

# Extractive Activities

## Education session

February 2021  
IASB - Agenda Paper 19A

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# Objective

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- The purpose of the session is to provide Board members with a summary of:
  - the life-cycle of a minerals and oil and gas property;
  - the activities that are performed in the different phases of that life-cycle; and
  - the financial reporting challenges associated with those different phases (this is not exhaustive, but a sample of common challenges drawn from the staff's experience and highlighted by stakeholders during outreach)
- The financial reporting challenges are highlighted to provide insights into the drivers of those challenges, not necessarily because the staff consider there to be a problem to solve
- The aim is to help Board members:
  - understand more of the context behind some of the financial reporting challenges faced by entities in the extractive industries; and
  - decide at a future Board meeting whether the scope of this project should cover any of the challenges that some stakeholders suggest should be explored by the Board

## Objective (cont.)

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- Some of the information provided for a minerals property has been duplicated for an oil and gas property. This is because it is relevant for both, and is therefore necessary for an understanding of the challenges related to each industry
- Items that have been included in the oil and gas property slides but not in the mining property slides are highlighted with the use of **shading**
- The appendix includes a glossary of terms specific to extractive industries. Terms explained in the glossary have been highlighted by *underlining and italicising*

# Contents

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1. Reserves and resources
2. Life-cycle of a minerals property
3. Life-cycle of an oil and gas property

Appendix A: Glossary

Appendix B: Reserve and resource classification systems



# Reserves and resources

# Reserves and resources

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- **Reserves and resources** are fundamental to entities in extractive industries and estimates of reserve and resource quantities are a key part of their communication with users of financial statements. These estimates can also be used to determine amounts in the **financial statements**—eg being used in **depreciation** calculations, in **impairment** assessments, and to estimate the timing of **rehabilitation provisions**
- The **2010 Discussion Paper *Extractive Activities*** described the basic concepts of reserves and resources as follows:
  - **Reserves** generally refer to the **quantity** of minerals or oil and gas that is **estimated to be economically recoverable** (ie reserve quantities are an estimate of the aggregate future production of minerals or oil and gas)
  - **Resources** generally refer to the **quantity** of minerals or oil and gas that has been discovered but is not yet capable of being classified as a reserve
  - Reserves and resources are **generally classified into subcategories according to the level of confidence** associated with the estimate of the reserve or resource quantities

# Reserves and resources (cont.)

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- Diagrams illustrating the Committee for Mineral Reserve International Reporting Standards (CRIRSCO) template for mineral reserve and resources and the Petroleum Resources Management System (PRMS) for oil and gas reserve and resources are included in [Appendix B](#)
- These are internationally recognised classification systems and the project team that developed the 2010 Discussion Paper recommended using the definitions of reserves and resources from these classification systems in a Standard for extractive activities
- The diagrams illustrate the relationship between reserves and resources and the subcategories (or grades). More detailed definitions of (Mineral) Reserves and (Mineral) Resources and the related subcategories of reserves and resources in accordance with CRIRSCO and PRMS are included in the glossary

# Relationship with the life-cycle

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- A **reserve is typically declared after a resource has been identified**—exploration and evaluation, and development activities enable the reserve or resource to move through the subcategories
- The completion of exploration and evaluation activities that establish that the **technical feasibility and commercial viability** of extracting a mineral resource is **demonstrable**, generally coincides with classification of a mineral or oil and gas deposit as a reserve
- **Resources** generally require further work to be performed, contingent events to occur or other uncertainties to be resolved prior to the resource being able to be classified as a reserve
- An entity will generally seek to replace the reserves and resources it extracts in order to extend the life of the mine or oil and gas field—further activities take place to convert existing resources to reserves or discover new reserves, ie **exploration and evaluation activities and further development activities can be performed throughout the life-cycle at the same time the mine or oil and gas field is producing**

# Relationship with the life-cycle (cont.)

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- **Other revisions of reserves** can occur during the life-cycle of a mine or oil and gas field (including during the production phase), eg as a result of improved geological data, estimates are continually updated, etc
- Not all entities will develop and/or produce a reserve or resource they discover; some entities will sell their discoveries to other entities that have the capability and/or interest to progress projects to production
- Some minerals or oil and gas may be produced during exploration and evaluation, and development phases as part of those activities
- **Reserves or resources may still be present when an entity chooses to close a mine or oil and gas field**—eg this might occur when an entity decides it is not economic to extract the remaining resource

A grayscale world map is the background. Overlaid on the map are several curved, overlapping bands and a network of dotted lines that suggest a global or cyclical theme.

# Life-cycle of a minerals property

# Minerals

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- The 2010 Discussion Paper explained that minerals are non-regenerative naturally occurring materials in or on the earth's crust that include metallic ores (such as copper, gold, silver, iron, nickel, lead and zinc), other industrial minerals (non-metallic minerals and aggregates), gemstones, uranium and fossilised organic material (coal)
- Slides 12-20 summarise the life-cycle and common accounting challenges associated with minerals properties

# Life-cycle of a minerals property



- Obtaining rights to mineral deposits, determination of viability of deposits
- Establishing access to deposits, construction of infrastructure
- Extracting higher grade material, transforming raw materials into upgraded products
- Transporting minerals from the extraction point through processing to the end user
- Winding down the mine site once extraction has been completed

## Common activities include:

- Prospecting, acquisition of legal rights, exploratory drilling, sampling, evaluation (eg core analysis) and feasibility studies
- Development of the mine site, drilling and blasting, permanent excavation, installing facilities to extract, treat and transport minerals
- Extraction, primary and secondary crushing, smelting, flotation and concentration, refining
- Transport, *stockpiling* inventory, waste management (eg dump sites, tailings dams, etc), shipment via ports to end users
- Rehabilitating the mine site and property

Slides 13-15

Slides 16-17

Slides 18-19

Slides 18-19

Slide 20

# Exploration – Prospecting\*

- **Prior to acquiring the legal right to explore** an *area of interest* (or property), an entity may elect to perform preliminary research to determine whether to acquire such a right
- Such activities are **similar to exploration and evaluation** activities – eg analysing geological data, drilling and sampling
- Not all entities will perform prospecting activities – eg prospecting activities might be combined with exploration and evaluation activities after the legal right has been acquired or it may not be necessary to perform prospecting activities if an entity:
  - acquires an exploration and evaluation project in progress; or
  - acquires a legal right to explore a property immediately adjacent to an active mine site

Common accounting challenges		Commonly applied Standards
<b>Prospecting expenditure</b>	<ul style="list-style-type: none"> <li>• Scoped out of IFRS 6 <i>Exploration for and Evaluation of Mineral Resources</i>*</li> <li>• The entity might apply IAS 16 <i>Property, Plant and Equipment</i>, IAS 38 <i>Intangible Assets</i>, develop its own accounting policy for prospecting expenditure applying IAS 8 <i>Accounting Policies, Changes in Accounting Estimates and Errors</i>, or a combination of these</li> <li>• Generally, prospecting expenditure is expensed</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IAS 8</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 38</li> </ul>
<b>Assets acquired for prospecting</b>	<ul style="list-style-type: none"> <li>• The entity might apply IAS 16 or develop its own accounting policy for assets acquired for prospecting applying IAS 8 – judgement is applied on whether these meet the definition of an asset and in estimating useful life given the nature of activities, particularly if the asset is specialised</li> </ul>	
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Deferred tax – eg complex calculations due to tax regimes for expenditure in some countries</li> <li>• Options to acquire exploration rights – eg an entity may enter into an agreement with the owner of an existing legal right to acquire that legal right following the entity performing its own prospecting activities</li> </ul>	

\*Note: activities relating to prospecting occur prior to an entity acquiring the legal right to explore and hence are outside the scope of IFRS 6 (see paragraph 5(a) of IFRS 6)

# Exploration & Evaluation (E&E)

- **Exploration for and evaluation** of mineral resources—the **search for** mineral resources, including **minerals**, oil and natural gas and similar non-regenerative resources after the entity **has obtained the legal rights to explore** in a specific area, as well as the determination of the **technical feasibility and commercial viability of extracting the mineral** resource (Appendix A, IFRS 6)
- Exploration and evaluation **assets**—exploration and evaluation **expenditures recognised as assets in accordance with the entity’s accounting policy** (Appendix A, IFRS 6)
- Exploration and evaluation **expenditures**—**expenditures incurred** by an entity in connection with the exploration for and evaluation of mineral resources **before the technical feasibility and commercial viability of extracting a mineral resource are demonstrable** (Appendix A, IFRS 6)
- **Examples of** exploration and evaluation **expenditures** (paragraph 9 of IFRS 6):
  - Acquisition of rights to explore
  - Topographical, geological, geochemical and geophysical studies
  - Exploratory drilling
  - Trenching
  - Sampling
  - Activities in relation to evaluating the technical feasibility and commercial viability of extracting a mineral resource

## Key drivers of common accounting challenges

- E&E expenditure is in the scope of IFRS 6 only – E&E expenditure is scoped out of IAS 16 (see paragraph 3(c) and (d)) and IAS 38 (see paragraph 2(c))
- Applying IFRS 6, entities apply judgement to develop their own accounting policies which may not be consistent with other entities in the same industry
- Uncertainty in the E&E phase – E&E activities are high risk, rarely resulting in the identification of an exploitable reserve or resource, eg difficult to determine the fair value of E&E assets when no reserve or resource has been identified

# Exploration & Evaluation (E&E) (cont.)

Common accounting challenges		Commonly applied Standards
<b>Assets acquired for E&amp;E</b>	<ul style="list-style-type: none"> <li>• Treatment of plant and equipment acquired (or leased) for the purpose of E&amp;E – judgement required about whether it meets the definition of an asset and estimating useful life, particularly if the asset is specialised</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 2</li> <li>• IFRS 3</li> <li>• IFRS 6</li> <li>• IFRS 9</li> <li>• IFRS 11</li> <li>• IFRS 16</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 36</li> </ul>
<b>Developing an accounting policy</b>	<ul style="list-style-type: none"> <li>• Unit of account</li> <li>• Full capitalisation – ie all E&amp;E expenditure is capitalised as incurred (eg full cost)</li> <li>• Partial capitalisation – ie not all E&amp;E expenditure is capitalised (eg successful efforts, <i>area of interest</i>)</li> <li>• Write-off – ie E&amp;E expenditure is expensed as incurred</li> </ul>	
<b>E&amp;E assets</b>	<ul style="list-style-type: none"> <li>• Determining the degree to which E&amp;E expenditure, such as overheads, can be associated with finding specific mineral resources</li> <li>• Whether an entity can capitalise borrowing costs</li> <li>• Nature of the asset – ie tangible, intangible or a combination of both</li> <li>• Impairment assessments – eg identification of indicators and valuation</li> </ul>	
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Deferred tax – eg complex calculations due to tax regimes for expenditure in some countries</li> <li>• Risk sharing agreements eg <i>farm-in arrangements</i> and <i>carry arrangements</i> (obligation to pay another partner's costs) and how these are accounted for</li> <li>• Joint arrangements – eg joint operations accounting (see lease accounting)</li> <li>• Lease accounting for operators and non-operators in a joint arrangement</li> <li>• Business combinations – eg valuation of E&amp;E projects</li> <li>• Share-based payments – eg acquiring an E&amp;E project by issue of shares and the valuation of those shares, in particular when these transactions occur between small exploration entities</li> </ul>	

# Development\*

- Refers to the **development of the mine site**—ie **mine development** and **building and acquiring the required infrastructure** to extract, process and transport minerals from the point of extraction to the point of sale/transport to buyer
- Development activities predominantly **relate to getting assets ready for use**—ie building, acquiring and utilising assets, such as infrastructure, up to the point that commercial levels of production are reached

## Key drivers of common accounting challenges

- Judgement about when commercial viability and technical feasibility are demonstrable
- Capital intensity and complexity of developing a mine site
- Complex jurisdictional tax regimes often apply
- Uncertainty in the development phase hence joint and risk-sharing arrangements are common, especially via contractual arrangements

Common accounting challenges		Commonly applied Standards
<b>E&amp;E vs development</b>	<ul style="list-style-type: none"> <li>• Differing views about when technical feasibility and commercial viability of extraction are demonstrable – ie differing views about when E&amp;E has been completed and development begins</li> <li>• Impairment assessment on reclassification of E&amp;E asset – eg valuation difficulties</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 6</li> <li>• IAS 8</li> <li>• IAS 16</li> <li>• IAS 36</li> <li>• IAS 38</li> </ul>
<b>Development expenditure</b>	<ul style="list-style-type: none"> <li>• Scoped out of IFRS 6 and IAS 38*</li> <li>• The entity might develop its own accounting policy for development expenditure applying IAS 8, based on IAS 16** or IAS 38 or a combination of both (because the nature of development expenditure can be intangible, tangible or a combination of both)</li> </ul>	

\*Note: activities relating to development of minerals, oil, natural gas and similar non-regenerative resources are specifically **scoped out of IAS 38** (see paragraph 2 of IAS 38), all extractive **activities occurring after technical feasibility and commercial viability of extracting a mineral resource are demonstrable are scoped out of IFRS 6** (see paragraph 5(b) of IFRS 6). The *Conceptual Framework* and IAS 38 provide guidance on the recognition of assets arising from development (see paragraph 10 of IFRS 6)

\*\*Note: mineral rights and mineral reserves such as oil, natural gas and similar non-regenerative resources are **scoped out of IAS 16** (see paragraph 3(d))

# Development\* (cont.)

Common accounting challenges (cont.)		Commonly applied Standards
<b>Development asset</b>	<ul style="list-style-type: none"> <li>• Nature of the asset – ie tangible, intangible or a combination of both</li> <li>• Judgements about the costs to capitalise – eg overheads, allocation of costs to pre-commissioning revenue, obligations to build local infrastructure such as schools, etc</li> <li>• Judgements about when a project moves from the development phase to production phase, when construction has been completed and the asset is in the location and condition for intended use</li> <li>• Allocation of expenditure to related <i>area of interest</i> (or property) – eg E&amp;E asset which results in more than one mineral being extracted, E&amp;E value established in a business combination, etc</li> <li>• Impairment assessment – eg valuation difficulties (similar to E&amp;E assets)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 9</li> <li>• IFRS 11</li> <li>• IFRS 16</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Rehabilitation liability – eg estimating the initial present value of rehabilitation costs (see also slide 20)</li> <li>• Deferred tax – eg complex calculations due to the tax regimes for expenditure in some countries</li> <li>• Risk sharing agreements</li> <li>• Joint arrangements – eg joint operations accounting (see lease accounting)</li> <li>• Lease accounting for operators and non-operators in a joint arrangement</li> <li>• <i>Streaming arrangements</i> – eg is it a commodity arrangement, financial liability or sale of interest in mineral property with a contract to provide future services?</li> <li>• Related party transactions – eg particularly between smaller entities that are developing their own mine for the first time often with common key management personnel</li> </ul>	<ul style="list-style-type: none"> <li>• IAS 8</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 24</li> <li>• IAS 36</li> <li>• IAS 37</li> <li>• IAS 38</li> </ul>

\*Note: activities relating to development of minerals, oil, natural gas and similar non-regenerative resources are specifically **scoped out of IAS 38** (see paragraph 2 of IAS 38), all extractive **activities occurring after technical feasibility and commercial viability of extracting a mineral resource are demonstrable are scoped out of IFRS 6** (see paragraph 5(b) of IFRS 6). The *Conceptual Framework* and IAS 38 provide guidance on the recognition of assets arising from development (see paragraph 10 of IFRS 6)

# Production – Extracting, Processing & Transport

- Refers to activities related to **production**—ie **extracting, processing and transporting** minerals from the point of extraction to the point of sale/transport to buyer
- Entities **can still be engaged in exploration and evaluation, and development activities** during this stage to replace the mineral resources being extracted and extend the life of the mine or just as part of the original mine plan

## Key drivers of common accounting challenges

- Capital intensity and complexity of mining projects (incl. the use of reserve and resource estimates as part of making accounting estimates)
- Judgements around assets which are expected to have long lives – eg the life of a mine asset can span more than a decade and the mine is continually developed during that period and therefore unit of account issues are common
- Complex jurisdictional tax regimes often apply
- Volatility of commodity pricing as a result of a highly liquid commodity markets

Common accounting challenges		Commonly applied Standards
<b>Mine asset</b>	<ul style="list-style-type: none"> <li>• Reclassification of development asset as mine asset – eg judgement about the point at which development has been completed, treatment of intangible development assets, etc</li> <li>• The <i>'life of mine'</i> model – ie ongoing estimation of life of the mine and the volume and quality of minerals that can be extracted (mix of geological and accounting concepts). This can also lead to judgements about allocating costs between production and further development of the mine</li> <li>• Unit of production depreciation – eg judgements about which reserve and/or resource estimate to use, whether to use tonnes of reserves or units of mineral content, complexities where there are joint products, dealing with revisions to reserve and resource estimates and componentisation, etc</li> <li>• Mines on “care and maintenance” – eg major asset overhauls and maintenance</li> <li>• Impairment assessments (incl. reversals) – eg valuation difficulties as a result of price assumptions and volatility, inclusion of additional value from undeveloped resources, inclusion (or not) of rehabilitation and lease liabilities, implications of <i>stranded assets</i>, etc</li> </ul>	<ul style="list-style-type: none"> <li>• IAS 8</li> <li>• IAS 16</li> <li>• IAS 36</li> <li>• IAS 38</li> </ul>

# Production – Extracting, Processing & Transport (cont.)

Common accounting challenges (cont.)		Commonly applied Standards
<b>Property, plant and equipment</b>	<ul style="list-style-type: none"> <li>• Componentisation of producing assets</li> <li>• Calculating useful life of relevant assets – eg some may be dependent on a subset of reserve and resource estimates used for the mine asset</li> <li>• Impairment assessments – eg valuation of specialised assets</li> <li>• Repairs and maintenance – eg judgements about asset enhancement versus maintenance</li> <li>• Judgements about whether strategic spare parts are inventory or PP&amp;E</li> </ul>	
<b>Inventory</b>	<ul style="list-style-type: none"> <li>• Net realisable value – eg volatile commodity prices, quality/grade of mineral, etc</li> <li>• Accounting for joint products and <i>by-products</i> – eg cost allocation</li> <li>• <i>Stockpiling</i> – eg inventory valuation</li> <li>• Accounting for waste products – eg when product increases in value at later date</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 3</li> <li>• IFRS 9</li> <li>• IFRS 13</li> <li>• IAS 2</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 21</li> <li>• IAS 36</li> <li>• IFRIC 20</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Deferred <i>stripping costs</i> – eg judgements between stripping activity asset and inventory</li> <li>• Transitioning from surface to underground mining</li> <li>• Deferred tax – eg complex calculations for some jurisdictional tax regimes, judgements about whether a royalty or a tax in the scope of IAS 12, etc</li> <li>• Functional currency assessments – eg multiple revenue currencies, local currency costs and taxes, changes over time, etc</li> <li>• <i>Streaming arrangements</i> – eg is it a commodity arrangement, financial liability or sale of interest in mineral property with a contract to provide future services?</li> <li>• Judgements about whether an acquisition is a business combination or asset acquisition</li> <li>• <i>Empowerment transactions</i> – ie arrangements with indigenous landowners</li> </ul>	

# Closure

- Refers to activities related to the long-term **decommissioning, rehabilitation and closure** of a mine site—ie decommissioning mine assets, rehabilitating the land to remove waste products (such as removing tailings dams), returning land (as close as possible) to its former state and returning it to indigenous landowners or the government

## Key drivers of common accounting challenges

- Judgements around assets which are expected to have long lives – eg the life of a mine asset can span more than a decade
- Complexity and cost of closing a mine site – amounts involved are significant
- Uncertainty around the cost and timing of rehabilitation

Common accounting challenges		Commonly applied Standards
<b>Decommissioning provisions</b>	<ul style="list-style-type: none"> <li>• Estimates of decommissioning costs – eg uncertainty, rapid technology changes, timing of rehabilitation; the costs of rehabilitation can exceed the provisions recognised by entities</li> <li>• Judgements about which costs to include in provision</li> <li>• Changes in provision during production phase – eg mine asset versus inventory</li> <li>• Disposal of mine and other assets – eg ongoing (often in perpetuity) guarantees and obligations</li> <li>• Calculating discount rates – eg estimations, whether to include own credit risk, negative risk free rates, etc</li> <li>• Climate change and associated risks – eg changes in environmental legislation resulting in changes to rehabilitation obligations, etc</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 3</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 37</li> <li>• IFRIC 1</li> <li>• IFRIC 5</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Business combinations – eg IFRS 3 fair value measurement to IAS 37 measurement on day 2</li> <li>• <i>Empowerment transactions</i> – ie arrangements with indigenous landowners</li> <li>• Deferred tax – eg deferred tax asset recoverability for decommissioning cost, initial recognition, etc</li> </ul>	



# Life-cycle of an oil and gas property

# Oil and Gas

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- The 2010 Discussion Paper explained that oil and natural gas, often referred to collectively as petroleum, is a non-regenerative naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid or solid phase (such as tar sands or oil shale)
- Slides 23-32 summarise the life-cycle and common accounting challenges associated with oil and gas properties

# Life-cycle of an oil and gas property



- Obtaining rights to oil and gas deposits; determination of viability of reservoir
- Establishing access to oil and gas reserves and construction of infrastructure
- Extraction of oil and gas (onshore and offshore, conventional and unconventional)
- Processing of oil and gas and transportation from extraction point onwards to the end user or *downstream* operations
- Cessation of production, and restoration of site to appropriate condition

## Common activities include:

- Prospecting, acquisition of legal rights, exploratory drilling, appraisal well drilling, evaluation of results
- Development drilling, access, construction of platform and other facilities
- Extraction of oil and gas, field processing
- Processing, treatment, storage, transportation via pipelines, ships etc
- Plugging of wells, removal of infrastructure, rehabilitating of production site

Slides 24-26

Slides 27-28

Slides 29-30

Slide 31

Slide 32

# Exploration – Prospecting\*

- **Prior to acquiring the legal right to explore** a property, an entity may elect to perform preliminary research to determine whether to acquire such a right
- Such activities are **similar to exploration and evaluation** activities – eg analysing geological data, drilling and sampling
- Not all entities will perform prospecting activities – eg prospecting activities might be combined with exploration and evaluation activities after the legal right has been acquired or it may not be necessary to perform prospecting activities if an entity:
  - acquires an exploration and evaluation project in progress; or
  - acquires a legal right to explore a property immediately adjacent to other properties

Common accounting challenges		Commonly applied Standards
<b>Prospecting expenditure</b>	<ul style="list-style-type: none"> <li>• Scoped out of IFRS 6*</li> <li>• The entity might apply IAS 16, IAS 38, develop its own accounting policy for prospecting expenditure applying IAS 8, or a combination of these</li> <li>• Generally prospecting expenditure is expensed</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IAS 8</li> <li>• IAS 16</li> <li>• IAS 38</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Options to acquire exploration rights – eg an entity may enter into an agreement with the owner of an existing legal right to acquire that legal right following the entity performing its own prospecting activities</li> </ul>	

\*Note: activities relating to prospecting occur prior to an entity acquiring the legal right to explore and hence **fall outside the scope of IFRS 6** (see paragraph 5(a) of IFRS 6)

# Exploration & Evaluation (E&E)

- **Exploration for and evaluation** of mineral resources—the **search for** mineral resources, including minerals, **oil and natural gas** and similar non-regenerative resources after the entity **has obtained the legal rights to explore** in a specific area, as well as the determination of the **technical feasibility and commercial viability of extracting the mineral** resource (Appendix A, IFRS 6)
- Exploration and evaluation **assets**—exploration and evaluation **expenditures recognised as assets in accordance with the entity’s accounting policy** (Appendix A, IFRS 6)
- Exploration and evaluation **expenditures**—**expenditures incurred** by an entity in connection with the exploration for and evaluation of mineral resources **before the technical feasibility and commercial viability of extracting a mineral resource are demonstrable** (Appendix A, IFRS 6)
- **Examples of** exploration and evaluation **expenditures** (paragraph 9 of IFRS 6):
  - Acquisition of rights to explore
  - Topographical, geological, geochemical and geophysical studies
  - Exploratory drilling
  - Trenching
  - Sampling
  - Activities in relation to evaluating the technical feasibility and commercial viability of extracting a mineral resource

## Key drivers of common accounting challenges

- E&E expenditure is in the scope of IFRS 6 only – E&E expenditure is scoped out of IAS 16 and IAS 38
- Applying IFRS 6, entities apply judgement to develop their own accounting policies which may not be consistent with other entities in the same industry
- **No standardised definition of successful efforts, full cost etc**
- Uncertainty in the E&E phase – E&E activities are high risk, rarely resulting in the identification of an exploitable reserve or resource eg difficult to determine the fair value of E&E assets when no reserve or resource has been identified yet

# Exploration & Evaluation (E&E) (cont.)

Common accounting challenges		Commonly applied Standards
<b>Developing an accounting policy</b>	<ul style="list-style-type: none"> <li>• Unit of account</li> <li>• Full capitalisation – ie all E&amp;E expenditure is capitalised as incurred (eg full cost)</li> <li>• Partial capitalisation – ie not all E&amp;E expenditure is capitalised (eg successful efforts, <i>area of interest</i>)</li> <li>• Write-off – ie E&amp;E expenditure is expensed as incurred</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 2</li> <li>• IFRS 3</li> <li>• IFRS 6</li> <li>• IFRS 9</li> <li>• IFRS 11</li> <li>• IFRS 16</li> <li>• IAS 36</li> </ul>
<b>E&amp;E assets</b>	<ul style="list-style-type: none"> <li>• Determining the degree to which E&amp;E expenditure such as overheads, <i>side-tracks</i>, etc can be associated with finding specific oil and gas resources</li> <li>• Judgements about whether an entity can capitalise borrowing costs</li> <li>• Nature of the asset – ie tangible, intangible or a combination of both</li> <li>• Impairment assessments – eg identification of indicators and valuation; <i>delays in approval of development plans (eg should impairment assessment occur?)</i></li> </ul>	
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Risk sharing agreements eg <i>farm-in arrangements</i> and <i>carry arrangements</i> (obligation to pay another partner's costs) and how these are accounted for. <i>Similar challenges with asset swaps and unitisation agreements</i></li> <li>• Joint arrangements – eg joint operations accounting (see lease accounting)</li> <li>• Lease accounting for operators and non-operators – <i>eg rig hires for joint operation</i></li> <li>• Share-based payments – eg acquiring an E&amp;E project by issue of shares and the valuation of those shares, in particular when these transactions occur between small exploration entities</li> <li>• Business combinations – eg valuation of exploration and evaluation projects</li> </ul>	

# Development\*

- Refers to the **development of the oil and gas asset**—ie **building and acquiring the required infrastructure** to extract, process and transport oil and gas from the point of extraction to the point of sale/transport to buyer
- Development activities predominantly **relate to getting assets ready for use**—ie building, acquiring and utilising assets, such as infrastructure, up to the point that commercial levels of production are reached

## Key drivers of common accounting challenges

- Judgement about when commercial viability and technical feasibility are demonstrable
- Capital intensity and complexity of developing an oil and gas field
- Complex jurisdictional tax regimes often apply
- Uncertainty in the development phase hence joint and risk-sharing arrangements are common, especially via contractual arrangements

Common accounting challenges		Commonly applied Standards
<b>E&amp;E vs development</b>	<ul style="list-style-type: none"> <li>• Differing views about when technical feasibility and commercial viability of extraction are demonstrable – ie differing views about when E&amp;E has been completed and development begins</li> <li>• Impairment assessment on reclassification of E&amp;E asset – eg valuation difficulties</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 6</li> <li>• IAS 8</li> <li>• IAS 16</li> <li>• IAS 36</li> <li>• IAS 38</li> </ul>
<b>Development expenditure</b>	<ul style="list-style-type: none"> <li>• Scoped out of IFRS 6 and IAS 38*</li> <li>• The entity might develop its own accounting policy for development expenditure applying IAS 8, based on IAS 16** or IAS 38 or a combination of both (because the nature of development expenditure can be intangible, tangible or a combination of both)</li> </ul>	

\*Note: activities relating to development of minerals, oil, natural gas and similar non-regenerative resources are specifically **scoped out of IAS 38** (see paragraph 2 of IAS 38), all extractive **activities occurring after technical feasibility and commercial viability of extracting a mineral resource are demonstrable are scoped out of IFRS 6** (see paragraph 5(b) of IFRS 6)). The *Conceptual Framework* and IAS 38 provide guidance on the recognition of assets arising from development (see paragraph 10 of IFRS 6)

\*\*Note: mineral rights and mineral reserves such as oil, natural gas and similar non-regenerative resources are scoped out of IAS 16 (see paragraph 3(d))

# Development\* (cont.)

Common accounting challenges (cont.)		Commonly applied Standards
<b>Development asset</b>	<ul style="list-style-type: none"> <li>• Nature of the asset – ie tangible, intangible or a combination of both</li> <li>• Judgement about costs to capitalise – eg overheads, what is an ‘abnormal’ cost, obligations to build local infrastructure such as schools, etc</li> <li>• Judgements about when a project moves from the development phase to production phase, when construction has been completed and the asset is in the location and condition for intended use</li> <li>• Impairment assessment – eg valuation difficulties (similar to E&amp;E assets)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Conceptual Framework</i></li> <li>• IFRS 9</li> <li>• IFRS 11</li> <li>• IFRS 16</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Rehabilitation liability – eg estimating the initial present value of rehabilitation costs (see also slide 32)</li> <li>• Deferred tax – eg complex calculations due to the tax regimes for expenditure in some countries, <b>recovery of deferred tax assets such as those associated with rehabilitation liabilities</b></li> <li>• Risk-sharing agreements</li> <li>• Joint arrangements – eg joint operations accounting (see lease accounting)</li> <li>• Lease accounting for operators and non-operators – <b>eg rig hires for joint operation</b></li> </ul>	<ul style="list-style-type: none"> <li>• IAS 8</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 36</li> <li>• IAS 37</li> <li>• IAS 38</li> </ul>

\*Note: activities relating to development of minerals, oil, natural gas and similar non-regenerative resources are specifically **scoped out of IAS 38** (see paragraph 2 of IAS 38), all extractive **activities occurring after technical feasibility and commercial viability of extracting a mineral resource are demonstrable are scoped out of IFRS 6** (see paragraph 5(b) of IFRS 6). The *Conceptual Framework* and IAS 38 provide guidance on the recognition of assets arising from development (see paragraph 10 of IFRS 6)

# Production

- Refers to activities related to **production**—ie **extracting**. There may also be limited processing at the wellhead to remove impurities (which may also be marketable), but the main **processing** and **transportation** assets are often separate assets to the production asset
- Entities **can still be engaged in exploration and evaluation and development activities** during this stage to replace the reserves, exploiting other **contingent resources** in other parts of the property
- A common arrangement in many countries providing access to oil and gas properties is a **production sharing agreement**. Generally these require the contractor to finance and carry out exploration and development activities in return for a share of revenues, recovering costs and a predetermined portion of profit

## Key drivers of common accounting challenges

- Capital intensity and complexity of oil and gas projects (incl. the use of reserve estimates as part of making accounting estimates)
- Judgements around assets which are expected to have long lives - eg the life of an oil and gas field can span more than a decade
- Complex jurisdictional tax regimes often apply
- Volatility of commodity pricing as a result of a highly liquid commodity markets

Common accounting challenges		Commonly applied Standards
<b>Production sharing agreements</b>	<ul style="list-style-type: none"> <li>• Accounting for reserves and fixed assets that the government retains legal title to</li> <li>• Obligations to construct local infrastructure</li> <li>• Non-recoverable costs and recoverable costs – eg determining what is recoverable, accounting for recoverable costs, etc</li> <li>• Often complex calculations to determine an entity’s share of production and the government’s share (cash, in-kind)</li> <li>• Accounting for income tax settled via the PSA, judgements whether income tax or royalty, etc</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 11</li> <li>• IFRS 15</li> <li>• IAS 12</li> <li>• IAS 16</li> </ul>

# Production (cont.)

Common accounting challenges (cont.)	Commonly applied Standards
<p><b>Oil &amp; Gas / Production assets</b></p> <ul style="list-style-type: none"> <li>• Reclassification of development assets as oil and gas assets – eg judgement about the point at which development has been completed, treatment of intangible development assets, etc</li> <li>• Unit of production depreciation – eg judgements about which reserve estimate to use (<i>proved, proved and probable?</i>) and whether to include only developed reserves or to include undeveloped reserves as well, dealing with revisions to reserve and resource estimates, etc</li> <li>• Componentisation of producing assets</li> <li>• Impairment assessments (incl. reversals) – eg valuation difficulties as a result of price assumptions and volatility, inclusion of additional value from <i>contingent resources</i>, inclusion (or not) of rehabilitation and lease liabilities, anticipated licence extensions, etc</li> <li>• Judgement about whether further exploration and evaluation, and development on the same property is a new asset, or part of the same unit of account as the main asset</li> <li>• Repairs and maintenance – eg judgements about asset enhancement versus maintenance</li> <li>• Judgements about whether strategic spare parts are inventory or PP&amp;E</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 3</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 21</li> <li>• IAS 36</li> </ul>
<p><b>Other challenges</b></p> <ul style="list-style-type: none"> <li>• Deferred tax – eg complex calculations for some jurisdictional tax regimes, judgements whether a royalty or a tax in the scope of IAS 12, interaction between different taxes, etc</li> <li>• Functional currency assessments – eg multiple revenue currencies, local currency costs and taxes, changes over time, etc</li> <li>• Judgements about whether an acquisition is a business combination or asset acquisition, often a significant portion of goodwill relates to deferred tax, etc</li> <li>• <i>Empowerment transactions</i> – ie arrangements with indigenous landowners</li> </ul>	

# Processing and transportation

- The staff have not extended the analysis to all *midstream* and *downstream* activities, however a few issues associated with the sale and transportation of extracted oil and gas are discussed

## Key drivers of common accounting challenges

- Complex agreements – often because of the long-life of assets and associated risks
- Accounting policies required to be developed for operating practices in the industry, largely due to the nature of the product

Common accounting challenges		Commonly applied Standards
<b>Processing facilities</b>	<ul style="list-style-type: none"> <li>• Where owned, determining appropriate depreciation methods and useful life, particularly where there is third party usage of own facilities</li> <li>• Where third party owned, there are often complex capacity agreements, lease assessments, etc</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 9</li> <li>• IFRS 11</li> <li>• IFRS 15</li> <li>• IFRS 16</li> <li>• IAS 2</li> <li>• IAS 16</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Judgements about whether strategic spare parts are inventory or PP&amp;E</li> <li>• Locational swaps of product between entities</li> <li>• <i>Overlift and underlift</i> – ie accounting for the imbalances (differences between volumes entitled to and volumes that are lifted) between partners in a project, etc</li> <li>• Line fill and cushion gas – quantities of gas required to remain in a pipeline or facility for the asset to operate properly, consideration of whether to classify those quantities of gas as inventory or a component of PP&amp;E</li> <li>• Long-term (often life of field) sales contracts, sellers or buyers nominations, take or pay quantities, price adjustment mechanisms, etc</li> </ul>	

# Closure

- Refers to activities related to the long-term **decommissioning, rehabilitation and closure** of the oil and gas field - eg plugging wells, decommissioning oil and gas assets, rehabilitating and restoring the site

## Key drivers of common accounting challenges

- Judgements around assets which are expected to have long lives
- Complexity and cost of rehabilitation (particularly for offshore assets) – amounts involved are significant
- Uncertainty around the cost and timing of rehabilitation

Common accounting challenges		Commonly applied Standards
<b>Decommissioning provisions</b>	<ul style="list-style-type: none"> <li>• Estimates of decommissioning costs – eg uncertainty, rapid technology changes, campaigns versus individual wells, timing of rehabilitation, etc</li> <li>• Judgements about which costs to include in provision</li> <li>• Timing of recognition – eg exploration, development, production or throughout?</li> <li>• Calculating discount rates – eg estimations, whether to include own credit risk, negative risk free rates, etc</li> <li>• Disposal of oil and gas properties – eg ongoing (often in perpetuity) guarantees and obligations</li> </ul>	<ul style="list-style-type: none"> <li>• IFRS 3</li> <li>• IAS 12</li> <li>• IAS 16</li> <li>• IAS 37</li> <li>• IFRIC 1</li> <li>• IFRIC 5</li> </ul>
<b>Other challenges</b>	<ul style="list-style-type: none"> <li>• Business combinations – eg IFRS 3 fair value measurement to IAS 37 measurement on day 2</li> <li>• Deferred tax – eg deferred tax asset recoverability for decommissioning cost, initial recognition, etc</li> <li>• <i>Empowerment transactions</i> – ie arrangements with indigenous landowners</li> </ul>	



# Appendix A – Glossary

# Glossary of terms

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- **Area of interest**—ie geological area, geographical area, well, field, etc. An entity can define its area of interest if it is not required to use a specific area of interest
- **By-product**—for example, when minerals occur together and can be extracted and processed together, however the entity elects to focus their business operations on only one of those minerals
- **Carry arrangements**—an arrangement whereby one party agrees to ‘carry’, or pay for, another party’s costs (eg exploration costs) on a property, usually in return for an interest in the property
- **Contingent resources**—quantities of petroleum estimated to be potentially recoverable from known accumulations but which are not currently considered to be commercially recoverable owing to one or more contingencies (see slide 42)
- **Downstream activities**—refining, processing, marketing and distributing minerals or oil and gas
- **Empowerment transactions**—these arrangements are intended to give disadvantaged individuals, or entities controlled by disadvantaged individuals, a means of meaningful participation in the economy

# Glossary of terms (cont.)

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- **Farm-in/out arrangements**—an arrangement in which the farmor agrees to assign an interest to a farmee in exchange for specified services – once these services have been rendered, the farmee has earned what is known as an ‘assignment’. This is a farm-out from the perspective of the farmor and a farm-in from the perspective of the farmee
- **Inferred mineral resources**—a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An inferred resource must not be converted to a mineral reserve. It is reasonably expected that the majority of inferred mineral resources could be upgraded to indicated mineral resources with continued exploration (see slide 41)
- **Indicated mineral resources**—a mineral resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. An indicated mineral resource may only be converted to a probable mineral reserve (see slide 41)

# Glossary of terms (cont.)

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- **Life of mine**—the time in which, through the employment of the available capital, the minerals reserves (or such reasonable extension of the minerals reserves as conservative geological analysis may justify) will be extracted
- **Measured mineral resources**—a mineral resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit. A measured mineral resource may be converted to a proved mineral reserve or to a probable mineral reserve (see slide 41)
- **Midstream activities**—storing, processing and transporting minerals or oil and gas
- **Mineral reserve**—is the economically mineable part of a measured and/or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at pre-feasibility or feasibility level as appropriate that include the application of modifying factors (see slide 41)
- **Mineral resource**—is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling (see slide 41)

# Glossary of terms (cont.)

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- **Modifying factors**—considerations used to convert mineral resources to mineral reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors
- **Overlift and underlift**—the difference between the amount of production a partner has taken compared to that partner's entitlement based on its share of ownership
- **Probable mineral reserve**—the economically mineable part of an indicated, and in some circumstances, a measured mineral resource. The confidence in the modifying factors applying to a probable mineral reserve is lower than that applying to a proved mineral reserve (see slide 41)
- **Prospective resources**—Quantities of petroleum estimated to be potentially recoverable from undiscovered accumulations (see slide 42)
- **Proved mineral reserve**—the economically mineable part of a measured mineral resource. A proved mineral reserve implies a high degree of confidence in the modifying factors (see slide 41)
- **Reserves (PRMS)**—those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must satisfy four criteria: they must be discovered, recoverable, commercial and remaining (as of a given date) based on the development project(s) applied (see slide 42)

# Glossary of terms (cont.)

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- **Resources (PRMS)**—term used to encompass all quantities of petroleum (recoverable and unrecoverable) naturally occurring in an accumulation on or within the Earth’s crust, discovered or undiscovered, plus those quantities already produced. Further, it includes all types of petroleum whether currently considered conventional or unconventional
- **Side-track**—drilling from an initial drill hole laterally to the location of reserves because, for example, the initial drilling was a dry hole
- **Stockpiling**—for example, an entity might decide that, due to the price of mineral X, it is currently not economically feasible to sell it so instead they stockpile mineral X as a waste product (ie it has no book value) and sell mineral Y which was extracted and processed alongside mineral X. However, years later the price of mineral X may increase to the point where selling it becomes economically feasible
- **Stranded assets**—generally accepted to be those assets that, at some time prior to the end of their economic life, are no longer able to earn an economic return as a result of changes associated with the transition to a low-carbon economy
- **Streaming arrangements**—are alternative financing arrangements whereby minerals or oil and gas entities can access funding in exchange for future production of mineral products from a mine or field

# Glossary of terms (cont.)

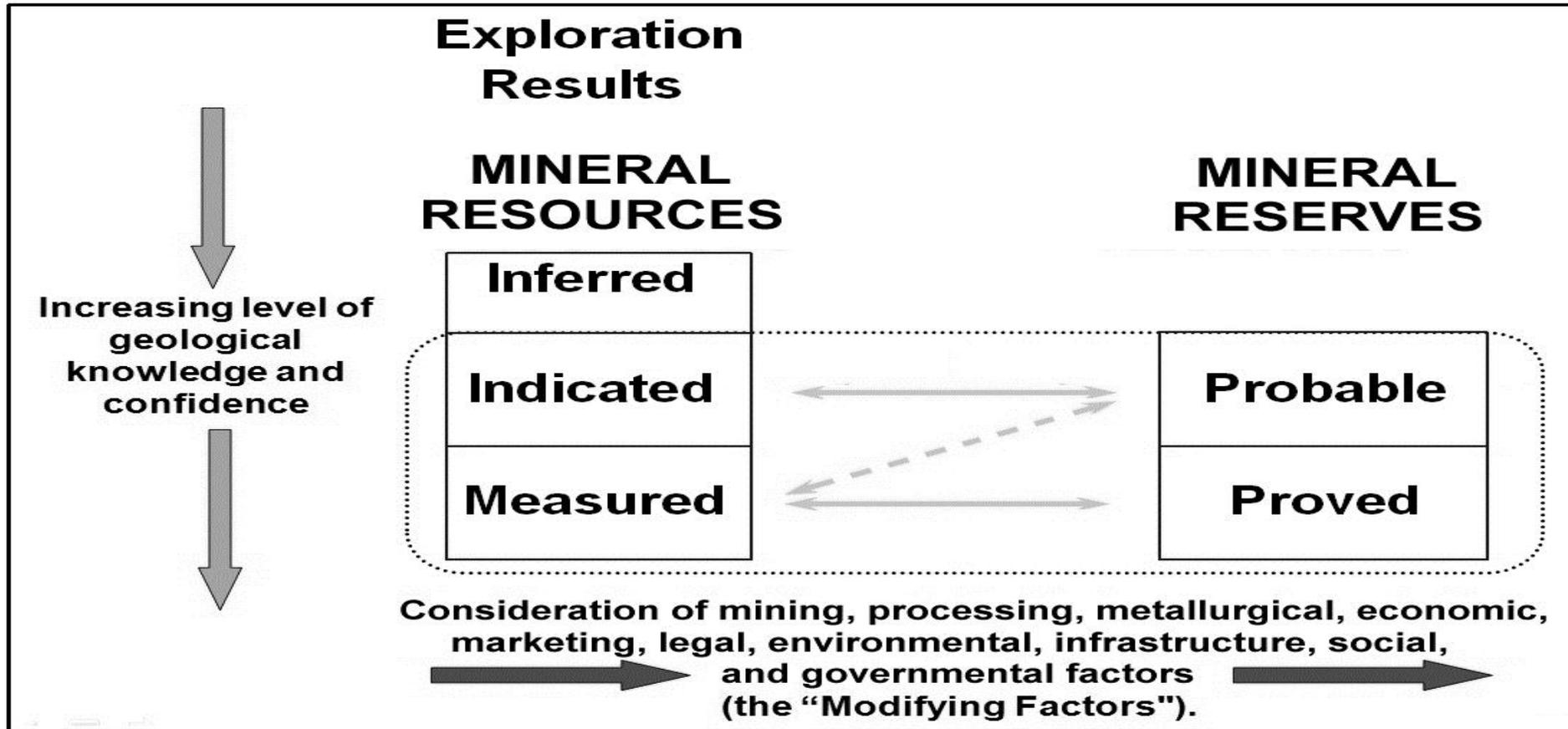
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- **Stripping costs**—costs of removal of mine waste materials (overburden) to gain access to mineral ore deposits
- **Unitisation agreement**—an agreement between two parties, each of which owns an interest in one or more mineral properties in an area (usually adjacent), to cross-assign to one another a share of the interest in the mineral properties that each owns in the area; from that point forward they share, as agreed, in further costs and revenues related to the combined properties
- **Upstream activities**—exploring, discovering and developing mineral reserves, and their subsequent extraction (production)
- **1P, 2P, 3P**—low (P90), best (P50) and high (P10) estimates of reserves used in PRMS. Also commonly labelled ‘proved’, ‘proved and probable’, and ‘proved, probable and possible’ reserves (see slide 42)
- **1C, 2C, 3C**—low (P90), best (P50) and high (P10) estimates of contingent resources used in PRMS (see slide 42)
- **1U, 2U, 3U**—low (P90), best (P50) and high (P10) estimates of prospective resources used in PRMS (see slide 42)

The background of the slide features a stylized world map in shades of gray. Overlaid on the map are several curved, concentric lines and dotted lines, creating a sense of global connectivity or data flow. The text is centered over the map.

# Appendix B – Reserve and resource classification systems

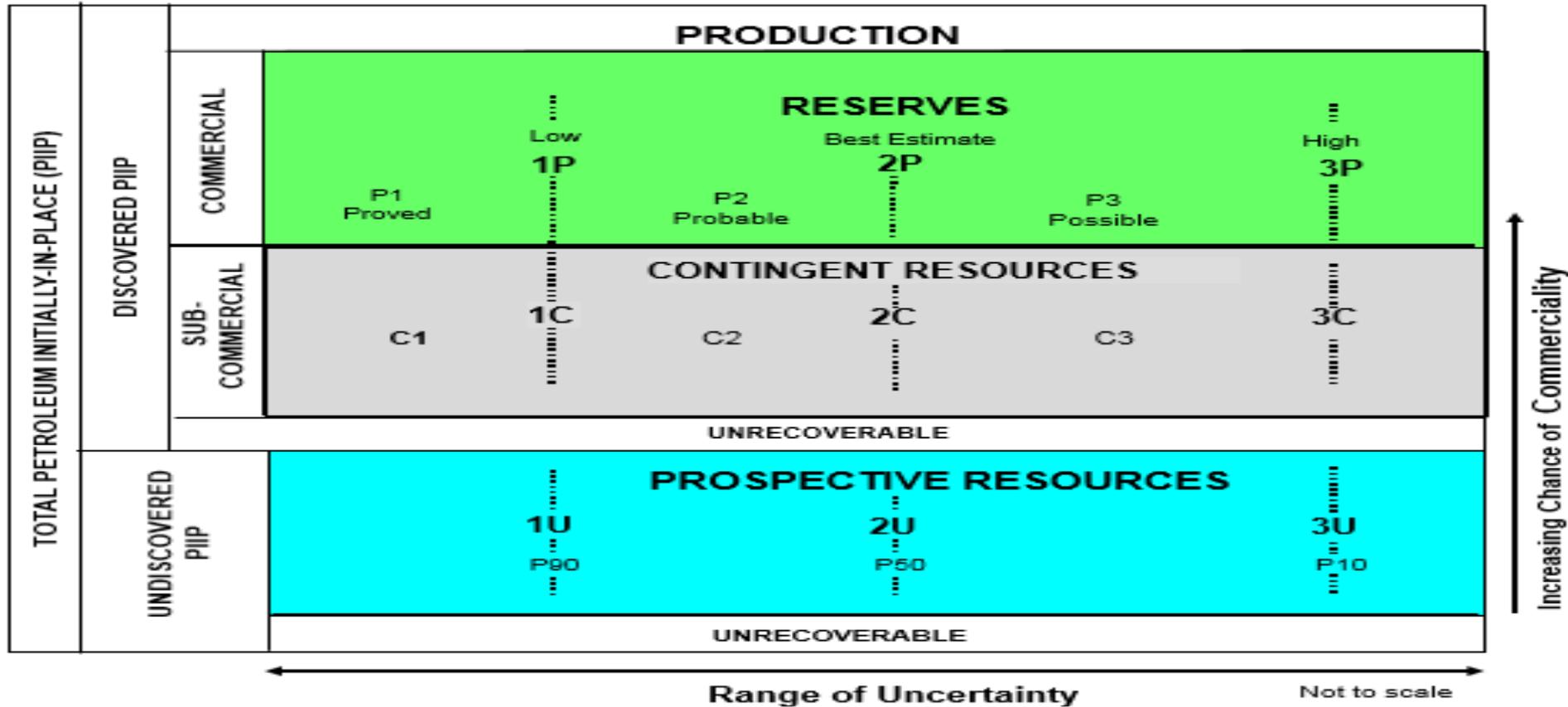
# CRIRSCO Template (Minerals)



Committee for Mineral Reserves International Reporting Standards (CRIRSCO) International Reporting Template November 2019

Refer to Appendix A for definitions of the terms used in the template above

# PRMS Framework (Oil and Gas)



The SPE/WPC/AAPG/SPEE/SEG/SPWLA/EAGE Petroleum Resources Management System (PRMS)  
June 2018

Refer to Appendix A for definitions of the terms used in the template above

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