FUELS INDUSTRY
Association of South Africa

FINANCIAL PROVISIONING FOR CONTAMINATED LAND

Presented by:

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ABOUT THE PRESENTERS

ROCHELLE BLOEMHOF (ASSOCIATE: MINE CLOSURE)

Rochelle is an Associate and Project Manager within the Mine Closure team at WSP in Africa and has over 12 years' closure consulting experience. She is actively involved in decommissioning, remediation, rehabilitation and closure planning and has completed many closure related projects for a wide variety of different commodity mines throughout South Africa and Africa (coal, copper, platinum, gold) and sectors (including power, wind farms, storage schemes and industrial complexes). She has particular strength in closure estimating, including provisioning, asset retirement obligations and financial assurance calculations.

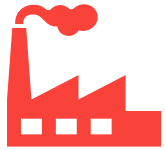
Furthermore, Rochelle has experience in the conceptualization and formulation of rehabilitation and closure strategies, measures, as well as the actions for implementation. This provides her with the ability to devise and combine multiple concepts and considerations into integrated rehabilitation and closure plans as well as the costing of these for feasibility and/or financial provisions aligned to the relevant regulatory environment guiding the rehabilitation and closure of mine and industrial sites.

BRANDON McGUGAN (DIRECTOR: CONTAMINATION, REMEDIATION & GEOCHEMISTRY)

Brandon is a Technical Director at WSP in Africa's Contamination, Remediation & Geochemistry team. He has 26 years of experience consulting on contaminated land and related environmental health & safety fields. He has helped diverse clients identify, understand, and manage environmental liabilities within their operations. Clients have included global corporations, buyers/sellers, legal firms, and financers across various sectors, including oil and gas, automotive, manufacturing, chemical, fertiliser, explosives, waste and agribusiness. Brandon has worked in over 17 countries across Africa, Latin America, Europe, and the United Kingdom.

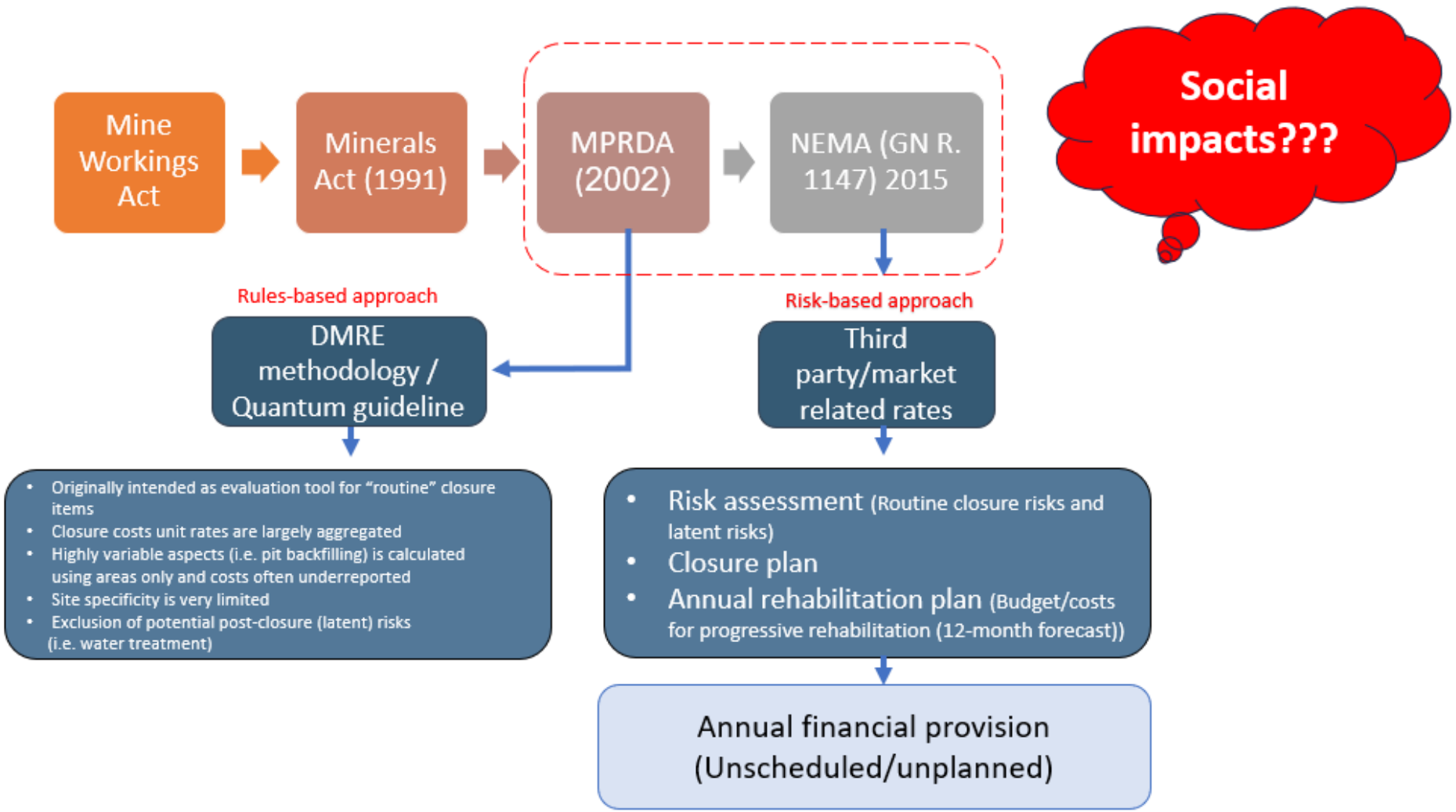
Brandon's expertise in the oil and gas sector is extensive and has acted as a Programme Manager, overseeing contaminated land assessments on portfolios of sites for three petroleum majors. His role extended to supporting a petroleum major's divestment from its downstream operations assets in Africa and conducting contamination liability assessments of its upstream operations in Angola and Nigeria.

RECAP OF LEGISLATIVE DRIVERS



- Compared to the mining sector, closure planning and progressive rehabilitation of industrial sites are mostly directed towards:
    - Adhering to conditions of environmental authorisations and permits
    - “Constructive obligations” i.e., duty of care
    - Reputational considerations where specific legal or reputational risks must be addressed
    - Event that specific public commitments in terms of closure-related aspects have been made
- Assume the continued use of the infrastructure by another owner or operator

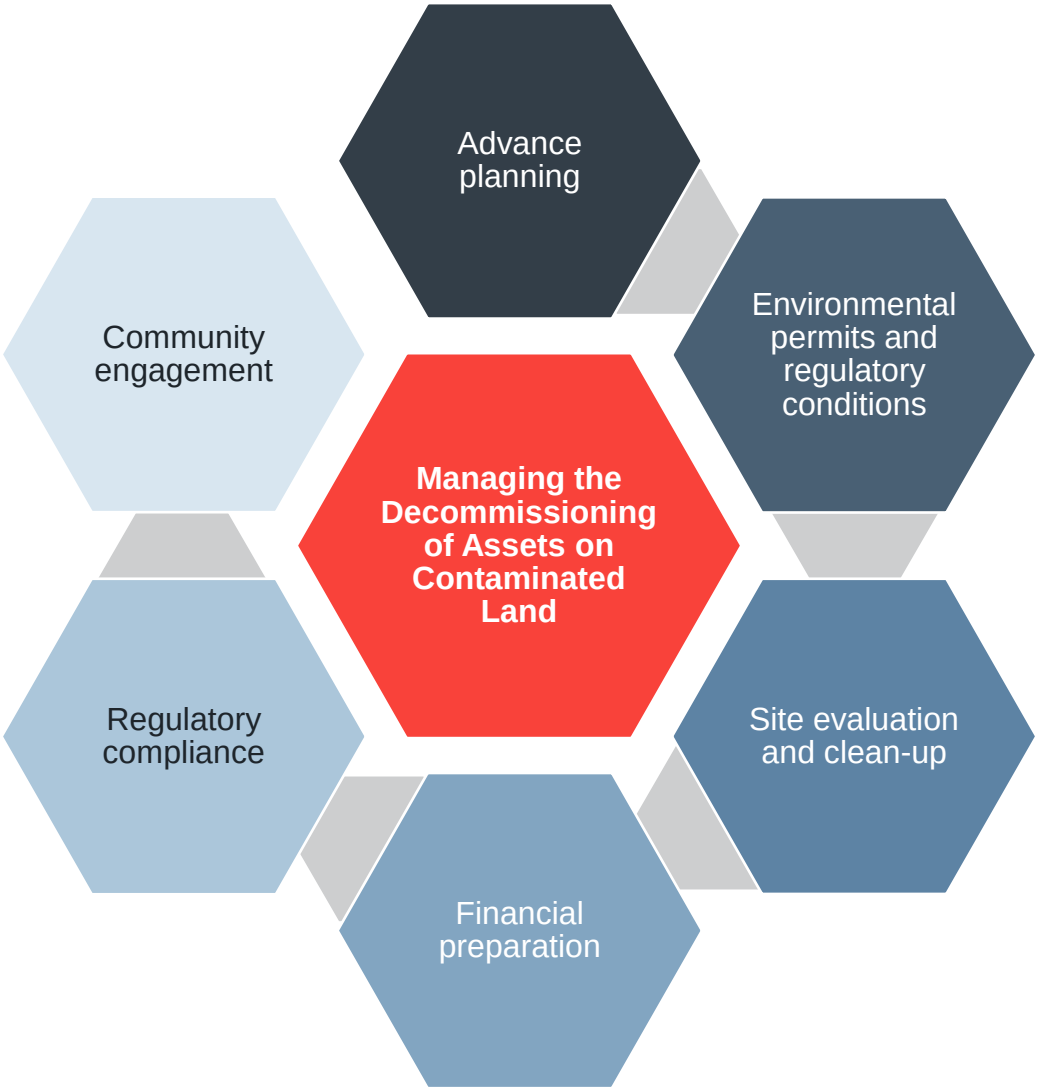
RECAP OF LEGISLATIVE DRIVERS CONT.



PURPOSE OF ARO/ERO

- Relevant when a company is responsible for dismantling equipment or managing hazardous material cleanup at a predetermined future date
- Ensure that known future problems are planned for and resolved
- Accurate financial reporting
- Ignore possible gains on the sale of assets
- Satisfy:
  - Generally acceptable international accounting practice
  - Public commitments/duty of care / constructive obligation
  - Stock market and specific shareholder reporting requirements
  - Legal requirements
  - Reputational risks

PLANNING FOR FINANCIAL PROVISIONING



COST ESTIMATE CLASSIFICATION SYSTEM

End of life of operation (or components of operation) from year of assessment	Design effort	Degree of accuracy in cost estimation
>30 years	Pre -Conceptual / Class 5 Estimate / up to 2% of complete definition	-50% to +50%
10 to 30 years	Conceptual / Pre -feasibility / Class 4 Estimate / up to 15% of complete definition	-30% to +30%
5 to 10 years	Preliminary / Feasibility / Class 3 Estimate / up to 40% of complete definition	-20% to + 20%
Less than 5 years	Detailed Designs / Bid / Tender / Class 2 estimate up to 75% of complete definition	-10% to +10% (or less)

NEMA GN R 1147 FinPro Regs

Table 2: ASTM / AACEI Cost Estimate Classification Matrix[1]

Estimate Class	Level of Project Definition	End Usage	Estimating Methodology	Expected Accuracy Range
Class 5	0% to 2%	Screening or Feasibility	Stochastic (Factors or Models) or Judgement	Low: -20% to -100% High: +40% to +200%
Class 4	1% to 15%	Concept Study or Feasibility	Primarily Stochastic	Low: -15% to -60% High: +30% to +120%
Class 3	10% to 40%	Budget Authorization or Control	Mixed but Primarily Stochastic	Low: -10% to -30% High: +20% to +60%
Class 2	30% to 70%	Control or Bid/Tender	Primarily Deterministic	Low: -5% to -15% High: +10% to +30%
Class 1	70% to 100% (ASTM) 50% to 100% (AACEI)	Check Estimate or Bid/Tender	Deterministic	Low: -5% High: +10%

[1] AACE International Recommended Practice No. 17R-97, and ASTM Designation: E2516-11

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical +/- range relative to best index of 1 [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Screening or Feasibility	Stochastic or Judgment	4 to 20	1
Class 4	1% to 15%	Concept Study or Feasibility	Primarily Stochastic	3 to 12	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Mixed, but Primarily Stochastic	2 to 6	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Primarily Deterministic	1 to 3	5 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Deterministic	1	10 to 100

KEY PLANNING CONSIDERATIONS

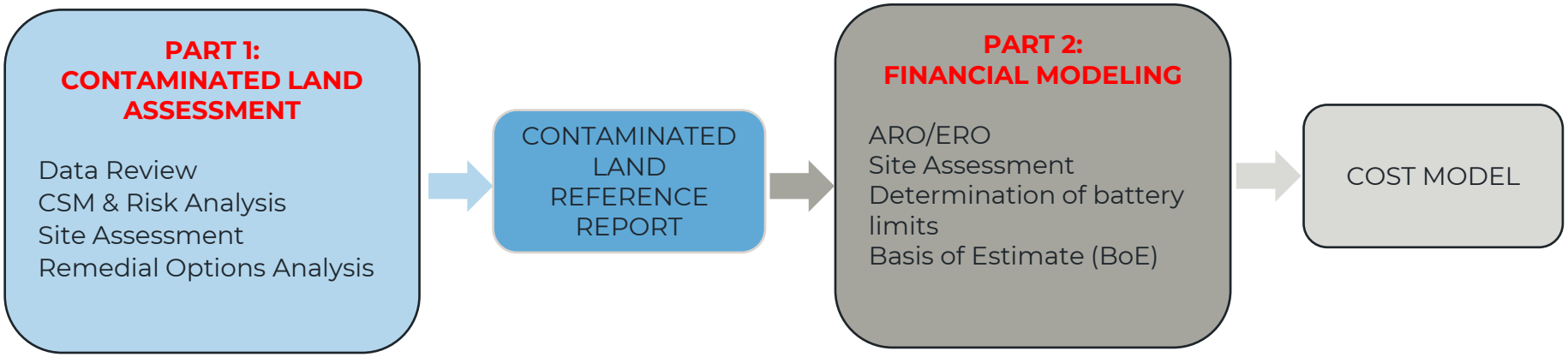
Closure requirements change with time:
- **Regulators are risk adverse**
- **Community expectations will change**
- **Regulatory controls will change**

- Integrated process:
  - Should start as early as possible and critically assess the plan on a regular basis to accommodate changes in expectations and the rules of the game
  - Multi-disciplinary effort - environment/rehabilitation, financial, legal, engineering/technical services, social/community, and safety/health to avoid conflict in the decision-making processes
- Decommissioning, closure, and aftercare costs are often notably higher than the simplistic closure scenario assumed to be decades into the future
- NPV of this cost seems insignificant and hence not an important factor in decisions
- **Closure liabilities are often under-represented until the last few years before closure**
- A large increase in closure costs is often seen in the last few years of the operational life, often when cash flows and profits from continuing operations are rapidly decreasing, leading to a focus on decreasing costs without adequately considering the risk of these decisions
- Realistic closure scenarios are based on the next land use. What is the next land use/closure vision?
  - Continued use of the facilities by another operator/s?
  - Transfer and repurposing?
  - Change of land zoning required?
  - Partial or full demolition?
  - Construction needed?

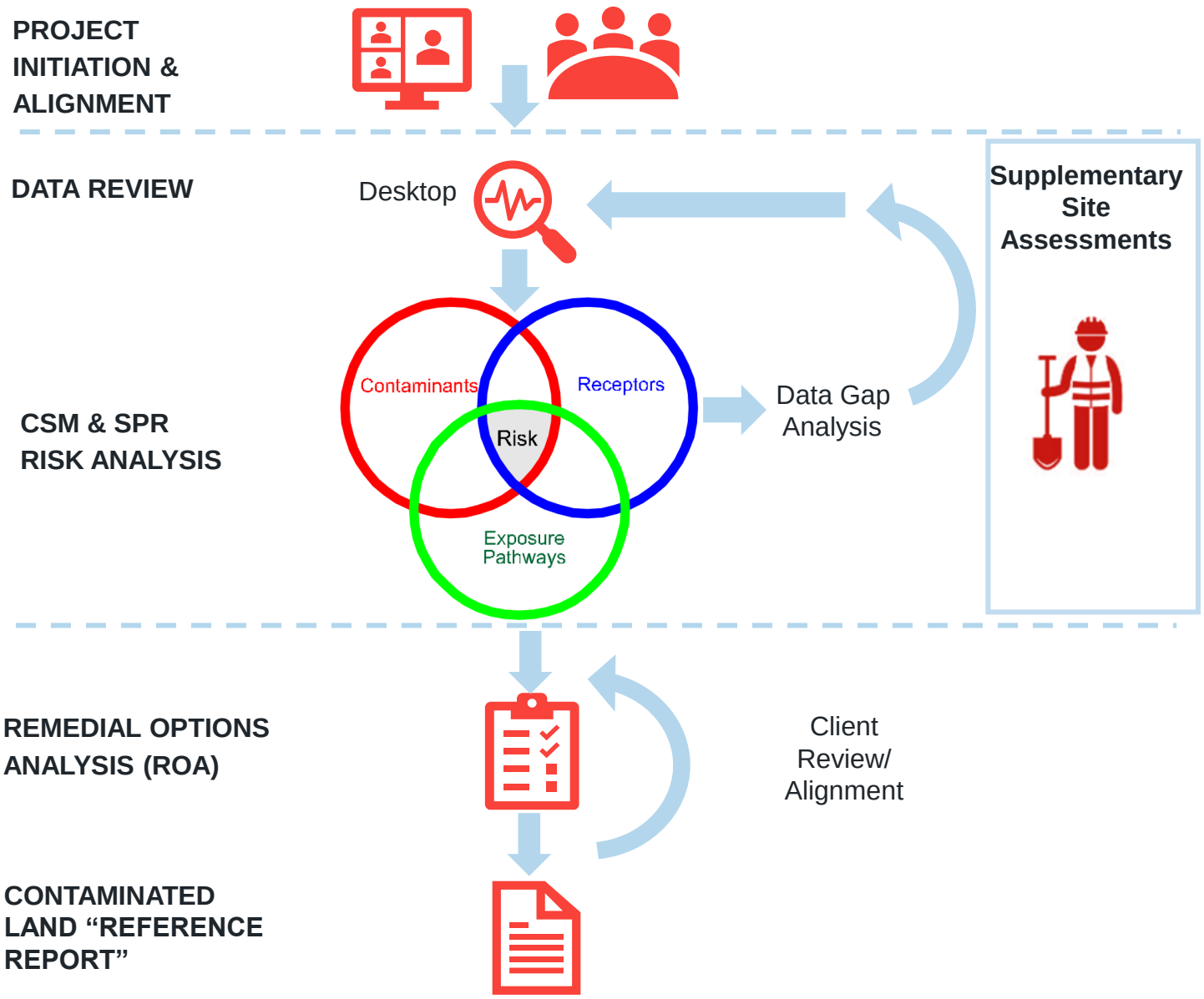
KEY CLOSURE CONSIDERATIONS (CONT.)

- Underestimation of monitoring and maintenance period
    - Some regulators pushing in-perpetuity funding of residual risks
    - Monitor until success criteria are reached
    - 10 – 30 years of monitoring required for groundwater plume
- Product run-down
- Removal of mechanical and electrical installations
- Decontamination of infrastructure
- Salvaging (although not off-setting against closure costs)
- Continuance of some existing operational units with a transfer of ownership to another party
- Demolition of some or all physical infrastructure
- Development of dedicated waste disposal facilities
- Treatment of contaminated land, sediment and/or groundwater. Various simulations to cover uncertainties
- Landscaping and reinstatement of functional ecosystems such as wetlands
- Preparation for the next land use
- Redevelopment

FINANCIAL PROVISIONING APPROACH



CONTAMINATED LAND ASSESSMENT



REMEDIAL OPTIONS ANALYSIS (ROA)

Based on the quantitative risk assessment, a Remedial Options Analysis (ROA) is undertaken in line with South African & global best practices (e.g. FTTR)
Remediation actions should only focus on addressing the risk drivers (i.e. SPR linkages identified).
As part of the process, a remedial technologies screening matrix is used to assess the technology against a set of criteria comprising:

- Applicability
- Technical Feasibility
- Effectiveness
- Cost
- Duration of Treatment
- Sustainability
- Operation and Maintenance
- Monitoring Requirements
- Non-technical considerations

The Contaminated Land Reference Report will form the basis of the cost modelling and contain the following:

- The site-specific **Remedial Strategy**, **Remediation Objectives** and a case for the **Preferred Remedial Alternative(s)**
- The suitability of the presented options for achieving the remediation objectives and how a combination of options may apply (e.g., active measures for the on-site source area + passive MNA for the off-site dissolved plume).
- An **Implementation Plan** i.e., how the Remedial Strategy should be executed, taking account of site-specific constraints and stakeholder issues.

CLOSING REMARKS

- Closure planning and adequate financial provision for the retirement of industrial assets
- Plan for closure during the operational phase – reduce the liability/time/cost
- The importance of planning and execution to meet a range of priorities for different role players and stakeholders
- Financial provisioning are crucial for both environmental stewardship and financial transparency, ensuring that companies responsibly manage their environmental impact and future financial obligations.

THANK YOU

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