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1.0 Purpose

The purpose of the Ground Disturbance Practice is to provide the operational framework for business units to prepare, coordinate, and safely conduct a ground disturbance or respond to a third party notification in their scope. Refer to the flow chart in Appendix A for the ground disturbance process.

2.0 Scope

This practice applies to all Cenovus worksites and encompasses all ground disturbance activities within their scope of work. Ground disturbance applies to all activities where there is a disturbance or displacement to the soil, but does not apply if the disturbance or displacement is a result of:

a) Routine minor road maintenance such as grading of a gravel road, providing it does not result in a reduction of the earth cover over a buried facility to a depth less than the cover provided when the facility was installed.

b) Hand-digging to a depth of less than 30 centimetres below the ground surface as long as it does not permanently remove the cover over a buried facility. See the following note for additional instruction on hand-digging.

Note: Due to the depth variation of some underground facilities on and off Cenovus worksites, all hand-digging activities that are expected to penetrate the earth to a depth of less than 30 centimetres require a sweep to ensure that there are no buried facilities within that immediate work area. A Cenovus site supervisor may authorize hand-digging up to a depth of 30 centimetres on a Cenovus worksite without a sweep, providing the site supervisor has been diligent in verifying through the means of current and up-to-date data that there are no facilities within that immediate work area. When in doubt, conduct a sweep.

Due to the depth variation of underground facilities, all mechanical excavation, regardless of depth or worksite location, and hand-digging to a depth greater than 30 centimetres must be conducted in accordance with this practice and local work procedures.

Exemptions – The following is a list of work activities that have been identified as not requiring an initial sweep:

- Insertion of a wooden survey peg to a depth of less than 30 centimetres
- Pushing in a wire marker survey flag to a depth of less than 30 centimetres

3.0 Safe Work Permit and Hazard Assessment

As part of the Safe Work Permit (SWP) process, a pre-job hazard assessment must be completed to identify potential hazards specific to the ground disturbance and to determine the controls necessary to eliminate or mitigate the potential hazards.

The hazard assessment will include the work and search areas. Refer to the diagrams in Appendix B for details.

Important Note: All affected workers (i.e. the work crew) must be included in the pre-job hazard assessment and in the control or elimination of those identified hazards. All other workers at the worksite or at other worksites affected by the work /hazards identified in the hazard assessment must be informed of the hazards and of the methods used to control or eliminate those hazards. A Concurrent Operations Permit (CEN020) may be required. For additional information on the Safe Work Permit, including Concurrent Operations Permit, please reference CEN-EHS114 Safe Work Permit Practice.
The ground disturbance hazard assessment should address the following:

a) **Hazards when a buried facility is ruptured:** Fire, explosion, toxic gases/substances, electrocution, high-pressure jetting, spills, oxygen-deficient atmospheres, cave-ins, or engulfment
   
   **Note:** A buried facility, as referenced throughout this practice, also means underground and concrete-embedded facilities; refer to Definitions for detailed explanations.

b) **Hazards of excavating and trenching may include:** Soil instability and trench wall collapse (i.e., from equipment vibration), limited access and egress, personal injuries (i.e., falling in or being struck by), engulfment or exposure through the introduction of chemicals, water, migration of hazardous atmospheres, and contaminated soil
   
   **Note:** Please reference CEN-EHS129 Trenching and Shoring Practice for more information.

c) In the case of trenchless ground disturbances, refer to the section on Horizontal Directional Drilling or boring

d) In excavations that are greater than 1.2 metres deep and where a potential exists for a hazardous atmosphere, these excavations should be considered as a confined space and must comply with CEN-EHS034 Confined Space Entry Code of Practice. The **SWP Issuer** will decide if the excavation is also declared a confined space

e) Overhead and swing radius hazards such as power lines, poles, trees, or structures. For work that may be conducted within seven (7) metres of an overhead power line or involve a load being transported under a overhead power line that has a total height of greater than 4.15 metres will require the use of a Overhead Power Line Encroachment Permit (CEN751).
   
   **Note:** Please reference CEN-EHS2837 Overhead Power Line Encroachment Practice for more information.

f) Undermining of adjacent structures or foundations

### 4.0 Minimum Business Unit Ground Disturbance Requirements

a) A competent ground disturbance supervisor will be designated by the business unit to coordinate and supervise Cenovus’s ground disturbance activities within 30 metres of any buried facility and will determine which business unit practices and government regulations/codes apply to the ground disturbance

b) When required, a competent Cenovus Representative is assigned to assist the ground disturbance supervisor where there are multiple pipelines and/or underground facilities in a congested area, for mechanical/energy isolation, or during boring/horizontal directional drilling (HDD) operations

c) A ground disturbance project meeting will be held with all appropriate personnel

d) Prior to starting work, the ground disturbance supervisor must have a completed SWP, Site Release (if applicable) and/or a Concurrent Operations Permit (if applicable), a completed Ground Disturbance Checklist CEN019, and a documented safety meeting where all aspects of the job, hazards and hazard controls were discussed with the workers involved in the activity

e) A competent Cenovus representative will be designated by the business unit to inspect a third party line locates, ground disturbance, backfill, or a reportable pipe or overhead/ buried power line contact
f) The business unit must have a system in place to prepare or acquire the necessary crossing access/entry and proximity agreements. Also required is receiving and responding appropriately to third party notifications of intent to disturb the ground within 30 metres of a Cenovus-buried facility.

g) A minimum hand-exposed zone of **five (5) metres** must be maintained for regulated pipelines.

h) Cenovus **does not** permit the operation of mechanical equipment within **60 centimetres** (or the distance specified in a foreign crossing agreement) of the exposed facility except under the direct on-site supervision of a Cenovus ground disturbance supervisor or if applicable, under the direct supervision of the owner representative for the foreign facility.

   **Note:** No machine digging within **one (1) metre** of high pressure lines or buried power lines or the distance specified within a foreign crossing agreement.

i) Minimum setback requirements for overhead power lines must be complied with.

j) Provincial One-Call must be notified.

k) Site-specific work plans will be developed for HDD or boring.

l) Excavations must comply with CEN-EHS129 Trenching and Shoring Practice.

m) Business unit area operations will:
   - Determine the need for a risk assessment to determine if a subsidence survey is required to monitor the settlement of adjacent facilities/structures
   - Ensure the Emergency Response Plan (ERP) applies to the worksite

5.0 Ground Disturbance Planning Requirements

5.1 Ground Disturbance Document Package

Prior to starting work, a ground disturbance document package for the job should consist of:

1. Crossing, proximity, access/entry agreements (all those required)
2. Record of notification to One-Call, foreign facility owners, and power line owners
3. All completed field locate records, including pipeline right-of-way (ROW); see Appendix D for details
4. Certificate of titles, the ROW plans, and facility easements
5. Recent pipeline base maps and/or aerial photography
6. Any and all Cenovus records related to the task including as-builts, plot plans, facility maps, engineering drawings, and well/pipeline file records

   **Note:** All information must be verified and checked.

7. Confirmation of third party/pipeline owner/co-op records
8. Material Safety Data Sheet (MSDS) for the expected hazardous substances in the buried facilities
9. Site specific required documentation or requirements (i.e. isolation points, cathodic protection)
10. In the case of trenchless ground disturbances, intended drill paths and access routes; Refer to Section 8.0 for additional information on HDD operations
5.1.1 Ground Disturbance Supervisor Visits the Worksite

The ground disturbance supervisor will visit the site to:

1. Discuss with area operations field personnel who are familiar with the area of the proposed ground disturbance as they may have knowledge of buried facilities not otherwise documented
   
   **Note:** The input by knowledgeable field personnel should not be bypassed under any circumstance and Cenovus personnel are encouraged to develop working relationships with other operating companies in their area

2. Meet with the landowner(s) who may have additional knowledge of buried facilities not documented elsewhere or installed by the landowner themselves

Other ground disturbance activities and landowner/occupant issues for discussion may include:

- Livestock and crops on site
- Access to site and gates
- Ground disturbance work schedule
- Stripped topsoil storage
- Location of gas co-op lines
- Type of locate markers

3. Check for pipeline or underground facility markers on all sides of the work area, ROWs, surrounding ditches and roads

4. Check for visible indicators such as changes in vegetation, land scarring, visible improvements, above-ground facilities, risers, and vents or seismic operations

5. Photograph the access and work area; e-mail it back to the office for inclusion in the job document file and distribute to applicable personnel and equipment operators

6. In the case of trenchless ground disturbances, there may be two different landowners involved with different request that may need to be addressed by the ground disturbance supervisor. Refer to Section 8.0 for additional information on HDD operations

6.0 Ground Disturbance Field Procedures

6.1 Ground Disturbance Pre-job Safety Meeting

Prior to starting the ground disturbance, the ground disturbance supervisor will:

1. Complete the Ground Disturbance Checklist

2. Read and comply with all agreements (crossing/proximity) and Cenovus permits

3. Verify that the field line locates and survey plans agree with the information sources compiled during the planning stage

4. Ensure the “table of crossings” on the survey plan **match** the “line list” on the Surface Acquisition Report

5. Inspect the work and search areas to ensure that all marked lines match the locate plot plan and that they are correctly colour-coded and marked

   **Note:** Any inconsistencies or omissions **must** be resolved before proceeding with the ground disturbance.

6. **Hold a pre-job safety meeting** to review and discuss the permits, the completed ground disturbance checklist(s), and if necessary the work plan for site-specific or trenchless ground disturbances. Ensure all personnel understand their job responsibilities
7. In the case of trenchless ground disturbances, ensure the work/search areas, intended drill path, and access routes are included in all aspects of the pre-job review; refer to Section 8.0 for additional information on HDD operations.

8. Know the location of the isolation points and the procedures to follow in the event of an emergency.

9. If necessary, isolate other sources of energy (e.g. electrical, mechanical, pneumatic, chemical, nuclear, and thermal).

**Note:** Please reference CEN-EHS103 Energy Isolation Practice for more information.

### 6.2 Hand Exposure and Hydrovac Excavation Procedures

1. **A minimum hand-exposed zone of five (5) metres** is required for regulated pipelines, direct bury trunk, and toll fibre optic cables.

2. **Concrete-embedded facilities** must be positively identified for size, direction, and depth before mechanical excavating is permitted.

3. **Minimum exposure requirements** when crossing under existing buried facilities:
   - **Single lines** – one (1) metre on either side to a depth of 30 centimetres below the planned depth of the excavation and ensure the facility is supported.
   - **Multiple lines** – two (2) metres on either side to a depth of 30 centimetres below the planned depth of the excavation and ensure the facility is supported.

4. **Pipelines or buried facilities** will be hand or hydrovac-exposed every five (5) metres (or more frequently if circumstances dictate) to confirm location, depth, and direction.

   **Note:** Hydrovacing is acceptable when it's confirmed by all owners of the buried facilities, including the operating pressure/temperature that will be used, to avoid damaging the buried facilities. The hydrovac work crew must be included in pre-job meetings.

5. **All exposure points or excavations** (including hydrovac holes) must be properly marked and suitably covered or barricaded to prevent injury to personnel or wildlife.

6. **Pipelines or buried facilities** running parallel to an existing buried facility and within the hand-exposed zone must be exposed at regular intervals sufficient to confirm the alignment and depth throughout the planned search/controlled areas.

7. **Buried facilities**
   - **Electrical cables or conduits** must be unearthed, grounded and, where possible, properly isolated.
   - **Pipes/cables/conduits to be cut into or removed** must be unearthed and correctly isolated so that the disconnection is clearly visible at both ends of the facility.

8. **Picks/wrecking bars** are not permitted when hand exposing. Shovels and probes are acceptable for hand exposing provided that they are used as per best practices (i.e., excavating parallel to the facility and exercising caution not to damage the facility).

9. **Portable lighting** may be required to illuminate the trench and work area.

### 6.3 Mechanical Excavation

1. **No mechanical equipment** is allowed within:
   - **60 centimetres** (or the distance specified in a foreign crossing agreement) of the exposed facility except under the direct on-site supervision of a Cenovus ground disturbance supervisor or if applicable, under the direct supervision of the owner representative for the foreign facility.
- **One (1) metre** (or the distance specified in a foreign crossing agreement) when the excavation is complex, or it involves multiple buried facilities, or includes a high pressure line

- **One (1) metre** (or the distance specified in a foreign crossing agreement) of a buried power line

2. A **competent swamper** must be present to assist the equipment operator

### 6.4 Ground Disturbance Working Conditions or Scope Changes

The ground disturbance supervisor will continuously monitor the work.

Any changes in working conditions or work scope will result in the immediate suspension of the SWP. Upon suspension, all work associated with that permit must stop. A hazard assessment is required to evaluate the changes for new hazards and the appropriate hazard controls must be implemented. Depending on the work change, a new SWP and ground disturbance checklist may be required.

### 6.5 Trenching and Shoring

Workers must be protected from cave-ins in trenches that are more than 1.2 metres in depth and the trench is narrower than its depth. The ground disturbance supervisor will comply with Cenovus’s CEN-EHS129 Trenching and Shoring Practice that requires:

1. In trenches 1.2 metres deep, adequate means of entry and exit must be provided; a ladder, a ramp, or steps are to be **no more** than eight (8) metres away from the worker

   **In Saskatchewan**, a Safety Watch is required for trenches more than 1.2 metres deep

2. **Atmospheric monitoring** must be performed in excavations greater than 1.2 metres deep, during hot work and where a potential exists for a hazardous atmosphere. The SWP Issuer will decide if it’s a confined space.

3. **Barricades or appropriate fencing** is a legal requirement and must be installed around open trenches to protect livestock, workers, and the public. This includes open hydrovac holes which must be fenced or covered

4. **Fall protection and lifelines** may be required for deep trenches

5. **Temporary lighting** other than barricades equipped with flashing lights will be determined by the SWP Issuer conducting a risk assessment

6. **Where a live pipeline, open trench, power line or bore** is left exposed, a risk assessment will be conducted by the SWP Issuer to determine the need for a security presence

#### 6.5.1 Temporary Bridges and Crossing Points

- **Bridges for vehicles** crossing over the trench will consist of laying steel plates/rig mats of adequate thickness approved by area operations or the facility owner.

- **Crossing points for workers and the public** will be constructed with guardrails and toe boards according to Alberta and Saskatchewan government regulations.

### 6.6 Overhead Hazards

1. Work and/or equipment operation is not permitted within seven (7) metres of an energized overhead power line without first contacting the power line owner/operator to obtain the voltage of the overhead power line and safe limit of approach.

2. The excavation must not reduce the original support provided for power line poles.
3. Overhead power line signs shall be placed 10 metres on either side of the overhead power line in plain view of those travelling in either direction under the lines. Signage must state the line voltage and the clearance required.

4. For work that may be conducted within seven (7) metres of an overhead power line or involve a load being transported under a overhead power line that has a total height of greater than 4.15 metres will require the use of a Overhead Power Line Encroachment Permit (CEN751).

Note: Refer to CEN-EHS2837 Overhead Power Line Encroachment Practice for more information.

6.7 Contacting an Underground Facility

If contact is made with an underground facility, the ground disturbance supervisor must immediately:

1. **Stop** the ground disturbance and, if necessary, activate the ERP
2. **Inspect** the pipe (includes coating) or buried facility for contact damage
3. **Order** an emergency locate
4. **Follow** all Cenovus reporting procedures for all facility contacts

Note: The ground disturbance cannot be started again without the approval of Cenovus and/or the owner of the damaged facility. Area Operations will ensure all business units and initial regulatory reporting requirements and procedures are followed and documented.

6.8 Backfilling

Prior to backfilling, Cenovus requires that a field mark-up drawing or equivalent be prepared that shows the location of the newly installed facilities and all encountered pre-existing underground facilities (photograph/sketches are acceptable). Sketches can be completed on Buried Facility Locate/As-Built Drawing Form (CEN750). A Cenovus ground disturbance supervisor or representative will:

1. Inspect the work (check the crossing agreement)
2. Photograph or video the open excavation and condition of exposed pipe/conduit
3. Complete Cenovus's Backfill Inspection Report (CEN214). The original ground cover over the buried facility must **not** be reduced.
4. If a third party pipeline was exposed, notify the owner a minimum of 24 hours prior to backfilling. Log the date and time of notification on the Backfill Inspection Report.
5. Remove all locate stakes/flags and photograph the work area after backfilling

7.0 Third Party Ground Disturbances

In situations where a third party (i.e., another company or landowner) seeks to cross a Cenovus underground facility, the appropriate Cenovus contract team must be notified to ensure that the proper agreements and requirements are established with the third party.

- Inside of the Cold Lake Air Weapons Range, contact Regulatory Environmental Applications
- Outside of the Cold Lake Air Weapons Range, contact Surface Land Asset Management

Note: Contact with either Cenovus team should be initiated by the Operations team who normally manages or is responsible for the facility in question.
A third party agreement may include:

a) Issuing crossing/proximity agreements, which cannot be revised in the field
b) Providing pipeline information within the 30-metre search or controlled area.
c) Providing any assistance the third party may reasonably require to enable compliance with regulatory requirements
d) Ensuring that a competent locator identifies and correctly marks the location and horizontal alignment of the pipeline at no charge to the third party
e) Ensuring that the locate provided is documented and a copy of the Locate Plot Plan or Locate Slip is provided to the third party
f) Inspecting the site before the commencement of a ground disturbance to ensure that the locating and marking has been done correctly, if the locating and marking has been done by someone other than a Cenovus representative.

Additional requirements may include:

g) Carrying out daily inspections of any area of construction activity that is in close proximity to a Cenovus pipeline ROW or facility, and a continuous inspection of any area of construction activity that is occurring on a Cenovus pipeline ROW or facility which may affect the safety of the pipeline or facility
h) Ensuring heavy equipment is not moving across, resting, or working over Cenovus-buried facilities unless stipulated otherwise in the agreements
i) Inspecting and photographing and/or videotaping the exposed facility prior to backfill to ensure that no damage has occurred
j) Notifying business unit Area Operations and, if necessary, the appropriate regulatory agency of any damage to a Cenovus pipeline or its protective coating
k) Ensuring backfill methods/equipment usage is as specified and the ground cover over the Cenovus buried facility is not reduced

8.0 Horizontal Directional Drilling (HDD) for Pipelines

Horizontal directional drilling or guided boring is a trenchless method used for installing pipes and casings under streams, wetlands, roads, railways, and other surface improvements to prevent traffic disruption and surface or environmental damage; see Appendix E for HDD diagrams. The ground disturbance supervisor will prepare the work areas for the contractor’s equipment.

The additional hazards associated with HDD include:

- Contact with a buried power line
- Rupturing gas lines causing the drill bore to become pressurized with gas that may cause explosion and fire to flash back to the equipment operators
- Dust being created by the boring equipment
- Loss of drilling mud from the circulation system (loss of returns)
- Collapse of the hole and subsidence occurring or water entering the bore hole
- Stuck drill stem, lost tools, damaged pipe or coating
- Incident on the obstruction (i.e., road) that enters or affects the work area

In addition to HDD, other types of trenchless technology include:

- Pipe jacking – Primarily used to install large diameter concrete sectional pipe
- Pipe ramming – When ground conditions (pit run, cobble, wet sand) are bad
The HDD process is typically comprised of the following four steps:

1. Pre-job planning, hazard assessment, permits/agreements, and safety meetings for the work/search areas. Same requirements as for trenched excavations
2. Drilling a pilot hole that is tracked along the drill path to the exit point
3. If necessary, expanding the diameter of the pilot hole by reaming back
4. Pulling the pre-fabricated pipe back to the entry point

**Note:** Diagrams of the HDD process are found in Appendix E.

**Minimum exposure requirements** when crossing under existing buried facilities:

- **Single lines** – one (1) metre on either side to a depth of 30 centimetres below the planned depth of the excavation and ensure the facility is supported
- **Multiple lines** – two (2) metres on either side to a depth of 30 centimetres below the planned depth of the excavation and ensure the facility is supported

**Additional ground disturbance considerations and requirements include:**

a) A work plan submitted by the HDD contractor to execute the project must include an alternative crossing method, should the primary method fail. Switching to an alternate method **cancels** the ground disturbance checklist; refer to Section 6.4 for details.

b) Ensuring the work area at the entry point is large enough to accommodate the drill rig, HDD supporting equipment and supplies

c) Ensuring the pipe string fabrication side (usually the exit side) is large enough to accommodate the mud tanks, welders, pipe coating/testing equipment, side booms, and other boring support equipment such as cranes

**Note:** The work area must be large enough to compensate for a deviation of the bore or an alternate boring method requiring a realignment of the pipe string and its fabrication equipment, the boring support equipment, and temporary berms.

d) Global positioning (GPS) of the line locate and the two work areas may be appropriate in some cases

e) Ensuring adequate center line profiles and cross-sections are surveyed

f) Additional federal/provincial permits may be required when boring under water and wetlands. Input from Cenovus’s environment department will be required

g) Ground disturbance pre-job procedures that must address:

- The positioning of the boring machine’s anchors
- Temporary berms necessary to retain spills and groundwater seepage
- Temporary lighting and security by conducting a risk assessment

**Note:** The business unit will identify the responsibilities of the ground disturbance supervisor during HDD operations including ground disturbance supervision at both entry and exit points.
9.0 Site-Specific or Generic Procedures

Where the ground disturbance cannot be completed within the confines of this practice and/or is too complex (involves multiple pipelines and/or associated buried facilities in the work area), a site-specific procedure or work plan must be written and approved by the business unit and, where applicable, by other provincial regulatory agencies. These site-specific procedures may, by necessity, apply only to specific locations and will only be used on that basis.

Any generic procedure(s) created to address repetitive work also requires approval by the business unit and, where applicable, by other provincial regulatory agencies.

10.0 Training, Competency Requirements, and Responsibilities

10.1 Level of Training

1. Cenovus Ground Disturbance Awareness

The Cenovus Ground Disturbance Awareness course is an interactive eLearning module that is available within the Learning Management System (LMS). It is intended to deliver basic awareness on ground disturbance, while providing the participant with the knowledge to accurately identify common worksite activities that may be considered a ground disturbance.

Note: This training is not suitable for workers who are involved in any ground disturbance activities. All workers involved in ground disturbance activities must hold a valid training certificate that aligns with standards outlined below.

2. Ground Disturbance Hazard Awareness (also known as 101 or Level 1)

This course is required for anyone who is involved in any type of ground disturbance activity, excluding supervision. Participants with this level of training must always be working under the direct supervision and guidance of a supervisor who has a valid supervisory certificate. The course is required to be compliant with the course specifications outlined within the Alberta Common Ground Alliance (ABCGA) Standard 101.

3. Ground Disturbance Supervisory (also known as 201 or Level 2)

This course is required for planners, managers, and supervisors who are involved in the planning, managing, and supervision of any kind of ground disturbance activity. The course is required to be compliant with course specifications outlined within the ABCGA Standard 201.

Note: All Cenovus and contract staff who are involved in any ground disturbance activities are required to possess a valid training certificate from a course provider that is endorsed by ABCGA. An ABCGA endorsement signifies that the course meets or exceeds the requirements set forth in the applicable ABCGA standards. All other ground training certificates for ground disturbance are not recognized on a Cenovus worksite. In addition to a valid ABCGA training certificate, the worker is required to have a copy of the Cenovus Ground Disturbance Handbook.

10.2 Training Requirements

Cenovus field based personnel who are not involved in any form of ground disturbance activities are still encouraged to take the Cenovus Ground Disturbance Awareness eLearning. This training is intended to provide the basic awareness on the ground disturbance topic so that they can identify activities or tasks that may be deemed ground disturbance.
The following training requirements apply to all staff involved in a ground disturbance activity.

**Non-Supervisory Cenovus Personnel**
- Completed Cenovus Ground Disturbance Awareness eLearning within LMS
- A copy of the Ground Disturbance Handbook with it readily available while conducting ground disturbance activities
- A valid ABCGA approved Level 1 (101) or Level 2 (201) training certificate

**Non-Supervisory Contractor Personnel**
- A copy of the Ground Disturbance Handbook with it readily available while conducting ground disturbance activities
- A valid ABCGA approved Level 1 (101) or Level 2 (201) training certificate

**Supervisory Cenovus Personnel**
- Completed Cenovus Ground Disturbance Awareness eLearning within LMS
- A copy of the Ground disturbance handbook with it readily available while conducting ground disturbance activities
- A valid ABCGA approved Level 2 (201) training certificate

**Supervisory Contractor Personnel**
- A copy of the Ground Disturbance Handbook readily available while conducting ground disturbance activities
- A valid ABCGA approved Level 2 (201) training certificate

**11.0 Roles and Responsibilities**

Roles and responsibilities for EH&S documents are described in the link below:

Cenovus CEN-EHS234, Roles and Responsibilities Standard

**12.0 Governing and Reference Documents**

**12.1 Governance**

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12.2 Internal References

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<td>CEN019</td>
<td>Ground Disturbance Checklist (form)</td>
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<td>CEN750</td>
<td>Buried Facility Locate/As-Built Drawing (form)</td>
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12.3 External References

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<tr>
<td>Enform</td>
<td>IRP 17, Ground Disturbance and Damage Prevention (2009)</td>
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<tr>
<td>CAPP</td>
<td>Planning Horizontal Directional Drilling for Pipelines (2004)</td>
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<td>Alberta OHS</td>
<td>Explanation Guides for Parts 2 and 32</td>
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<td>Safety in Excavations and Trenches (1998)</td>
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<td>ABCGA</td>
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13.0 Change Management

Proposed changes to this practice can be directed to EH&S Document Management

14.0 Definitions and Acronyms

Definitions and acronyms for safety documents are described in the link below:

Cenovus CEN-EHS243, Definitions and Acronyms

Definitions and acronyms specific to the CEN-EHS184 Ground Disturbance Practice are described below:

**ABCGA** means Alberta Common Ground Alliance

**Buried facility** means anything below ground (underground) used in the collection, storage, transmission or distribution of: water, storm water, sewage, electronic, telephonic or telegraphic communications, cable television, electrical energy, oil, natural gas, steam, petroleum products, chemicals, and other substances and includes but is not limited to: pipes, conduits, ducts, wire, valves, manholes, catch basins, and attachments to these items.
Concrete-embedded means facilities which are encased in concrete and partially or completely buried.

Contractor means a company, partnership, or unincorporated proprietorship hired by Cenovus to perform a specified task or job.

Competent means a person who is adequately qualified, suitably trained, and sufficiently experienced to complete a defined procedure or task. With respect to ground disturbance activities, this means a person who is familiar with the intent of applicable ground disturbance legislation, is knowledgeable of the potential risk to health or safety surrounding ground disturbance activities, and is aware of the means to control or eliminate the hazards while performing a ground disturbance.

Crossing Agreement means a written and executed document issued in advance of any ground disturbance to be undertaken by a third party within a right-of-way (ROW) or within 5 metres of a pipeline where there is no ROW. The term “crossing agreement” does not necessarily imply that a pipeline or ROW will be crossed.

Field level hazard assessment means a function of steps which identifies hazards related to specific task and provides measures to reduce the risk of exposure by eliminating or effectively controlling the hazard.

Ground disturbance is any work, operation, or activity that results in a disturbance of the earth; this includes, without limitation: surveying, excavating, digging, trenching, plowing, rig anchor installation, drilling, tunnelling, auguring, backfilling, blasting, topsoil stripping, land levelling, peat removing, quarrying, clearing, grading, pounding a ground rod, fencing, and hydrovacing for the purpose of excavation.

Ground Disturbance Checklist means a Cenovus document utilized to help ensure correct ground disturbance procedures will be followed and provide written approval to conduct the ground disturbance. The Cenovus Ground Disturbance Checklist is intended to be used as verification that all of the pre-disturbance tasks have been completed prior to work commencing.

Ground disturbance supervisor means any Cenovus employee, contractor, or consultant authorized by Cenovus and deemed competent by training, experience, and certification and who ensures ground disturbance activities are completed in strict conformance with all Cenovus and regulatory requirements.

Hand exposure means the exposure of an underground facility, whose location has been marked, using non-destructive exaction techniques acceptable to Cenovus or the owner of a third party facility to the extent that its identity, location, and alignment can be confirmed. Buried facilities must be hand exposed before mechanical excavation equipment is used within the exposure zone.

Hand-exposure zone means the work area plus an area extending 5 metres in all directions from the work area. Cenovus requires that all underground facilities within the hand-exposure zone be hand exposed.

HDD means horizontal directional drilling

Hot Work Safe Work Permit means a Safe Work Permit that is used strictly for work that either involves equipment or activities that have the potential to ignite flammable or explosive vapours or material.

Hydrovacing is the use of pressurized water to loosen and a vacuum to extract soil. Cenovus accepts hydrovacing as an acceptable method of hand exposing underground pipelines whose locations have been marked. Third party owners of other types of underground facilities may allow hydrovacing as a method of exposing their
underground facilities under certain conditions such as certification of operators, maximum pressure, maximum temperature, or type of nozzle. Hydrovacing in the vicinity of buried facilities without locates, constitutes a ground disturbance with mechanical excavation equipment.

**MSDS** means material safety data sheet

**NEB** means National Energy Board

**Oxygen deficient atmosphere** means an atmosphere where the oxygen content is less than 18kPa (3 psi) partial pressure or less than 19.5% oxygen by volume.

**Proximity Agreement** allows a party to create a ground disturbance within a 30-metre proximity of the owner’s buried facility. In some instances an agreement may be required by the buried facility owner. This agreement is very similar to a crossing agreement but removes the confusion of the term “crossing”. This notification and/or agreement is also utilized for providing direction and specifications for ground disturbances that are not related to installing a buried facility.

**Right-of-Access Agreement** means a written approval that provides the terms and conditions for entry into property not owned by the party creating the ground disturbance; could apply to land, a right-of-way (ROW) owned by a company, a county road, ditch, etc. It is common to have several right-of-access agreements.

**Right-of-Entry Agreement** means a written approval that provides specific directions as to when, where, and how the party creating the ground disturbance can access the ground disturbance site; in many companies, right of entry and right of access are addressed in a single document.

**Safe Work Permit Issuer** means a person who has the understanding of the intended work scope and is authorized to permit work for their area of responsibility.

**Search area** means an area extending 30 metres in all directions surrounding the work area. Cenovus requires that all underground facilities within the search area be located, identified, and marked prior to undertaking a ground disturbance. If, during the course of a ground disturbance, the limits of the work area increase, the 30-metre search area will also expand to match that increase. A 30-metre undisturbed area will be maintained between the perimeter of the work area and the search area.

**Swamper** means a general assistant or helper. May also be referred to as a spotter depending upon the activity.

**Record** means a physical or electronic media which is created or received in the course of Cenovus operational activities and provides.

**Third Party Underground Facility** means any underground facility that is owned by someone other than Cenovus.

**Work Area** means the physical surface location where the ground will be disturbed. The size and shape of the work area will be site and activity dependent.

**Worksite** means the general location where a ground disturbance activity is to occur. A worksite may be a facility, lease/well site, pipeline right-of-way (ROW) or a portion there of.
Appendix A – Ground Disturbance Process Flow Chart

**Office Procedures**

1. Ground Disturbance Pre-Job Planning Initiated and Agreements Issued
2. Owner Notification
3. Collect all Information Within the 30-Metre Search/Controlled Area
4. Cert. of Title and Legal Survey Plans
5. Pipeline Base Maps
6. Cenovus As-Builts, and Facility Plans (ID Isolation Points)
7. Municipal/Rural Utility Maps
8. Order a Line Locate and Survey of Buried Facilities and ROWs
9. Contact Power Line Owner
10. Discussion with Area Operations Personnel
11. Discussion with Landowner
12. Look for Pipeline Signage
13. Look for Visible Indicators

**Field Procedures**

1. On-site Observations by the Ground Disturbance Supervisor
2. GD Document Package to Include the Above Information and the Crossing Agreements
3. Prior to Starting the Ground Disturbance For Boring Operations Complete These Steps for “Two” Work/Search Areas
   - Expose the Buried Facility according to the approved procedure
   - Mechanical Excavation Must Not be Used Within 60 cm of the Buried Facility (Check the Crossing Agreement for Restrictions)

**Third Party Ground Disturbance**

1. Cenovus Ground Disturbance (Business Unit Designates Ground Disturbance Supervisor)
2. Crossing or Proximity Agreements are Issued
3. Companies That are Not Registered with One-Call
4. One-Call Centre AB or SK
5. Order a Line Locate of Buried Facilities
6. Provide Ground Disturber With all Reasonable Information Within the 30-Metre Search or Controlled Area
7. No Inconsistencies or Omissions Permitted!

**GD Supervisor, Work Crew, and Equipment Mobilize**

1. Review the Crossing/Proximity Agreements and Check for Restrictions
2. Obtain/Complete the Hazard Assessment, Safe Work Permit, and GD Checklist Hold Safety Meeting
3. Confirmation of Line Locate with Plot Plan, Maps and Line Location List in Work/Search Areas
4. Confirmation of Line Locate and Agreement by Cenovus Representative
5. Boring Operation?
   - Yes: Initiate Contact Procedures and Order an Emergency Locate
   - No: Complete Backfill Inspection
7. Hand and/or Hydrovac Exposure
8. Mechanical Excavation or HDD/Boring
9. Contact with Buried Facility?
   - Yes: Complete Backfill Inspection
   - No: Mechanical Excavation or HDD/Boring

**Important Note:** The GD Supervisor will continuously monitor the work and if conditions or the scope changes a new hazard assessment, GD Checklist and safety meeting are required. Contact Area Operations and discuss the impact on issued permits (i.e., Safe Work Permit and Concurrent Operations Permit) and agreements.
Appendix B – Work Area and the 30-Metre Search/Controlled Areas

When proposing to undertake a ground disturbance, precautions must be taken to ascertain whether or not a pipeline or buried facility exists in the area before commencing any work, operation, or activity. It is the responsibility of the ground disturbance supervisor to determine what facilities exist within the following:

a) The **work area** is defined by the scope of work and the physical geographical area that is being disturbed and will change at each site as no two ground disturbances are exactly the same size.

b) The **search area** extends 30 metres from the edge of the work area. No ground disturbance takes place in the search area.

**In the case of pipelines:**

The **controlled area** is a strip of land 30 metres wide on each side of a **pipeline or buried facility**, or the distance from the pipeline to the edge of the right-of-way (ROW), whichever is the wider.

In this diagram where the pipe is centered in the ROW, the “controlled area” equals the “search area.”

**Important Note:** The “search area” and the “controlled area” are often confused. The search area is used in the context of a generic work area, while the term “controlled area” is used when there is a known pipeline as referenced in the Alberta Pipeline Regulation, Section 1(3).

For pipelines regulated by the National Energy Board (NEB), the search and control area’s may be different. For more information, please reference the following URL:

Appendix C – Ground Disturbance Stakeholders

Ground disturbance activities
(i.e. drilling, boring, digging, fencing, etc.)

- Cenovus or foreign facility owners
- Alberta, Saskatchewan or Federal
- Contractor personnel
- Government regulations
- Information sources
- Locations
- Landowners, renters and government
- Cenovus Ground Disturbance Supervisor and consultants
- Work crews, equipment operators, hydrovac operators, etc.
- Cenovus personnel
- Facility or project owners

- » Alberta or Saskatchewan one-call system
  » Surveyors
  » Locators
- » Land titles
  » Maps, survey plans, as-builds
  » Various Cenovus records
  » Utility company records
  » Work area searches/inspections
  » Consultation with landowners
  » Consultation with foreign facility owners
- Cenovus operations foreign facilities, government
Appendix D – Line Locate and Marking of Buried Facilities

All known pipelines and utilities (includes concrete-embedded structures) as recorded on the construction survey plans, as-built and pre-job planning searches that pass within the 30 metre search or controlled areas must be located and staked to indicate location alignment, line size, and where possible, the approximate depth. The results of the line locate must be recorded on the Locate Plot Plan.

1. General Instructions: It is mandatory that each worksite has two independent sweeps conducted. The parties (i.e., One-Call and survey/line locate company) locating the buried facilities should plant a series of markers that meet the following requirements:

a) Conduct blind searches according to the locator manufacturer’s specifications on sweeping (active) induction mode locating; two people will conduct the search which must include at least four separate grid pattern sweeps at different angles (0º, 90º, 45º, and 135º) of the search area

Note: Circle sweeps conducted by one operator in lieu of a proper blind sweep are not acceptable.

b) To be spaced not more than five (5) metres (or paces) apart or, where pipe follows a curve or there is a bend, the markers should be spaced so that the alignment is clearly visible

c) Mark and identify all buried facilities and ROW within 30 metres of the work area; see Appendix B

d) Mark the limits of the job site with white flags (use black in winter)

e) Use the colour-code scheme used by the One-Call System for the markers and indicate the owner’s name, line size and, where possible, the approximate depth in metres.

f) Clearly mark the owner’s name on each pipeline marker. This is critical at the point where the facility is to be exposed by hand

g) Clearly identify the overhead power lines that encroach upon the proposed work area. Clearance distances must be maintained at all times

h) Ensure that in addition to normal locate practices, an inductive source method is utilized where possible to trace, locate, and mark any piping that can be reasonably expected to be within the 30-metre search/controlled area of the proposed ground disturbance

Note: This method can be utilized when there is a tracer wire on an exposed section of the pipe

i) If the activities of the ground disturbance will destroy locate marks, establish offset marks that can be maintained during the ground disturbance

Note: Ground disturbance supervisor approval (according to business unit procedures) is required before replacing markers that are inadvertently knocked over. If there is any doubt as to the original location of the marker, a new locate must be requested by the party creating the ground disturbance from the owner of the buried facility.

j) Locates are valid for a maximum of 14 calendar days in Alberta and 10 working days in Saskatchewan

k) The line locator is to acknowledge on locate sketch confirmation of calibration as per the manufacturers owner’s manual
2. Provincial One-Call Centre Listings

The following provinces have a One-Call centre that should be called whenever a ground disturbance is undertaken:

a) Alberta One-Call Corporation

**Toll Free Number:** 1-800-242-3447

Fax Notification:........1-800-940-3447

Online Locate Request is available by going to [http://www.alberta1call.com/](http://www.alberta1call.com/)

**Notice:** ................Two full working days

**If your locate is an Emergency or Priority request,** you must call Alberta One-Call directly at **1-800-242-3447** and speak with a Customer Service Representative.

**For all other inquiries:**

Alberta One-Call operates 8 a.m. to 5 p.m. Monday to Friday and is closed on weekends and holidays. Locate requests can be e-mailed 24 hours a day.

E-mails received after hours will be processed the next business day.

b) Saskatchewan First-Call Corporation

**Toll Free Number:** 1-866-828-4888

Fax Notification:........1-866-455-5559

Online Locate Request is available by going to [http://www.sask1stcall.com](http://www.sask1stcall.com)

**Notice:** ................Two full working days

**If your locate is an Emergency or Priority request,** you must call Saskatchewan 1st Call directly at **1-866-828-4888** and speak with a Customer Service Representative.

**For all other inquiries:**

Saskatchewan 1st Call operates 8 a.m. to 7 p.m. Monday to Friday and is closed on weekends and holidays. Locate requests can be e-mailed 24 hours a day.

E-mails received after hours will be processed the next business day.

3. GPS positioning and photographing/video of the line locate: There may be some situations where GPS positioning is required such as for boring across an obstruction where two work areas are required. The ground disturbance supervisor may also need to have the work area photographed prior to excavating or boring.

4. Exemptions for farmland, forested areas, wetlands, and production facilities: Should parts of the 30-metre search area be in locations where it’s not practical or possible to conduct the line locate and there is no intention to excavate near these locations, then an exception is permitted (third party approval is required) under the following conditions:

a) All drawings and records indicate there are no buried facilities in or near those areas. Most enclosed production facilities would be exempt for work outside the facility.

b) One-Call has been contacted and has no record of buried facilities in the area
c) The exemption has been reviewed by the designated ground disturbance supervisor, area operations, and the exception is recorded in the permits and sketched on the applicable drawings.

5. **Buried or concrete-embedded facilities:** The use of as-built drawings for the location of buried or concrete-embedded facilities is permitted, if:

a) The work does not require excavation or removal of the soil, ground, or existing concrete,

b) The ground is penetrated to a depth of one (1) metre or less or the existing concrete is penetrated to a depth of 15 centimetres or less, and

c) The as-built record drawings must be certified by the owner of the buried or concrete-embedded facility as the most current drawings of record that indicate the constructed location of the buried or concrete-embedded facility.

6. **Parallel line identification:** Where a proposed ground disturbance will be parallel to an existing buried facility and within the hand exposure zone, the buried facility shall be exposed at intervals as set out by the owners of the buried facility in the crossing or proximity agreement.

7. **Repetitive work on leases (within 14 days):** The one-call requirement may be waived if the lease maps are certified current and accurate by the ground disturbance supervisor that all underground facilities are identified. All other requirements of the practice will apply. Copies of the certification must be maintained on the pipeline license and/or in the well file. Use of permanent anchors for rigs is encouraged.

8. **Types of markers and colour codes:** Environmental, weather, livestock, safety, and site conditions should be considered when selecting an appropriate marker. Some examples of markers include:

- Wire pin flags
- Biodegradable pin flags
- Coloured paint or chalk
- UV (sunlight) sensitive paint
- Wooden lathe
- Stake chasers (fibre clusters)

a) Exceptions can be made if the colour code causes confusion. For example, at a plant site, there might be 12 lines that would need to be flagged with the same colour. To avoid confusion and to increase the safety factor, a site-specific colour code may be implemented.

b) Markers should be of a material and type that is acceptable to all parties involved or affected by the ground disturbance. Paint and wire pin flags can fall into dispute due to the real and potential impacts on the surrounding land and livestock. Locators are encouraged to use chalk-based paint as the marks are intended to be temporary.
9. **Colour codes for marking buried facilities:** The marking of buried facilities in Alberta and Saskatchewan follow the Uniform Colour Code:

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<tr>
<th>Limits of proposed excavation*</th>
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<tr>
<td>Temporary survey markings</td>
<td>Pink</td>
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<tr>
<td>Electrical power lines, cables, conduits, and ducts or lighting wires and cables</td>
<td>Red</td>
</tr>
<tr>
<td>Gas, oil, petroleum, steam, or gaseous material</td>
<td>Yellow</td>
</tr>
<tr>
<td>Telephone, communications, cable TV, alarm or signal lines, wires, cable conduits or ducts</td>
<td>Orange</td>
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<tr>
<td>Water lines or pipes</td>
<td>Blue</td>
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<td>Sanitary sewer, storm sewer, culvert or drain lines</td>
<td>Green</td>
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<tr>
<td>Irrigation, reclaimed water, slurry lines or pipes</td>
<td>Purple</td>
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*The person proposing the ground disturbance is encouraged to mark the limits of job sites with white flags. Stakes or paint may be used to provide the locators and project personnel with an accurate understanding of the proposed construction area. In winter conditions, black may be used rather than white.

Examples of locate marks for different buried facilities

- Red
- Orange
- Yellow

10. **Hand expose zones:** The hand expose zones in the above One-Call diagram are:

- **Five (5) metres for all underground facilities**

**Caution:** Electronic locating equipment locates the presence of electromagnetic signals but has limitations. It is not a 100% accurate tool for pipe and utilities location, no matter what the level of training or the quality of equipment.
Appendix E – Horizontal Directional Drilling (HDD) for Pipelines

1. Drilling the Pilot Hole

2. Reaming the Pilot Hole

3. Pipe String Pullback

Aerial View of Equipment Layout

<table>
<thead>
<tr>
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<th>Fabrication Side</th>
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<td>Entry Point</td>
<td>Exit Point</td>
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<tr>
<td>Pipe Trailer</td>
<td>Pipe Roller</td>
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<tr>
<td>Obstacle such as a road or watercourse</td>
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