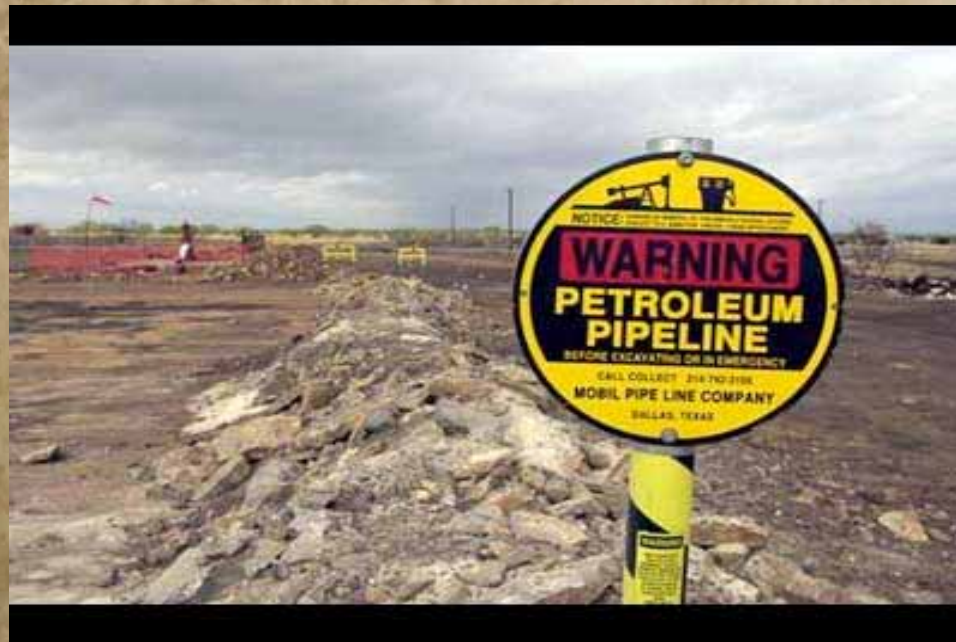


Pipelines & Land Use How Can They Help You?

Charles H. Batten, P.E. President
Batten & Associates, Inc.
Locust Grove, Virginia



Some Early Efforts Establishing Protection for People and Buildings Adjacent to Pipelines.

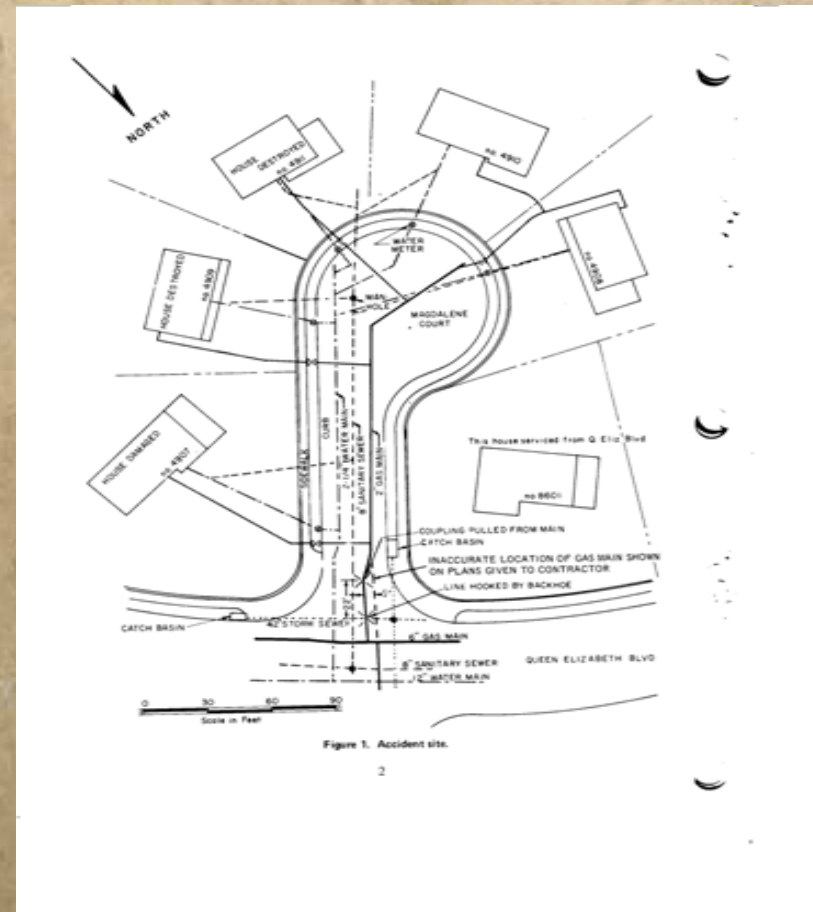
- 1982 *Risk Analysis* Paper Addressed Risk-Based Zoning & Established a model for Alberta, Canada in determining buffer zones and graded setbacks.
- 1988 TRB Special Report 219 Encouraged Use of Setbacks.
- Fairfax Co., Santa Barbara Co. & Others Considered Setbacks.

What's Wrong With Standard Setbacks?

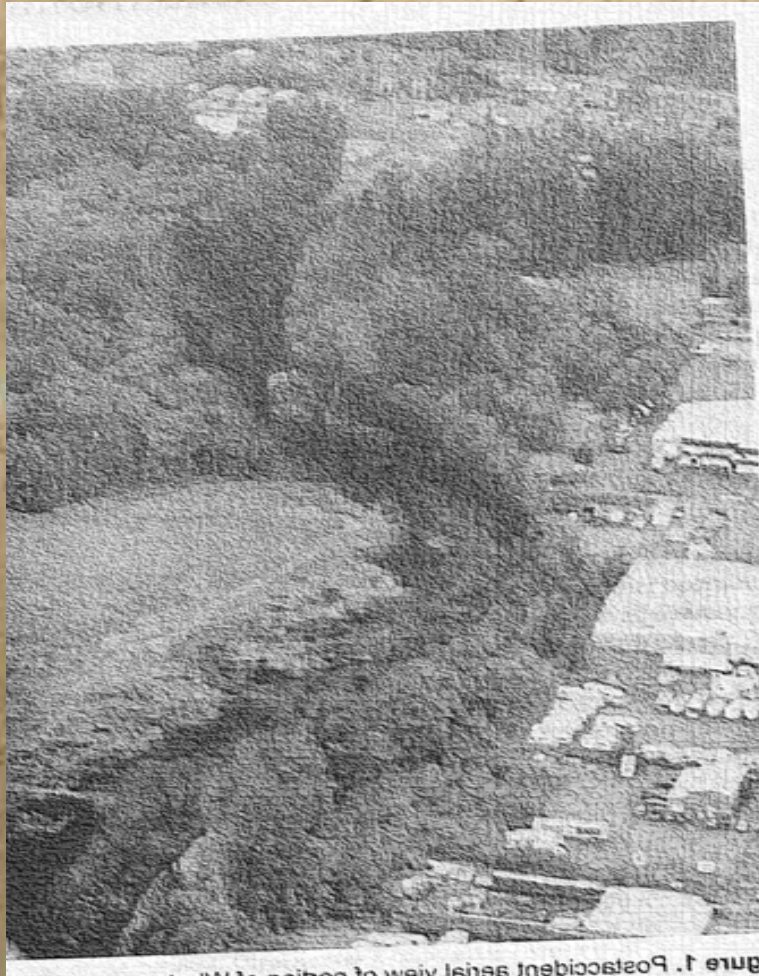
- One size does not fit all .
- Other factors that affect risk zones
 - Pipe size & pressure
 - Properties of materials transported
 - Adjacent environment
- Area characteristics can change with time.

Real Life – Annandale, VA

- Gas line at 22 psig ruptured in residential area.
- Gas migrated 240 feet below ground entering house
- 3 killed, 1 injured
- No offset would have worked



Real Life – Bellingham, WA



- 16-inch steel pipe rupture flowed ~237,000 gallons of gasoline into Whatcom Falls Park
- Creek carried fuel about 1 _ miles where it ignited.
- 3 killed, 8 injured.
- No offset would have worked.

Real Life – Edison, NJ

- 36-inch natural gas pipe ruptured at 970 psig blowing pipe fragments and rocks more than 800 feet and flames more than 500 feet.
- 83 injuries, 1,500+ evacuated.
- Any reasonable setback would not have helped.

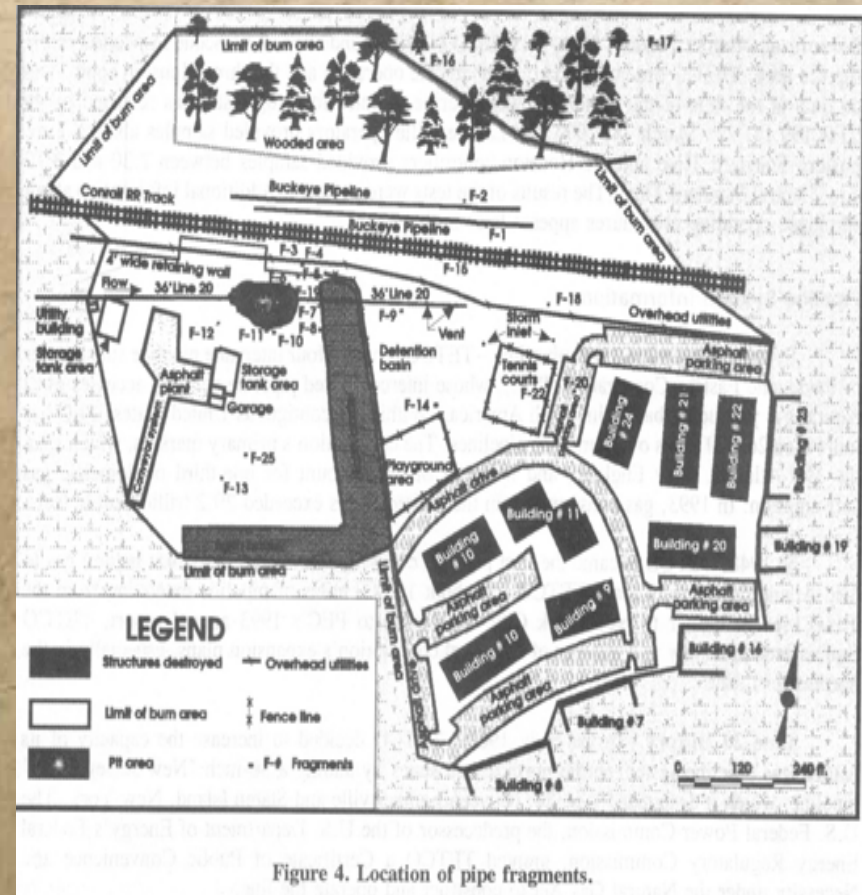


Figure 4. Location of pipe fragments.

Real Life - San Bernardino, CA

Derailment destroys train & 7 houses, kills 4, injures 3, damages 14-in fuel pipeline.

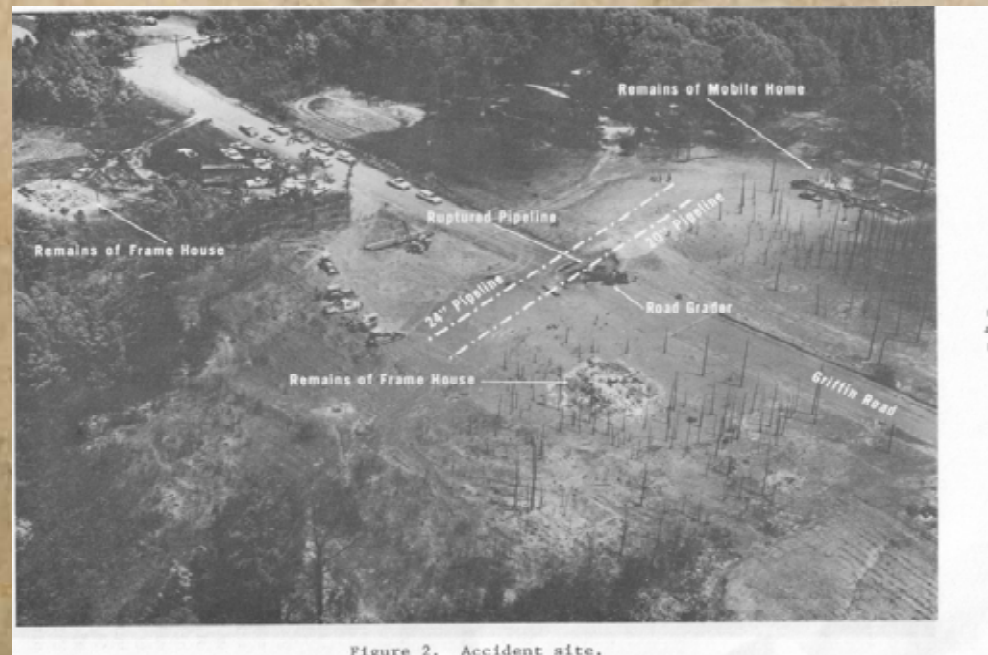
Delayed Pipeline rupture - sprayed gasoline 100's of feet both laterally and into air and it exploded killing 2, injuring 19 & destroying 11 additional homes.

No reasonable offset would have made a difference.



Real Life – Cartwright, LA

- 20-in natural gas pipeline rupture under 770 psig, igniting and sending flames about 150 ft. horizontal & 200 ft. high.
- 6 killed. 1 injured
- No Reasonable offset would have made a difference.



Most often, Set Backs have
little potential for
preventing Incidents and
even less potential for
preventing harm to people
or property.

SO. What Are We Left With?

What's the Answer?

1. Comprehensive, Effective Safety Standards for All Pipelines
2. Vigilant Operator and Government Oversight
3. Vigorous Federal and State Enforcement

Comprehensive, Effective Safety Standards for All Pipelines

- Standards Must Specifically address Hazards and Preventive Actions
- To be Fair Both to Public and Operators, Standards Must Include Explicit Criteria Against Which to Measure Compliance With Regulations.

Vigilant Operator and Government Oversight

- Operators Need to Implement Effective Self-Evaluation Compliance Programs.
- Operators Should Never Consider Government Evaluations as Evidence of Their Compliance.
- Government Oversight by State and Federal Must be More Thorough and More Frequent

Vigorous Federal and State Enforcement

- All Pipeline Operators Know or Should Know by Now What is Expected for Compliance; Thus, There is No Room for Leniency. All Fines Should Be Max, at Least Initially and Until Proven to Have Been Unavoidable.
- All Operators, Including Municipals and Master Meters, Must be Held to Same Safety Standards or They Should Sell Their Systems to Operators Capable of Safely Operating Pipeline Systems.

Pipeline Safety for Tomorrow

- We can no Longer Afford Insufficient Regulations.
- We can no Longer Afford Deficient Oversight.
- We can no Longer Afford Ineffective Enforcement.



Land Use Guidance

- No Easy Sound Byte Solution Here!!
 - On The Pipeline ROW
 - The Pipeline Operator's Responsibility.
 - Loading/Corrosion/Damage/Material /Operational /Etc.
 - Goes Beyond Federal Regulatory Minimum Requirements
 - One-Call Has Limitations
 - Can't Subcontract This Ultimate Operator Obligation!
 - A Good Easement Helps Sets the Rules on Use
 - The Pipeline/Landowner/Tenant/user
 - Off The Pipeline ROW
 - Not Really Addressed in U.S.
 - Some Pipeline Operator Responsibility
 - Usually Local Authorities (aka Zoning)
 - The Landowner/Tenant/user Property Rights