

RISK ASSESSMENT

A process to review all factors that contribute to understanding pipeline risk as it relates to safety and the community in which pipelines are located

1

PURPOSE OF RISK ASSESSMENT

2

- To address the risks & impacts of pipeline development on the identified three main risk categories -- **LIFE, PROPERTY, and ENVIRONMENT**
- To help to define unknown risk factor data, then compare/contrast to already established industry risk data
- To understand the level of risks posed on each of the three risk categories, and compare it to already established acceptable levels of risk
- To provide a risk assessment that is readily available to the general public

LIFE	PROPERTY	ENVIRONMENT
<ul style="list-style-type: none"> •*Loss of Life •*Health Concerns (stress, quality, etc.) •*Injury •*Safety for community •*Assess targeted locations 	<ul style="list-style-type: none"> *Loss of homes, property *Insurance concerns (HOAs, homeowners) *Zoning issues *Home values *Negative stigmas 	<ul style="list-style-type: none"> *Impacts to drinking water *Loss of wetlands *Geological concerns (Karst, aquifers, etc.) *Air quality surrounding pumps, flares, etc.

3 MAIN RISK CATEGORIES

To assess the impacts of pipeline development on three risk categories

1. LIFE
2. PROPERTY
3. ENVIRONMENT

and how targeted risk analysis will reveal the impacts to the health, safety, and welfare of a community.

WHAT IS RISK?

Risk is the condition of being exposed to potential danger or loss.

Risk can be caused by foreseen or unforeseen circumstances.

Risk can also be realized as an intentional interaction with uncertainty.

The level of risk associated with this pipeline is completely unknown, and yet communities are being asked to accept it.

RISK REALIZED

A fireball erupts across Interstate 77 from a gas pipeline explosion in Sissonville, W.Va. In the 2012 incident, the stretch of pipeline that ruptured had not been inspected or tested for **24 years**.

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ALL RISK FACTORS MET

U.S. proposes new safety rules for natural gas pipelines - MARCH 18, 2016

<https://stateimpact.npr.org/pennsylvania/2016/03/18/u-s-to-expand-safety-rules-for-natural-gas-pipelines/>

What's the difference?

Hazard



Risk

Anything that can cause injury, illness, property damage, or loss of life.

(Specific pipeline safety concern)

The probability and severity of harm caused by the hazard.

(Consequence of all pipeline safety concerns)

REACTIVE

Emergency Management Response

PROACTIVE

Careful Planning Response

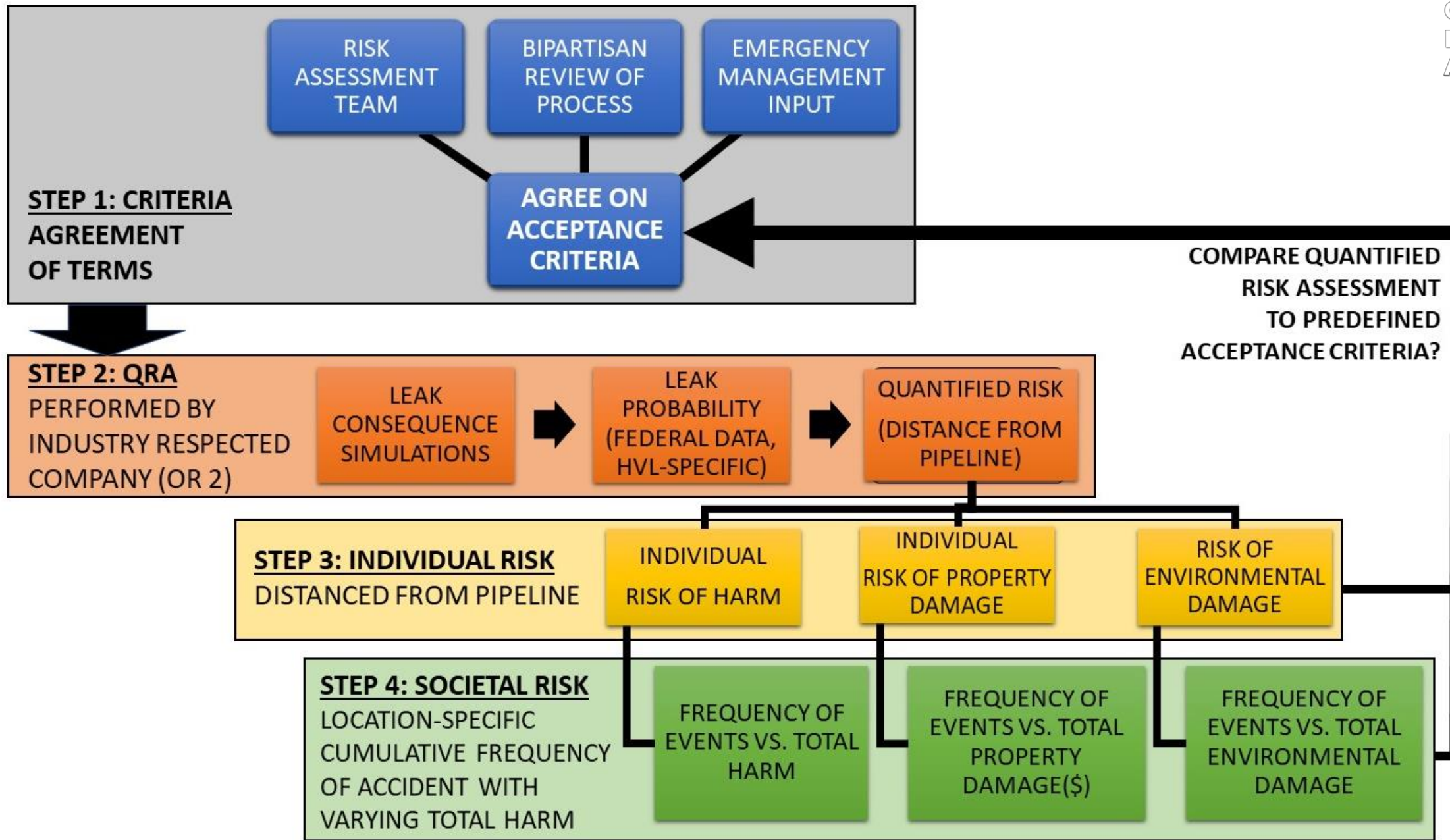
HAZARD VS. RISK

Hazard Assessment:

Identifying anything that can cause harm (pipeline breach, pump failure, release of gas, etc.)

Risk Assessment:

How high is the likelihood and what is the severity of the hazard (number of people injured, homes destroyed, drinking wells destroyed, etc.)



QRA PACKAGE

Quantitative Risk Assessment (QRA)

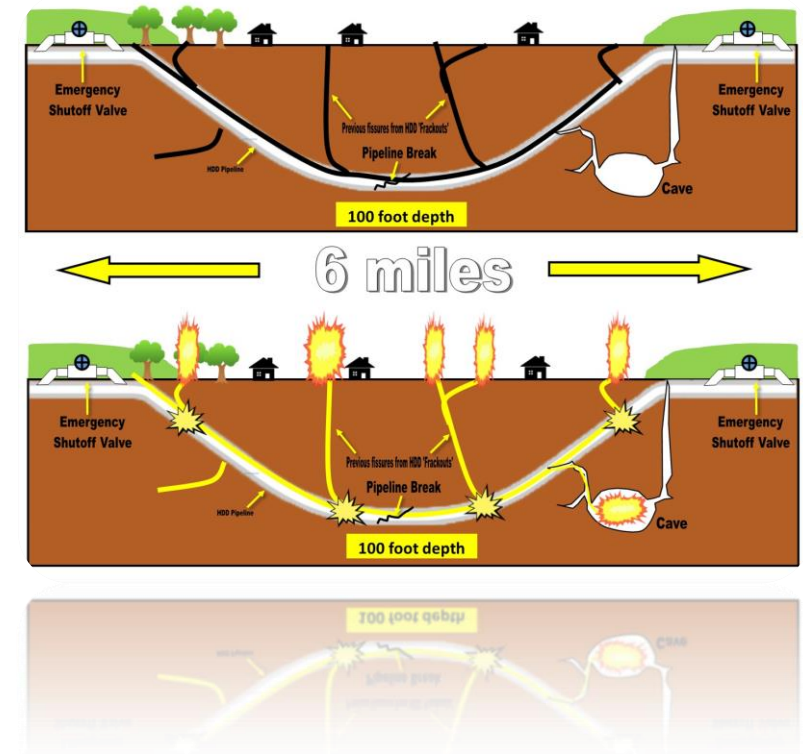
Goal: Quantify risk as a function of distance from the pipeline

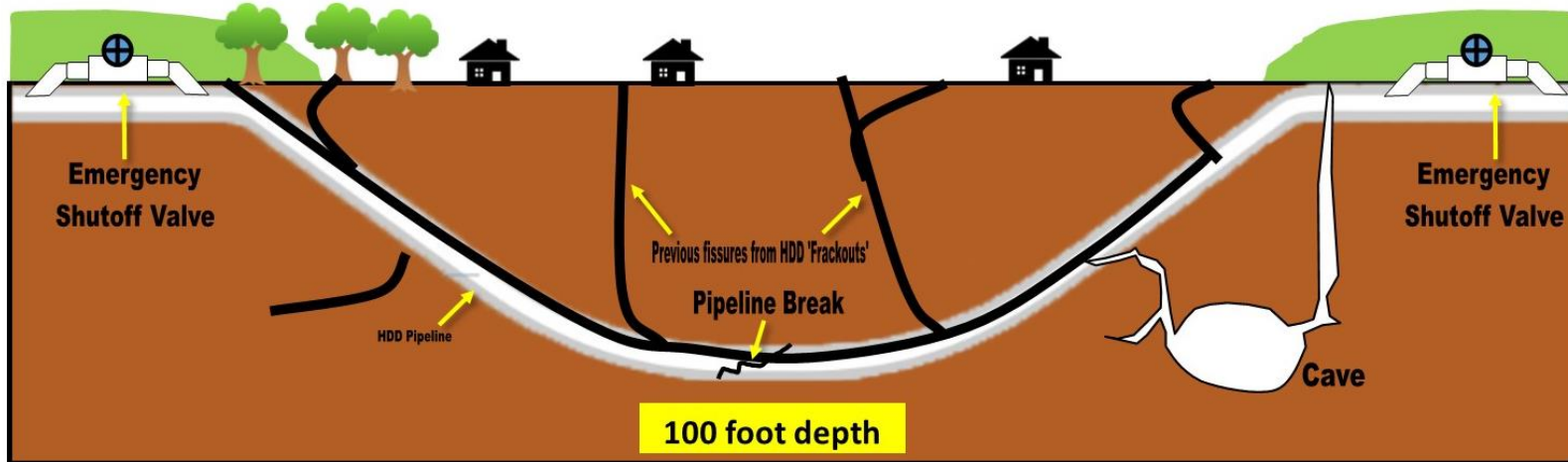
Input: Simulations of varying conditions that will describe potential consequences

Output: Generic Risk plots that show risk of damage at various distances from a pipeline leak based on specific quantitative variables

QRA PACKAGE CONT'D

- **Variety of leak scenarios with timing**
 - Leak hole sizes (1/8", 1/4", 1/2" and 3/4" holes, rupture)
 - Failure Modes
 - Variable Local Operating Pressures at leak site
 - Population Density Variable (Rural vs. Urban)
- **Different pipelines**
 - ME1: 8in, 85+ years old, out-dated welding methods
 - ME2 & 2X: 16 in & 20in, large diameter seam-welded, field bends, etc
 - Interchanges with and crossovers of other pipelines by other operators
- **Different Pipeline features**
 - Valves, pumps
 - Depth 3-6ft. buried pipe, 50ft HDD, 100ft. HDD
 - Types of steel and protective coatings





UNKNOWN

HDD will be up to 100 ft. (or more) in depth.

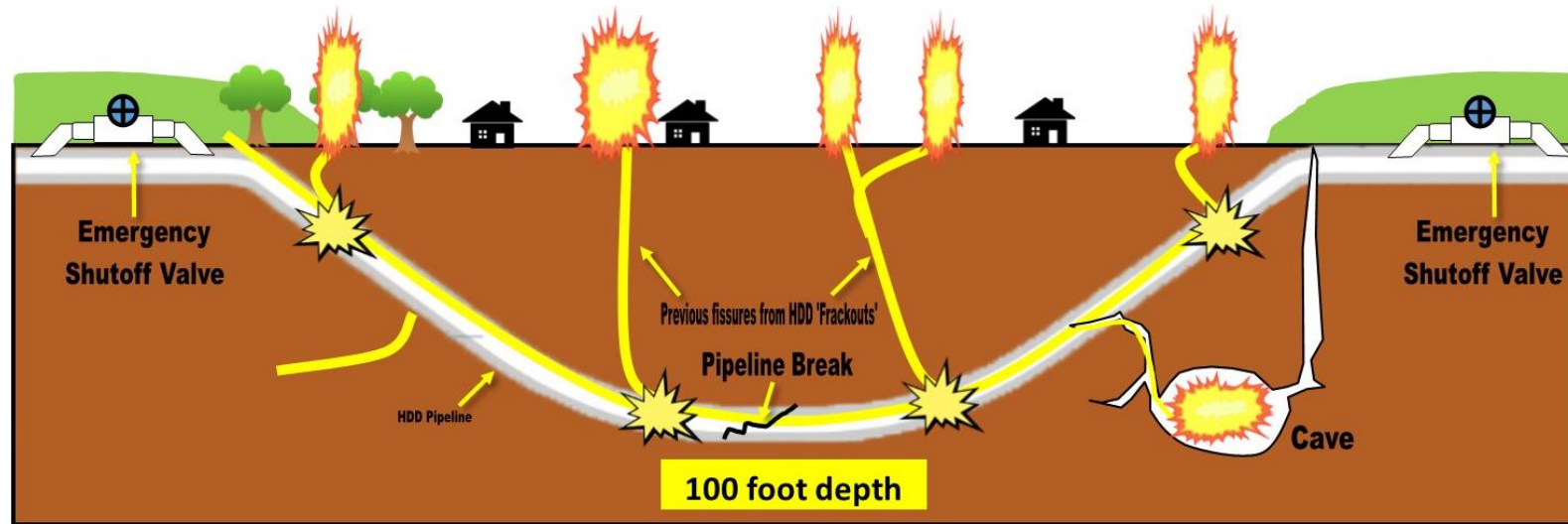
What happens when there is a breach at that depth?

What is the impact to the entire pipeline exploding when the HDD pipe channel is full of gas?

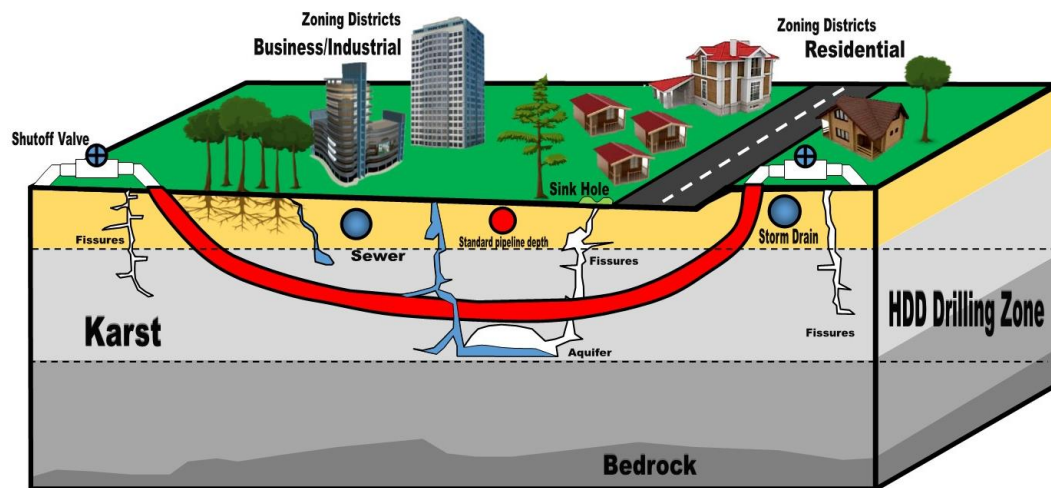
What is the potential damage to surrounding infrastructure?

Speaks to Emergency Planning issues.

← 6 miles →



QRA PACKAGE CONT'D



Pipeline installation in varying zoning districts

▪ Pump Station Configurations

- With and Without Berks County Pump Station Active
- Determine pressure at end of line (Twin Oaks)
- Determine if Ethane can be operated safely without Berks station

▪ Probability

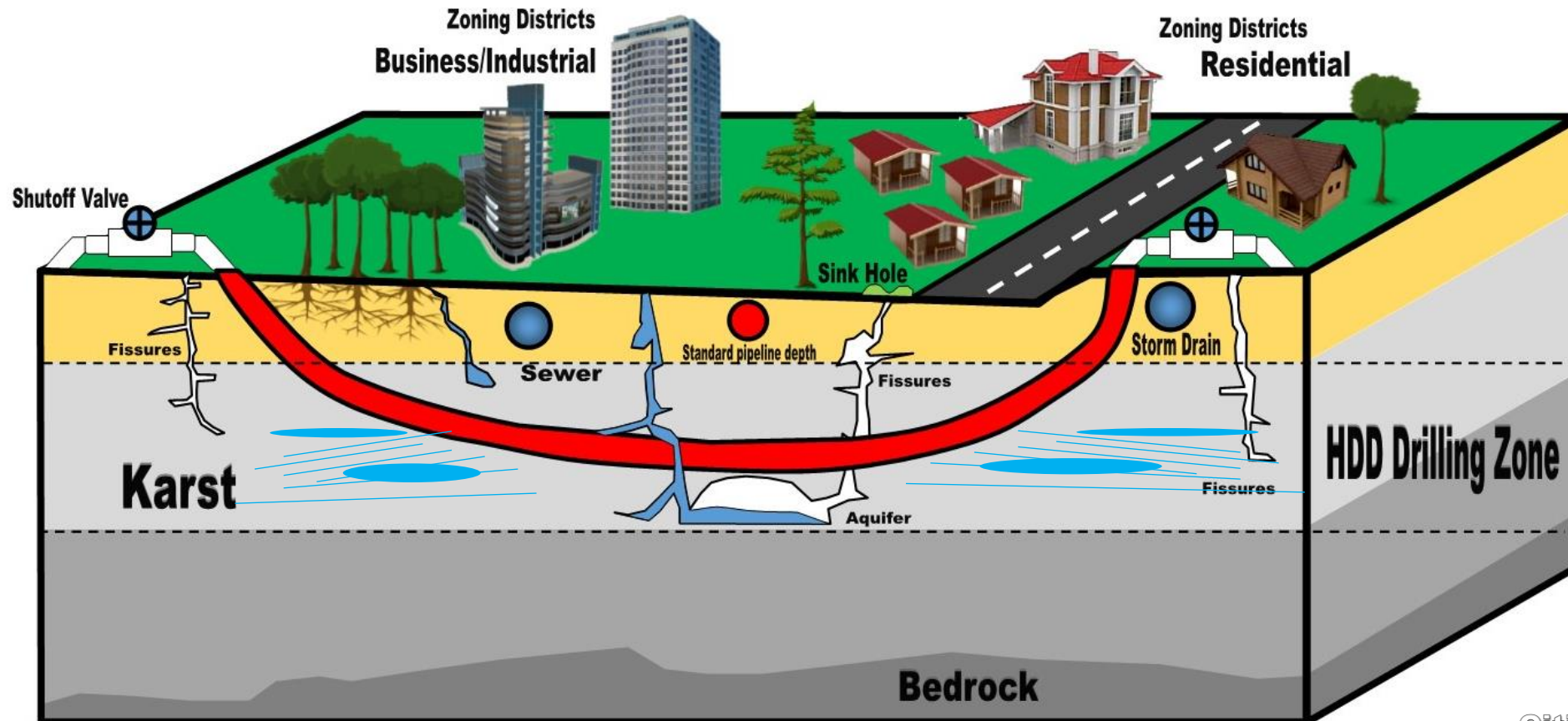
- Company Specific federal leak data (self-reported)
- Assess both worst operator vs. operator with best safety record
- Enforcement Actions (Unreported but verified)
- Account for different materials (ethane) and thermal risks

▪ Risk Mitigation

- De-inventory tanks at valve sites?
- Procedures to de-inventory lines at each valve site
- Estimate of minimum time & pressure to invoke ESD
- Community notification in densely populated residential and institutional settings?

**This is not a comprehensive list of all that is being considered.*

IMPACTS TO OTHER INFRASTRUCTURE?



Pipeline installation in varying zoning districts

POTENTIAL RESULTS COULD YIELD SIMILAR CHARTS

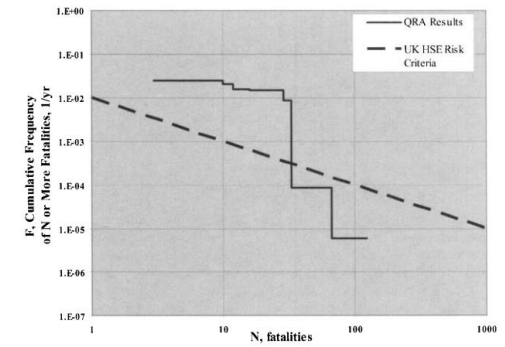
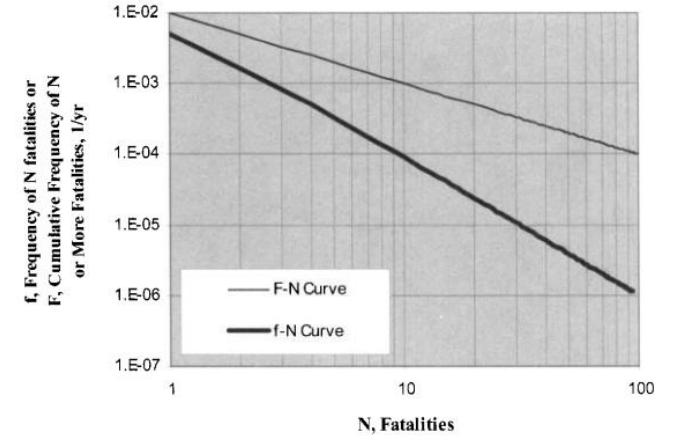
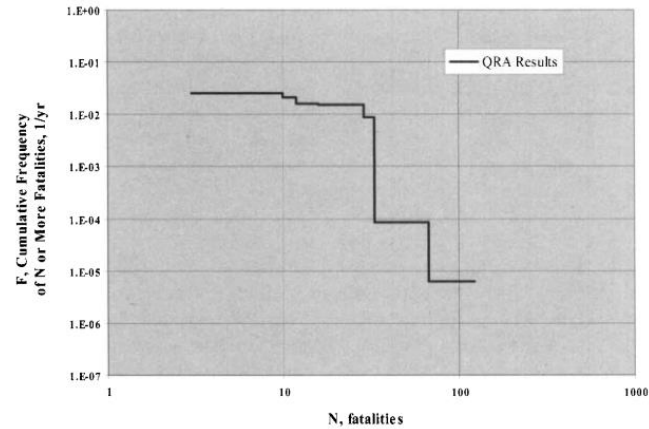
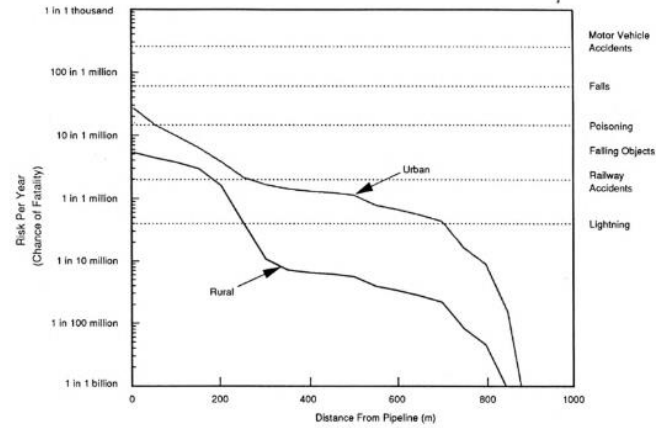


FIGURE A.2. Hypothetical QRA Results with UK HSE Societal Risk Criterion



FINANCES

What happens with all the money?

THE CONTRIBUTION PROCESS



- Anyone can donate to the assessment via Go Fund Me, donation to CAC, or a check
 - Donors must put “Risk Assessment” in the memo for their donation so the Council can track the money.
- Clean Air Council (CAC) accepts & holds the money with 100% going to the costs of the assessment
- Only pre-approved bills will be paid by these funds
 - Approval goes through the Risk Assessment Committee (RAC) to be paid
 - Once approved, the bill is given to the Risk Assessment Finance Committee to be sent to CAC
- Contributions will be tax deductible and will include a free membership to CAC
- Clean Air Council will provide Del-Chesco United with accounting reports of donations about once a month.
- **Clean Air Council will not hold responsibility for developing the study or influencing the outcome in any way.**



WHY DO THIS?

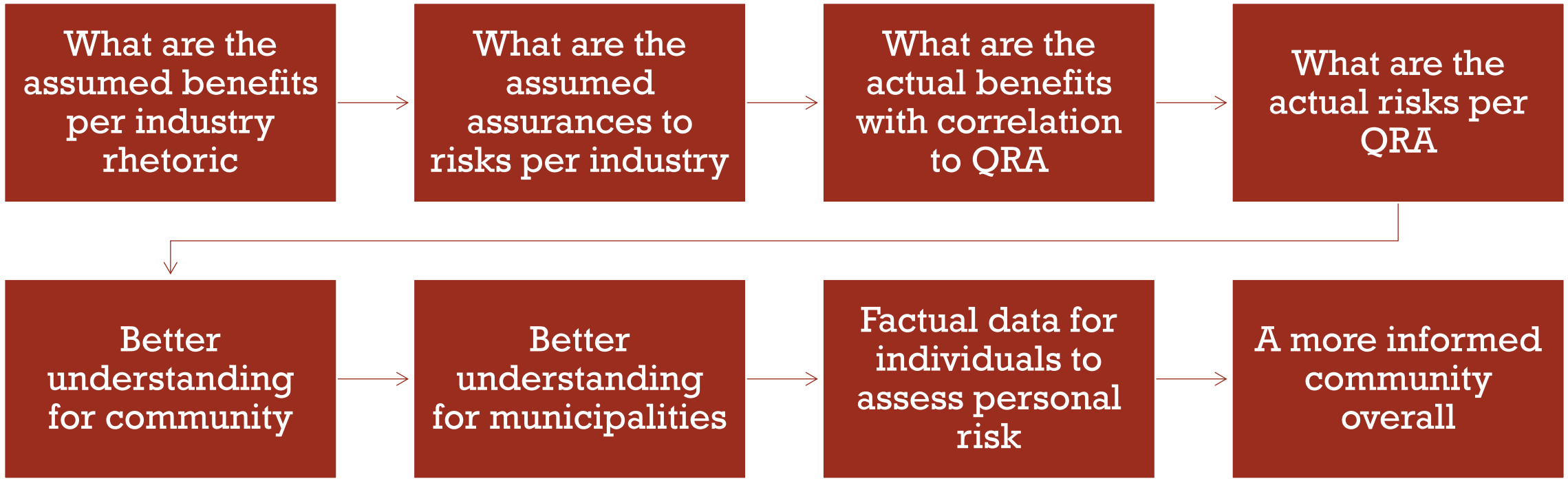
Pipeline and Hazardous Materials Safety Administration (PHMSA) has collected data on more than **3,200** accidents deemed serious or significant since 1987.

PHMSA

Pipeline & Hazardous Materials Safety Administration

A "significant incident" results in any of the following consequences:

- Fatality or injury requiring in-patient hospitalization
- \$50,000 or more in total costs, measured in 1984 dollars
- Liquid releases of five or more barrels (55 USgal/barrel)
- Releases resulting in an unintentional fire or explosion



BENEFITS OF DOING A RISK ASSESSMENT



QUESTIONS