

Risk Based Leakage Survey

SP AusNet's objective was to find an optimum balance between proactive leak management and reactive leak management



SP AusNet™
A member of Singapore Power Group

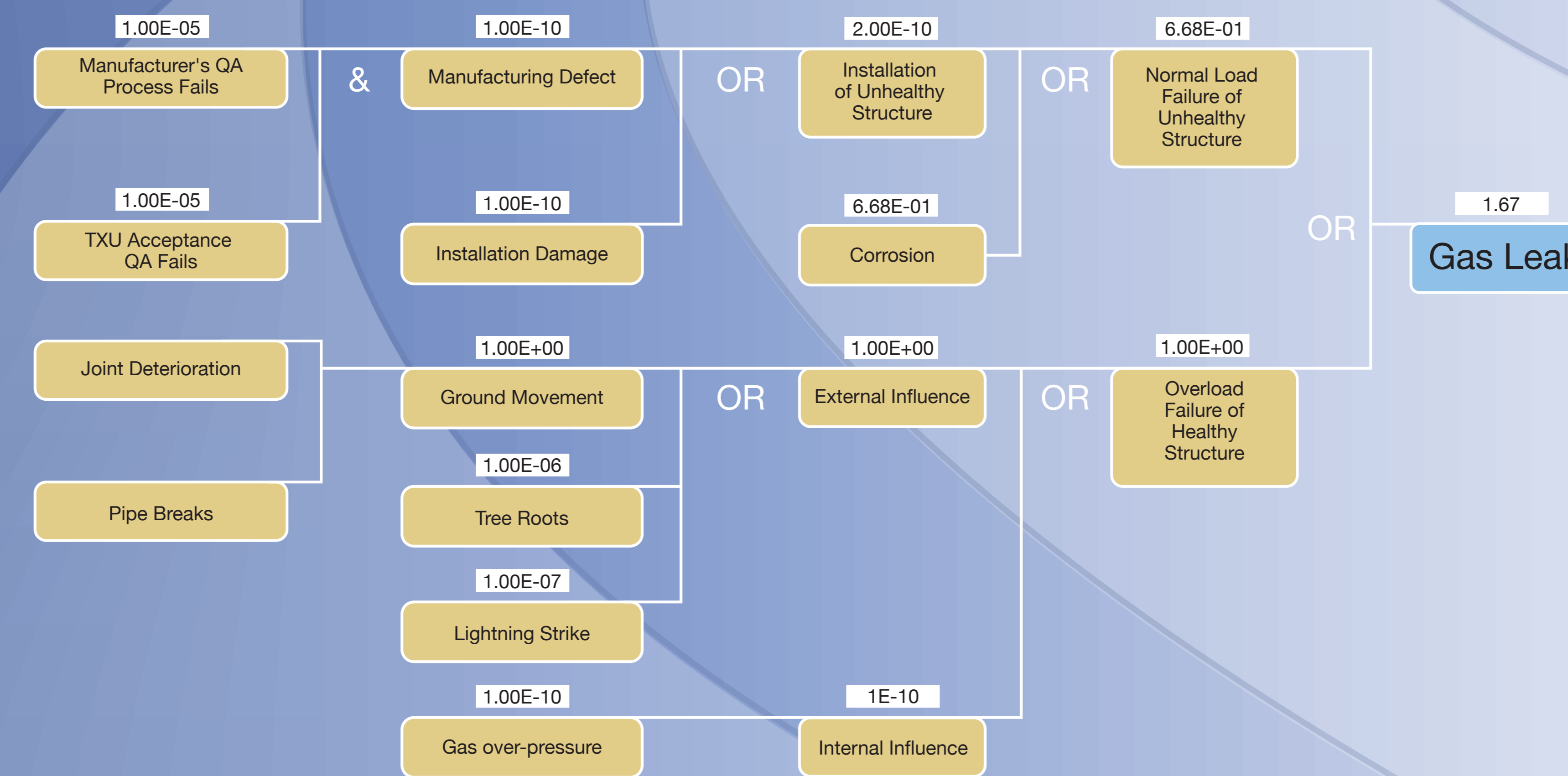
Pipe Types – Leakage Data

Material	Leaks/km/yr
Cast iron	1.67
Unprotected steel	.78
PVC	0.28
Protected steel	0.12
Polyethylene	0.07
Transmission	0.00
System average	0.36

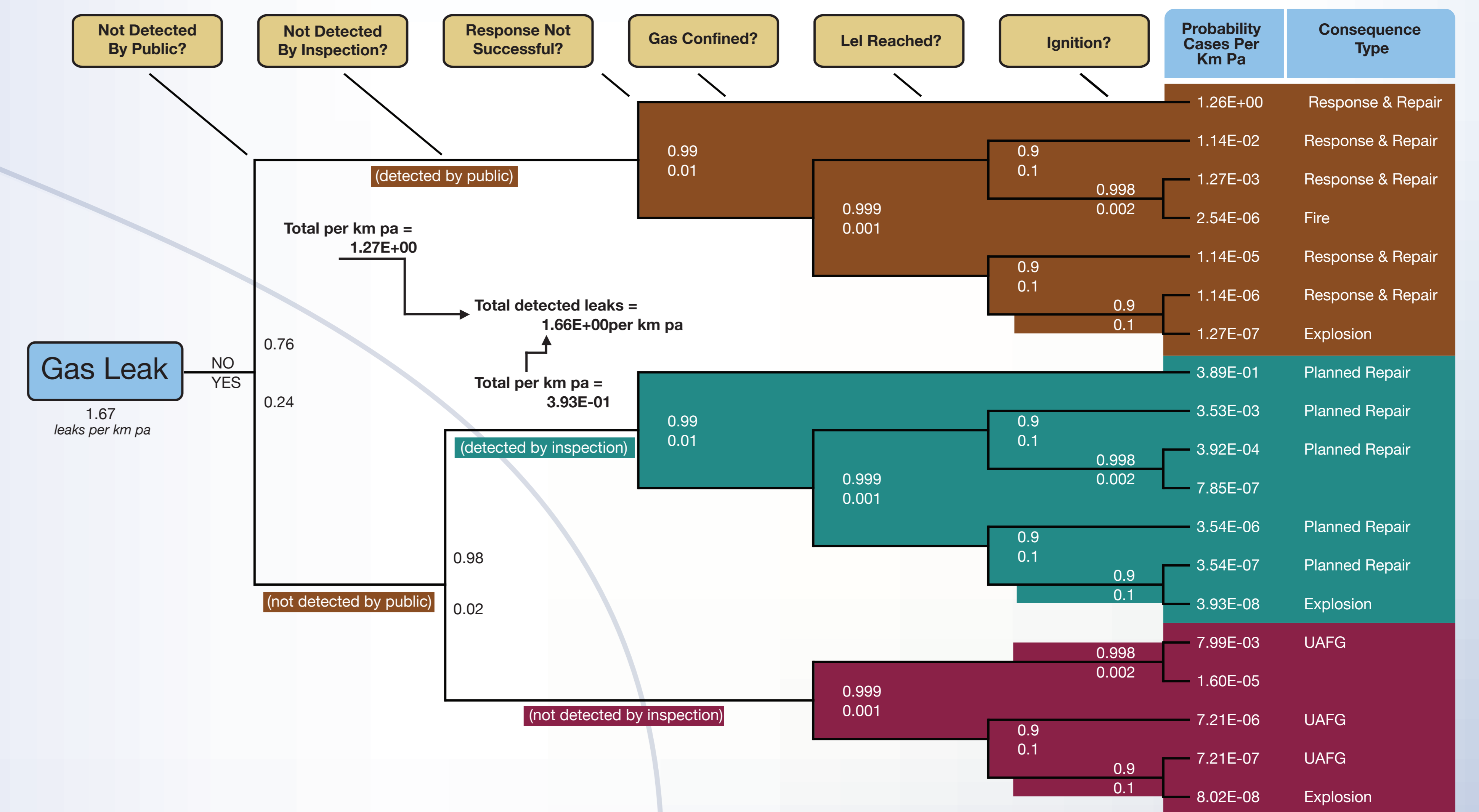
Area Categories:

- Population density
- Leak Path
- Type of Building
- Ground Movement

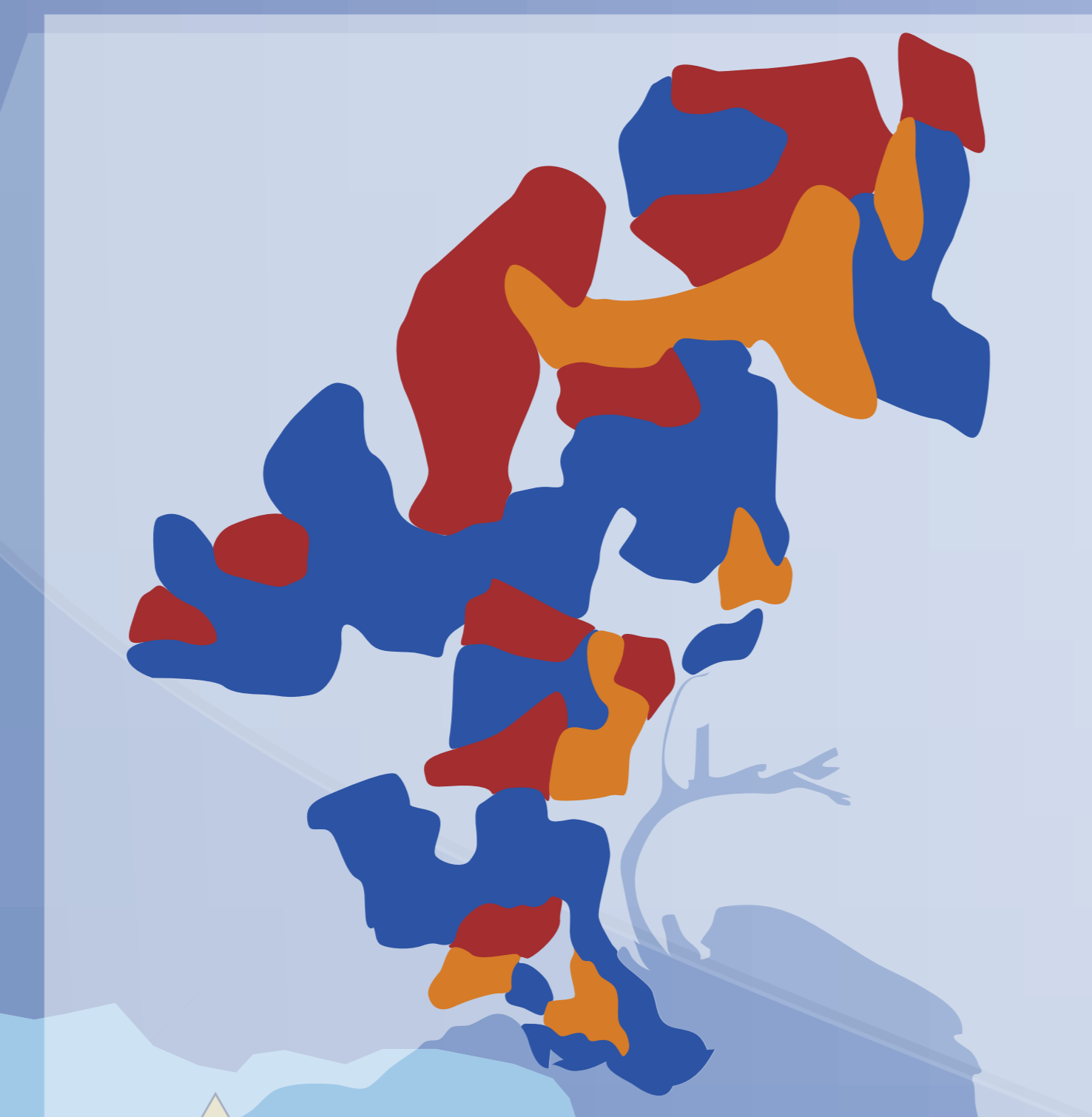
Fault Tree Analysis



Outcome Analysis - Probabilities of Consequences



Low
Med
High



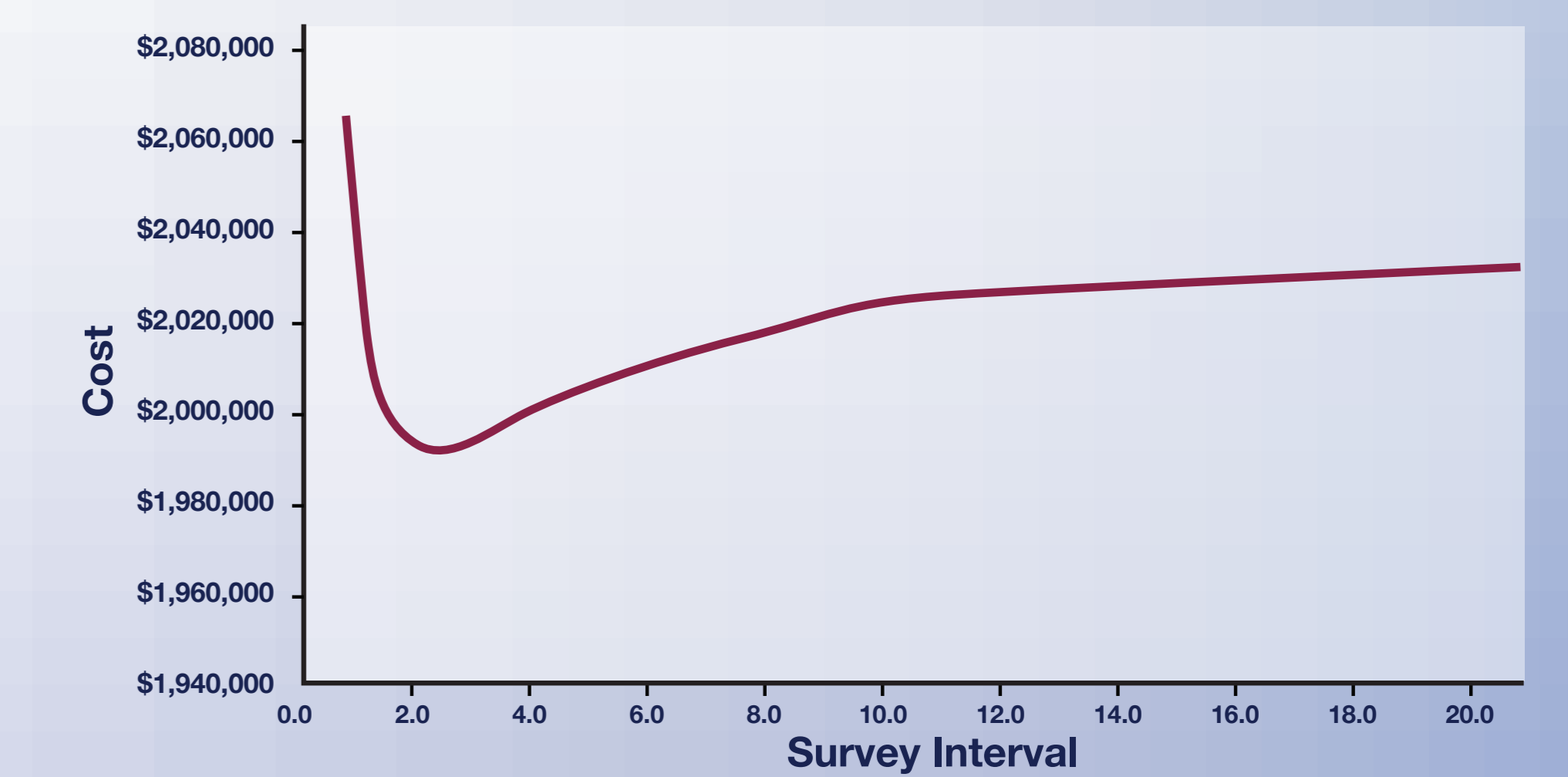
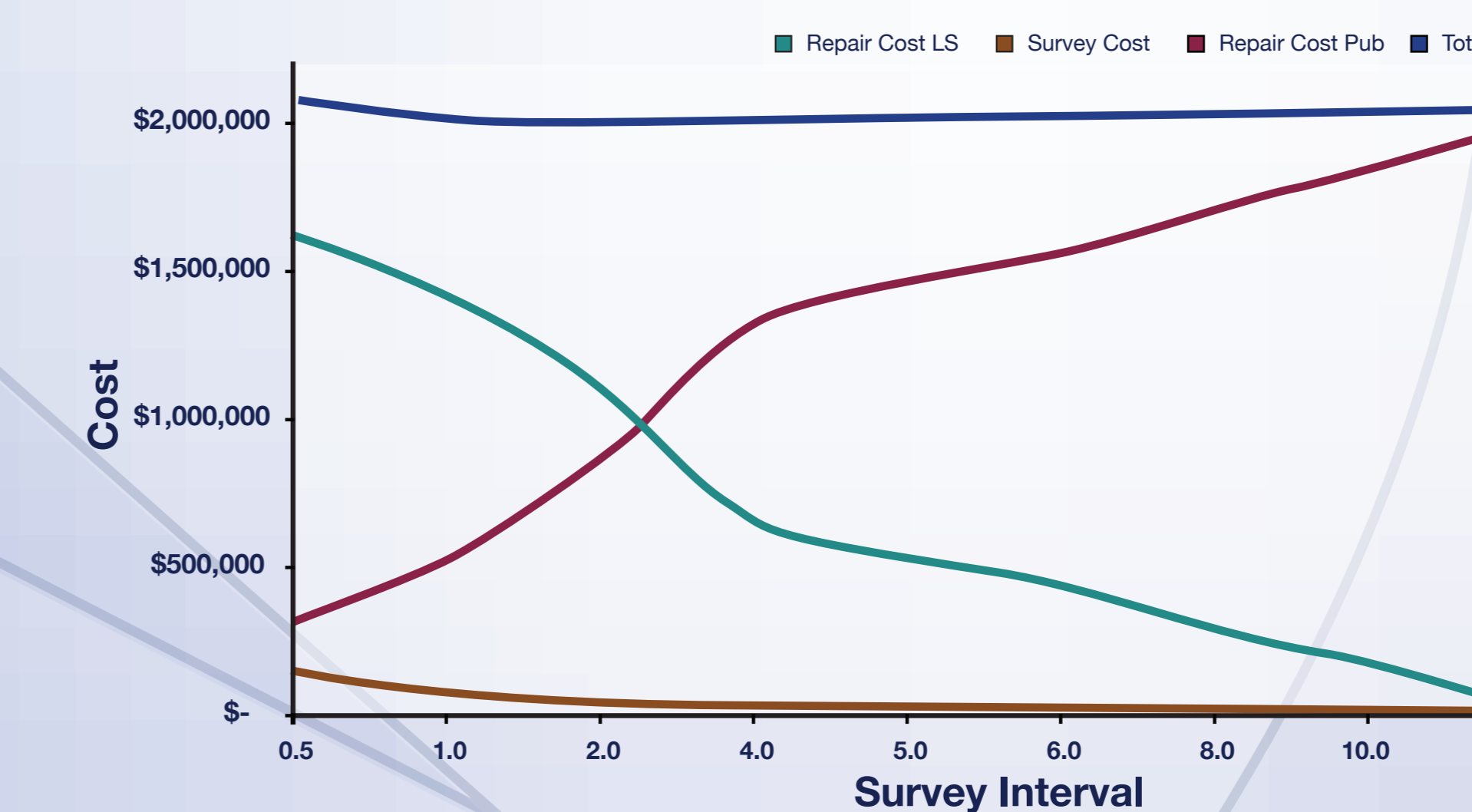
Australian Standards AS 4645:2005

"The network shall be surveyed for leaks to a schedule designed on risk management principles."

Risk-Based Leakage Survey Outcomes

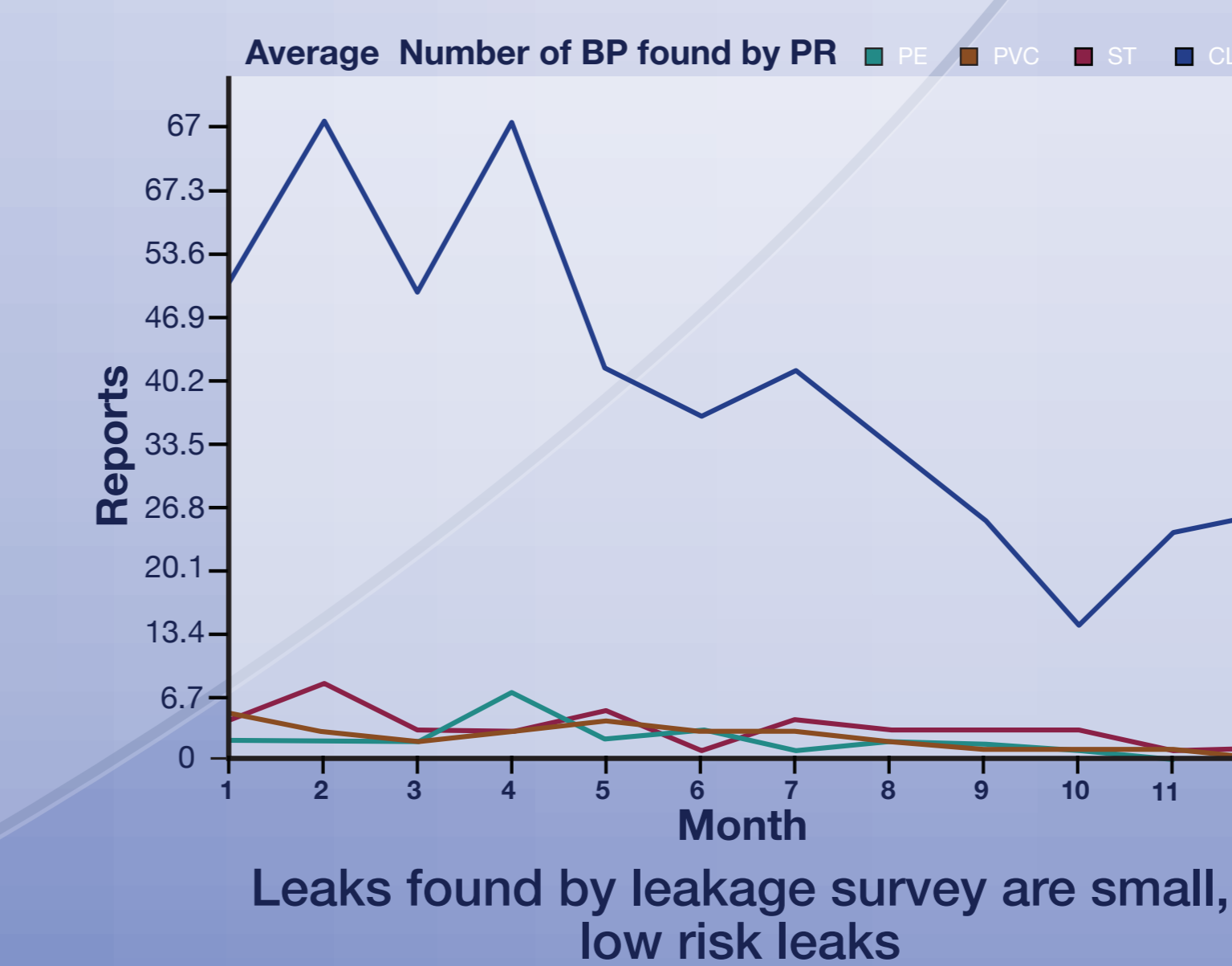
Pipe Type	Survey Intervals (Years)					
	Area Category 1 & 2			Area Category 3 & 4		
	Current	Calc'd	Optimised	Current	Calc'd	Optimised
Cast Iron	4	2	2	1	2	1
Unprotected Steel	4	6	4	1	6	1
Polyethylene Pipe and Protected Steel	4	20	8	1	20	1
PVC	4	8	8	1	20	1
Transmission Pipe	4	20	4	1	1	1
Internal Services	0.5	-	0.5	0.5	-	0.5

Survey Intervals and Repair



Graph of leakage costs plotted against survey interval for cast iron pipe in risk category 2

Broken Mains by Public Report



Leaks found by leakage survey are small, low risk leaks

New Leakage Management System

Pipe Type	Survey Intervals (Years)					
	Area Category 1 & 2			Area Category 3 & 4		
	Old	2002	New	Old	2002	New
Cast Iron	4	2	Trigger	1	1	1
Unprotected Steel	4	4	Trigger	1	1	1
Polyethylene Pipe and Protected Steel	4	8	Nil	1	1	Nil
PVC	4	6	Trigger	1	1	1
Transmission Pipe	4	4	4	1	1	1
Internal Services	0.5	0.5	0.5	0.5	0.5	0.5

Risk Based Leakage Survey; reduces the cost of leakage survey and leak repair, lowers environmental effects and increases public & network safety