



Enterprise
Products



ENCROACHMENT GUIDELINES





ENCROACHMENT GUIDELINES

Enterprise Products Partners L.P.

Introduction & Definitions 3

What to Do4-5

What to Look For 6

What to Send..... 7

What to Expect/Crossing Types

 Excavation Activities 8

 General Excavation Guidelines 8

 State Tolerance Zones 8-9

 Structures, Fencing & Landscape Activities..... 10-11

 Roadways, Driveways, Sidewalks & Parking Lots 12

 Construction Equipment & Large Vehicle Crossings..... 13

 Foreign Pipelines & Utility Crossings 14-15

 Waterway Crossings 16-17

 Railroad Crossings..... 16-17

 Vibrations 18-19

 Seismic Surveying 20-21

 Blasting 22

 Conclusion..... 23

Introduction

Enterprise Products Partners L.P. and related entities (Enterprise) has over 50,000 miles of pipeline in more than 27 states. Enterprise pipelines transport a variety of products under pressure such as natural gas, natural gas liquids (NGLs), liquefied petroleum gas (LPG), crude oil and refined petroleum products. As a pipeline owner, operator and your neighbor, Enterprise is committed to safely operating its pipelines.

This publication identifies common encroachments and provides general guidelines on the standards and procedures to be followed by you when planning land use, development or construction activities in the vicinity of a pipeline right-of-way.

Definitions

- **Encroachment** – An improvement, structure, or any activity that (a) intrudes on another’s property or (b) adversely affects the rights of an interest holder in the property.
- **Right-of-Way or Rights-of-Way** – The right to pass across the land, property or interest in land or property of another for transportation purposes (e.g., roads, public transport, utilities, etc.).

This Publication is Intended for Use By

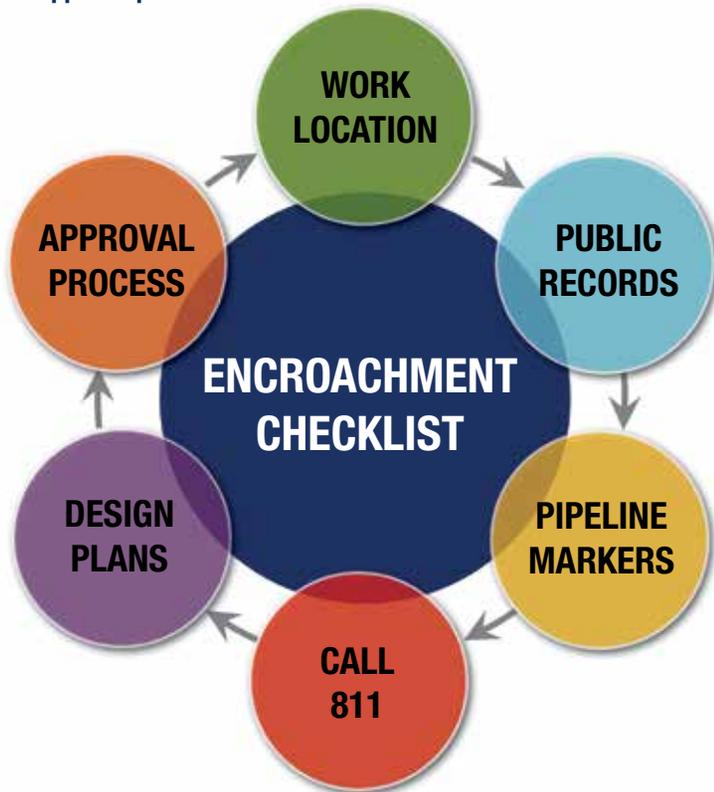
- Landowners
- Developers
- Contractors
- Anyone involved in land development near Enterprise pipeline systems
- Utility owners
- Engineers
- Land surveyors

Common Encroachments on Pipeline Rights-of-Way Include

- Foreign utilities/crossings including electrical and communication cables
- Installing fence posts, patios and decks
- Landscaping
- Building or maintaining roads, driveways, sidewalks and parking areas
- Railroads and Waterway Crossings
- Construction Equipment & Large Truck Crossings
- Surface grade or elevation changes or any activity that will result in the removal of soil from the surface of the right-of-way

Encroachment Checklist

- ✓ Identify the work location.
- ✓ Search county public records for pipeline easements.
- ✓ Look for any Enterprise Products pipeline markers in the vicinity of the work location.
- ✓ Place a One-Call to 811 at least two working days before excavation is scheduled to begin (some states may require 72 hours before excavation). Wait the required amount of time for the lines to be marked (48-72 hours, depending on the state regulations). Respect the line markers.
- ✓ Design your plans using this Encroachment Brochure to help guide your decisions.
- ✓ Submit your plans to the Land Encroachment Group and begin the approval process.



811: How it Works

- One easy phone call to 811 prior to digging, starts the process of getting underground utility lines marked for free.
- When calling 811 from anywhere in the country, a representative from the appropriate state One-Call Center will answer the call to find out the location and description of the digging site and will notify affected utility companies, who will then send a professional locator to identify and mark the approximate location of lines within 48-72 hours of the call (depending on the state regulations).
- Once underground lines have been marked, callers will know the approximate location of utility lines.
- Please visit www.call811.com in the "state specific" area of the website for more information about the local One-Call Centers across the country.

**ALWAYS
CALL
BEFORE YOU
DIG**

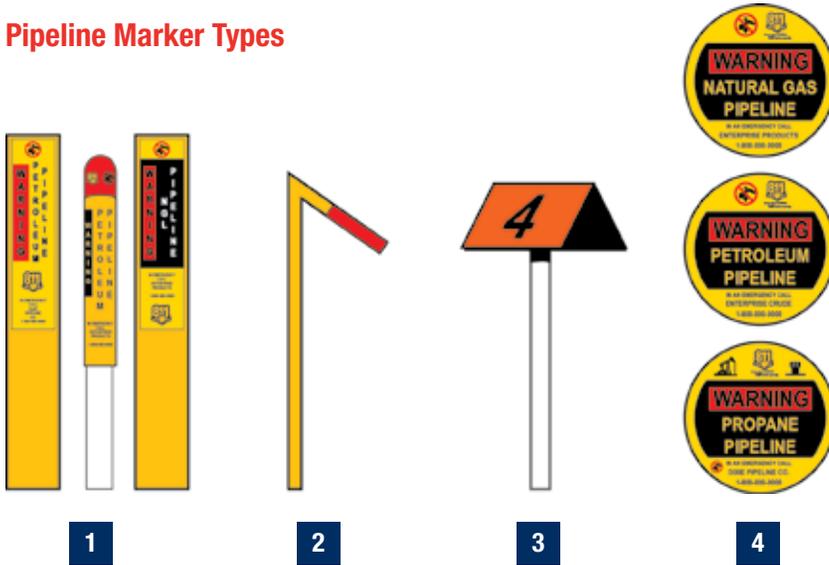


One free, easy call gets your utility lines marked AND helps protect you from injury and expense.

Know what's below. Always call 811 before you dig.
Visit call811.com for more information.



Pipeline Marker Types



- 1 Painted Metal or Plastic Posts
- 2 Pipeline Casing Vent
- 3 Marker for Pipeline Patrol Plane
- 4 Signs located near Roads, Railroads, and along Pipeline Rights-of-Way

Pipeline markers are limited in the information they provide. Markers are placed near pipelines, but not necessarily on top of them. Marker signs do not provide information on the exact location, depth, diameter or number of pipelines they mark. In addition, a pipeline may not follow a straight line between adjacent markers.

What does a pipeline marker tell you?

By law, a pipeline marker must provide the approximate location of a pipeline(s), identify the material transported, identify the pipeline operator, and the operator's 24-hour emergency telephone number.

It is a federal crime to remove or deface a pipeline marker sign.

Pipeline marker signs such as those pictured above are important to public safety. They are so important, in fact, that in 1988 Congress passed a law making it a federal crime to willfully deface, damage, remove or destroy any pipeline sign or right-of-way marker that is required by federal law (49CFR 190.229(d)).

Enterprise Encroachment Notification

This list of common encroachments is not exhaustive – each situation should be independently evaluated. Therefore, when planning any type of activity that could encroach on Enterprise's pipeline rights-of-way, notify the Land Encroachment Group for approval before construction takes place:

- Mail/Courier:** Enterprise Products
Attn: Land Encroachments Group
PO Box 4324
Houston, TX 77210
- Email:** Land_Encroachments@eprod.com
- Toll Free:** 866-901-8170
- Fax:** 281-887-7390
- Web Page:** www.EnterpriseEncroachments.com

What to Include in Your Notification

- **Description of Project**
- **Map of Project Location:** Include geographical references such as legal description, physical address, nearby major road intersections, and/or latitude-longitude coordinates.
- **Plans and Profiles:** Include detailed construction/development plans, including pipeline location, existing and proposed surface elevations and pipeline depth.
- **Name and Contact Information**

Enterprise will review the material submitted and may contact you to discuss the project, if needed. The time required to conduct our review varies based upon the nature of the proposed encroachment, the proximity to our pipeline assets, and the amount and quality of details and information in the plans.

In some situations, it may be determined by Enterprise that an adjustment, relocation or lowering of the pipeline may be necessary to ensure the safety of your project and the integrity of the pipeline. In these situations, the encroaching party will be notified to further discuss the necessary changes. These situations are handled on a case-by-case basis.

Enterprise Standards for New Projects Encroaching on Enterprise's Rights-of-Way

The following is a general summary of Enterprise's standards and guidelines related to common encroachments. Every encroachment presents a unique set of circumstances; as such, **Enterprise recommends you contact our Land Encroachments Group to discuss your project and related safety issues prior to beginning work.**

Excavation Activities

Tolerance Zone: Enterprise defines the tolerance zone as 18 inches from the outer edge of the pipe (in all directions), or as defined by State regulations, whichever is **greater**.

- Mechanized equipment is not allowed within the tolerance zone.
- Any excavation taking place within the tolerance zone must be done by hand.

General Excavation Guidelines

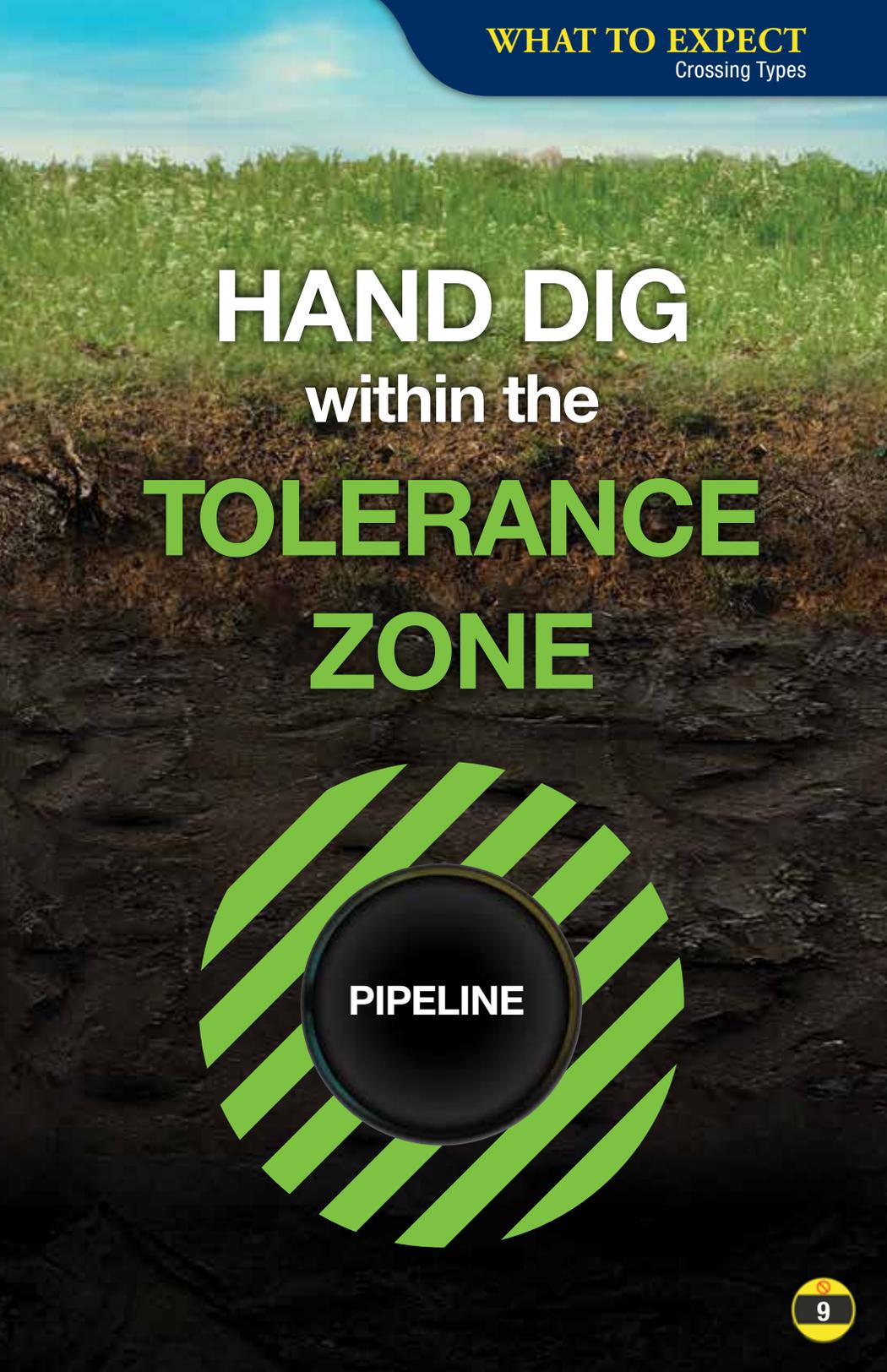
- Always make a One-Call prior to performing any excavation activities. Dial 811 or go to www.call811.com.
- Do not perform any excavation activities on Enterprise's rights-of-way without approval from Enterprise. Enterprise will review your plans for excavation within Enterprise's rights-of-way, locate and mark the pipeline assets (if necessary) and an Enterprise representative will be on-site to monitor the excavation activity.
- No heavy equipment is allowed to work directly over the pipeline. The right-of-way boundary should be marked with temporary fencing or white line to assist the operator with positioning heavy equipment.
- All mechanical digging equipment must dig parallel to the pipelines and have the teeth removed or barred with a plate welded across the bucket.

An Enterprise representative has the authority to suspend excavation activities if an equipment operator appears to be unqualified or equipment maintenance is not in accordance with applicable regulations.

STATE TOLERANCE ZONES

ALABAMA	18 in.	NEW MEXICO	18 in.
ARKANSAS	18 in.	NEW YORK	24 in.
COLORADO	18 in.	N. CAROLINA	24 in.
GEORGIA	24 in.	OHIO	18 in.
ILLINOIS	18 in.	OKLAHOMA	24 in.
INDIANA	24 in.	PENNSYLVANIA	18 in.
IOWA	18 in.	S. CAROLINA	24 in.
KANSAS	24 in.	TENNESSEE	24 in.
KENTUCKY	18 in.	TEXAS	18 in.
LOUISIANA	18 in.	UTAH	24 in.
MINNESOTA	24 in.	W. VIRGINIA	24 in.
MISSISSIPPI	18 in.	WISCONSIN	18 in.
MISSOURI	24 in.	WYOMING	24 in.
NEBRASKA	18 in.		

HAND DIG within the TOLERANCE ZONE



PIPELINE



Shrubs on the ROW should not exceed 18 inches in height

Fence post should not be within 5 feet of any Enterprise Pipeline

Structures, Fencing & Landscape Activities

In general, **NO** structures or obstructions are allowed within Enterprise's rights-of-way. **Examples include buildings, houses, barns, garages, patios, swimming pools, reinforced concrete slabs, utility or flag poles, retaining walls or large debris such as old cars, trailers, scrap metal, and boulders.**

Every fence crossing should be approved by Enterprise prior to any construction and follow these specifications:

- Fences should not parallel the pipeline within the rights-of-way.
- Fence posts shall not be allowed within 5 feet of any Enterprise pipeline.
- Fences shall not obstruct access or the line of sight to the rights-of-way for Enterprise personnel.
- Gate(s) may be required for access.

New plantings of **trees or shrubs** over 18 inches tall are **not** permitted on Enterprise's rights-of-way. Enterprise may trim or remove trees, brush, or other vegetation as necessary to maintain the rights-of-way.



Roadways, Driveways, Sidewalks & Parking Lots

- All proposed roadways, including temporary access roads, field roads and unimproved roads, driveways, sidewalks or parking lots that extend onto the right-of-way should receive written approval from Enterprise before any construction takes place.
- The proposed encroachment should cross as close to 90 degrees as possible, lying perpendicular to the pipeline.
- In general, roadway crossings should have a minimum coverage of 4 feet from the top of the pipeline to the top of the paved surface. A minimum cover of 3 feet between the top of the pipeline and top of other surfaces or bottom of ditches shall be maintained.
- Minimum cover may vary according to Federal, State and County regulations.
- Depending on the design and intended use of the proposed roadway, additional measures may be required to adequately protect the pipeline.
- All parking lots planned within the Company's right-of-way should incorporate green areas (areas where surface access is not impeded by improvements) over the pipeline at intervals of approximately 60 feet but no more than 100 feet, measured along the pipeline centerline. Location and size will be subject to Enterprise's review and approval.
- Stress analysis results that do not meet Enterprise's minimum requirements may require pipeline adjustments, modification or mechanical protection.

Construction Equipment & Large Vehicle Crossings

- Construction equipment and large vehicles crossing the pipeline easement may present a risk of damage to underground utilities. Therefore, when properly notified, Enterprise will perform stress analysis to ensure that the proposed use of construction equipment or large vehicles will neither damage the pipeline nor present a safety hazard. When submitting a request for heavy equipment crossing, please include the following for any vehicle proposing to cross Enterprise's rights-of-way:

- ✓ **Make/model**
- ✓ **Size**
- ✓ **Weight**
- ✓ **Maximum axle load**

- Enterprise will work diligently to perform its analysis, but typically requires a minimum of three working days to complete the review process.
- Construction equipment should only cross the pipeline at Enterprise-designated locations.



Compactors



Articulated Dump Trucks



Pipelayers (Sideboom)



Wheel Tractor Scrapers



Excavators

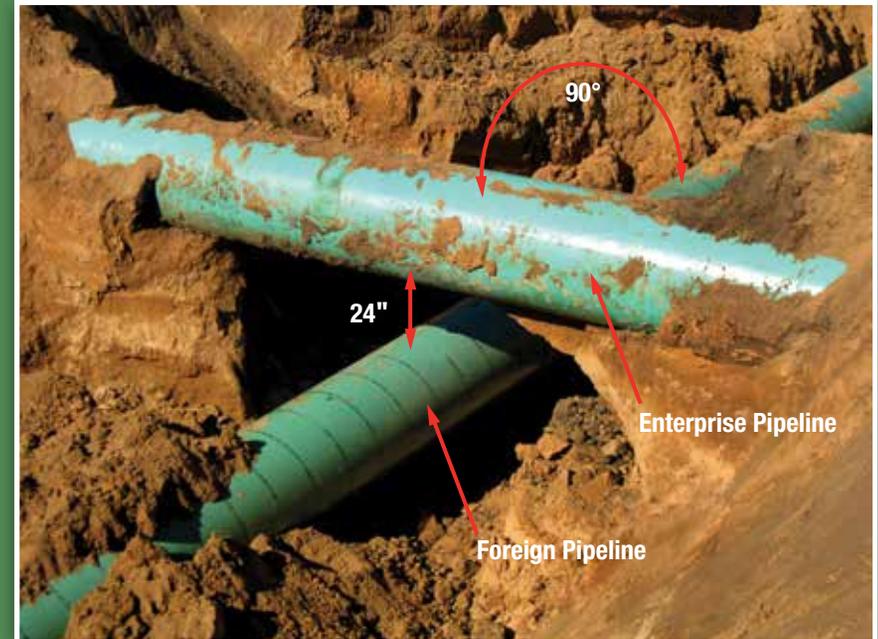
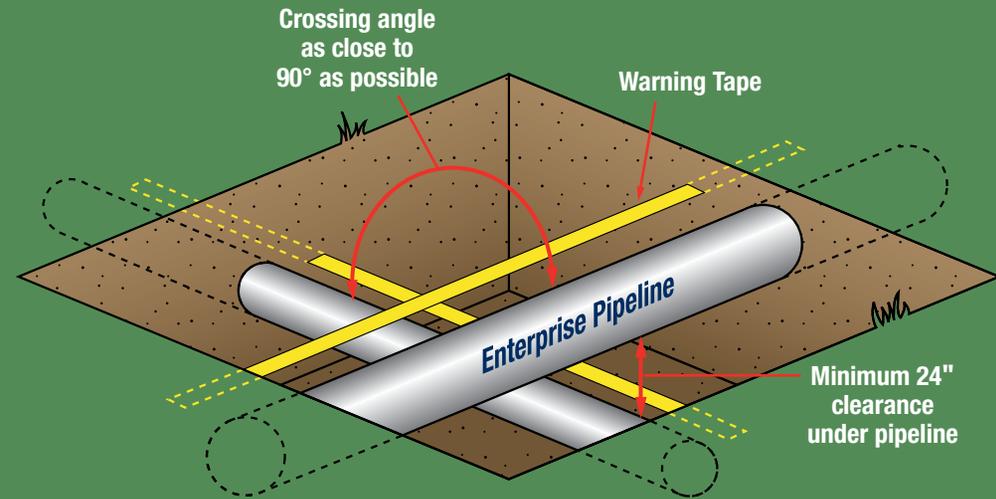


Dozers

Foreign Pipelines & Utility Crossings

For your safety and the safety of others, Enterprise should be involved in the planning of any pipeline or utility crossing Enterprise's rights-of-way. There are numerous issues to be considered in any foreign utility crossing, and the following are common utility industry standard guidelines:

- Crossings should be at an angle as close to 90 degrees as possible in order to minimize the area of potential impact.
- Enterprise prefers that no foreign lines run parallel to Enterprise pipelines within the rights-of-way. Any plan to run a foreign line parallel to Enterprise's pipeline should be submitted to Enterprise's Land Encroachments Group for review and approval.
- The preferred method is to have foreign lines cross below Enterprise pipelines.
- In general, foreign pipeline and utility crossings should maintain a minimum clearance of 24 inches between the bottom of Enterprise's pipeline and the top of the pipeline/utility when installed via open cut excavation. Trenchless crossings may require additional clearance, among other things.
- Metallic pipe crossing Enterprise pipelines may be subject to a cathodic protection study. Foreign metallic pipe crossings shall be coated with an appropriate non-conductive coating the full width of Enterprise's rights-of-way.
- All buried electrical cables shall be installed in accordance with the National Electric Safety Code (NESC) or the National Electrical Code (NEC). All power cables shall be installed in non-metallic or high impact PVC conduit. In the event the conduit crosses over or below Enterprise's pipeline by open cut trench excavation, it shall be encased in red concrete the full width of the right-of-way.
- All buried communication cables, such as telephone, TV, internet services and other data lines shall cross Enterprise pipelines with a minimum clearance of 24 inches and encased in a rigid, non-metallic conduit. Exceptions will be reviewed on a case-by-case basis.
- Warning tape shall be placed over the foreign utility for a minimum of 20 feet (perpendicular to the utility and 10 feet on both sides) in such a manner that it would be unearthed before damage could result to the pipeline.
- In general, utility poles and guy anchors are not permitted within Enterprise's rights-of-way. Overhead electrical or telephone lines shall be installed so that a minimum of 25 feet vertical clearance is maintained between the lowest point of the overhead crossing and the natural ground level above Enterprise's pipeline.





Waterway Crossings

The construction of rivers, streams, creeks, canals, ponds, and drainage ditches crossing over Enterprise pipelines must comply with current standards and federal, state and local regulations.

- New drainage channels and irrigation canals should have a minimum of 5 feet of cover from the top of the pipe to the bottom of the channel or canal. Drainage channels and irrigation canals having less than 5 feet of cover must be lined or be protected from damage to withstand anticipated external loads and anticipated scour using an approved method and material.
- Rivers, creeks, and streams shall have a minimum cover of 20 feet, as measured from the top of the pipeline to the waterway bottom/flow line.

Any proposed waterway on Enterprise's rights-of-way needs to be submitted to Enterprise's Land Encroachments Group to determine whether the crossing poses a risk to pipeline assets. There are numerous safety considerations related to the construction of new waterways, but the following are common issues that should be considered with any new waterway:

- If the waterway will cause the pipe to float, the project may require the installation of weights or other devices to ensure the new waterway does not create a safety hazard.
- Enterprise may require that erosion control measures be placed over the pipeline rights-of-way to protect the pipeline and control erosion.
- Crossings should be at an angle as close to 90 degrees as possible in order to minimize the area of potential impact.
- Ponds, lakes, retention ponds, or wetlands should not be constructed on the pipeline rights-of-way without Enterprise's review and approval.
- Irrigation systems, field drain lines and drain tiles should cross as close to 90 degrees as possible. Lateral lines from septic systems should not extend onto the right-of-way.

Railroad Crossings

American Railway Engineering and Maintenance-of-Way Association require new railroads be installed with a minimum compacted cover over the pipeline as measured from the base of the rail to the top of the pipe, as follows:

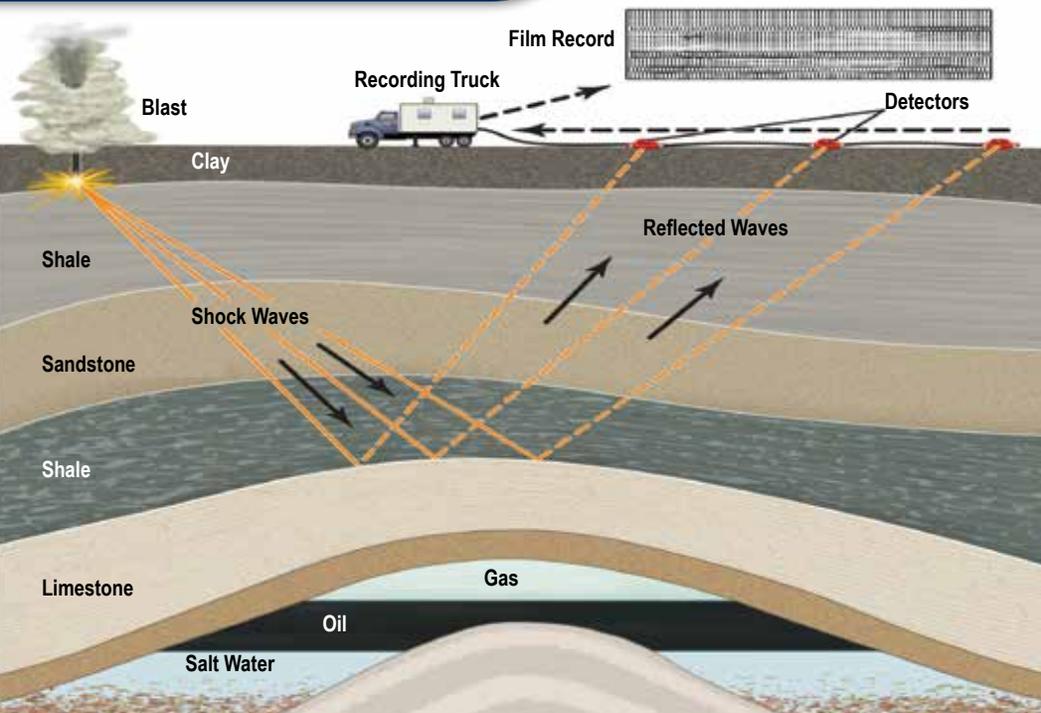
- Under track structure proper: 6 feet cased; 10 feet uncased.
- Under all other surfaces within the rights-of-way: 4 feet cased; 6 feet uncased.

If the minimum coverage cannot be provided, additional mechanical protection will need to be evaluated and installed accordingly.

Construction Induced Vibrations

- Construction activities that generate ground vibrations, including, but not limited to, pile driving, steel sheet driving, soil compaction, pavement material compaction, hydraulic jack hammering, or any type of surface impact that will induce vibrations, should be reviewed by Enterprise on a case-by-case basis.
- If the encroaching party anticipates this type of activity within 100 feet from the pipeline, then continuous testing monitored by a seismograph located directly over the pipeline at its closest point to the activity should be conducted. The encroaching party shall provide, at their expense, the monitoring service contractor and equipment.
- The encroaching party shall provide the make and model of the vibratory or compaction equipment. If construction-induced vibrations are associated with using pile driving or vibratory driving equipment, then the specifications of the equipment and the maximum anticipated energy shall be provided to Enterprise.
- The encroaching party shall determine and limit the maximum peak force allowed under continuous seismographic vibration monitoring such that the peak particle velocity will not exceed 5 inches per second. The peak particle velocity results shall be provided to Enterprise or field representative. If results are above 5 inches per second, Enterprise reserves the right to halt seismic activities to evaluate the integrity of the pipeline.
- In general, large vibratory compaction equipment poses a risk to underground pipelines and is not allowed within Enterprise's rights-of-way.





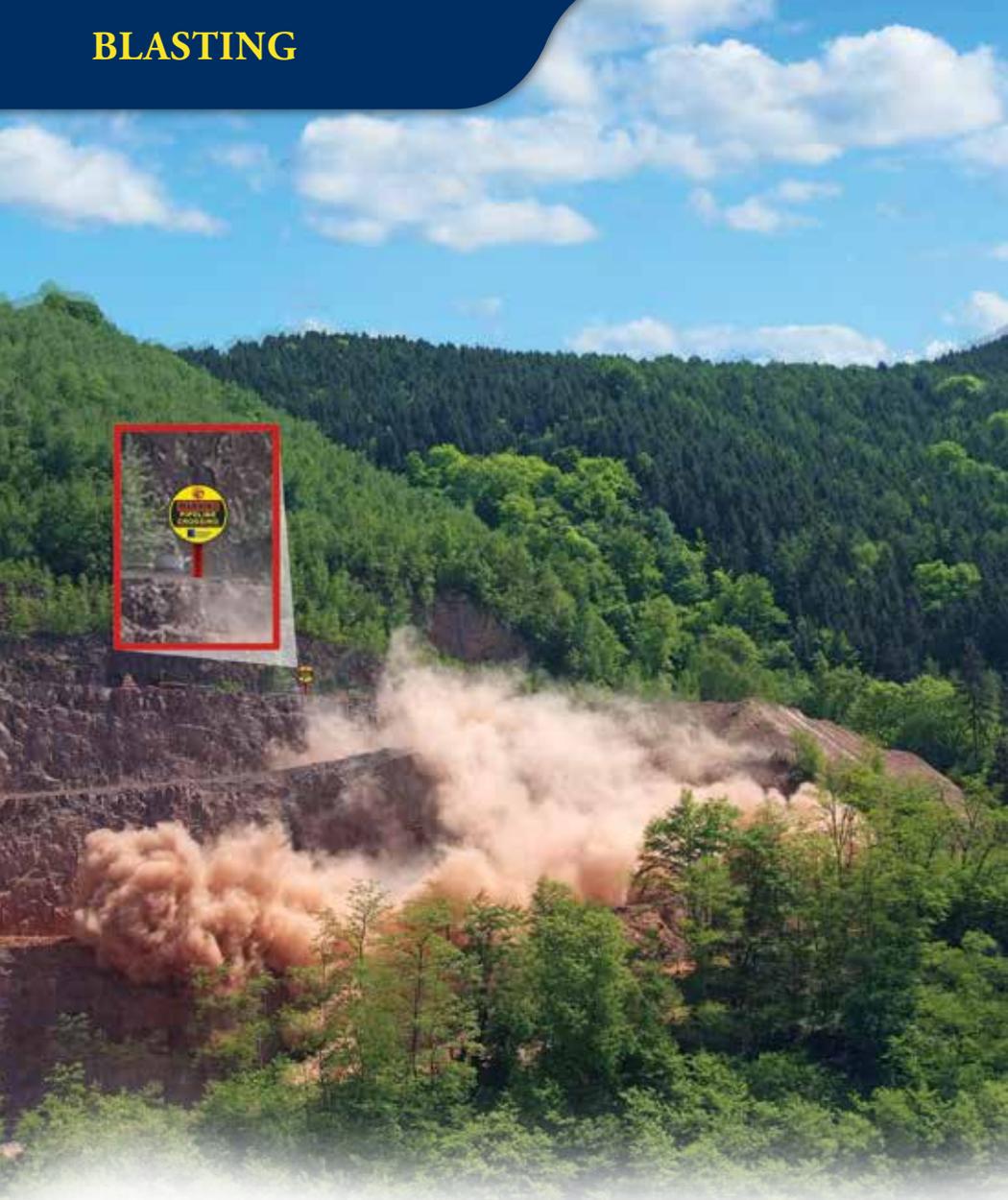
- The encroaching party shall also arrange for an Enterprise on-site inspector to be present to witness the seismic survey operations.
- Seismic vibrations shall be monitored by seismograph instruments located directly over the pipeline at its closest point to the vibroseis trucks that provide peak particle velocity results. The encroaching party shall provide, at their expense, the monitoring service contractor and equipment.
- The encroaching party shall determine and limit the maximum peak force allowed under continuous seismographic vibration monitoring such that the peak particle velocity will not exceed 5 inches per second. The peak particle velocity results shall be provided to Enterprise or a field representative. If results are above 5 inches per second, Enterprise reserves the right to halt seismic activities to evaluate the integrity of the pipeline, at the cost of the encroaching party.
- Seismic surveys shall not be conducted closer than 25 feet to the pipeline.

In some areas where vibroseis trucks cannot be used due to topography, it may be necessary to use explosive charges to generate seismic vibrations. If dynamite is used, the blasting operations must be in accordance with federal, state, and local governing agencies.

Seismic Surveying

- Encroaching parties planning to conduct seismic surveying operations within 300 feet from Enterprise's rights-of-way to explore the presence of oil and gas, geothermal energy and other mineral deposits underneath the earth's surface should be reviewed on a case-by-case basis. Seismic surveying energy sources that generate seismic vibrations generally include vibroseis trucks (also referred to as thumper trucks or weight-drop trucks) and shot hole blasting (for shot hole blasting refer to blasting guidelines on page 22).
- Seismic Survey operations within 300 feet of the pipeline right-of-way:
 - The encroaching party must submit a seismic survey plan to Enterprise for review and approval.
 - Seismic survey plans, when using vibroseis trucks to radiate ground vibrations, must include a seismic vibroseis survey report performed using vibroseis truck to determine safe distance and peak particle velocity results from above ground structures and underground pipelines. This survey report should include information on soil conditions, the anticipated number of vibrations, make and model of the vibroseis truck, anticipated peak particle velocity results, map layout of vibroseis truck locations with the anticipated closest horizontal distance to the pipeline right-of-way, safety measures and a copy of the permit approval to perform seismic operations.





Blasting

Any proposed blasting operations within 1,320 feet (1/4 of a mile) of an Enterprise right-of-way, shall be submitted with a comprehensive blasting plan for review and approval by Enterprise. All blasting operations shall be in accordance with federal, state and local governing agencies. Where discrepancies occur between Enterprise specifications and federal, state and local agencies, the more stringent application shall apply.

For your safety and the safety of others, any planned encroachment on Enterprise's rights-of-way should be submitted to Enterprise's Land Encroachments Group. Enterprise will work with you to analyze your plans and incorporate appropriate safety measures. Each encroachment will be handled on a case by case basis. Not all sections of this guideline will be applicable to every situation. This information shall not create any duties or responsibilities on the part of Enterprise in favor of any third party.

Help us keep YOU safe by contacting Enterprise if:

- You will be performing excavation work near our pipelines.
- You are planning construction activity in the vicinity of our pipelines or operating facilities.



Know what's below.
Call before you dig.



Mail/Courier: Enterprise Products
Attn: Land Encroachments Group
PO Box 4324
Houston, TX 77210

Email: Land_Encroachments@eprod.com

Toll Free: 866-901-8170

Fax: 281-887-7390

Web Page: www.EnterpriseEncroachments.com