



What is Mine Closure?

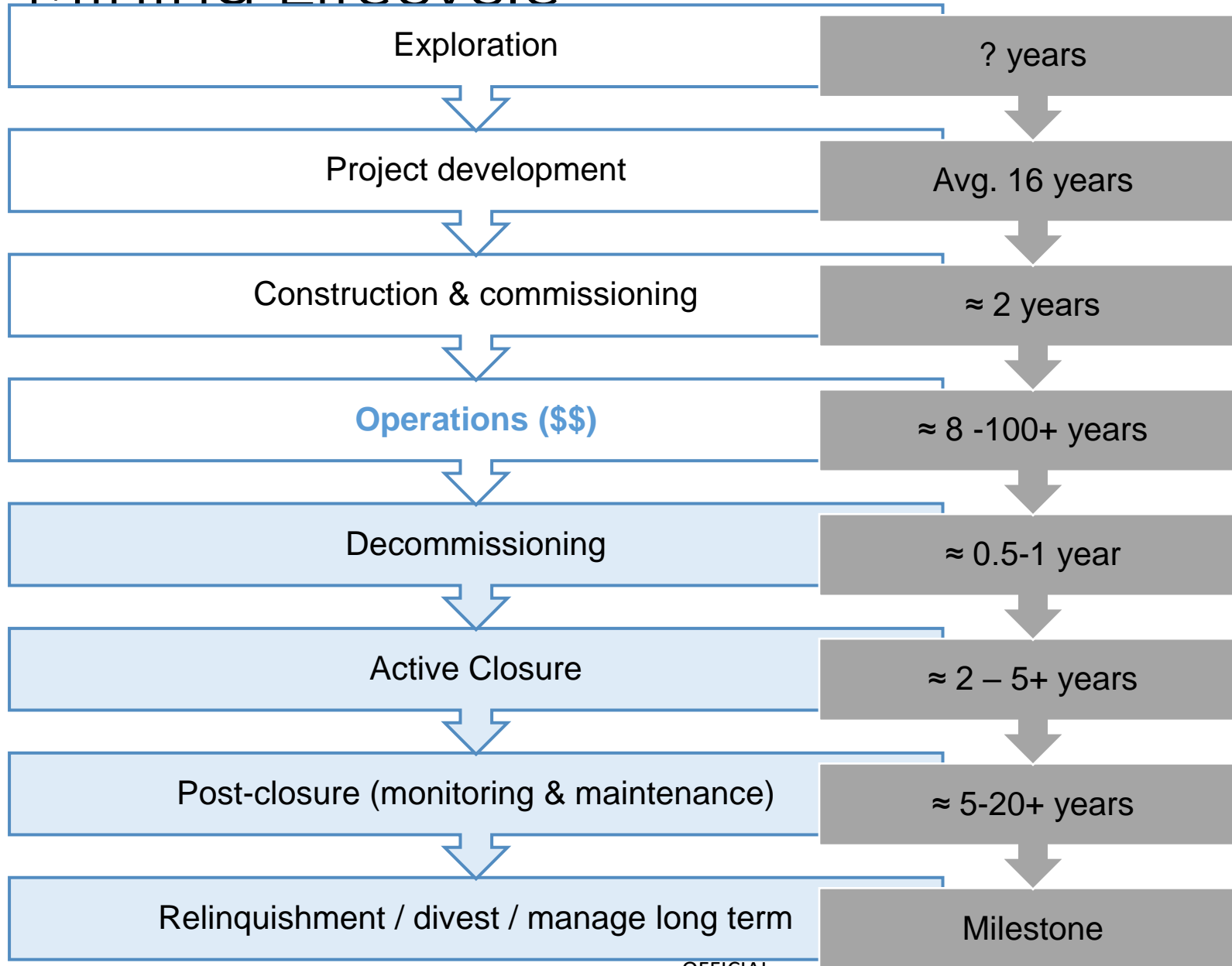
May 2024
Kim Ferguson
Global Director Mine Closure



What is Mine Closure?



Minina Lifecycle



At any time can go into care & maintenance and loop back to an earlier phase & phases can be concurrent

INTEGRATED MINE CLOSURE

International Council
on Mining & Metals

**Mining with Principles
- Integrated Mine Closure**

*The ICMM's
leading practice approach
to
integrated mine closure*



https://www.youtube.com/watch?v=xe6wmLRKDEM&feature=emb_logo

What is 'mine closure'?

Process: Integrated mine closure is a **dynamic and iterative process** that considers **environmental, social and economic factors** from an early stage of mine development and **throughout the life** of an asset (ICMM, 2019).

Event: When a mine permanently ceases operations.....?

Why plan for closure?

Rhetoric Vs Reality

A 'snap shot' of progressive rehabilitation performance in the global mining industry



Newmont Expects \$1.2B Charges Due to Peru Mine Closure

'This is a fight for Mt Isa': Glencore to close copper mines after 60 years, placing 1,200 jobs at risk

\$6.4B needed to clean toxic selenium from B.C. coal mines: report



The Australia Institute
Research that matters.

Dark side of the boom (NSW)

What we do and don't know about mines, closures and rehabilitation in New South Wales

Rio Tinto and Bougainville Copper face class action over mine impact



FRIDAY ENVIRONMENT FORUM
NPA Environment Centre
28 October 2016

Lock The Gate's Mine Rehabilitation Reform Campaign.

Noosa Parks Association's guest speaker at Friday Environment Forum on October 28 will be Rick Humphries who is currently coordinating Lock The Gate's Mine Rehabilitation Reform Campaign. Having worked with a range of environmental NGOs as well as in the corporate



Ranger mine closure and rehab to cost \$1b

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ICMM & Closure Planning Elements



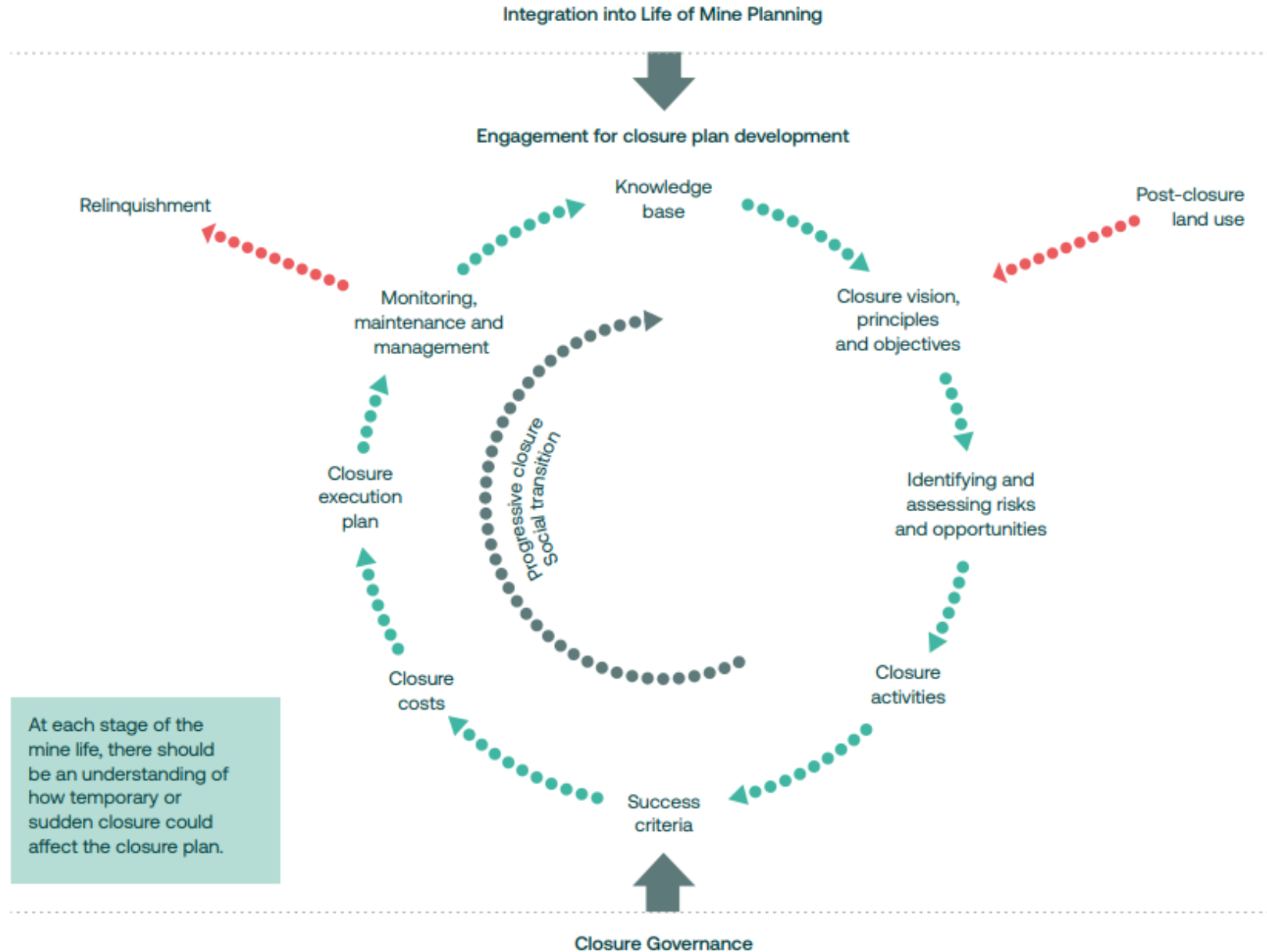
The How and Why of the ICMM Integrated Mine Closure Good Practice Guide



- International Council of Mines and Metals (ICMM)
 - Industry Body
 - 1/3 of metals and mining industry and key industry associations
 - Cover the sustainable development agenda: environment, social and economic development, health and safety and materials stewardship
- Closure working group
- Integrated Mine Closure Good Practice Guide
 - First version 2008 -> second version 2019
 - Why 'good' not 'best' or 'leading'?



Elements of Closure Planning

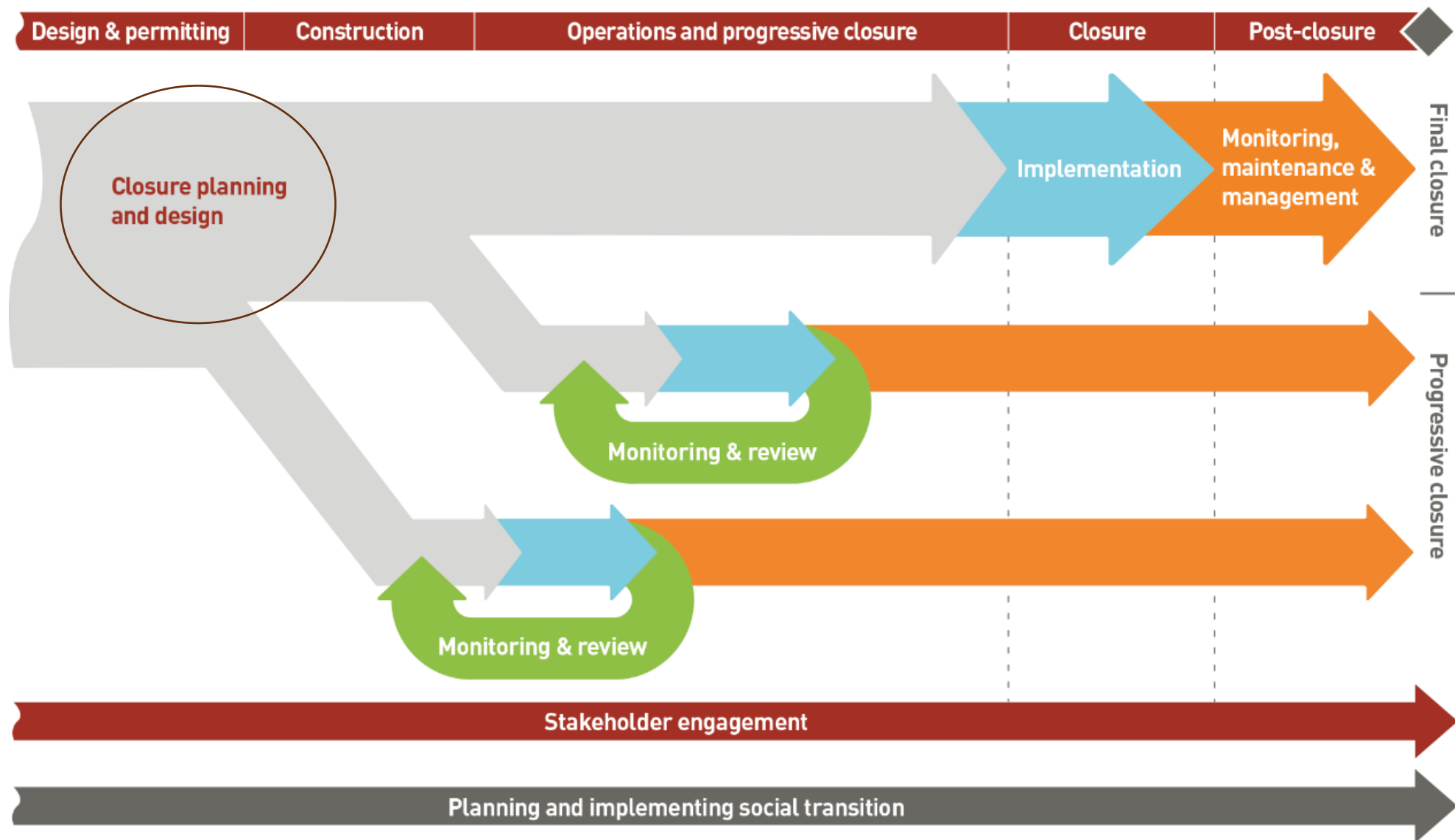


At each stage of the mine life, there should be an understanding of how temporary or sudden closure could affect the closure plan.

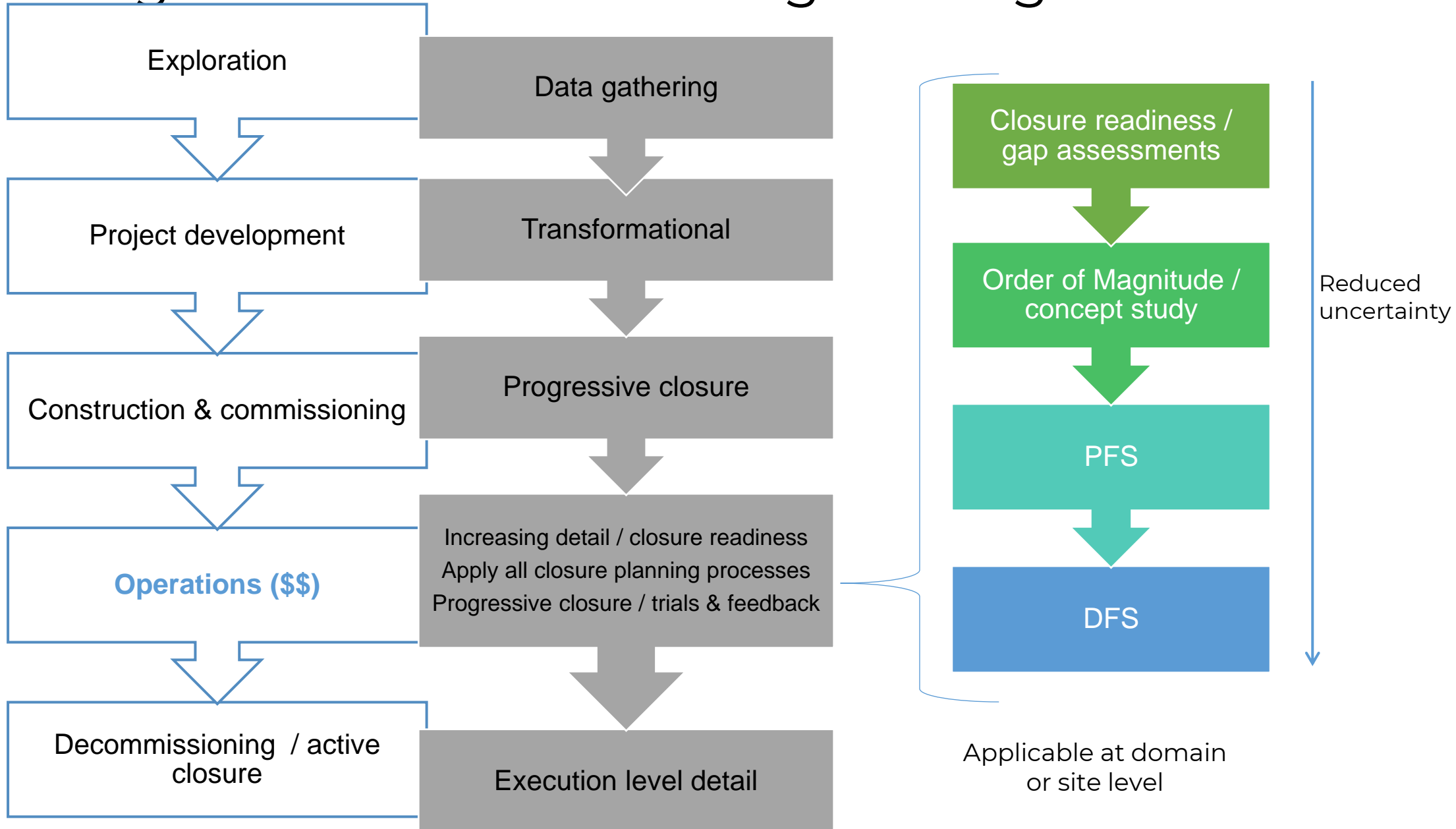


Figure 2:
Elements of
Closure
Planning ICMM,
2019

When do you apply these planning elements?



Integrated Closure Planning & Design



Closure Challenges



Mine Closure

Closure Planning Challenges

- Scope is significant
- Dynamic and iterative over the life of asset
 - Process is not linear
- Flexibility, agility and ambiguity
 - Progressive closure vs optionality
- Expectations & reputation
- Lack of common language
- Complexity
- Time scales
- Knowing / agreeing when enough is enough
 - Good practice vs leading
 - Safe, stable and non-polluting
- Stewardship models, relinquishment & the “why bother?” mentality
- Everything is a trade-off / balance
 - Different / competing drivers



Unplanned closure is more common than planned

- 70% sites close 'unplanned'
- Commodity price changes
- Regulatory changes **Trevali to close Burkina Faso Perkoa zinc mine after deadly flood**
- Societal changes
- Accidents **Vancouver Island's Myra Falls Mine not 'financially viable,' going into maintenance**

What Happens When a Country Says 'No' to Mining?

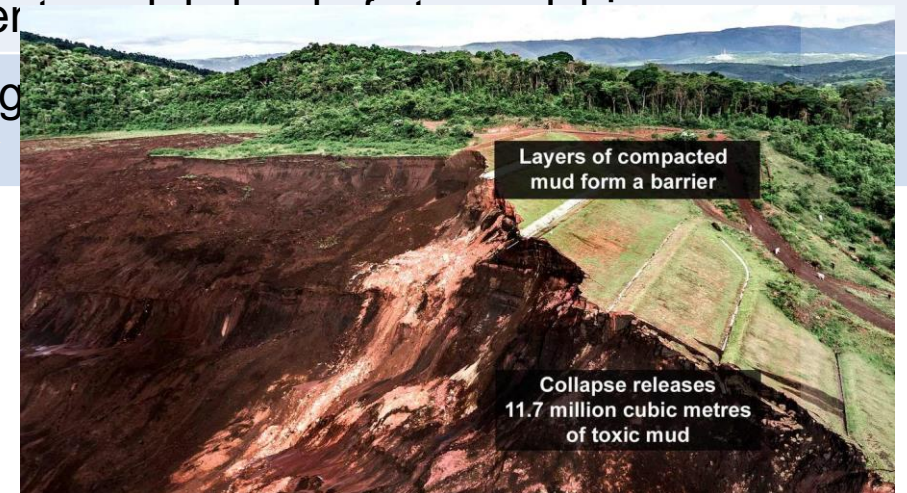
Banks don't want to lend to Australia's coal miners any more



Evolving closure practice

Aspect	Past practices	Evolving practices
Closure practitioners	Environmental team	Multi-disciplinary integrated teams
Timing	Leave it till the end	Progressive closure
Closure scope	Physical & biological	Physical, biological, socio-economic, human health, workforce, reputational, land use transition...
Activity scope	Revegetation / "rehabilitation"	Full spectrum
Land use	Revegetation	Various
End point	Relinquishment	Differer
Closure risks	Tactical execution safety risks	Strateg

Revegetation: icing a bad cake still leaves a bad cake



Good Closure Planning Practices



Mine Closure

Good Closure Exists, Perfect Does Not



Coal (infrastructure re-use) - Germany



Salina Turda Amusement Park, Transylvania



Eden Project - Cornwall



Sun Mine – Teck, Canada



Salt mine to underground church - Poland



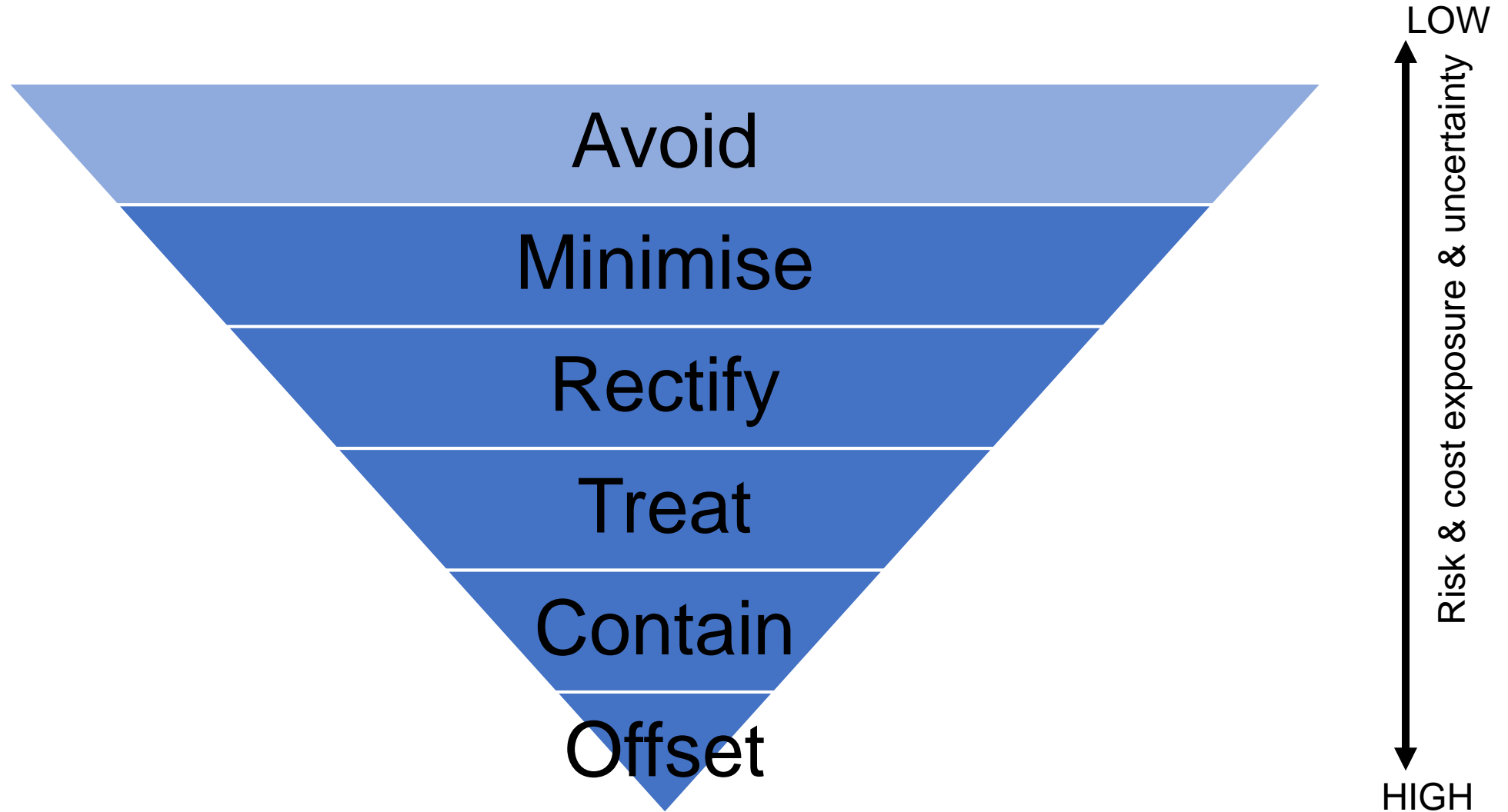
The Big Hole, South Africa

Integrated Life of Asset Planning AND execution!!

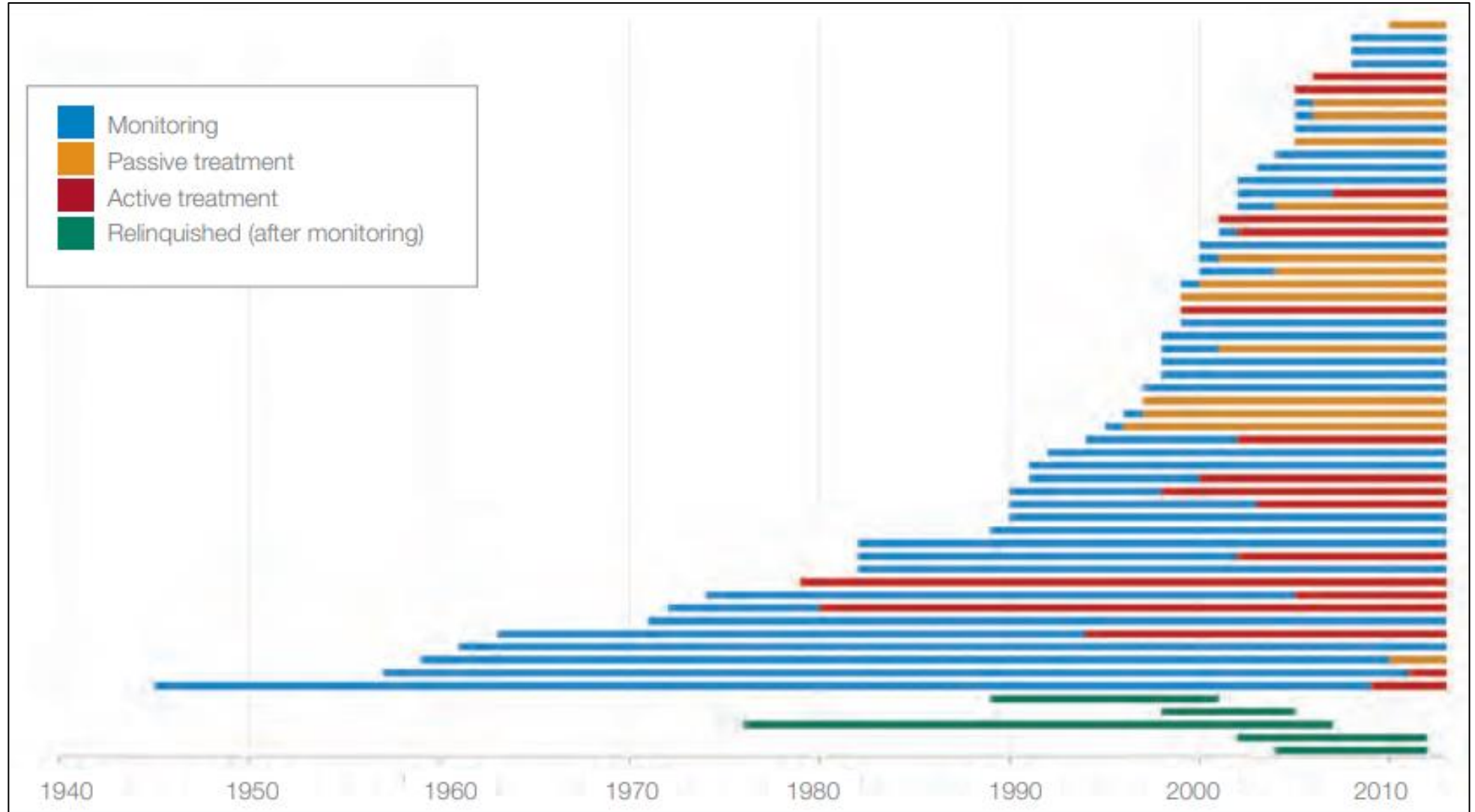
- Why?
 - ONLY ability to AVOID closure impact is design and operations
 - And then actually build and operate to that
 - Increased effectiveness
- How?
 - Multi-disciplinary involvement
 - Realistic risk and opportunity identification and management
 - Integration is more than just internal – all stakeholders play a role



The longer you leave integrated closure, the more challenging it becomes.....



Poor Closure Integration: a lasting legacy



Progressive Closure

Reduce Risk & Uncertainty

- Proof of concept
 - Increased certainty
- Reduce risk
 - More accurate design and risk identification
 - Reduce the ambiguity and unknowns
 - More accurate closure cost estimates
- Time
 - Time to monitor and understand monitoring and maintenance costs
 - Time to understand trajectory to completion / stable state
 - Time to adjust, amend to get to the optimised closure outcome
- Reduce liability
- Reduce financial assurance held



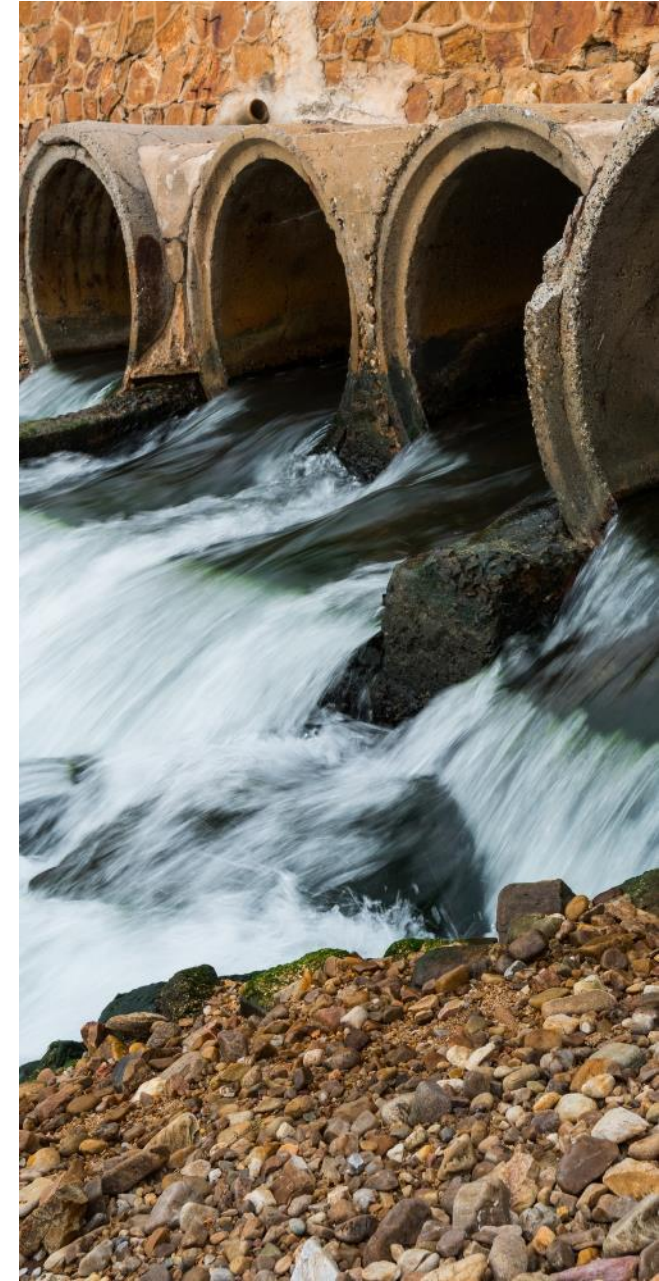
What else does 'good' look like?

- Common language for common understanding
- Early and ongoing stakeholder engagement
 - Closure consultative committees
 - Honest, transparent, co-created
 - Shared value with shared responsibility
- Focus on land capability rather than land use
- Realistic risk and opportunity identification and management
- Regional integrated and cumulative planning
- Robust closure governance



Available Closure Planning Tools

- ICMC Good Practice Guide
 - Tools in guide
 - Training modules
- ICMC additional guidance's and tools:
 - Key performance indicators (KPIs)
 - Financial concepts for closure
 - Closure maturity assessment tool
- Anglo American Closure Toolbox & SEAT Toolbox
- Industry share forums
- Increasing training options
 - AusIMM
 - BRIMMs
 - EduMine
 - CRC Time + Curtin



**Questions?
Thank you**

