

ALARP ASSESSMENT

Method proposed in HSE Cost Benefit Analysis Checklist

Threat - Installation of new service (Horizontal drilling)

Threat ID - 17

Conclusion of ALARP assessment : Prevent or control the use of rippers and HDD over the pipeline easement in this Development - via Council Development specifications and liaison activities.

Proportionality Factor 10 (Most conservative)

Value of prevention (assumed - based on HSE Paper)

Fatality	\$5,000,000
Incapacitating injury	\$1,000,000
Serious Injury	\$250,000
Slight Injury	\$10,000
Property	\$750,000
Infrastructure	\$15,000,000 <i>includes roads and bridge structures</i>
Company Reputation (includes litigation, etc.)	\$1,000,000,000

Frequency of incident	0.0000001 events per year	year
Exposure (pipeline life)	50 years	10,000,000 (Hypothetical)

COST OF INCIDENT CALCULATION

Outcome	Number	Cost	Frequency	Exposure	Value
Fatality	10	\$5,000,000	0.0000001	50	\$250
Incapacitating injury	20	\$1,000,000	0.0000001	50	\$100
Serious Injury	50	\$250,000	0.0000001	50	\$63
Slight Injury	100	\$10,000	0.0000001	50	\$5
Property	30	\$750,000	0.0000001	50	\$113
Infrastructure	1	\$20,000,000	0.0000001	50	\$100
Company Reputation (includes litigation, etc.)	1	\$1,000,000,000	0.0000001	50	\$5,000

TOTAL

Maximum justified spend \$56,300

Further Protection Measure Considered	Estimated Cost	Effectiveness	Justification
Slabbing over the pipeline (2km)	\$ 400,000	Not effective	Not Justified
Permanent Fencing off of easement (800m)	\$ 40,000	Not effective	Not Justified
Pipeline relocation	\$ 20,000,000	Effective for this area but just moving the problem to another area.	Not Justified
MAOP Reduction	\$ 20,000,000	Probably require new pipeline to continue gas supply	Not Justified
Lowering of pipeline	\$ 5,000,000	Not effective	Not Justified
Change land use	\$ 100,000,000	Planning authorities have already modified plans and any further changes could cost \$100M	Not Justified
Pipe Replacement - non leak pipeline	\$ 20,000,000	Effective for this area but just moving the problem to another area.	Not Justified
APA secure Land	\$ 100,000,000		Not Justified
Prevent or control the use of rippers and HDD over the pipeline easement in this Development via Council Development specifications and liaison activities.	-	Liaison Activity	Justified