Trenchless Engineering and Permitting TRAINING AGenDA – Kinder morgan

June 15, 2018

7:30 am – 8:00 am Breakfast

8:00 am – 8:15 am Welcome, Introductions, Safety Moment - Robison

8:15 am – 8:45 am HDD and Direct Pipe® Introduction - Miller

* What is HDD?
* What is Direct Pipe®
* Basic Geometry
* Construction Process
* Comparison of HDD and DP

8:45 am – 9:30 am Environmental Permitting for Pipeline Construction Projects - Muller

* Federal
* State
* Local

9:30 am – 9:45 am Trenchless Planning and Routing - Miller

* HDD Routing
* HDD Alignment and Profile Planning
* Minimum Length HDD Crossings

9:45 am – 10:15 am Break

10:15 am – 10:45 am Trenchless Evaluation and Design Process - Robison

* Workflow
* Desktop Study
* Desktop Feasibility
* Site Visit
* Subsurface Explorations
* Laboratory Testing
* Feasibility
* Design

10:45 am – 11:15 am HDD Tooling and Equipment - Miller

* Pilot Hole Tools
* Hole Opening Tools
* Pullback Tools and Equipment
* Drilling Fluid Management
* Steering
* Drilling Fluid

11:15 am – 11:45 am Environmental Permitting Project Examples – Muller

11:45 am – 12:00 pm Morning Wrap-up Discussion

12:00 pm – 1:00 pm Lunch

1:00 pm – 1:45 pm HDD Design Exercise - Miller

1:45 pm – 2:15 pm Hydraulic Fracture - Robison

* Hydraulic Fracture vs. FracOut
* Design Considerations
* Compliance with Permit Requirements
* Risk Management
* What are the risks?

2:15 pm – 2:30 pm Construction Observation and Risk Mitigation - Miller

* Pre-Construction
* Construction Observation
* Compliance with Plans and Specifications
* Risk Management

2:30 pm – 2:45 pm Environmental Red Flags - Muller

2:45 pm Training Wrap-up

* Final Questions/Discussion
* Training Survey