

Risk Management in Voluntary Dam Removals

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Potential Risks Associated with Dam Removal

- Regulatory permits
 - Delay in schedule
 - Denial or unexpected conditions
 - Litigation and resulting delay
- Construction
 - Unexpected site conditions, resulting in ...
 - Cost overrun
 - Delay
- Damages to third parties
 - Flood exposure
 - Sediment discharge, including contaminated
 - Wildfire risk



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Stacked Risk Management

- Dam removal entity separate from licensee
- Risk register, updated regularly
- Comprehensive design (incorporated into regulatory approvals)
 - Engineering
 - Mitigation including sediment discharge
- Design-build procurement method
- Performance and surety bonds
- Comprehensive insurance program
 - Actuarial and predictive modeling
 - Integration of policy coverages
- Settlement and defense funds for uninsurable events





General Liability Results

\$ in millions

| | | Scenario 1 - Dam | Scenario 4 - Water Main | Scenario 5 - House Elevation | Scenario 3 - Wildfire | Scenario 2 - Substation | GL - Other | Total GL |
|------------------|-------------|---------------------|----------------------------|------------------------------------|--------------------------|----------------------------|------------|----------|
| Average Loss | | \$1.59 | \$2.63 | \$0.00 | \$0.06 | \$0.62 | \$1.28 | \$6.19 |
| CATLoss | | \$31.82 | \$33.65 | \$0.00 | \$0.81 | \$10.23 | \$10.18 | \$62.12 |
| Confidence Level | Years/Event | | | | | | | |
| 10% | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.22 | \$0.26 |
| 20% | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.30 | \$0.39 |
| 30% | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.38 | \$0.53 |
| 40% | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.48 | \$0.70 |
| 50% | 2 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.59 | \$0.93 |
| 60% | 2.5 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.73 | \$1.34 |
| 70% | 3.3 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.94 | \$2.26 |
| 80% | 5 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$1.33 | \$6.64 |
| 90% | 10 | \$0.00 | \$10.01 | \$0.00 | \$0.21 | \$0.85 | \$2.37 | \$16.93 |
| 95% | 20 | \$0.00 | \$21.63 | \$0.00 | \$0.40 | \$3.32 | \$5.46 | \$29.01 |
| 99% | 100 | \$50.35 | \$41.30 | \$0.00 | \$0.98 | \$13.91 | \$9.67 | \$67.92 |
| 99.5% | 200 | \$119.97 | \$48.55 | \$0.00 | \$1.41 | \$20.79 | \$12.98 | \$125.98 |
| 99.90% | 1,000 | \$251.67 | \$62.31 | \$0.06 | \$2.48 | \$41.21 | \$27.54 | \$254.81 |
| 99.95% | 2,000 | \$293.77 | \$66.86 | \$0.11 | \$3.14 | \$47.03 | \$37.42 | \$303.28 |
| 99.99% | 10,000 | \$392.90 | \$77.69 | \$0.22 | \$6.26 | \$54.91 | \$124.99 | \$394.77 |

Questions?

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