

# Coordinated Response & Excavator Exercise® PIPELINE SAFETY TRAINING



# **PROGRAM GUIDE**

Overview

**Pipeline Safety** 

**Exercise Outline** 

**Emergency Response Guidebook** 

**NENA Pipeline Emergency Operations** 

Signs Of A Pipeline Release

High Consequence Areas Identification

Pipeline Industry ER Initiatives

Pipeline Damage Reporting Law

2025



# Table of Contents

Overview	4
Pipeline Safety	6
Emergency Response Guidebook	22
Emergency Response	23
NENA Pipeline Emergency Operations - Initial Intake Checklist	25
Signs Of A Pipeline Release / What To Do If A Leak Occurs / Pipeline Emergency	26
High Consequence Areas Identification / Identified Sites	27
Common Ground Alliance Best Practices / Pipelines In Our Community	28
Damage Prevention Programs / Pipeline Markers / Call Before You Dig / OSHA General Duty Clause	29
Product Characteristics	30
Excavation Best Practices Jobsite Checklist	31
Pipeline Damage Reporting Law / Websites	32
About Paradigm	33
Operator Information	34
Emergency Contact List	37

# **Pipeline Purpose and Reliability**

- · Critical national infrastructure
- Over 2.7 million miles of pipeline provide 65% of our nation's energy
- · 20 million barrels of liquid product used daily
- · 21 trillion cubic feet of natural gas used annually

#### **Safety Initiatives**

- · Pipeline location
  - ° Existing right-of-way (ROW)
- · ROW encroachment prevention
  - ° No permanent structures, trees or deeply rooted plants
- · Hazard awareness and prevention methods
- Pipeline maintenance activities
  - ° Cleaning and inspection of pipeline system

#### **Product Hazards and Characteristics**

# Petroleum (flow rate can be hundreds of thousands of gallons per hour)

- Flammable range may be found anywhere within the hot zone
- · H2S can be a by-product of crude oil

Type 1 Products	Flash Point	Ignition Temperature
Gasoline	- 45 °F	600 °F
Jet Fuel	100 °F	410 °F
Kerosene	120 °F	425 °F
Diesel Fuel	155 °F	varies
Crude Oil	25 °F	varies
Diesel Fuel	155 °F	varies

# Natural Gas (flow rate can be hundreds of thousands of cubic feet per hour)

- Flammable range may be found anywhere within the hot zone
- · Rises and dissipates relatively quickly
- H2S can be a by-product of natural gas PPM = PARTS PER MILLION

° 0.02 PPM	Odor threshold
• 10.0 PPM	Eye irritation
- 400 DDM	11 1 1 1

° 100 PPM Headache, dizziness, coughing, vomiting

200-300 PPM
 500-300 PPM
 6 Source Source Consciousness/possible death in 30-60 min.
 700-900 PPM
 8 Consciousness/possible death in 30-60 min.
 700-900 PPM
 9 Over 1000 PPM
 100 Ove

- · Incomplete combustion of natural gas may release carbon monoxide
- Storage facilities may be present around populated areas/can be depleted production facilities or underground caverns
- · Gas travel may be outside the containment vessel along the natural cavern between the pipe and soil

# **Propane, Butane and Other Similar Products**

- Flammable range may be found anywhere within the hot zone
- · Products cool rapidly to sub-zero temperatures once outside the containment vessel
- · Vapor clouds may be white or clear

Type 3 Products	<u>Flash Point</u>	Ignition Temperature
Propane	- 150 °F	920-1120 °F
Butane	- 60 °F	725-850 °F

# Line Pressure Hazards

- Transmission pipelines steel (high pressure: average 800-1200psi)
- Local gas pipeline transmission steel (high pressure: average 200-1000psi)
- Local gas mains and services steel and/or plastic (low to medium pressure)
  - Mains: up to 300psi
  - · Service lines: up to regulator
    - Average 30-45psi and below
    - Can be up to 60-100psi in some areas
- · At regulator into dwelling: ounces of pressure

#### Overview

# **Leak Recognition and Response**

- · Sight, sound, smell indicators vary depending on product
- · Diesel engines fluctuating RPMs
- Black, dark brown or clear liquids/dirt blowing into air/peculiar odors/dead insects around gas line/dead vegetation
- · Rainbow sheen on the water/mud or water bubbling up/frozen area on ground/frozen area around gas meter
- · Any sign, gut feeling or hunch should be respected and taken seriously
- · Take appropriate safety actions ASAP

## **High Consequence Area (HCA) Regulation**

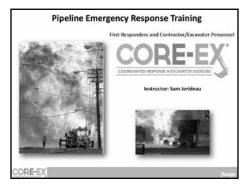
- Defined by pipeline regulations 192 and 195
- · Requires specialized communication and planning between responders and pipeline/gas personnel
- May necessitate detailed information from local response agencies to identify HCAs in area

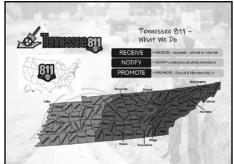
# **Emergency Response Basics**

- · Always follow pipeline/gas company recommendations pipeline representatives may need escort to incident site
- · Advance preparation
  - Get to know your pipeline operators/tour their facilities if possible
  - Participate in their field exercises/request on-site training where available
  - Develop response plans and practice
- · Planning partners
  - · Pipeline & local gas companies
  - º Police local/state/sheriff
  - Fire companies/HAZMAT/ambulance/hospitals/Red Cross
  - LEPC/EMA/public officials
  - · Environmental management/Department of Natural Resources
  - · Army Corps of Engineers/other military officials
  - · Other utilities
- · Risk considerations
  - Type/volume/pressure/location/geography of product
  - Environmental factors wind, fog, temperature, humidity
  - · Other utility emergencies
- · Incident response
  - Always approach from upwind/park vehicle a safe distance away/if vehicle stalls DO NOT attempt to restart
  - $^{\circ}\,$  Gather information/establish incident command/identify command structure
  - Initiate communications with pipeline/gas company representative ASAP
  - Control/deny entry: vehicle, boat, train, aircraft, foot traffic, media refer all media questions to pipeline/gas reps
- · Extinguish fires only
  - · To aid in rescue or evacuation
  - To protect exposures
  - · When controllable amounts of vapor or liquid present
- · Incident notification pipeline control center or local gas company number on warning marker
  - · In Pipeline Emergency Response Planning Information Manual
  - · Emergency contact list in Program Guide
  - Call immediately/provide detailed incident information
- · Pipeline security assist by noting activity on pipeline/gas facilities
  - Report abnormal activities around facilities
    - Suspicious excavation/abandoned vehicles/non-company personnel/non-company vehicles
  - Freshly disturbed soil/perimeter abnormalities

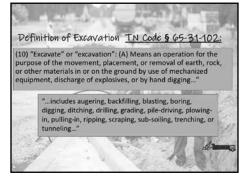
### One-Call

- · One-Call centers are not responsible for marking lines
- Each state has different One-Call laws. Familiarize yourself with the state you are working in
- · Not all states require facility owners to be members of a One-Call
- · You may have to contact some facility owners on your own if they are not One-Call members
- · In some states, homeowners must call before they dig just like professional excavators









#### TN 811 Business Hours:

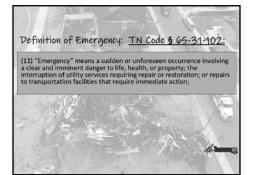
6 AM – 6 PM Central Time 7 AM – 7 PM Eastern Time Monday - Friday (excluding holidays)

**Emergency & Second** Accepted 24/7.



As of July 1, 2024, Emergency Ticket Notification Changes







# After the Call (or online entry):



- ✓ Wait for validation\*
- ✓ Check Positive Response ✓ Verify there are marks for all facilities that you can see ✓ Enter a 2<sup>nd</sup> Notice, if needed
- ✓ Dig with care

\*Valid after 72 hours or prior to 72 hours if all utilities have

"responded in the responded on necessite observer clear editions of immediate utilities, the if after all utilities have responded on necessite clear editions to the state of utilities have responded on the responded of the responded of the responded of the responded of utilities as long as the excession responded or an avoids the resisting utilities.



# Signs of Underground Facilities











# Signs of Underground Facilities

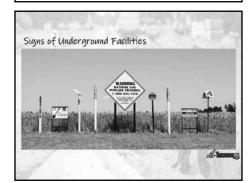




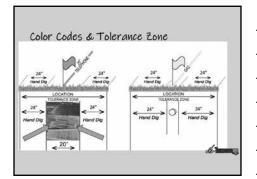




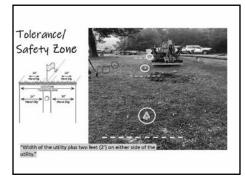


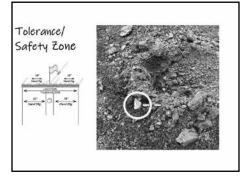


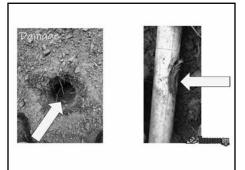
# What do the color markings/flags mean? Association Pulgin Newford Association unform color code White-Proposed exceeding markings and a second of the condition of the conditi



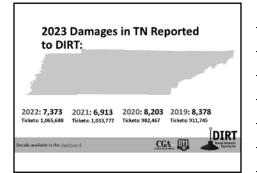


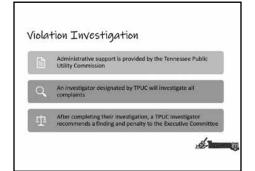












# Penalties & Remedies





\* As of July 1, 2024







- TPUC / UUDE8 case studies and roundtable discussions
- Networking with vendors, utilities and other stakeholders

Save the date: March 25-27, 2026 Franklin, TN





# Every Job. Every Time.

Presenter: Title: Phone: Email:







811 Marazine

# **Dredging Operations**

If your company conducts dredging operations, shoreline stabilization or pile driving activities, please be aware of the following:

- Underground hazardous liquids and natural gas pipelines do traverse lakes and navigable waterways
- 811 requirements to submit a one-call ticket prior operations commencing, to include a sub-aqueous ticket option
- Identify all pipeline warning markers near the shorelines where you will be working
- Contact the pipeline company as part of your preplanning before work begins





# **Logging Operator Responsibilities**

- Notify pipeline company before work begins
- No skidding of logs on right of
- Crossing of pipeline must be approved
- · Drop cut trees away from
- pipeline
- Do not remove existing cover
   Restore right of way



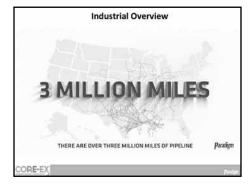
CORE-EX

ORE-EX

oden.

# Safe Digging Practices Phase-I commonstrated dilance comf. CGA Total Relative State Sta

# Coordinated Response Exercise® Learn your roles and responsibilities as emergency responders should a pipeline emergency happen in your jurisdiction. As well as you access to resource. Acquaint you with the operator's ability to respond to a pipeline emergency. Identify the types of pipeline emergencies. Plain how all parties can engage in mutual assistance to misimize hazards to life, property and the environment. Code of Federal Regulations (CFR): 40 CFR Parts 192 and 195 By attending this session today, you see preparing, along with the pipeline companies, to constant a condinated effort in responding to pipeline incidents and accidents. These programs take place over 1,000 times in 46 states annually.



efine Operator. The Jim Ames with ABC Ripeline Company, the calling your direct number because I am in special specialisms in a ner incorns in insertine Trees. We are required to gon you a "history of notemal Release" on one of sea populates in your particle.

niter Liberty Courty 5-1-1 - What is sour emerg

The Operator: I'm ion some with AM. Populms Company, I am in special operations in our SCADA centre I med to contact you reperting a "Nistric of Potential Release" on one of our pipelines in your periodiction.

cy Dispatcher: Dk, its you brow the most booties

ncy Sieputch: What company are you with again?

y Dispatchers, So, what emergency services do you

point Operator: We are unsure at this time because we are required by Printin to gave or load conferentials. We will keep your PSAP interned what information becomes wealible cother calls.

ine Operator: Um have 30 miles of pipeline in Liberty otar and has an MADP p1900 PSI.

or Dispution. What estimate do you need up to take right now.

e Operator; Engage your pipeline emergency response procedure attor. The got to provide notice of potential relative to these adult

# ORE-EX Central Dispatch Receives a call

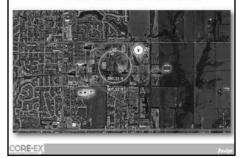
# Table and / or Group Discussion



- Your dispatch has just received a NOTICE OF POTENTIAL RUPTURE. The caller represents a pipeline company following their in-house emergency response plans.
- Now, discuss with those around you how your dispatch will handle this information. What existing policies and procedures are applicable to this call? Describe, at least generally, those relevant policies and procedures.
- Work with the pipeline operators present to discuss, evaluate and prepare for a response to a potential rupture on their facilities.

ORE-EX

# Virtual Scenario Manager (VSM™) Map



# New PHMSA Rule - Impact on PSAPs

- Routure mitigation valves must be installed on all newly constructed and replaced pipelines of indiameter or greater for onshore gas transmission and hazardous liquids
  This does not include natural gas distribution pipelines
  Pipeline operation must contact 9-1-1 or Emergency Management with a 'notice of potential rupture'

# How does this rule potentially affect PSAPs

- How will your agency process this call when notified of a potential release?

  Willyour ecord it and righ pass it on to your response agencies?

  Willyour ecord and pass that information on to your response agencies?

  Will this require your PSAF (and emergency services) to develop written policies?

  Where, potentially, could this call the coming from

  - Pipeline coetrol center locations
     Contacting a PSAP through the non-emergency number [no Automatic Number identification (AIN). No Automatic Location Identification (ALI).
     Is this number monitored 24/7?
- Pipeline operators were required to update their Emergency Response Plans (ERP) with this requirement in October 2022

# What is the intent of this new final rule?

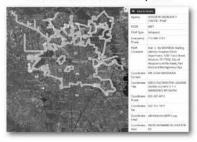
To require design and equipment elements and improved operations practices for quick and efficient identification of ruptones, that in turn will improve cupture mitigation and shorter nupture isolating limes for certain gan transmission, gradient presentations in the properties of the properties of







### Potential "Best Practice" for Pipelines



ORE-EX

# National Emergency Number Association (NENA)

# Pipeline Emergency Operations Standard

NENA's pipeline emergency operations workgroup NEMA 3 Pages

- Awareness of pipelines affecting the 911 service area

- Pipeline leak recognition and initial response actions

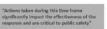
- Additional notices to pipeline operators

Initial Intake checklist

\* Quick reference guide in program materials

Pipeline emergency operations standard/model recommendations

Access the full report through nena.org





ORE-EX

# **Pipeline Outreach to Stakeholders**

- · Mailings (More than 20 Million pieces annually)
- Over 1,000 Liaison Meetings with Emergency Officials, Public Officials, and Excavators
- Face-to-Face Meetings with Emergency Officials at their agencies Emergency Response Planning Portal (ERP)



# **Pipeline Operators Emergency Response Plans**

# Natural gas and hazardous liquids

- Notify appropriate fire, police, and other public officials of gas or liquid pipeline emergencies, coordinate planned responses, and actual responses during an emergency lentified from the coordinate planned responses measures. Availability of personned and equipment

- Make safe any actual or potential hazard to life, property, and the environment Incident investigation and review

# Natural gas (49 CFR 192.615)

- Establish and maintain communication with fire, police, and other public officials
- Direct actions to protect people, then property

  Emergency shutdown to minimize hazard to life, property, and the en
  Safely restore service

### Hazardous liquid (49 CFR 195.402)

- Take necessary actions, such as emergency shutdown and pressure reduction Control of released hazardous liquid or carbon dioxide at scene to minimize hazards Minimize public exposure to injury by taking appropriate actions such as evacuations or traffic
- Use instrumentation to assess vapor cloud coverage and determine hazardous areas



# **Emergency Response and 811**

Derailments, car accidents, excavating/farming mishaps, natural disasters, and wildfires

#### PHMSA Advisory Bulletin (2012-08)

- Based on National Transportation Board
- Inform emergency responders about the benefits of 811
- Identify underground utilities in the area
- · Notify underground utilities in the area







# Integrity Management

Pipeline companies are required to have Integrity Management programs to insure safe and efficient operations:

- Internal and external cleaning and inspection, of the pipeline and affected areas
  - Rights-of-Way and valves
- Supervisory Control and Data Acquisition (SCADA)
- . Identification of High Consequence Areas (HCA)
- · Aerial Rights-of-Way Patrols
- Public Awareness Outreach to stakeholders
- · Participation as a member of 811
- Operator Qualification (OQ) Training Local Distribution Company (LDC)
  - . Meter Testing
  - teakSurveys
    - · May also be utilized on transmission pipelines





# Other challenges impacting pipelines...

### Natural Disasters

- Tornadoes
- Wildfires/Forest Fires
- Flooding/Mudslides/Slips
- Earthquakes

# Human Error

- · Vehicle accidents involving above ground valve sites
- · Third party strikes by contractors and excavators
- Agricultural activities, field tiling

#### National Security Threats

- · Cyberterrorism involving pipeline systems
- IED's on pipeline assets





ORE-EX

# Pipeline Operator / Responder Challenges

- Timely notification of the incident
- Denied entry at scene of incident
- Quick access to remote valves/ICP
- Getting equipment into the area
- · Communications with incident command Clear lines of communication (both ways)
- Face to face meetings with local officials
- Pre-planning with emergency services





# Pipeline Company - Internal Responsibilities

- Regular pressure testing of the pipeline
- Smart pigging in a timely manner of the pipeline Personnel logistics – Drive time and other factors
- Personnel training = Actual practice of closing a Pipeline
- Tool placement / positioning
- Human reaction to working under stress
- Working with local Public officials and First





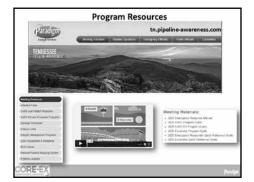
# Local Operator Information\*

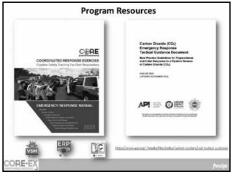
- Operator and/or company name
- Pipeline systems and products
- Location of pipelines
- Pipeline size/operating pressure(s)
- Operator Response(s) to a pipeline emergency

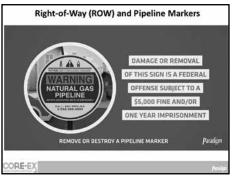
\*Information in the materials may not represent all pipeline companies in your area.

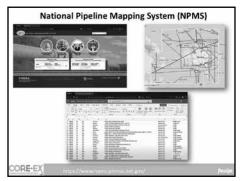


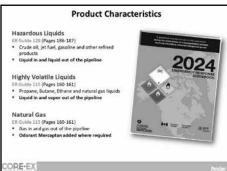




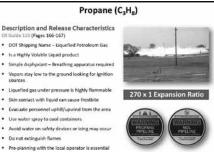




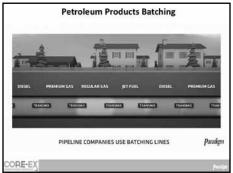








ORE-EX





# **Above Ground Storage Tanks**

Considerations when responding to tank farms/ terminals

- Work with your local operator to: Develop an effective response plan
- Identify products and hazards
- Determine evacuation radius

may occur

- Cool tank(s) or nearby containers by flooding with water
- Use unmanned hose holders/monitor nozzles
- Do not direct water at safety devices or icing
- Let product burn, even after air supply line/system is closed
- Beware of the potential for Boiling Liquid Expanding Vapor Explosion (BLEVE)

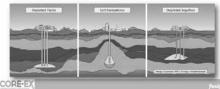




# **Underground Storage Fields**

# Emergency response "non-intervention"

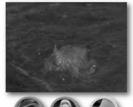
- Emergency contact information found on pipeline markers and all wellhead locations
- Always be aware of wind direction; walk into the wind, away from hazardous furnes
- Do not drive into a leak or vapor cloud
- Monitor combustible atmosphere
- Determine hazardous area and escape routes



# **Leak Recognition**

- Pools of liquid on the ground near a
- Dense white cloud or fog over a pipeline
- Discolored wegetation surrounding a pipeline
- Unusual dry spot in an otherwise moist field
- Dirt blowing up from the ground
- Bubbling in marshland, rivers or creeks · Oily sheen appearing on water
- surfaces
- Frozen ground near a pipeline . Unusual noise coming from a pipeline







# ORE-EX

# **Local Distribution Systems**

ORE-EX

- Be aware, not all natural gas leaks are from excavation; unintended leaks from stoves, water, heaters, furnaces, etc. can occur
- When called out on natural gas leak events, use combustible gas indicators
- Mercaptan can be stripped as it travels through soil
- Frost heaves, breaking pipes
- Gas meter breaks due to snow buildup from melting snow falling from roofs

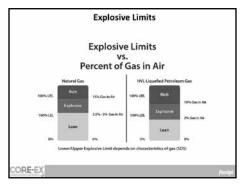
# Excess flow valve meter tags

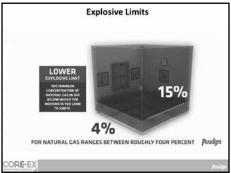
# ntification tags [192.381(c)]

The presence of an excess flow valve on the service lines may or may not be marked with an identification tag. The identification tag (if present) will typically be located at the top of the service riser below the meter stop valve.

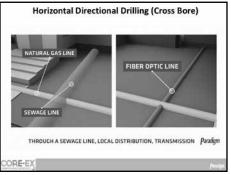


# Excess Flow Valve (EFV) Local Distribution Lines Automatic reduction of as flow should a service line break. May not completely stop the flow of natural gas. May not hear a distinct hissing sound Maystoon and ignition sources may still exist Always work a coordinated response with your local operator Not all service lines have an EFV installed The Party Damager Damager



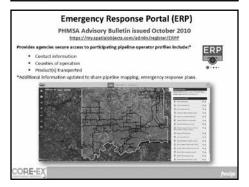




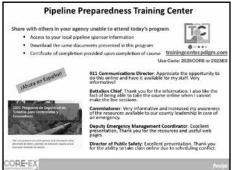




ORE-EXT



Systems



# Product INFORMATION



The Emergency Response Guidebook is available at: <a href="https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf">https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf</a>







# Emergency Response

# EMERGENCY RESPONSE PLANS FOR GAS AND HAZARDOUS LIQUID PIPELINE OPERATORS

Federal regulations for both gas and hazardous liquid pipelines require operators to have written procedures for responding to emergencies involving their pipeline facility. Because pipelines are often located in public space, the regulations further require that operators include procedures for planning with emergency and other public officials to ensure a coordinated response. Please contact your local pipeline operators for information regarding their company specific emergency response plan.

#### **Natural Gas**

Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

- · Receiving, identifying, and classifying notices of events which require immediate response by the operator.
- Establishing and maintaining adequate means of communication with appropriate fire, police, and other public
  officials.
- Prompt and effective response to a notice of each type of emergency, including the following:
  - 1. Gas detected inside or near a building.
  - 2. Fire located near or directly involving a pipeline facility.
  - 3. Explosion occurring near or directly involving a pipeline facility.
  - Natural disaster.
- The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.
- · Actions directed toward protecting people first and then property.
- Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.
- Making safe any actual or potential hazard to life or property.
- Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.
- Safely restoring any service outage.
- Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:
  - Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;
  - 2. Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;
  - 3. Identify the types of gas pipeline emergencies of which the operator notifies the officials; and
  - 4. Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

\*Reference 49 CFR 192.615

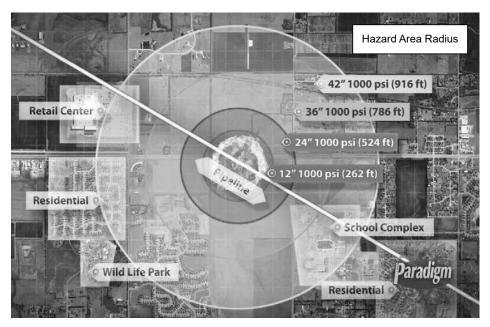
# **HAZARDOUS LIQUIDS**

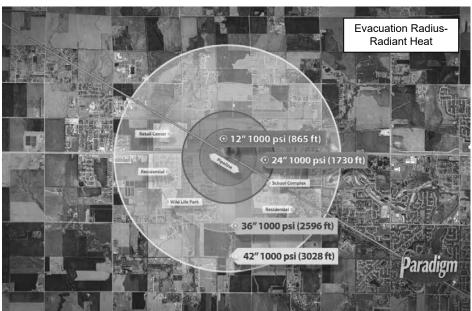
(a) General: Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. This manual shall be reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline system commence, and appropriate parts shall be kept at locations where operations and maintenance activities are conducted.

**Emergencies.** The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs:

- Receiving, identifying, and classifying notices of events which need immediate response by the operator or notice
  to fire, police, or other appropriate public officials and communicating this information to appropriate operator
  personnel for corrective action.
- Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental release of hazardous liquid or carbon dioxide from a pipeline facility, operational failure causing a hazardous condition, and natural disaster affecting pipeline facilities.
- · Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.
- Taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume of hazardous liquid or carbon dioxide that is released from any section of a pipeline system in the event of a failure.
- Control of released hazardous liquid or carbon dioxide at an accident scene to minimize the hazards, including
  possible intentional ignition in the cases of flammable highly volatile liquid.
- Minimization of public exposure to injury and probability of accidental ignition by assisting with evacuation of residents and assisting with halting traffic on roads and railroads in the affected area, or taking other appropriate action.
- Notifying fire, police, and other appropriate public officials of hazardous liquid or carbon dioxide pipeline
  emergencies and coordinating with them preplanned and actual responses during an emergency, including
  additional precautions necessary for an emergency involving a pipeline system transporting a highly volatile liquid.
- In the case of failure of a pipeline system transporting a highly volatile liquid, use of appropriate instruments to
  assess the extent and coverage of the vapor cloud and determine the hazardous areas.
- Providing for a post accident review of employee activities to determine whether the procedures were effective in
  each emergency and taking corrective action where deficiencies are found.

# **Emergency Response**





# NENA Pipeline Emergency Operations - Initial Intake Checklist

In accordance with NENA Pipeline Emergency Operations Standard/Model Recommendation NENA 56-007 (https://www.nena.org/?page=PipelineEmergStnd)

#### **GOALS FOR INITIAL INTAKE:**

- 1. Obtain and Verify Incident Location, Callback and Contact Information
- 2. Maintain Control of the Call
- 3. Communicate the Ability to HELP the Caller
- Methodically and Strategically Obtain Information through Systematic Inquiry to be Captured in the Agency's Intake Format
- Recognize the potential urgency of situations involving the release of dangerous gases or liquids related to pipelines or similar events of this nature and immediately begin the proper notifications consistent with agency policy
- 6. Perform all Information Entries and Disseminations, Both Initial and Update

# FIRST RESPONSE CALL INTAKE CHECK LIST

The focus of this Standard is on the first minute of the call intake process. Actions taken during this time frame significantly impact the effectiveness of the response and are critical to public safety.

The following protocol is intended as a solid framework for call intake, but should not in any manner rescind or override agency procedures for the timing of broadcasts and messaging.

These procedures are established as recommended practices to consider with existing agency policy and procedure to ensure the most swift and accurate handling of every incident involving the release of dangerous gases or hazardous liquids.

All information should be simultaneously entered, as it is obtained by the telecommunicator, into an electronic format (when available) that will feed/populate any directed messages which will be sent to emergency responders in conjunction with on-air broadcasts.

# Location:

Request exact location of the incident (structure addresses, street names, intersections, directional identifiers, mile posts, etc.) and obtain callback and contact information.

### **Determine Exactly What Has Happened:**

Common signs of a pipeline leak are contained in Table 1 below. If any of these conditions are reported, THIS IS A PIPELINE EMERGENCY.

TABLE 1
Common Indications of a Pipeline Leak

Condition	Natural Gas (lighter than air)	LPG & HVL (heavier than air)	Liquids
An odor like rotten eggs or a burnt match	Х	Х	
A loud roaring sound like a jet engine	Х	Х	
A white vapor cloud that may look like smoke		Х	
A hissing or whistling noise	Х	Х	
The pooling of liquid on the ground			Х
An odor like petroleum liquids or gasoline		Х	Х
Fire coming out of or on top of the ground	Х	Х	
Dirt blowing from a hole in the ground	Х	Х	
Bubbling in pools of water on the ground	Х	Х	
A sheen on the surface of water		Х	Х
An area of frozen ground in the summer	Х	Х	
An unusual area of melted snow in the winter	Х	Х	
An area of dead vegetation	Х	Х	Х

# Signs Of A Pipeline Release

#### SIGHT\*

- · Liquid on the ground
- · Rainbow sheen on water
- · Dead vegetation in an otherwise areen area
- · Dirt blowing into the air
- White vapor cloud
- Frozen area on ground
- \*Signs vary based upon product

#### SMELL

- · Odors such as gas or oil
- Natural gas is colorless and odorless
  - Unless Mercaptan has been added (rotten egg odor)

## OTHER - NEAR PIPELINE OPERATIONS

- · Burning eyes, nose or throat
- Nausea

# What To Do If A Leak Occurs

- Evacuate immediately upwind
- Eliminate ignition sources
- Advise others to stay away
- CALL 911 and the pipeline company number on warning marker
  - · Call collect if necessary
- Make calls from safe distance not "hot zone"
- Give details to pipeline operator:
  - Your name
  - Your phone number
  - Leak location
  - Product activity
  - Extent of damage
- · DO NOT drive into leak or vapor cloud
- DO NOT make contact with liquid or vapor
- DO NOT operate pipeline valves (unless directed by pipeline operator):
  - · Valve may be automatically shut by control center
  - Valve may have integrated shut-down device
  - Valve may be operated by qualified pipeline personnel only, unless specified otherwise

Ignition sources may vary - a partial list includes:

SOUND

· A hissing or roaring sound

- Static electricity
- Metal-to-metal contact
- Pilot lights
- Matches/smoking
- · Sparks from telephone
- Electric switches
- Electric motors
- Overhead wires
- Internal combustion engines
- · Garage door openers
- Firearms
- Photo equipment
- · Remote car alarms/door locks
- · High torque starters diesel engines
- · Communication devices

# Pipeline Emergency

# Call Gas Control Or Pipeline Control Center

Use Pipeline Emergency Response Planning Information Manual for contact information Phone number on warning markers Use state One-Call System, if applicable

### **Control Center Needs To Know**

Your name & title in your organization Call back phone number - primary, alternate Establish a meeting place

Be very specific on the location (use GPS) Provide City, County and State

# Injuries, Deaths, Or Property Damage

Have any known injuries occurred? Have any known deaths occurred? Has any severe property damage occurred?

## **Traffic & Crowd Control**

Secure leak site for reasonable distance Work with company to determine safety zone No traffic allowed through any hot zone Move sightseers and media away Eliminate ignition sources

# Fire

Is the leak area on fire? Has anything else caught on fire besides the leak?

# Evacuations

Primary responsibility of emergency agency Consult with pipeline/gas company

#### Fire Management

Natural Gas - DO NOT put out until supply stopped **Liquid Petroleum –** water is NOT recommended; foam IS recommended

Use dry chemical, vaporizing liquids, carbon dioxide

# **Ignition Sources**

Static electricity (nylon windbreaker)

Metal-to-metal contact

Pilot lights, matches & smoking, sparks from phone Electric switches & motors

Overhead wires

Internal combustion engines

Garage door openers, car alarms & door locks Firearms

Photo equipment

High torque starters - diesel engines

Communication devices - not intrinsically safe

# High Consequence Areas Identification\*

Pipeline safety regulations use the concept of "High Consequence Areas" (HCAs), to identify specific locales and areas where a release could have the most significant adverse consequences. Once identified, operators are required to devote additional focus, efforts, and analysis in HCAs to ensure the integrity of pipelines.

Releases from pipelines can adversely affect human health and safety, cause environmental degradation, and damage personal or commercial property. Consequences of inadvertent releases from pipelines can vary greatly, depending on where the release occurs, and the commodity involved in the release.

# What criteria define HCAs for pipelines?

Because potential consequences of natural gas and hazardous liquid pipeline releases differ, criteria for HCAs also differ. HCAs for natural gas transmission pipelines focus solely on populated areas. (Environmental and ecological consequences are usually minimal for releases involving natural gas.) Identification of HCAs for hazardous liquid pipelines focuses on populated areas, drinking water sources, and unusually sensitive ecological resources.

# **HCAs for hazardous liquid pipelines:**

- Populated areas include both high population areas (called "urbanized areas" by the U.S. Census Bureau) and other populated areas (areas referred to by the Census Bureau as a "designated place").
- Drinking water sources include those supplied by surface water or wells and where a secondary source of water supply is not available. The land

- area in which spilled hazardous liquid could affect the water supply is also treated as an HCA.
- Unusually sensitive ecological areas include locations where critically imperiled species can be found, areas where multiple examples of federally listed threatened and endangered species are found, and areas where migratory water birds concentrate.

# **HCAs for natural gas transmission pipelines:**

- An equation has been developed based on research and experience that estimates the distance from a potential explosion at which death, injury or significant property damage could occur. This distance is known as the "potential impact radius" (or PIR), and is used to depict potential impact circles.
- Operators must calculate the potential impact radius for all points along their pipelines and evaluate corresponding impact circles to identify what population is contained within each circle.
- Potential impact circles that contain 20 or more structures intended for human occupancy; buildings housing populations of limited mobility; buildings that would be hard to evacuate. (Examples are nursing homes, schools); or buildings and outside areas occupied by more than 20 persons on a specified minimum number of days each year, are defined as HCA's.
- $^* \, \textit{https://primis.phmsa.dot.gov/comm/FactSheets/FSHCA.htm}$

# Identified Sites\*

Owners and companies of gas transmission pipelines are regulated by the US Department of Transportation (DOT). According to integrity management regulations, gas pipeline companies are required to accept the assistance of local public safety officials in identifying certain types of sites or facilities adjacent to the pipeline which meets the following criteria:

- (a) A small, well-defined outside area that is occupied by twenty or more persons on at least 50 days in any twelve-month period (the days need not be consecutive). Examples of such an area are playgrounds, parks, swimming pools, sports fields, and campgrounds.
- (b) A building that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12 month period (the days and weeks need not be consecutive). Examples included in the definition are: religious facilities, office buildings, community centers, general stores, 4-H facilities, and roller rinks.
- (c) A facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate. Examples of such a facility are hospitals, schools, elder care, assisted living/ nursing facilities, prisons and child daycares.

# **Identified Site Registry**

of the area.

Pipeline operators need your help keeping people and property safe.

Identified Sites - locations where many people occupy an area near a pipeline asset or facility. These are places where people may gather from time to time for a variety of reasons.



Some of these sites are very difficult for companies to obtain without help from those with local knowledge

Please use the following website to gain secure access, so you can assist in identifying sites where people congregate in your community:

my.spatialobjects.com/admin/register/ISR

Pipeline operators are required by law to work with public officials who have safety or emergency response, or planning responsibilities that can provide quality information regarding identified sites.

# Common Ground Alliance Best Practices

In 1999, the Department of Transportation sponsored the Common Ground Study. The purpose of the Common Ground Study was to identify and validate existing best practices performed in connection with preventing damage to underground facilities. The collected best practices are intended to be shared among stakeholders involved with and dependent upon the safe and reliable operation, maintenance, construction, and protection of underground facilities. The best practices contain validated experiences gained that can be further examined and evaluated for possible consideration and incorporation into state and private stakeholder underground facility damage prevention programs.

The current Best Practices Field Manual is divided into nine chapters that provide a collection of current damage prevention best practices. The nine chapters include:

- 1. Planning & Design Best Practices
- 2. One Call Center Best Practices
- 3. Location & Marking Best Practices
- 4. Excavation Best Practices
- 5. Mapping Best Practices
- 6. Compliance Best Practices
- 7. Public Education Best Practices
- 8. Reporting & Evaluation Best Practices
- 9. Miscellaneous Practices

To view the latest version of the Best Practices please visit www.commongroundalliance.com

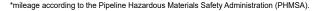


# Pipelines In Our Community

According to National Transportation Safety Board statistics pipelines are the safest and most efficient means of transporting natural gas and petroleum products, which are used to supply roughly two-thirds of the energy we use. These pipelines transport trillions of cubic feet of natural gas and hundreds of billions of ton/miles of liquid petroleum products in the United States each year.

This system is comprised of three types of pipelines: transmission, distribution and gathering. The approximately 519,000 miles of transmission pipeline\* transport products, including natural gas and petroleum products, across the country and to storage facilities. Compressor stations and pumping stations are located along transmission and gathering pipeline routes and help push these products through the line.

Approximately 2.2 million miles of distribution pipeline\* is used to deliver natural gas to most homes and businesses through underground main and utility service lines. Onshore gathering lines are pipelines that transport gas from a current production operation facility to a transmission line or main. Production operations are piping and equipment used in production and preparation for transportation or delivery of hydrocarbon gas and/or liquids.





# Training Center

Supplemental training available for agencies and personnel that are unable to attend:

- · Train as your schedule allows
- · Download resources including pipeline operator specific information
  - Sponsoring pipeline operator contact information
  - · Product(s) transported
- Submit Agency Capabilities Survey
- Receive Certificate of Completion

Visit https://trainingcenter.pdigm.com/ to register for training



# Damage Prevention Programs

Pursuant to 49 CFR Parts 192.614 (c)(2)(i) and 195.442 (c)(2)(i) pipeline operators must communicate their Damage Prevention Program's "existence and purpose" to the public in the vicinity of the pipeline and persons who normally engage in excavation activities in the area in which the pipeline is located.

State and federally regulated pipeline companies maintain Damage Prevention Programs. The purpose of which is to prevent damage to pipelines and facilities from excavation activities, such as digging, trenching, blasting, boring, tunneling, backfilling, or by any other digging activity.

# Pipeline Markers

The U.S. Department of Transportation (DOT) requires the use of signs to indicate the location of underground pipelines. Markers like these are located on road, railroad, and navigable waterway crossings. Markers are also posted along the pipeline right-of-way.

# The markers display:

- · The material transported
- The name of the pipeline operator
- · The operator's emergency number

# MARKER INFORMATION

- · Indicates area of pipeline operations
- · May have multiple markers in single right-of-way
- May have multiple pipelines in single right-of-way
- DOES NOT show exact location
- DOES NOT indicate depth (never assume pipeline depth)
- · DOES NOT indicate pipeline pressure



# Call Before You Dig

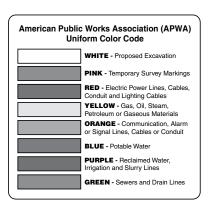
Statistics indicate that damage from excavation related activities is a leading cause of pipeline accidents. If you are a homeowner, farmer, excavator, or developer, we need your help in preventing pipeline emergencies.

- 1. Call your state's One-Call center before excavation begins regulatory mandate as state law requires.
- 2. Wait the required amount of time.
- 3. A trained technician will mark the location of the pipeline and other utilities (private lines are not marked).
- 4. Respect the marks.
- 5. Dig with care.

National One-Call Dialing Number:



For More Details Visit: www.call811.com



# OSHA General Duty Clause

Section 5(a)(1) of the Occupational Safety and Health Act (OSHA) of 1970, employers are required to provide their employees with a place of employment that "is free from recognizable hazards that are causing or likely to cause death or serious harm to employees."

https://www.osha.gov/laws-regs/oshact/section5-duties

# **Product Characteristics**

PRODUCT	LEAK TYPE	VAPORS	
HIGHLY VOLATILE LIQUIDS [SUCH AS: BUTANE, PROPANE, ETHANE, PROPYLENE, AND NATURAL GAS LIQUIDS (NGL)]	Gas	Initially heavier than air, spread along ground and may travel to source of ignition and flash back. Product is colorless, tasteless and odorless.	
Will be easily ignited by heat, sparks or flames and will form explosive mixtures with air. Vapors <b>HEALTH</b> may cause dizziness or asphyxiation without warning and may be toxic if inhaled at high concen-			

HEALTH may cause dizziness or asphyxiation without warning and may be toxic if inhaled at high conce HAZARDS trations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases.

PRODUCT		LEAK TYPE	VAPORS	
	NATURAL GAS Gas		Lighter than air and will generally rise and dissipate. May gather in a confined space and travel to a source of ignition.	
HEALTH HAZARDS Will be easily ignited by heat, sparks or flames and will form explosive mixtures with air. Vapors may cause dizziness or asphyxiation without warning and may be toxic if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.				

PRODUCT	LEAK TYPE VAPORS		VAPORS
HAZARDOUSLIQUIDS[SUCH AS: CRUDE OIL, DIESEL FUEL, JET FUEL, GASOLINE, AND OTHER REFINED PRODUCTS]		Liquid	Initially heavier than air and spread along ground and collect in low or confined areas. Vapors may travel to source of ignition and flash back. Explosion hazards indoors, outdoors or in sewers.
HEALTH HAZARDS Inhalation or contact with material may irritate or burn skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Vapors may cause dizziness or suffocation. Runoff from fire control or dilution water may cause pollution.			

# Excavation Best Practices Jobsite Checklist

#### **EXCAVATOR RESPONSIBILITIES:** ■ White Lining (Pre-marking) Call Before You Dig - It's the Law! □ One Call Facility Request Wait the required time for the markings! □ One Call Access (state specific time - check your local One Call Locate Reference Number Law) □ Tolerance Zones – May vary by state and/or company! □ Separate Locate Request □ Respect the marks! Pre-excavation Meeting Dig with care! ☐ Facility Relocations One Call Reference Number at Site RISK CONSIDERATIONS Contact Names and Numbers □ Type/volume/pressure/location/geography of ¬ Positive Response product Facility Owner/Operator Failure to Respond □ Environmental factors – wind, fog, temperature, humidity □ Locate Verification ☐ Sight, sound, smell – indicators vary depending on ☐ Work Site Review with Company Personnel product Documentation of Marks □ Black, dark brown or clear liquids/dirt blowing into ☐ Facility Avoidance air/peculiar odors/dead insects around gas line/ Marking Preservation dead vegetation Excavation Observer □ Rainbow sheen on the water/mud or water bubbling up/frozen area on ground/frozen area around gas □ Excavation Tolerance Zone □ Excavation within the Tolerance Zone Other utility emergencies ¬ Vacuum Excavation PIPELINE MARKERS Exposed Facility Protection The U.S. Department of Transportation (DOT) requires the use of signs to indicate the location of underground Locate Request Updates pipelines. Markers like these are located on road, ☐ Facility Damage Notification railroad, and navigable waterway crossings. Markers ■ Notification of Emergency Personnel are also posted along the pipeline right-of-way. Markers may not be located directly over the pipeline it marks. Emergency Coordination with Adjacent Facilities Emergency Excavation The markers display: □ Backfilling ☐ The product transported As-built Documentation □ The name of the pipeline operator ☐ The operator's emergency number □ Trenchless Excavation No Charge for Providing Underground Facility Locations Federal and State Regulations



# Pipeline Damage Reporting Law As Of 2007

# **H.R. 2958 Emergency Alert Requirements**

Any person, including a government employee or contractor, who while engaged in the demolition, excavation, tunneling, or construction in the vicinity of a pipeline facility;

- A. Becomes aware of damage to the pipeline facility that may endanger life or cause serious bodily harm or damage to property; or
- B. Damages the pipeline facility in a manner that may endanger life or cause serious bodily harm or damage to property, shall promptly report the damage to the operator of the facility and to other appropriate authorities.

### Websites:

Call Before You Clear www.callbeforeyouclear.com

Association of Public-Safety Communications Officials - International (APCO) www.apcointl.org/

www.apcointi.org/

Common Ground Alliance www.commongroundalliance.com

Federal Emergency Management Agency www.fema.gov

Federal Office of Pipeline Safety www.phmsa.dot.gov

National One-Call Dialing Number: 811 www.call811.com

Government Emergency Telecommunications www.dhs.gov/government-emergency-telecommunications-service-qets

Infrastructure Protection – NIPC www.dhs.gov/national-infrastructure-protection-plan

National Emergency Number Association https://www.nena.org/?

National Fire Protection Association (NFPA) www.nfpa.org

National Pipeline Mapping System www.npms.phmsa.dot.gov

National Response Center

https://www.epa.gov/emergency-response/national-response-center or 800-424-8802

Paradigm Liaison Services, LLC www.pdigm.com

United States Environmental Protection Agency (EPA) www.epa.gov/cameo

Wireless Information System for Emergency Responders (WISER) https://wiser.nlm.nih.gov/

FOR MORE INFORMATION ON THE NASFM PIPELINE EMERGENCIES PROGRAM

www.pipelineemergencies.com

FOR EMERGENCY RESPONSE INFORMATION, REFER TO DOT GUIDEBOOK.

FOR COPIES: (202) 366-4900

www.phmsa.dot.gov/hazmat/erg/emergency-responseguidebook-erg



Register for access to Training Center Code: CORE or EX





Register for access to the Emergency Response Portal



# **About Paradigm**

Paradigm is public awareness. We provide public awareness and damage prevention compliance services to assist with the regulatory requirements of 49 CFR 192 and 195, as well as API RP 1162. Since 2001, the oil and gas industry has worked with Paradigm to fulfill public education and community awareness requirements.

Our history of implementing public awareness programs and compliance services pre-dates API RP 1162. Most of the pipeline industry's large, mid-sized and small operators, as well as many local distribution companies utilize Paradigm's compliance services.

In serving our clients, Paradigm performs full-scope compliance programs from audience identification through effectiveness measurement. In addition, we offer consulting services for plan evaluation and continuous improvement. At the completion of each compliance program, we provide structured documentation which precisely records all elements of the program's implementation to assist with audits.

Paradigm leads the way in industry service. Pipeline operators and local distribution companies trust in Paradigm to implement their public awareness and damage prevention programs. Each year we:

- · Distribute 25 million pipeline safety communications
- · Compile and analyze roughly 250,000 stakeholder response surveys
- Facilitate over 1,200 liaison programs
- · Implement approximately 1,000 public awareness compliance programs
- Provide audit support and assistance with over 50 public awareness audits

Contact Paradigm for more information regarding custom public awareness solutions.

# Contact us:

Paradigm Liaison Services, LLC PO Box 9123 Wichita, KS 67277 (877) 477-1162 Fax: (888) 417-0818 www.pdigm.com











# Operator Information

Operator Name(s) / Contact Information	Type(s) of Pipeline Systems Operating	Location within County	Pipe Size and Operating Pressure Range(s)	Average Emergency Response Time(s)

Notes

Notes

# **EMERGENCY CONTACT LIST**

Athens Utilities Board	1-423-745-4501
Atmos Energy	
BBT AlaTenn, LLC	
Bedford County Utility District	1-931-684-1667
Bolivar Utility Department	
BP Pipelines (North America), Inc.	
Brownsville Energy Authority	
Centerville, Town of	
Chattanooga Gas	
City of Clarksville Gas Department (8-4:30 M-F)	1-931-645-7422
City of Clarksville Gas Department (Holidays and weekends)	
City of Clifton	
City of Collinwood.	
City of Friendship	
City of Henderson	
City of Hohenwald	
City of Lafayette Gas Department	
City of Lebanon Gas Department	
City of Loretto - Gas Division	
City of Martin Public Works	
or	
City of Mt. Pleasant	
City of Munford	
City of Portland Natural Gas System	
City of Red Boiling Springs	
City of Savannah (Day)	
City of Savannah (After Hours)	
City of South Fulton	
City of Waynesboro	
Claiborne Utilities District	
Cookeville Energy Department Gas Division	
Covington Gas	
Crockett Public Utility District	
Delek Logistics Partners, LP	
Diversified Gas & Oil Corporation (legacy Atlas Tennessee)	
Diversified Gas & Oil Corporation (legacy Coalfield Pipeline)	
,	
Dyersburg Gas System	
East Termessee Natural Gas	
Energy Transfer Crude Oil Enterprise, TE Products Pipeline System	
1 7	
Etowah Utilities.	
Fayetteville Public Utilities	
Gallatin Public Utilities Natural Gas System	
Gibson County Utility District	
Greater Dickson Gas Authority	
Hardeman Fayette Utility District	
Hawkins County Gas Utility District	
Horton Highway Utility District	
Humboldt Utilities	
or	1-/31-/84-1322

# **EMERGENCY CONTACT LIST**

Jackson Energy Authority	
Jamestown Gas Department, City of	1-931-879-8815
Jefferson-Cocke County Utility District	1-423-623-3069
or	1-865-475-7911
Lewisburg Gas Department	1-931-359-4016
Lexington Gas System	1-731-968-2917
Loudon Utilities	1-865-458-2091
Lucy Woodstock Marine Terminal (Operated by Lemm Corp)	1-901-358-0151
Marion Natural Gas System	1-423-942-2528
Mid-Valley Pipeline	1-800-753-5531
Navitas Utility Corporation	1-866-797-3342
Oak Ridge Utility District	1-865-483-1377
Plains Pipeline, L.P.	1-800-708-5071
or	1-800-322-7473
Powell Clinch Utility District	1-865-426-2822
Pulaski Natural Gas System	1-931-363-1752
Ridgetop Natural Gas	1-615-440-2616
Selmer Utility Division	1-731-645-7928
Sevier County Utility District	1-865-453-3272
Smyrna Municipal Gas System (8 am - 4:30 pm)	1-615-355-5711
Smyrna Municipal Gas System (After Hours)	1-615-355-5742
Southern Company Pipelines	1-844-357-4656
Springfield Gas System	1-615-384-0008
Sweetwater Utilities Board	1-423-337-5081
Tennessee Gas Pipeline	1-800-231-2800
Texas Eastern Transmission L.P. (Enbridge)	1-800-231-7794
Texas Gas Transmission, LLC	1-800-626-1948
Town of Livingston	1-931-823-6496
Town of Somerville	1-901-465-7300
Trunkline Gas	1-800-225-3913
Unicoi County Gas Utility District	1-423-743-6793
Valero Terminaling and Distribution Company	1-866-423-0898
Valero Partners Operating Co., LLC	1-866-423-0898
-	

Note: The above numbers are for emergency situations. Additional pipeline operators may exist in your area. Visit the National Pipeline Mapping System at www.npms.phmsa.dot.gov for companies not listed above.

ONE-CALL SYSTEM	PHONE NUMBER
Tennessee 811	1-800-351-1111 or 811



Established in 1983, Tennessee 811 serves as the statewide official one-call center. Tennessee 811 does not mark lines but functions as a communications link between our member utilities and anyone excavating.

Tennessee's Underground Utility Damage Prevention Act (TCA 65-31-101) requires everyone who digs to contact Tennessee 811 at least three (3) working days' notice before starting a project. Tennessee 811 processes the notification of proposed excavation and notifies our member utilities, or their contract locators, to mark their underground facilities prior to the excavation.

This free service helps prevent damage incidents which can result in millions of dollars in property damage, the interruption of utility service, personal injuries, and even loss of life.

# Visit tenn811.com for more information

		TICKE	ETS		STATE LAWS & PROVISIONS								NOTIFICATION EXEMPTIONS					NOTIFICATIONS ACCEPTED						
TENNESSEE					age		Ise	Membership	ts Issued	ıarks	se	9	ng											
Tennessee 811 800-351-1111 Website: tenn811.com Hours: 24 hours Advance Notice: Not less than 3 working days, not more than 10 working days	FAX	Online	Mohile		Statewide Coverage	Civil Penalties	Emergency Clause	Mandatory Mem	Excavator Permits	Mandatory Prem	Positive Response	Hand Dig Clause	Damage Reporting	DOT	Homeowner	Railroad	Agriculture	Depth	Damage	Design	Emergency	Overhead	Large Projects	Tolerance Zone
Marks Valid: 15 calendar days Law Link: https://www.tenn811.com/law	N	Υ	Υ	,	Υ	Υ	Υ	Υ	N	Υ	Υ	Υ	Y	Υ	N	Υ	Υ	N	Υ	Υ	Υ	N	N	24"
* 2' either side of the utility plus the width of the utility.	Chart F	Refe	renc	e: h	nttos	//pip	eline	awa	rene	SS.OI	a/me	edia/	nato5	ixni/2	021-	exca	vatio	n-sat	etv-a	uide.	-pipe	line-	editio	n pd



