, non-toxic, inert clay that meets NSF/ANSI 60 NSF Drinking Water Additives Standards and is frequently used for drilling potable water wells.

The environmental impact of a release of drilling fluid into a water body is a temporary increase in local turbidity until the drilling fluid dissipates with the current or is settles to the bottom. In the immediate vicinity of a release, benthic organisms may be smothered if sufficient quantities of bentonite settle upon them.

Drill fluid is easily contained by standard erosion and sedimentation control measures such as stray bales and silt fence. Drill fluid would be contained on entry and exit worksites by hay bales and silt fence installed and maintained around the perimeter of each site. Within the boundaries of the worksites drill fluid would be controlled through the use of pits at the crossing entry and exit points and typical fluid handling equipment such as trash pumps. Drill fluid is released regularly on the drill rigs as part of normal operations when sections of drill pipe are separated. The worksite will be graded such that fluid released on the rig will flow into the fluid pit in front of the rig.

2.5 Operating hours

Due to issues associated with borehole stability for the large diameter boreholes required, it will be necessary for all HDD installation operations to be performed on a 24 hour per day, 7 day per week basis.

3.0 HDD FAILURE MODES

An HDD installation can fail during any one of the three processes that make up the installation. They are dealt with individually in the following paragraphs.

3.1 Failure during Pilot Hole Process

During the drilling of the pilot hole, the hole may collapse on the drill pipe string. This is typically caused by unfavorable drilling stratum containing glacial till, highly fractured rock, non cohesive alluvial material, cobbles, or boulders. An increase in friction resulting from collapse of the borehole will produce a corresponding increase in the torque and axial force required to move the drill pipe string. In severe cases the increases can be large enough to cause the drill pipe string to break, resulting in an unsuccessful pilot hole attempt.

A second mode of pilot hole failure is also a result of unfavorable ground conditions. Formations consisting of alternating strata of hard and soft rock, or soft clay containing large numbers of boulders can push the downhole assembly off course resulting in an unacceptable drill trajectory. In this event all or a portion of the pilot hole must be abandoned and redrilled. This would be considered an unsuccessful pilot hole attempt.

The HDD installation method will be considered a failure if there are two unsuccessful attempts at completing the pilot hole.

3.2 Failure during Hole Opening Process

There are generally two modes of failure during the hole opening process. The first results from collapse of the borehole, the second from failure of the drill pipe string or other downhole components.

As in the pilot hole process, a severe borehole collapse can cause friction acting on the drill pipe string and downhole tools to increase to the point where attempts to move the string result in it breaking. This would be considered a failure.

The second mode of failure occurs when hole opening in hard rock or in formations containing large amounts of cobbles and boulders. In these instances the downhole tools are subjected to severe amounts of wear and or impact loading. In extreme cases this can result in the hole opener breaking apart. Pieces of downhole tools lost in the borehole impede or halt further efforts at completing the installation.

It may be possible to recover pieces of downhole tools that have been lost in the borehole. Recovery efforts are generally very time consuming, are hampered by cobbles and boulders and are often fruitless. However, often it is possible to push the offending piece out of the borehole and into a soft zone in the surrounding formation. In either scenario the hole opening process can resume. If attempts at recovering or displacing lost pieces of downhole tools take more than seven working days the process will be considered a failure.

The HDD installation will be considered a failure if there are two failed attempts at hole opening.

3.3 Failure during Pullback Process

During the pullback process the drill rig must exert a pull load sufficient to overcome the friction forces acting on the pipeline as it is pulled into the borehole. If the friction forces rise to excessive levels, the pullback operation must be halted. At this point the direction of pull must be reversed and the pipeline pulled from the borehole. Once the pipeline is successfully withdrawn the portions of the hole opening and swabbing process are repeated to recondition the borehole and then the pullback process is repeated.

On occasion the pipeline becomes stuck in the borehole before the pullback operation is complete. When this occurs it is impossible to move the pipe in either direction.

The HDD installation method will be considered a failure if there are two unsuccessful attempts at the pullback process or if the pipe becomes stuck in the borehole.

4.0 FRAC OUT OF DRILLING FLUID

Throughout the HDD process there is a loss of drilling fluid into the geologic formation through which the drill passes. In some cases, the drilling fluid may be forced to the surface resulting in what is commonly referred to as a frac out. Therefore, while the intent of the HDD method is to avoid surface disturbance, surface disturbance may occur when there is a frac out of drilling fluid.

<u>It is extremely important to note that a loss of drilling fluid into the formation is not necessarily an indication that a frac out has occurred or is about to occur. It is normal to lose a significant amount of fluid into the formation without ever having a frac out. In fact, in very soft ground formations or in highly fractured formations it is normal to lose all of the drill fluid pumped into the borehole without a frac out occurring.</u>

A frac out cannot occur unless drill fluid escapes from the borehole into the formation. Hence preventing and managing such escapes will in turn prevent and manage frac outs.

Drilling fluid releases are typically caused by pressurization of the drill hole beyond the containment capability of the overburden soil material. In some cases, an frac out of drilling fluid can be caused by existing conditions in the geologic materials (e.g., fractures) even if the down hole pressures are low.

Drill fluid pressures are generally the highest during the pilot hole process and hence it is this process that presents the greatest risk for a frac out. If a frac out occurs during the pilot hole it opens a path through the ground formation for drill fluid to escape during the subsequent processes. Hence frac outs are likely, at the same location during the hole opening and pullback process. Similarly, if the pilot hole process can be completed without a frac out, then it is likely that the entire installation can also be completed without a frac out.

Considerations for preventing and managing frac outs are described below.

4.1 Frac out prevention

The risk of a frac out in a sensitive area can be mitigated through profile design and through implementation of specific measures throughout the installation process.

4.1.1 Profile design

The HDD profile is designed to minimize the potential for the release of drilling fluid in sensitive areas. The type of subsurface material and the depth of cover material are factors considered in developing the profile of an HDD crossing. Cohesive soils, such as clays, dense sands, and competent rock are considered ideal materials for containment of drill fluid. An industry recommended minimum depth of cover of 25 feet in cohesive soils should be maintained to provide a margin of safety against drilling fluid loss in sensitive areas. In non cohesive soils, a greater depth of cover will be used. In the designs of all the HDD crossings, REX has used depths of cover well in excess of the recommended minimum.

In the vicinity of the entry and exit points of the crossing the depth of cover will be minimal. It is probable and expected that frac outs will occur in these segments of the crossing. The crossings are designed such that these segments will be in upland areas.

4.1.2 Preventative measures implemented during installation

Key preventative measures implemented during installation are geared toward keeping the drill fluid contained in the borehole and preventing its escape to surrounding ground formations. This is accomplished through monitoring and management of drill fluid pressures and drill fluid volumes.

4.1.2.1 Drill fluid pressure monitoring and management

Drill fluid pressures are affected by several factors. A description of some of these factors and how they can be managed follows.

- *Drill fluid density.* Greater drill fluid densities result in greater downhole pressures. A large component of drill fluid density is the concentration of cuttings in the fluid. By controlling drilling and hole opening penetration rates and maximizing the effectiveness of drill fluid recycling equipment drill fluid densities can be kept below acceptable limits.

- *Drill fluid viscosity.* Greater drill fluid viscosities result in greater downhole pressures. However, greater viscosities also help seal off fissures and other escape paths into the surrounding formation from the HDD borehole. Similarly increased viscosity improves the cuttings carrying capability of the drill fluid. Drill fluid viscosity must be carefully managed to obtain a balance between these conflicting requirements.

- *Borehole cleanliness.* Cuttings tend to settle out of the flow of drill fluid in the annular space around the drill pipe string. Accumulations of cuttings or cutting beds restrict the flow of drill fluid through the annular space. This results in an increase in the pressure required to maintain flow. Careful management of drill fluid properties and the regular use of borehole swabbing techniques will keep the borehole free of cuttings beds and their associated pressure increases.

The drill fluid pressures in the borehole will vary throughout the installation processes. They will change with the depth of cover, the distance drilled, and the borehole diameter. However, changes in pressure should be gradual and can to large extent be predicted. Rapid or unexpected changes in pressure are indicators of potential problems downhole. It is critical that drill fluid pressures be monitored and recorded throughout the pilot hole process, when pressures are the highest. There are two techniques available for drill fluid pressure monitoring. They are standpipe pressure monitoring and downhole pressure monitoring.

Standpipe pressure monitoring

Standpipe pressure is the pressure in the drill pipe string at the surface. The difference between this pressure and the downhole pressure in the borehole is the pressure drop experienced by the fluid as it flows down the drill pipe string and through the downhole tool. Hence standpipe pressure gives only an approximate indication of the downhole pressure.

Nevertheless, careful monitoring of standpipe pressure can provide an indication of a rapid or unexpected change in downhole pressure.

Downhole pressure monitoring

Downhole pressure monitoring can be used during the pilot hole operation only. This is a sophisticated technique that involves the use of a pressure transducer incorporated into the downhole survey probe immediately behind the drilling assembly. The transducer measures the drill fluid pressure in the annular space around the probe. Data from the transducer is transmitted to the drill rig at the surface via the same electrical wire line used to transmit survey data. Due to the added complexity and cost associated with the use of this technology it will only be used on crossings that are deemed to be particularly sensitive.

Prior to beginning the HDD installation, REX shall develop an annular pressure diagram for the crossing. This diagram will show, for every point along the length of the planned profile, the maximum annular pressure that can safely be resisted by the formations. This pressure is known as the confining pressure. The curve will also show the predicted drill fluid pressure that will be required to push the cuttings laden drill fluid back to the surface via the annular space.

Throughout the pilot hole drilling operation the annular drill fluid pressure measured at the bottom hole assembly will be continuously monitored. The measured pressure will be compared with the predicted and allowable pressures shown on the annular pressure curve. The following three scenarios are possible

1) Measured pressure approximately equal to predicted pressure
   This is an indication that conditions are normal and the driller will be allowed to proceed with the pilot hole drilling.

2) Measured pressure greater than predicted pressure
   This is an indication that the annular space behind the drill bit is becoming plugged with cuttings or that the concentration of cuttings in the drill fluid returns is too high resulting in excess drill fluid density. The driller will be required to implement measures to clean the annular space and or reduce the concentration of cuttings. This typically involves “swabbing” the borehole by slowly retracting the drilling assembly while pumping clean drill fluid into the bore to flush out cuttings and replace the cuttings laden fluid with clean,

less dense fluid. The composition of the drill fluid pumped into the bore may also be modified to improve its cuttings carrying capacity.

3) Measured pressure less than predicted pressure.
   If the measured pressure is significantly less than the predicted pressure this is normally an indication that some of the drill fluid is escaping from the borehole.

   It is extremely important to note that having fluid escape from the borehole is not necessarily an indication that a frac out has occurred or is about to occur. It is quite normal to have a significant amount of fluid lost to the surrounding formation without a frac out occurring.

   Nevertheless, if the measured pressure is less than the predicted pressure and in particular if this is the result of a sudden drop in pressure, the contractor will be required to implement measures to reduce or eliminate the loss of drill fluid from the borehole. One measure that may be implemented is the use of Lost Circulation Materials (LCM) to plug a fissure in the formation. The use of additives to improve the sealing properties of the drill fluid is another measure.

4.1.2.2 Drill fluid volume monitoring and management

It is intuitive that if drill fluid is not allowed to escape from the borehole then the entire volume of fluid pumped downhole should return to the surface via the annular space. However, as described above, it is normal that a portion or all of the drill fluid will be lost to the surrounding formation. Nevertheless a program for monitoring and managing the volumes of drill fluid used will be beneficial in identifying sudden increases in the volume of fluid lost which could signal a potential frac out.

Throughout the HDD processes the contractor will keep a running balance of the total volume of fluid pumped downhole and the total volume recovered from the return pits. The difference between these volumes will be the volume lost from the borehole.

If the rate of loss of fluid is greater than expected or if it suddenly increases this could be an indication of a problem downhole. Measures to reduce the loss of fluid from the borehole would be implemented as described in previous paragraphs.

4.2 Frac out management

Management of frac outs is key to minimizing the environmental impact of an HDD crossing and ensuring its successful completion. Managing frac outs requires that appropriate equipment is available, that the frac outs are detected in a timely manner, and that appropriate procedures are used to minimize the volume of fluid released and its environmental impact. A discussion of these issues follows.

4.2.1 Response Equipment

Equipment for containing, controlling and cleaning up any drill fluid released during a frac out will be kept on site throughout the installation process.

Heavy equipment not specifically designated for control and clean up of drill fluid such as backhoes will also be available on site.

The following list identifies some materials and equipment that will be maintained at each HDD site in sufficient quantities to help ensure containment of frac outs of drilling fluid:

- Weedfree straw or hay bales.
- Sand bags
- Stakes to secure bales.
- Silt fence.
- Shovels, rakes, brooms and buckets
- Trash pumps and flexible hose
- Light tower(s), so that cleanup work could continue after dark.
- A boat with appropriate personal safety equipment at major water body crossings.

4.2.2 Monitoring and detection

An obvious key to the timely detection of a frac out is monitoring of the surface above the HDD crossing for drill fluid. This is relatively easy to accomplish in upland areas during daylight hours. However, for large diameter pipelines such as the one proposed by REX, the HDD process must be done on a 24 hour per day, 7 day per week basis.

Visually detecting a frac out in a large waterbody or marshy area will be difficult, especially at night.

Unfortunately the areas where the potential environmental impact of a frac out are greatest are wetlands and waterbodies. These areas will present the greatest challenge visual monitoring.

REX will employ a program of visually monitoring the ground above the HDD crossing for frac outs. However, this program will be supplemented by data from the downhole monitoring measures described above, namely pressure monitoring and volume monitoring.

The downhole pressure is greatest in the vicinity of the downhole tool in all three of the HDD processes described above. If a frac out occurs it will initiate from the borehole in the immediate vicinity of the downhole tool. Hence, visual monitoring on the surface will be concentrated on the area above the downhole tool.

Survey stakes will have been placed and labeled on the surface at 100 foot intervals along the HDD centerline. The monitors will be constant radio contact with the driller who will keep them apprised of the position of the downhole tool. The survey stakes will provide the monitors with the necessary reference to allow them to concentrate their efforts above the downhole tool.

The driller will also keep the monitors apprised of the drill fluid pressures and mud volume balance and will provide his professional opinion of level of risk of a frac out occurring at any given time.

Armed with this data the monitors will be able to decide if monitoring a difficult area, such as a deep swift river at night is warranted. It will also allow them to allocate their resources in the most effective manner.

The identification of a potential frac out prior to it actually occurring is dependent upon the skill and experience of the people involved. For this reason, Rockies Express will be using a contractor that specializes in HDD to perform the proposed crossings. Similarly the

environmental inspector who will supervise monitoring and mitigation efforts will also be experienced in this type of work.

4.2.3 Corrective Action for Frac outs

If a frac out occurs the chief inspector and the environmental inspector will be immediately notified. The following describes the sequence of events that will then take place.

4.2.3.1 Minimization of volume released.

The first action required when a frac out is detected is to minimize the volume of drill fluid that is released. This will be done by immediately halting pumping of drill fluid downhole. Pumping will not resume until the situation is assessed and, if possible, the fluid release is contained and controlled. As it is probable that the frac out will resume as soon as fluid pumping starts again containment and control measures will have to be able to contend with a further release of fluid. Normally the frac out stops of its own accord when the drilling assembly progresses a short distance ahead of the release point.

The risk of failure of the HDD installation increases dramatically as the duration over which pumping is halted increases. Hence, actions will be taken quickly in order that pumping may resume as quickly as possible.

4.2.3.2 Containment and control of drill fluid released

The types of measures implemented to contain the fluid released will depend on the type of area in which the release occurs.

Upland areas. Frac outs in upland areas are most common as the drill profiles are designed such that the portions that have minimal depth of cover are beneath upland areas. Containment measures in these areas are easily implemented and consist of using hay bales, and or silt fence to contain the fluid within the immediate vicinity of the release. If the rate of release is large, a collection pit will be dug at the point of release and a trash pump will be set up to draw fluid from the pit and pump it back to the drill rig via a flexible hose. Once the containment measures are in place drilling operations will resume.

Wetlands. Frac outs in wetlands are quite rare as the depth of cover provided in these areas is normally sufficient to prevent frac outs. If a frac out occurs the containment and control measures will be similar to those used in upland areas with the exception that the use of heavy equipment will be severely restricted. Once the containment measures are in place drilling operations will resume. Depending of the flow rate of fluid released, drilling procedures may be modified to reduce that rate. These modifications include introduction of LCM's (Lost Circulation Material) into the drill fluid, increasing drill fluid viscosity and the temporary reduction of drill fluid pumping rates. Drill penetration rates may also be temporarily increased in an effort to move the drilling assembly away from the release point as quickly as possible in order that the release stops quickly.

Waterbodies. Frac outs in waterbodies are also rare due to the provision of adequate depth of cover. Implementation of containment and control measures is most difficult in waterbodies and is only practicable when the depth of water is less than two feet and the water is slow moving. In these cases only, the drill fluid will be contained by hand carrying sand bags into the waterbody. A containment barrier that extends above the water surface will be built by hand

placing the sand bags around the release point. If practicable, a trash pump will be placed on the shore and a suction hose extended from the pump to the release point. The drill fluid will then be pumped through a flexible hose back to the drill rig. Once the containment measures are in place drilling operations will resume.

If a frac out occurs in a water body that is more than two feet in depth or has significant flow there is nothing that can be done to contain or control the drill fluid that has been released. Drilling operations will resume immediately and measures will be implemented to limit the further release of fluid into the waterbody. These include introduction of LCM's into the drill fluid, increasing drill fluid viscosity and the temporary reduction of drill fluid pumping rates. Drill penetration rates will also be temporarily increased in an effort to move the drilling assembly away from the release point as quickly as possible in order that the release stops quickly.

The effectiveness of the measures implemented to limit the release of drill fluid will be closely monitored. If the measures are not effective and if the environmental impact of the release is deemed unacceptable the HDD installation will be abandoned. Another attempt using a modified profile or at an alternate location may be made.

Rockies Express will notify appropriate downstream water intake authorities of the existence and location of any drill fluid plume that extends more than 1,000 yards from the HDD crossing site.

4.2.3.3 Additional control measures

A determination will be made of the cause of the frac out. If it is determined that downhole pressures are excessive then measures to reduce them will be implemented. These measures are described above and include swabbing the hole and or modifying the drill fluid properties.

4.2.4 Drill fluid clean up

Measures to clean up drill fluid released by a frac out will be determined on a case by case basis in consultation with the environmental inspector. Often, if the features affected are not sensitive and the volumes released are small minimal or no clean up will be required. Similarly, it is often determined that clean up measures will do more harm than good to sensitive features and that it is best to let the drill fluid dissipate naturally.

Drill fluid can be cleaned up by collecting it by hand with shovels, brooms and buckets. Larger volumes can be cleaned up by means of pits and pumps or mechanized equipment.

In wetland and upland areas drill fluid can be diluted by washing the affected area down with water.

4.2.5 Agency Notification Procedures

If a frac out occurs within a stream, wetland or wetland buffer, or other sensitive resources, or poses a threat to public safety, the Environmental Inspector will immediately notify Senior Environmental Specialist for the project.

The Environmental Inspector will provide the following:

- The location of the frac out;

- A description of the area affected; and
- The containment measures implemented.

As soon as possible, a report, containing the following information, will be prepared and emailed to the appropriate agencies.

- The cause of the release;
- Photographs of the release site;
- The area affected;
- The location and size of the resulting work area; and
- The location of any drainage, streams or wetlands in the area and the distance to them from the failure site.

Upon completion of HDD activities, Rockies Express will prepare a report that summarizes:

- The events leading up to the frac out;
- The measures taken to minimize the impacts following the release;
- Any impacts from the release;
- Mitigation for the impacts from the release; and
- Agency contacts.

Rockies Express Pipeline - East Project Contact List of Agencies for Notification of HDD Failure or Frac-out			
Agency	Contact	Phone	E-Mail
FEDERAL			
National Response Center and U.S. Coast Guard		1-800-424-8802	
MISSOURI			
Missouri Department of Conservation	Doyle Brown	573/522-4115 x3355	Doyle.brown@mdc.mo.gov
Missouri Department of Natural Resources	Robert Stout	573/522-2553	robert.stout@dnr.mo.gov
U.S. Army Corps of Engineers (COE) - St. Louis District	Rob Gramke	314/331-8187	robert.gramke@mvs02.usace.army.mil
U.S. Fish and Wildlife Service (USFWS) - Columbia Ecological Services Field Office	Heidi Kuska	573/234-2132	heidi_kuska@fws.gov
ILLINOIS			
Illinois Department of Natural Resources	Rick Pietruszka	217/785-5500	rpietruszka@dnrmail.state.il.us
Illinois Environmental Protection Agency	Daniel Heacock	217/782-3362	dan.heacock@epa.state.il.us
COE - Rock Island District	Jeff Sniadach	309/794-5351	jeff.w.sniadachh@usace.army.mil
COE - Rock Island District	Eugene (Gene) Walsh	309/794-5351	Eugene.w.walsh@usace.army.mil
USFWS - Marion Ecological Services Sub Office	Joyce Collins	618/997-4565 x340	Joyce_Collins@fws.gov
INDIANA			
Indiana Department of Natural Resources	Matt Buffington	317/232-4080	mbuffington@dnr.IN.gov
Indiana Department of Environmental Management	Jason Randolph	317/233-0467	jrandolp@idem.in.gov
COE - Louisville District	Max Hagan	317/532-4198	charles.m.hagan@usace.army.mil
FWS - Bloomington Ecological Services Field Office	Forest Clark	812/334-4261 x206	Forest_Clark@fws.gov
OHIO			
Ohio Department of Natural Resources	Brian Mitch	614/265-6378	Brian.Mitch@dnr.state.oh.us
Ohio Department of Natural Resources	Bob Gable	614/265-6814	bob.gable@dnr.state.oh.us
Ohio Environmental Protection Agency	Thomas Harcarik	614/644-2139	Tom.harcarik@epa.state.oh.us
COE - Huntington District	Lee Pittman	304/399-5210	Lee.A.Pittman@lrh01.usace.army.mil
National Park Service - Midwest Regional Office	Sue Jennings	402/661-1848	Sue_jennings@nps.gov
FWS - Reynoldsburg Ecological Services Field Office	Angela Zimmerman	614/469-6923	Angela_Zimmerman@fws.gov