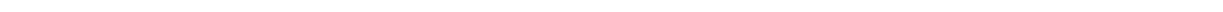


**EDGE CABLE HOLDINGS USA LLC**

**DRILL BREAK AVOIDANCE PLAN**

December 2020



# 1. SUMMARY

This Drill Break Avoidance Plan details the plan for avoiding horizontal directional drill (HDD) break incidents in connection with the Jupiter subsea cable construction project on Lot 3200, Tierra Del Mar, Tillamook County, Oregon, and incorporates the lessons learned from the work carried out Lot 3200 during construction in 2020. This Plan establishes improved procedures to ensure the successful completion of the HDD work when construction recommences in January 2021. This Drill Break Avoidance Plan may be revised as the 2020 geotechnical data is further analyzed or as feedback is received from stakeholder agencies.

## 2. ADDITIONAL HDD CONSIDERATIONS

### 2.1 Lessons Learned from 2020 HDD Operation

The predictions of soft, unconsolidated sediments along the length of the HDD path, based on initial surveys, geology of the immediate area and past project survey results, were incorrect. There is hardground / rock present along a portion of the proposed Jupiter HDD route, which requires a different drilling approach than the one originally planned.

### 2.2 Requirements prior to Resumption of HDD in 2021

Supplemental geophysical and geotechnical investigative surveys were needed in order to identify the exact sub-terrain along the entire proposed HDD route. This work has been ongoing and Section 3 describes the modifications that will be implemented for the 2021 HDD Operations.

In summary:

Subject	Situation	Recommendations & Comments	Follow-Up Needed?	ACTIONS BEFORE RECOMMENCEMENT
Broken Drill String	Drilling in Predicted Soft Jet-able Formation & Limited Timeline to Complete drill. Speed and thrust of drilling operation planned for soft formations leading to a exceeding the drill string design limit when encountering unexpected rock.	<ol style="list-style-type: none"><li>1. Detailed Investigative Survey to identify sub-formation along drill profile</li><li>2. Design the Drilling Parameters according to the identified sub-formations post survey (Speed &amp; Thrust)</li><li>3. Supply suitable tooling, casing and drilling fluids for the Drilling Operation in accordance with the identified sub-formation post survey</li><li>4. Allow adequate time to drill depending on the identified sub-formation post survey</li></ol>	Yes	<ol style="list-style-type: none"><li>1. Detailed Investigative Survey to identify sub-formation along drill profile to be completed (ERT/SEISMIC /BOREHOLE)</li><li>2. Drilling operations to be redesigned based on survey results.</li></ol>
Lost / Abandoned Downhole Tooling / Drill String	Unplanned broken drill string	<ol style="list-style-type: none"><li>1. Maintain a Drill Pipe Recovery "Fishing" Tool on-site to allow a potential recovery of broken drill string (Long Lead / Specialty Item)</li></ol>	Yes	<ol style="list-style-type: none"><li>1. A Fishing Tool should be maintained on-site to expedite recovery operation (if possible).</li></ol>

## 3. DRILL BREAK AVOIDANCE PLAN UPON HDD RECOMMENCEMENT IN 2021

The 2020 geotechnical surveys consisting of the marine seismic survey, the marine ERT survey, and beach ERT survey have been completed. The geophysical survey consisting of the subsurface borehole coring will be completed in early January 2021 on TL 3200 when work

may resume onsite. The geotechnical survey investigation report has been submitted under separate cover (dated 01 December 2020). Based on the data collected to date, and the drill teams experience from the initial effort, the HDD bore profile and alignment have been modified as indicated below

1. Use a slightly (3/4") larger diameter drill pipe (6 5/8 inch OD) than that used in the previous effort (5 7/8 OD).
2. Due to the changing nature of the geology throughout this bore path, experienced in the 2020 drill effort and confirmed via the geotechnical survey, we will install an approximately 900' of HDD drill casing through the soft sediments that will be encountered during the initial portion of the drill (note that 240' of drill casing was used in the 2020 operation). The additional 660' of will casing will: a) support the heavy mud motor when it is installed prior to encountering the hard sediment; and b) create a stable path for the drilling fluids to return directly back to the entry pit also enhancing the steering capabilities of the Mud-Motor.
3. The installation of casing will include installing 300 ft of 18" casing, then inserting 16" casing inside the 18" casing for a distance of 900 ft. The advantage in this casing installation method (telescoping 16" casing inside of 18" casing) is that for the first 300 ft, the 16" casing will be inside the 18" casing and have little external pressures on it which will make the entire 900 ft of 16" casing easier to extract.
4. Additional Rock Drill Bits & and additional Mud-Motor maintained on-site; and
5. Fishing tools to help extract portion of the drill string will be maintained on-site in case of another drill break (see Drill Break Response Plan).

The results from the geophysical survey (the subsurface borehole coring on TL 3200) will be used to finalize the HDD engineering to prepare for drilling through interchanging formations of soft and hard materials, including:

1. Adjusting progress rates according to the identified formations;
2. Slowing down prior to approaching hard formations;
3. Stopping the drill on impact with the hard formations and switching out tooling to drill through (Mud Motor / Rock Bits); and
4. Adjusting drilling fluid properties according to the formations.

END OF DOCUMENT

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**EDGE CABLE HOLDINGS USA LLC**

**DRILL BREAK RESPONSE PLAN**

January 2021

# 1. OBJECTIVE

This Drill Break Response Plan establishes the measures that will be implemented by Edge Cable Holdings USA, LLC (“Edge”) in the event of a horizontal directional drill (HDD) break during construction of the Jupiter subsea cable landing beach manhole and steel shore-to-ocean conduit on Lot 3200, Tierra Del Mar, Tillamook County, Oregon. This Drill Break Response Plan may be revised as the 2020 geotechnical data is further analysed or as feedback is received from stakeholder agencies.

## 2. PROJECT DESCRIPTION

### 2.1 Overview of the Project

One (1) steel conduit will be installed by HDD from Lot 3200 to an off-shore Punch-out Location (POL) and will be used as a long-lasting protective conduit for the Jupiter fiber optic cable as it traverses from the POL to the Beach Manhole (BMH) installed on Lot 3200. The map below shows the approximate location of the POL, BMH and the HDD.



Figure 1: Project Location Map

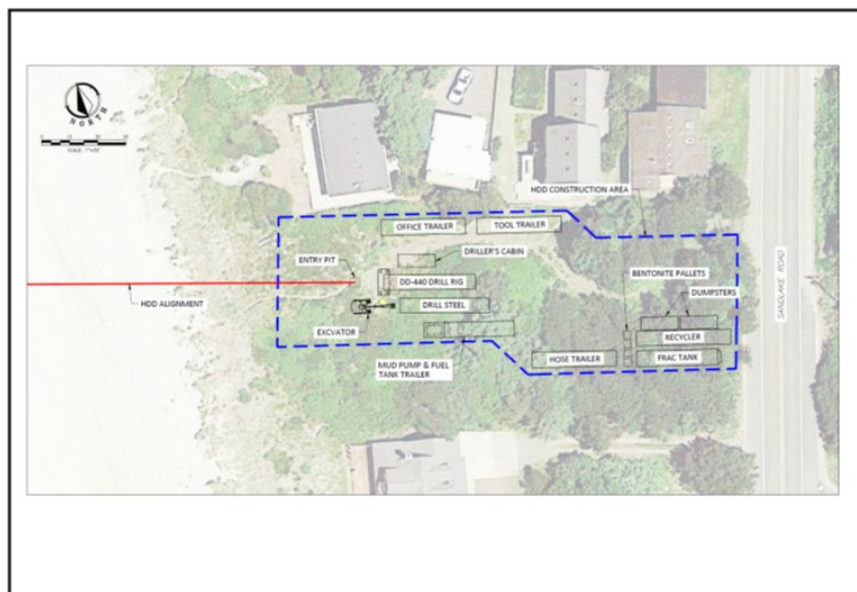


Figure 2: Drilling Area Overview

### 3. DRILL BREAK RESPONSE PLAN

#### 3.1 Notification of County, State and Federal Agencies

In the event of an HDD break during construction on Lot 3200, Edge (or its designated representative, contractor or subcontractor) will notify the individuals listed in Table 3.1 below by phone and e-mail within twenty four (24) hours of the occurrence of the break (the “Initial Notification”). Following the Initial Notification, Edge will submit a written report regarding the incident (the “Preliminary Report”) to the same individuals within three (3) business days following the occurrence of the break. The Preliminary Report will provide at least the following:

- Description of the break, including the date, time, location of drill head relative to the punch in location, and other material details regarding the break;
- Description of the suspected root cause of the break;
- Description of the immediate responsive action taken on-site;
- Description of the corrective actions taken to preclude recurrence of the break and to prevent similar occurrences involving similar components or systems;
- A copy of the Daily Progress Report from the date of the incident; and
- Summary of all the third parties/agencies notified and preliminary responses from those parties.

Governmental Body	Individual Contact	Contact Information
Army Corp of Engineers	Kinsey Friesen	<a href="mailto:Kinsey.M.Friesen@usace.army.mil">Kinsey.M.Friesen@usace.army.mil</a> Office: 503-808-4378 Cell: 503-577-8298
Oregon Department of State Lands	Blake Helm	<a href="mailto:blake.helm@state.or.us">blake.helm@state.or.us</a> Office: 503-986-5288 Cell: 971-701-1507
Oregon Parks and Recreation Department	Jay Sennewald	<a href="mailto:jay.sennewald@oregon.gov">jay.sennewald@oregon.gov</a> Office: 541-563-8504 Cell: 541-270-3226
Oregon Department of Environmental Quality	Haley Teach	<a href="mailto:Haley.teach@state.or.us">Haley.teach@state.or.us</a> 503-229-5051
Tillamook County	Sarah Absher	<a href="mailto:sabsher@co.tillamook.or.us">sabsher@co.tillamook.or.us</a> 503-842-3408x3317

Table 3.1

#### 3.2 Corrective Actions Following an HDD Break

In the event of an HDD break, the following corrective actions will be taken:

- HDD operations will stop immediately.
- The HDD operator will attempt to pull-back and fish-out the broken drill string with an appropriate “fishing” tool, guided back into the drill profile to the break location. Fishing tools use the principle of one-way grip designed to slide over the broken drill string and

latch on to the broken drill pipe. See Figure 4 below for images of “Fishing” tools that may be utilized. All attempts to recover the broken drill string will occur during approved hours for construction on Lot 3200.

- The HDD operator will contain any released drilling fluid (see Section 3.3 below).
- The HDD operator will create an incident report that documents the break and that includes photographs of the break and details regarding the break, such as location, activity in progress, drilling parameters, personnel involved and mitigating actions to be taken. This incident report will be created and provided to the individuals in Table 3.1 within 7 days of the incident.



Figure 4: Examples of Types of Fishing Tools

### 3.3 Drilling Mud Releases<sup>i</sup>

#### Inadvertent Release

The drill operator will be equipped with a tracked hydraulic excavator, straw or hay bales, stakes to secure bails, silt fence, sandbags, shovels, pumps, and any other materials or equipment necessary to contain and clean up inadvertent releases of drilling mud caused by an HDD break. Drill operator will position barriers to keep any inadvertent release on Lot 3200 from reaching to the ocean shore.

#### Clean-up of Releases

The drill operator will promptly remove all visible drilling mud located in accessible areas. Removal methods will vary based on the volume of the release and the site-specific conditions. Removal equipment may include vacuum trucks, loader and track hoe buckets, small pumps, shovels and buckets. After removal of the released drilling fluid, the release area will be returned to its original condition to the greatest extent possible.

If any removal equipment must be located on the ocean shore, the drill operator must contact Jay Sennewald at OPRD (541-270-3226) immediately for oral emergency drive-on-beach permit.

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<sup>i</sup> The requirements for the use and recovery of HDD drilling mud on Lot 3200, and Edge’s plans for addressing inadvertent releases of drilling mud from Lot 3200, were provided and incorporated into the original permitting for the Jupiter project. This section is intended to highlight Edge’s existing obligations, and is not intended to alter or replace those obligations.