Excavation Monitoring and Observation

Purpose	This document contains items to consider when developing a process to monitor or observe excavation activity after a one-call ticket has been analyzed and the excavation may pose a risk to the pipeline.
Reference	49CFR 195.442(c)(6) "Damage prevention program" American Petroleum Institute Recommended Practice 1166 (API RP 1166) published November 2005 covers many considerations in addition to items listed in this document. API RP1166 Covers: • Items to consider when screening a one-call ticket. • Items to consider when evaluating the proximity of work to the pipeline and type of work. • One-Call Ticket Process (Close ticket, Secure additional information, Conduct Site Visit, Perform Locate) • Definitions for Monitoring and Observation • Items to consider for Excavation Monitoring (Excavation within 25 feet of pipeline) • Items to consider for Excavation Observation (Excavation within 5 feet of pipeline)
Appendices	• Appendix A: Forms and Reports • Appendix B: Other Documents
Related Toolbox Topics	• One-Call Notifications Response and Communications • Line Locating and Temporary Marking • Unauthorized Activities, Encroachment, and Excavation: Management, Response, and Correspondence • Crossing and Encroachment Agreements and Correspondence

Frequency of Monitoring or Need for Observation:

Monitoring may be conducted on a pre-determined frequency (daily, bi-weekly, weekly, etc.) while Observation may be on a full time basis while active excavation is taking place.

CONSIDERATIONS: Factors Affecting Frequency of Monitoring or Need for Observation
• Scope of Work • Duration of expected excavator work   o In the event of parallel encroachments or other circumstances where monitoring will require a Company Representative to be present for a long duration, the contractor's work schedule should be provided to Company and a meeting held with Company inspector(s) periodically to review the schedule and scope • Type of equipment • Potential impact on pipeline • Complexity of work • Depth of excavation – what safety requirements will be necessary for pipeline, excavator, and monitor • History with the landowner/excavator • Number of excavators involved on the site • Proximity of work to pipe – Less than [X] feet Observation recommended • Depth of pipeline • Foreign utility crossing – Observation recommended • Isolation measures in place to protect pipeline (security fencing, physical barriers, natural barriers, etc.) • Company Risk Tolerance

Excavation Results in Damage or Excavator Won't Follow Company Requirements:

During monitoring or observation, if excavator does not comply with company's expectations and requirements or damage results, consider the following actions:

CONSIDERATIONS:
• Stop excavation • Inspect site • Take necessary steps to correct or prevent unsafe or abnormal operating conditions including shutting down the pipeline if necessary • Take necessary steps to inspect integrity of pipeline if damage observed or suspected following your company's integrity management requirements • If excavator won't stop work, contact Control Center, ROW Department, Company Management, Company Legal Department, Excavation Company, Law Enforcement or 911 as deemed necessary to determine and enforce Company rights

Training:

Processes should be considered which ensure that any required training for monitoring and observation personnel is current and maintained. Additionally, joint training between company personnel and contractors may be beneficial.

CONSIDERATIONS: The following training should be considered for Company Representatives performing Excavation Monitoring or Observation
• Company Safety Training (PPE, Excavation Access including Confined Space Entry, etc) • Locate Underground Pipeline including Placement of Temporary Markers & Line Locating Equipment • Monitor Right-of-way Encroachment including Observation • Inspect Excavation and Backfilling of Pipeline Facility • Abnormal Operating Conditions • Install and Maintain Line Markers • Perform Right-of-way Inspection • Verify Placement of Line Markers • GPS Mapping Skills • State One-Call Requirements • Communication and Conflict Resolution • Company Public Awareness Education

Documentation of Communication with the Excavator:

Documentation should be completed each time the Company Representative is on-site or makes contact with the excavator.

CONSIDERATIONS: Items to Consider Documenting and Communicating During Monitoring/Observation
Items to be discussed in initial meeting with excavator:
• Excavator and Excavation Company name and contact information • One-Call Ticket information • Location – ROW #, Station #, Mile Marker, GPS Coordinates • Excavation start date and time • Depth of excavation • Description of excavation • Duration of excavation • Safety and security concerns – barricades, fencing, signs, PPE, excavation access/grading requirements around pipeline, etc. • Monitoring expectations (fulltime, daily, bi-weekly, weekly, etc.) • If pipeline will be exposed – pot holing, hand/soft digging, pipe support, pipeline backfill requirements • If directional drilling – Ensure that directional drilling plans have been reviewed and approved by competent personnel and that any required precautions are being followed in the field including company clearance requirements • If blasting – company requirements for clearances and inspection/leakage surveys • If foreign utility crossing – clearance, orientation, other company crossing requirements • Load restrictions and matting or depth of cover requirements for heavy loads over pipeline • Set-back requirements for structures, fences, landscaping, septic systems • Hand excavation requirements agreed to by the pipeline company and the excavator or based on the State one-call law tolerance zone if agreement can't be reached • Agreed excavation distances/depths/practices if Company Representative is not onsite. If no excavation is permitted without Company Representative document

that communication with Excavator • Site restoration requirements for excavation on easement including trash removal, ground cover requirements, pipeline markers • Liability of excavator if damage occurs and monitoring plan not followed or deviation occurs without approval. This could include reimbursement for damage repairs or expenses to relocate Company's facilities if necessary • Company communication and approval requirements for schedule or scope changes • Document any of the aforementioned discussion items • Request the excavator sign an acknowledgement of the company's expectations and requirements. Refusal should also be documented
Each time the site is visited or contact with excavator is made until excavation is complete:
• Company personnel, locator, or contractor that visited excavation site • Excavator on-site • Date and Time of Monitoring/Observation • Photos • Any schedule or scope changes • Location of work to pipeline and progress (faster/slower than expected, moving to another area, etc.) • Any pertinent communication with excavator regarding scope, schedule, concerns, expectations, changes in work, company requirements, back-fill requirements, etc. • Any crossing of the pipeline by foreign utility including type of utility, distances, and coordinates. Communicate to appropriate department for mapping updates • Any safety concerns • Update documentation provided to excavator to reflect changes in company's expectations and requirements and reissue to excavator

Company Records – Ensure company records are updated and maintained with crossing information and other pertinent information:
• Crossing Information – Life of the asset • Monitoring/Observation Logs - per company's retention policy or regulatory requirements

1 Appendix A: Forms and Reports

This appendix contains industry examples of forms and reports related to the topic.

1.1 Example of Checklist for Hydro-Vac

Hydro-Vac Soft Digging Checklist-Jobsite Inspection Required?

If any of the following questions are answered "Yes", Hydrovac/Soft Digging should be strongly considered. If Hydrovac/Soft Digging is not used, you must get endorsement from your supervisor and address hazard mitigation steps in JSA. *Please check the box for a "Yes" answer.*

- ❒ Is the Excavation at a manifold heavily congested with pipelines and/or utilities?
- ❒ Is the Excavation Inside a pipeline station or terminal?
- ❒ Are drawings confusing, incomplete, conflicting, not available, or do you suspect any undocumented changes have been made to a pipeline?
- ❒ Is information about the size and location of pipeline appurtenances incomplete?

Supervisor notified: _____

Time: _____

Date: _____

If one or More of the following questions are answered "Yes" Hydro-Vac/Soft Digging may be considered instead of a backhoe excavation: *Please check the box for a "Yes" answer.*

- ❒ Is probing difficult or impossible?
- ❒ Do you want to supplement probing by exposing start and end points, or turns?
- ❒ Is the excavation in a ROW congested with other pipelines and/or utilities?
- ❒ Are you removing the final 18 inches of soil around the pipeline?
- ❒ Is precision excavation desired to limit the amount of soil removed?

1.2 Example of Work Check List for Jobsite Inspection

- ❒ Review JSA and/or detailed work procedures? Add site specific hazards
- ❒ Has the pipeline(s) been physically verified by probing or potholing and compared to the alignment sheet for this specific job?

  Date on alignment sheet: _____
- ❒ If this is a complex bore, is the directional drill competent person onsite and using roles and responsibility checklists?
- ❒ Has pipeline measured depth of cover been recorded on form?
- ❒ Have appropriate actions been taken to protect the pipeline(s) that have less than 36 inches of ground cover?
- ❒ Has the third party/competent person read and signed the Excavation/Constriction Restrictions?
- ❒ Does this job require a One-Call procedures waiver?

  Procedure waived: _____

  Approved By: _____
- ❒ Are work site warning devices in place?
  - ❍ Barricades
  - ❍ Warning Signs
  - ❍ Guarded Walkways and Work Areas
- ❒ Personal Protective Equipment Required?
  - ❍ Hard Hat
  - ❍ Safety Shoes/Boots
  - ❍ Hearing Protection
  - ❍ Safety glasses with side shades
  - ❍ Gloves
  - ❍ Fire Retardant Clothing
  - ❍ Goggles
  - ❍ Face Shield

- ❍ Welding PPE
- ❍ Life Vest
- ❍ Safety Vest
- ❍ Snake Leggings
- ❍ Other: _____

Excavation Access Considerations

When an employee needs to enter an excavation of a pipeline, the employee needs to:

- ❒ Verify the excavation has been inspected by a competent person
- ❒ Evaluate the depth of the excavation to see if it is 4 feet or greater
  - ❍ Depth of Pipeline: _____
  - ❍ Depth of Excavation:_____
- ❒ Conduct a gas test in excavations 4 feet or greater when the potential for exposure to a hazardous atmosphere exists, e.g. contaminated soil.
- ❒ Evaluate access into the excavation. Excavations 4 feet or greater without access ramp (ladder access, ramp sloped to a 1 1/2:1 ratio or 34 degrees), will require a Confined Space Entry Permit

1.3 Example of Checklist for Exposed or Crossed Pipeline

- ❒ All required documentation must be completed prior to completion of job.
  - ❍ Crossing Company information
  - ❍ Photos
  - ❍ Global Positioning System (GPS) Location
  - ❍ ROW#, Stationing#, Mile Mark
- ❒ Have test leads been installed?
- ❒ Has form been completed? Exposed Pipe Information

1.4 Example of Post-work Checklist

- ❒ Has the backfill been mechanical compacted to the top of the pipeline(s) after the removal of water and trash?
- ❒ Have all the permanent above ground pipeline markers been properly installed in the correct location?
- ❒ Is there line-of-sight visibility of permanent above ground markers?
- ❒ Has all trash been packed up and the ROW restored to pre-work or better condition?
- ❒ Has all equipment and materials (i.e. pipe, skids, rollers, etc.) been removed from the ROW?
- ❒ Has the responsible operation person been notified that the work is complete?
    - ❍ Supervisor notified? (Full Name): _____
    - ❍ OCC Controller Notified? (Full Name): _____
- ❒ Has a post blasting leak survey been completed?
- ❒ If rectifiers were turned off, have they been turned back on?
- ❒ If pipeline depth of cover is 36 inches or less, has pipeline depth of cover information been communicated?

1.5 Example of a Monitoring/Observation Daily Log

Monitoring/Observation Daily Log					
General Information					
Company Name:		Arrival Time:		DATE:	
Name:		Departure Time:			
One-Call Ticket #:		Total Hours/Min on Site:			
ROW #:					
System:		Observed (hours/min):		Hours Driven for project:	
Segment:		Monitored (hours/min):		Area:	
Location Description (i.e. street or address):					
EXCAVATOR CONTACT INFORMATION	NAME	FUNCTION	PRIMARY CONTACT#	SECONDARY CONTACT #	
Company:					
Primary:					
Secondary:					
Equipment Operator:					
Other:					
Line Location Verification					
Verification of Locate Marks/Flags:		Action Taken:			
Comments on Locate Verification:					
Daily Activity					
Scope of work for the Day:					
Proximity of Activity to Pipeline:					
Additional Comments on Proximity of Work:					
Types of Activities Conducted:					
Primary Type of Equipment:			Additional/Other Equipment:		
Secondary Type of Equipment:					
Anticipated End Date for Monitoring:					
Expected Start Date of Observation:					
Daily Notes					

1.6 Example of an Excavation Safety Checklist

Excavation Safety Checklist

The information noted on this form is intended to communicate general information about our pipeline(s) and is not intended to be solely relied upon by any party for the purpose of excavation or any similar purpose.

By law, to enable all participating utilities time to mark their facilities, the **One-Call Center** in your state requires notification by calling 811 prior to any excavation. Company is a member of this One-Call enterprise and will automatically be notified through this system. In addition, a Company inspector will perform and/or review with the excavator representative the applicable checklist items below.

Pipeline Locate Activity:

- ❒ If plans are available, requested a copy of the written project plans and drawings for review with the excavator and/or engineer. Had the excavator and/or engineer explain the extent of the work area, location and depth of the excavation, type of proposed utilities, location of proposed utilities, number of utility crossings, etc.
- ❒ Established the pipeline(s) location and marked the line(s) per state One-Call requirements throughout the entire work area.
- ❒ Photographed all established pipeline markings throughout the work area.

Communication with the Excavator and/or Engineer:

- ❒ The excavator and/or engineer was advised that a Company inspector must:
  - ❍ Monitor the excavation site daily when work is performed within 25 feet of a Company pipeline.
  - ❍ Observe continuously all excavation and backfill activity performed within 10 feet of a Company pipeline or during the installation of any utility across a Company pipeline facility.
  - ❍ In addition, the excavator was instructed to call 800-XXX-XXXX if they were ready to excavate within either above distance of a Company pipeline and a Company inspector was not present. When called a Company inspector will be sent to perform the inspection, which is free of charge.
- ❒ The excavator was advised that only backhoes or trackhoes with a steel plate welded across the teeth of the bucket are permitted to be used during excavation work around a Company pipeline.
- ❒ The excavator was advised that the Company inspector is required by law to perform an external inspection of any Company pipeline exposed during excavation activity. The excavator understands that he/she is responsible to provide an OSHA compliant excavation, allowing the Company inspector safe ingress and egress to examine our exposed pipeline.

- ❒ Walked through the work area with the excavator and communicated the locations of all Company pipelines in the planned work area.
- ❒ Discussed the number of pipelines, pipe size(s), approximate pressures, approximate depths, excavation tolerance zones, hand digging requirements, and the hazards and characteristics of product(s) in the pipeline system(s) located in the planned work area.
- ❒ The excavator was advised to call the One-Call Center 811 or contact Company, if the Company markings are destroyed or need to be refreshed in the planned work area. This service is provided free of charge.
- ❒ The excavator was advised that before any exposed Company pipeline can be backfilled, the Company inspector will direct the placement of an orange warning mesh over the pipeline.
- ❒ The excavator was advised that **any contact** with the pipeline, pipeline coating, test station wiring, or anode beds **must be reported to Company prior to backfilling the excavation** to permit further inspection of the damage to assure continued safe pipeline operations.
- ❒ The excavator was advised that failure to comply with the conditions outlined above would result in Company requiring the excavator to expose the pipeline again to allow an examination of the pipeline at the excavator's expense. If damage to the pipeline is discovered, Company may seek monetary compensation for all repair costs. Company may also report this activity to all concerned parties (State One-Call Center, Regulatory Agencies, Principal Contractor, Excavator's Insurance Company, etc.).

If you are unable to reach the representative designated below, or in case of an emergency, call 1-800-xxx-xxxx.				
One-Call Ticket:		Line Segments:		
Work Order:		Mile Posts:		
Nearest Street:				
Company Information			Property Owner/Excavator/Engineer	
Date:			Name:	
Name:			Phone:	
Cell Phone:			Signature:	