

LANDSLIDE CAUSES EXPLOSION OF A NEWLY CONSTRUCTED HIGH-PRESSURE GAS PIPELINE IN PENNSYLVANIA

An ESi investigation determines the failure stemmed from negligent design and construction in geologically unstable terrain, not from an alleged force majeure rainfall event. The court rejected this defense, crediting ESi expert testimony and reinforcing the legal importance of sound geotechnical, construction, and design engineering practices in pipeline infrastructure.

SITUATION

In 2018, a catastrophic rupture of the recently constructed Revolution Pipeline occurred in steeply sloping terrain in Beaver County, PA, just days into a critical earnout period under a sale agreement for natural gas infrastructure. The high-pressure pipeline was part of a system sold by the plaintiff, an oil and exploration company, to the defendant, an affiliate of a large midstream pipeline operator with performance milestones linked to natural gas throughput.

The pipeline operator affiliate argued that a force majeure event, specifically, heavy rainfall from the remnants of Tropical Storm Gordon, caused the rupture relieving them of responsibility for the system's failure. The oil and exploration company asserted that the rupture was no mere accident of nature, but rather the predictable result of negligent pipeline design and construction through a known landslide-prone area.

Practices:

Geotechnical & Mechanical Engineering

ESi Consultants

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Services Utilized

- Mechanical Engineering
- Civil Engineering
- Geotechnical Engineering
- Engineering Geology
- Water Hydrology
- Materials Science

About ESi

For over 35 years, ESi has leveraged its multidisciplinary team of engineers, scientists, and professional technical staff to investigate many major accidents and disasters. Our technical expertise, hands-on experience and state-of-the-art facilities, combined with diagnostic, analytical and physical testing capabilities create an ideal environment for quickly identifying and interpreting the facts of a particular case.

Contact ESi

For more information visit our website or call us toll free at 866.596.3994

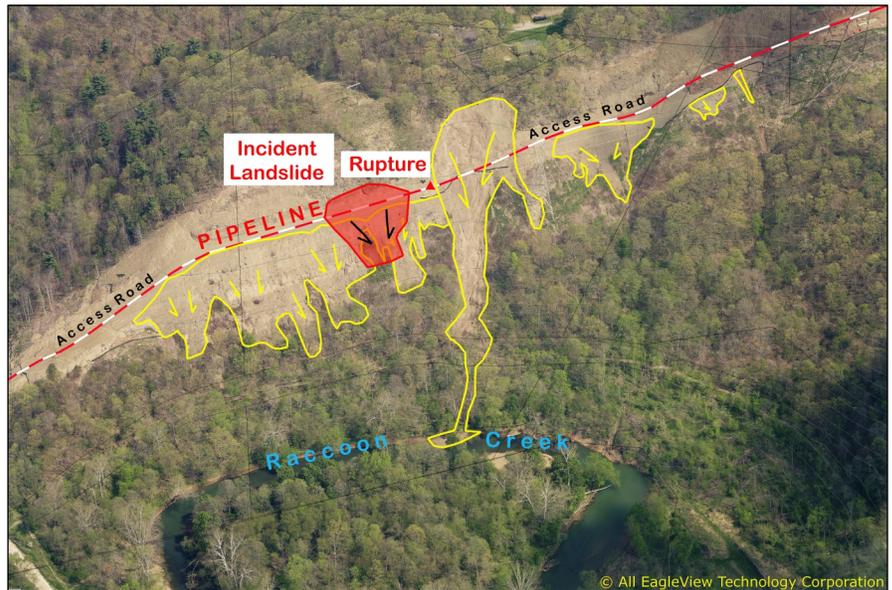
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SOLUTION

The oil and exploration company retained ESi consultants Dr. Philip Shaller, an engineering geologist, and Dr. Alfred Pettinger, a mechanical engineer, to conduct a forensic root cause analysis and evaluate the standard of care exercised by the pipeline operator affiliate during the design and construction of the Revolution Pipeline, consistent with regulatory requirements and engineering norms.

The ESi investigation determined that:

- The pipeline route traversed slopes with a documented history of slope instability and landslides, identifiable in geological surveys dating back to 1975; the operator's own geohazard study furthermore had ranked the terrain at the highest hazard level, consistent with ESi's independent findings.
- The design and inspection process lacked supervision by licensed geotechnical engineers or engineering geologists, despite the clear risk profile demonstrated by the terrain and unabated ground movement documented during construction and after declaration of mechanical completion of the pipeline.
- The rupture occurred on a steep (80%) slope that had been modified using wet, uncompacted landslide debris as fill. The slope was rebuilt without proper benching, drainage, or subgrade stabilization. The rupture occurred where the pipeline transitioned between bedrock and



unstable soil, precisely where landslide activity was most likely.

- The erosion protection and geotechnical mitigation measures the pipeline operator affiliate constructed were inadequate and contributed to the failure.
- ESi's rainfall recurrence analysis showed that the preceding rainfall was above average, but not an extreme or causative event in isolation.

ESi's conclusions were drawn from a detailed review of design documents, environmental permits, construction inspection records, rainfall records, and historical landslide data, supported by forensic analysis and corroborated by third-party reports.

RESULTS

The court rejected the force majeure defense, holding that the rupture was not an "act of God" but rather a consequence of substandard engineering decisions in known unstable terrain. Judge J. Ross found the ESi witnesses to be credible and knowledgeable.

This case illustrates ESi's ability to integrate geotechnical, mechanical, and regulatory expertise to support litigation in complex infrastructure failure cases, and to set the factual record in disputes involving pipeline safety, regulatory compliance, and land risk.

WHY ESi. The geotechnical & mechanical engineering practice groups are comprised of consultants with backgrounds in:

- Cause and Origin Identification
- Rainfall Accumulation and Recurrence Interval Analysis
- Landslide Analysis
- Soil Erosion Analysis
- Data Acquisition
- Natural Disaster Analysis
- Risk Analysis
- Materials Analysis
- Subsurface Characterization
- Failure Analysis
- Fatigue Life and Fracture Mechanics
- Vibration Analysis
- Storm Damage Analysis
- Reliability Testing



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