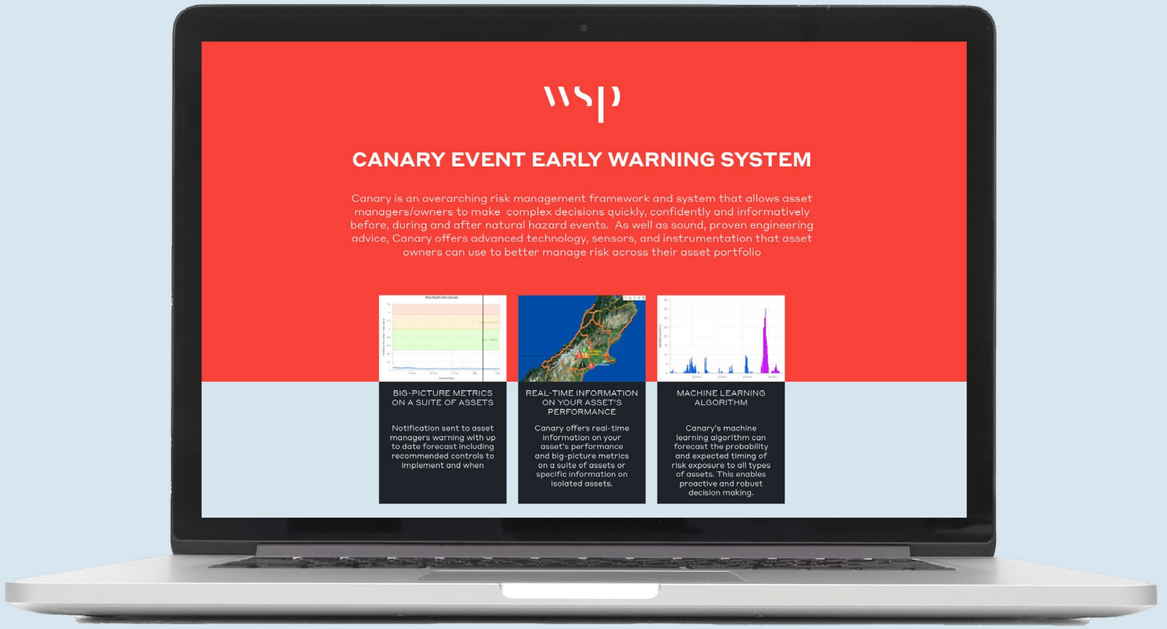
CANARY

Saving lives, protecting assets,
and keeping your business going.



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01 Executive Summary

Canary is a proactive risk management system that provides confidence to asset owners, asset managers and asset users before, during and after natural hazard events.

01

Canary is an overarching risk management framework and system that allows asset managers/owners to make complex decisions quickly, confidently and informatively before, during and after natural hazard events. As well as sound, proven engineering advice, Canary offers advanced technology, sensors, and instrumentation that asset owners can use to better manage risk across their asset portfolio.

02

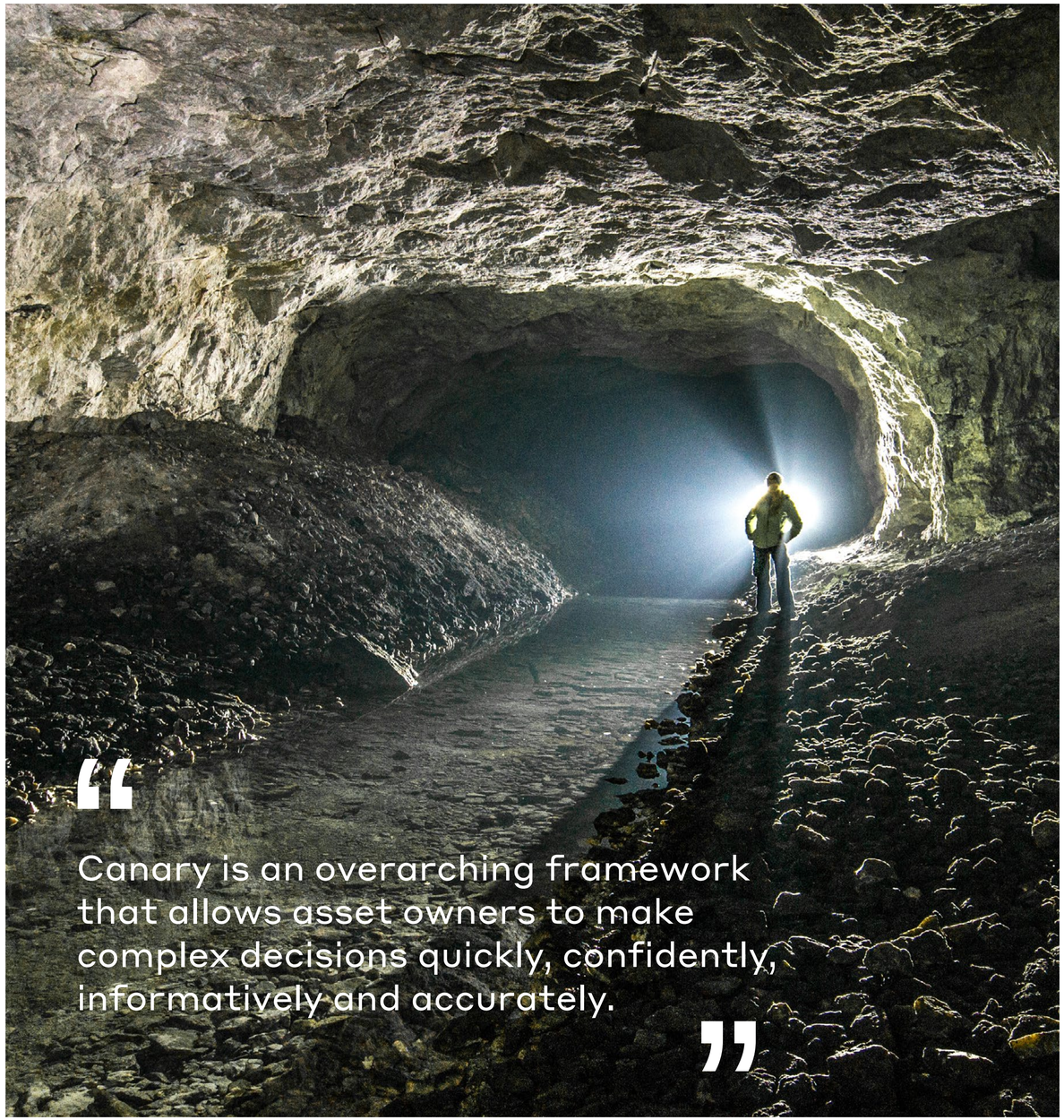
Canary dashboards offer real-time information on your asset's performance and big-picture metrics on a suite of assets or specific information on isolated assets.

03

Canary's machine learning algorithm can forecast the probability and expected timing of risk exposure to all types of assets. This enables proactive and robust decision making.

04

Canary has been developed by the world's leading asset management advisors, so we have a deep understanding of infrastructure assets and their associated risks.



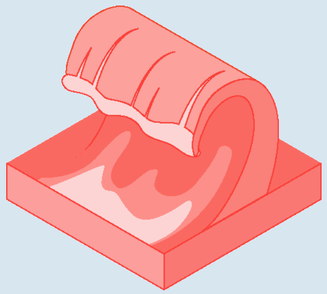
Dating back to 1911, miners took canaries underground to give them advanced warning of rising carbon monoxide levels– this was an early version of a Trigger Action Response Plan or TARP. Today we have advanced technology, sensors and instrumentation that we can utilise to help manage risks across many different asset classes.

Asset owners have the responsibly of managing risk to their assets and asset users. With the frequency and severity of natural hazards increasing due to climate change, asset owners are increasingly having to make risk-based decisions on their assets and networks.

Canary is an overarching framework that allows asset owners to make complex decisions quickly, confidently, informatively and accurately. As well as sound, proven engineering advice, Canary offers advanced technology, sensors, and instrumentation that asset owners can use to better manage risk across their asset portfolio.

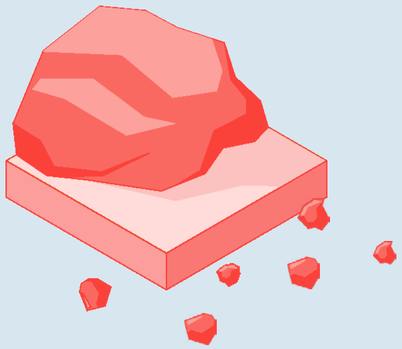
02

Hydraulic Risks



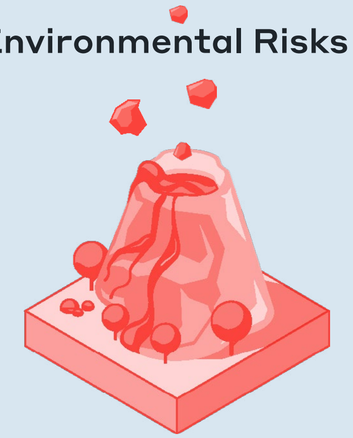
Flooding / Scour / Tsunami / Storm surges

Geological and Seismic Risks



Landslips / Rockfalls / Earthquakes

Environmental Risks

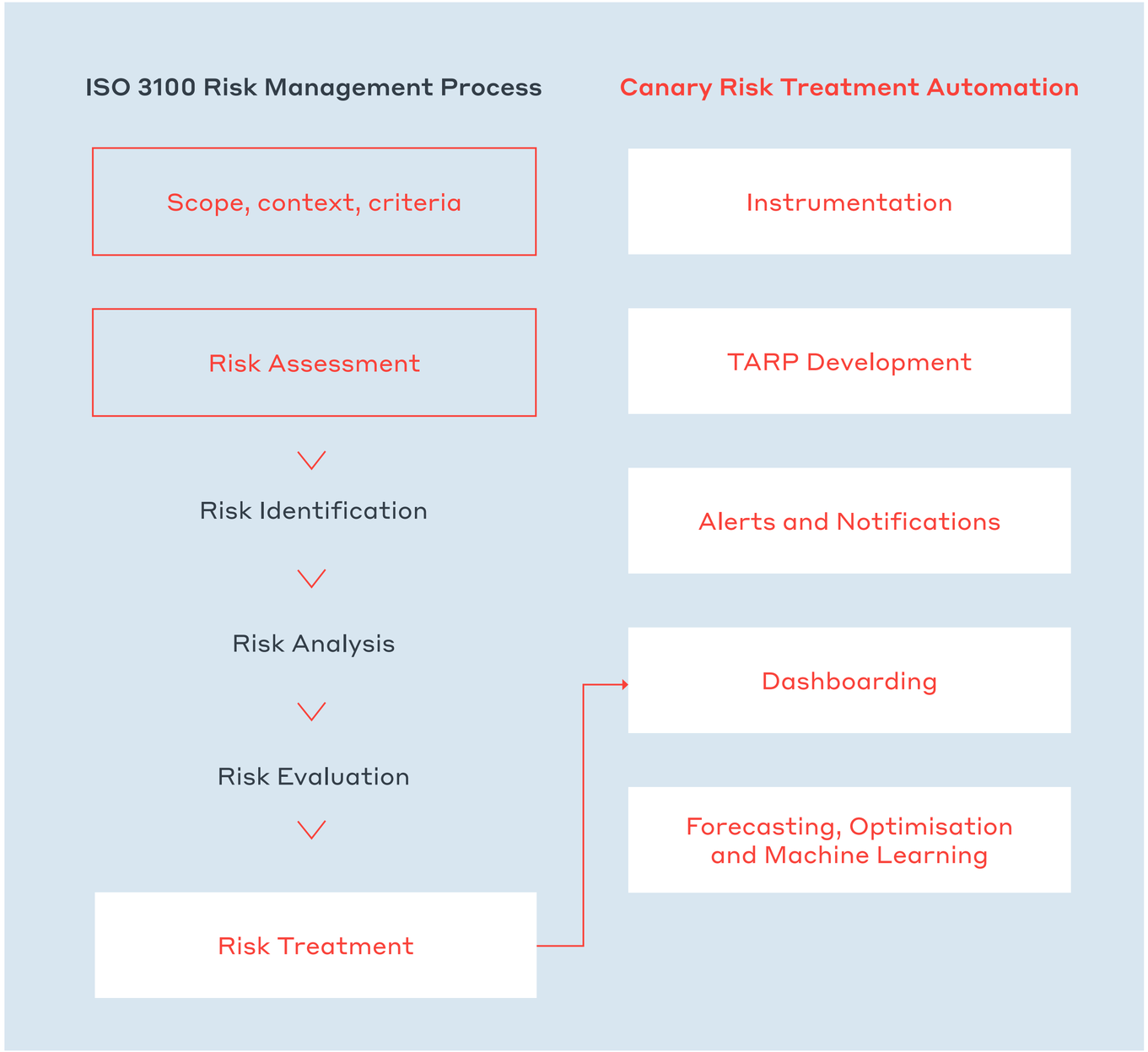


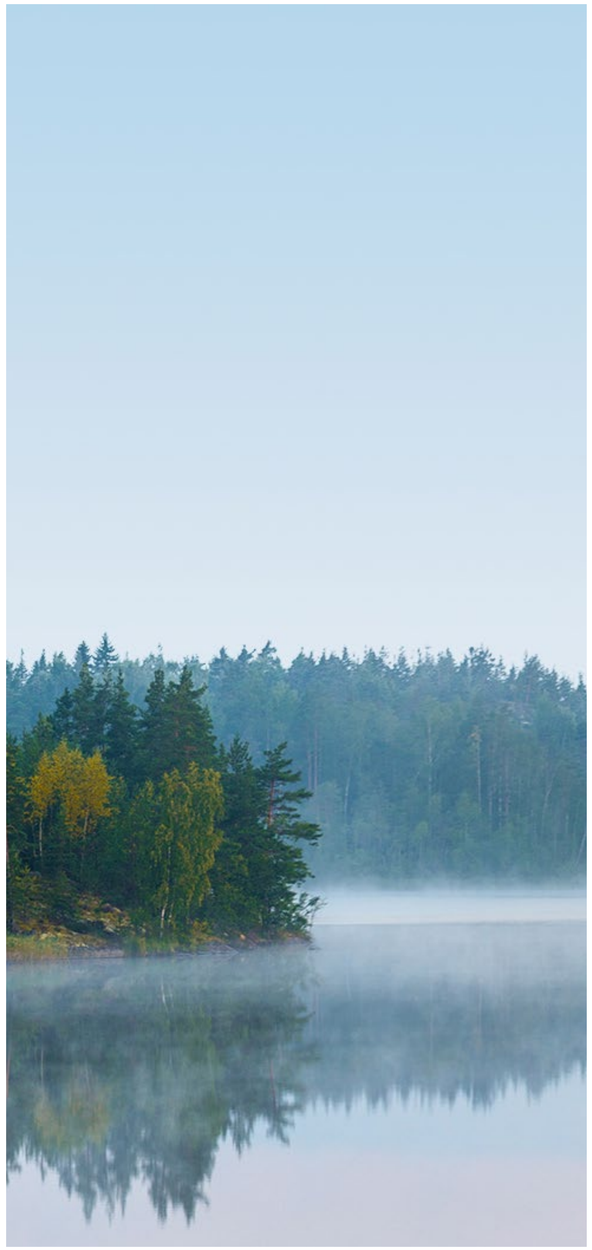
Wind / Heat / Volcanic

What is Canary Designed for?

03

The Key Components of Canary





04

Establishing Risk Framework and Leveraging Engineering and Asset Management Insights

Establishing your Risk Profile and Context

One of the fundamental phases on the Canary framework is establishing the context, then undertaking a risk identification, analysis and evaluation process.

This could be using established guidelines or developing specific guidelines where established practice is not well developed.

WSP have unparalleled asset management experience in New Zealand which enables us to pass this benefit on to our clients.

Advanced Insights with Canary Automation

Where Canary comes into its own is the Risk Treatment process.

This is where the use of the ever-evolving technology and the real smarts of the system comes in.

This includes some or all of the following activities:

- Instrumentation
- TARP development
- Alert and notifications
- Dashboarding
- Forecasting optimisation and machine learning

Machine learning can be used to review forecast vs actual observational data to refine forecasting and TARPs over time since machine learning is great at helping predict non-lineal forecasts such as in hydrological settings.

05

Dashboard Designed for Proactivity and Insight

Canary combines engineering based risk assessment with cutting edge technology to be a full risk management suite.

01 Real-time information on asset performance

02 Forecasting when trigger levels are likely to be met or exceeded

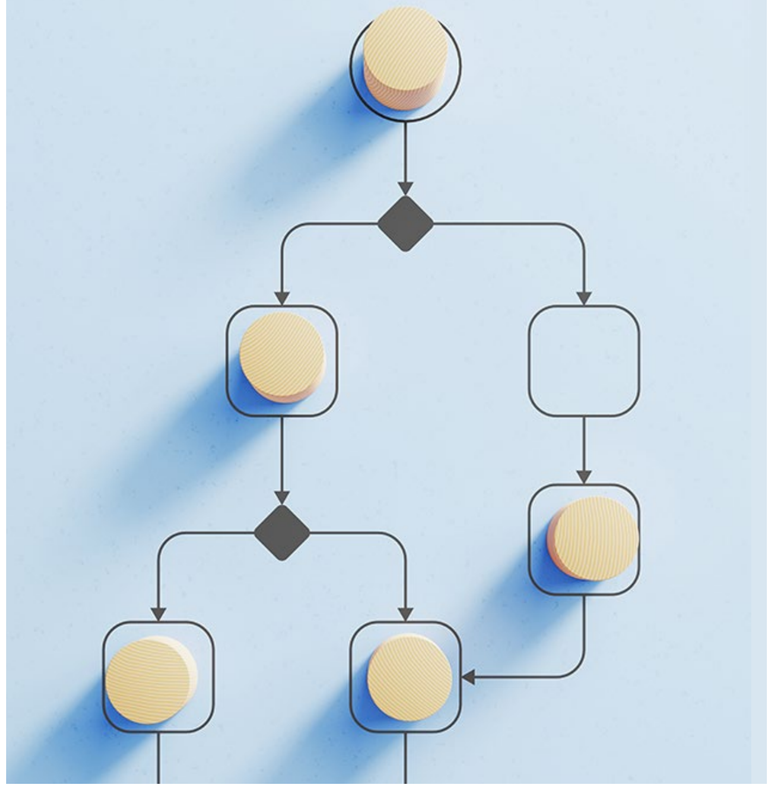
03 Big-picture metrics on a suite of assets or specific information on isolated assets

04 Alerts & Notifications with risk control actions for asset managers (or other parties [e.g. contractors])

05 GIS mapping to visualise and interrogate information on asset performance, environmental conditions and other insights

06 How Canary's automation works

While Canary is fully customisable, one application could be:



Monitoring

Dashboard monitored with automatically updated forecast information

Early Warning

Asset Managers get weather watch notification - informing of upcoming event and assets likely to be affected

Implement Controls

Further notification sent to asset managers warning with up to date forecast including recommended controls to implement and when

7 days out

3 days out

1 day out

07

A market leading system

- Definition of risk criteria, and risk assessment
- Advanced asset risk management
- Full integration of remote monitoring sensors plus incorporation of other available sensor information
- Trigger Action Response Plans developed by industry experts (with asset management and infrastructure knowledge)
- Alerts and notifications (email and text message)
- Full customisation of dashboard interface
- Real-time data
- Ability to integrate and interact with many different datasets
- Risk forecasting using established risk management techniques supplemented by machine learning and artificial intelligence (AI)

08

About WSP

WSP is one of the world's leading asset management advisors and are unrivalled in New Zealand.

Our capability encompasses both consultancy assignments and prime contractor roles ensuring that our advice is grounded and practical as well as strategic and visionary.

We are truly global in our outlook, and actively combine the learnings and experience from our engagements in markets and jurisdictions the world over with local skills and knowledge.

We work with our clients to help them make informed decisions about their assets, through advanced asset knowledge and operational efficiencies that support their business processes and goals.

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