

固体矿产资源储量报告规则 (2025)

中国矿业权评估师协会
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1 前言

《固体矿产资源储量报告规则》（以下简称本规则）依据中华人民共和国国家标准《固体矿产资源储量分类》（GB/T 17766—2020）和矿产储量报告国际标准委员会（CRIRSCO）《勘查靶区、勘查结果、资源量和储量公开报告国际模板》（2019年版）制定。

1.1 中国矿业权评估师协会（以下简称中矿评协）负责制订《固体矿产资源储量报告规则》，根据章程为会员提供服务，有纪律处分权，包括暂停会籍或开除会员的权力。

1.2 本规则制定了中国资本和证券市场报告勘查靶区、勘查结果、资源量和储量的最低标准与指南。

1.3 本规则包括正文文本，表 1 报告编制内容查对清单以及：

附录 1 胜任人同意书指南；

附录 2 合规性声明指南；

附录 3 技术报告编写指南。

1.4 本规则对中矿评协会员具有约束力。

1.5 本规则共包括 17 个术语定义，如下表所示：

胜任人 ¹	第 4.1 款	第 3 页
技术报告	第 5.1 款	第 4 页
公开报告 ¹	第 5.2 款	第 4 页
转换因素 ¹	第 6.3 款	第 6 页
勘查靶区 ¹	第 9.1 款	第 8 页
勘查结果 ¹	第 10.1 款	第 9 页
资源量 ¹	第 11.1 款	第 10 页
推断资源量 ¹	第 11.6 款	第 11 页

1 矿产储量报告国际标准委员会 2023 年会确定的标准术语。

控制资源量 ¹	第 11.8 款	第 11 页
探明资源量 ¹	第 11.9 款	第 12 页
储量 ¹	第 12.1 款	第 13 页
可信储量 ¹	第 12.2 款	第 13 页
证实储量 ¹	第 12.3 款	第 13 页
矿山服务年限 ¹	第 12.10 款	第 14 页
概略研究 ¹	第 13.2 款	第 15 页
预可行性研究 ¹	第 13.3 款	第 15 页
可行性研究 ¹	第 13.4 款	第 15 页

1.6 本规则中术语及其定义均以**粗体**予以突出，一般条款采用常规字体，指引性内容则以斜体置于相关条款之后。

2 制定原则

2.1 指导本规则实施与应用的原则是**透明性、实质性、胜任性**（以下简称三原则）。各项原则的具体要求如下：

透明性：要求公开报告向投资者、潜在投资者及其专业顾问提供充分的信息。所提供的信息应清晰、无歧义，确保其能够准确理解报告内容，而不产生误导。

实质性：要求公开报告中应包含投资者、潜在投资者及其专业顾问合理要求并预期获取的一切合理相关信息，以支持其对所报告的勘查靶区、勘查结果、资源量和储量作出合理且审慎的判断。

胜任性：要求公开报告应以具备相应工作经验的专业人员（即胜任人）所负责完成的工作成果（如技术报告）为依据。胜任人应为本协会会员或本协会认可的专业组织成员，中矿评协具备可强制执行的道德规范与纪律程序，包括暂停会籍或开除会员的权力。

3 适用范围

本规则适用于中国资本与证券市场。本规则第 6.2、第 9.1、第 10.1 款所定义的矿产资源范围内的勘查靶区、勘查结果、资源量和储量的公开报告，也推荐和鼓励用于其他用途的勘查靶区、勘查结果、资源量和储量的估算、评估与报告。

4 胜任人

4.1 胜任人：是指具备相应资历与经验的矿业行业专业人员，具备中矿评协的高级会员或资深会员资格，或具备中矿评协认可的其他专业机构中同级别的会员，且该机构应具备可执行的纪律机制，包括暂停会籍或开除会员的权力。

胜任人拥有至少 5 年与所涉矿化类型或矿床类型及所从事相关工作的专业经验。

胜任人定义中的关键词为“相关”。相关经验的认定，应基于行业普遍认可的的经验共识。例如，在估算脉状金矿化的资源量时，高块金效应、脉状化（如锡、铀等）的经验可能是相关的，而块状贱金属矿床的经验则可能不被认定为相关。

4.2 能力要求：

- 应为矿业行业专业人员，具有大学本科或以上学历（或同等学力）。
- 在矿产勘查、资源量和储量估算、矿山建设、矿产开采、矿业项目评价或其他相关专业领域具有 10 年以上工作经验。
- 在行业内有良好的职业信誉，具备团队协作能力，且无不良诚信记录或违反职业道德的行为。

4.3 相关经验：

- 若胜任人负责编制勘查靶区或勘查结果的技术报告，则应具备勘查领域的相关经验。
- 若胜任人从事或组织资源量估算，则应具备资源量的估算、评估和评价任一方面的相关经验。
- 若胜任人进行储量估算，或指导储量估算，则应具备储量的估算、评估、评价及经济开采任一方面的相关经验。

5 报告类型及责任

5.1 技术报告是为公开报告提供关于勘查靶区、勘查结果、资源量和储量估算等详细支持信息的报告，必须由胜任人独立编写，或在其指导下完成，并经胜任人签字确认，作为编制公开报告的基础。技术报告应客观、公正地反映所报告事项，并须说明资源量估算的不确定性。本规则未强制要求发布技术报告，是否发布由企业自行决定。

5.2 公开报告是指企业为向投资者或潜在投资者及其专业顾问提供勘查靶区、勘查结果、资源量和储量信息而编制的文件，包括但不限于企业报告、新闻发布、信息备忘录、技术文章、社交媒体发布、网站发布和公开展示等。

考虑到企业可能要在一个以上司法管辖区发布公开报告，其要求的报告标准可能不同于本规则。此类公开报告应加入声明，提示投资者或潜在投资者及其专业顾问注意该情况。中矿评协会员在其他资本市场发布公开报告时，应遵循其相关规定。

尽管本规则已涵盖资本市场公开报告勘查靶区、勘查结果、资源量和储量时可能面临的大多数情形，但不可避免会出现对适用程序存疑的特殊情况。在此类情况下，本规则的使用者和根据本规则编制报告的人员应严格遵从本规则确定的“透明性、实质性、胜任性”三原则。

5.3 技术报告与公开报告编制原则：表 1 提供了胜任人在编制技术报告和公开报告时应参照的查对清单。应基于“如未包括，须说明原因”的原则填写各项查对内容，该清单建议作为公开报告的附件。胜任人须逐项说明表 1 中各项的完成情况；如果某项信息缺失或对应工作未开展，则必须说明其原因。

报告采用“如未包括，须说明原因”的原则旨在确保投资者或潜在投资者及其专业顾问能够明确知悉：某类内容是否因重要性较低而未纳入，或属尚未涉及或尚未解决的事项。

本规则引入“如未包括，须说明原因”的原则，其核心目的是要求表 1 中每一项内容均须经过讨论。如某事项未予涉及，胜任人必须说明其不予包括的理由。

5.4 公开报告的责任：企业发布的勘查靶区、勘查结果、资源量、储量公开报告，由企业通过其董事会承担责任。任何公开报告必须基于胜任人编制或在其指导下编制的技术报告及相关信息，并客观反映其内容。

企业发布公开报告时，除应公开胜任人姓名外，还须说明其是否为企业全职员工。如不是，则应公布胜任人所在机构名称，并说明该机构与企业之间的关系。同时，必须披露胜任人与报告发布企业及其关联方之间任何实际或潜在的利益冲突。胜任人与企业之间的其他关系也必须披露。

企业须在发布公开报告前，获得胜任人对公开报告形式和内容的书面同意。

若企业重新发布以往已获胜任人书面同意的信息，应注明原报告的名称、发布日期及对应的胜任人姓名，并提供可公开获取的报告来源或出处。在此种情况下，企业无须重新获得胜任人对报告形式与内容的书面同意，但须附如下声明：

- 本公司确认，在以下公告中未发现任何对相关市场公告产生重大影响的信息或数据。对于资源量和储量估算，本公司确认，相关市场公告中沿用的所有重大假设和技术参数，未发生实质性变化。
- 本公司确认，公告的形式和内容是经胜任人同意的，未发生实质性修改。企业通过董事会对以下公告负责，确保其形式和内容未发生实质性变化。

6 分类与术语定义

6.1 涉及勘查结果、资源量、储量的公开报告和支撑公开报告的技术报告只能采用图 1 和第 1.5 款定义的术语。

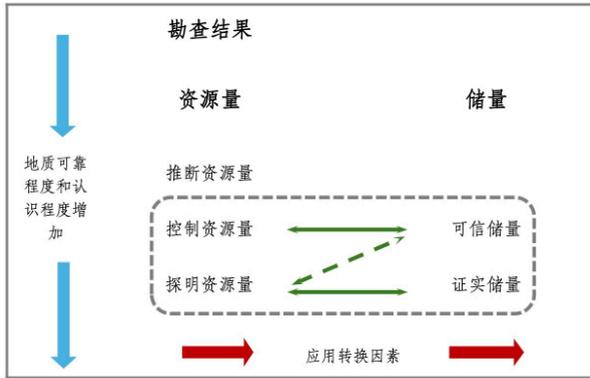


图1 勘查结果、资源量和储量的关系

6.2 本规则定义的固体矿产资源量和储量是指从地表或地下开采的有经济价值的物质。不包括油气开采获得的石油和天然气以及其他气体（如氦气或二氧化碳）、地热和水。

6.3 **转换因素**：在评估勘查靶区，勘查结果，估算资源量、储量时应考虑的因素。包括但不限于采矿，选矿，冶炼，基础设施，经济，市场，法律，环境、社区和政策法规治理（ESG）及监管等因素。

6.4 公开报告和技术报告所采用的资源量和储量类别如图1所示。资源量按地质可靠程度，划分为推断资源量、控制资源量、探明资源量。储量按可靠程度，划分为可信储量、证实储量。

探明资源量可以转换为证实储量或可信储量。在将资源量转换为储量时，由于部分或全部转换因素的不确定性，胜任人可将探明资源量转换为可信储量，如图1中的虚线箭头所示。

7 资源量、储量估算的原则和指引

7.1 资源量仅可划分为图1所示的推断资源量、控制资源量、探明资源量3个类别，且须由胜任人确定。

资源量类别的合理划分取决于可用数据的数量、分布和质量及数据的可靠程度，并严格遵循本规则各类资源量的定义。胜任人在评估地质与品位的连续性时，应综合考虑矿化类型、规模和边界品位等因素。

资源量的估算，应依据勘查工程、地质、采样及分析结果等数据，确定矿化范围，并在此基础上依据边界品位圈定矿体，同时评估考虑矿化的规模、位置及连续性。估算过程中应基于合理的技术与经济假设条件，分析其具备经济开采的合理预期。

7.2 资源量估算并非精确计算，估算结果取决于对矿体的位置、形态和矿化连续性，以及有限的取样工程与测试数据的解释。矿石量与品位的估算结果应四舍五入至适当的有效数字。若为推断资源量，则应冠以“初步”之类的限定词，以明确其不确定性。

鼓励胜任人应对资源量估算的相对准确性与可靠程度进行说明。这类表述应详细说明是全局估算（该矿产资源整体）还是局部估算（其准确性和可靠程度可能与整体存在差异）；若为局部估算，则应说明估算范围及相关重量或体积参数；若无法明确说明相对准确性、可靠程度，则应遵循“如未包括，须说明原因”原则，对其不确定性做定性阐述（见表 1）。

7.3 储量仅可划分为图 1 所示的可信储量和证实储量两个类别，且须由胜任人确定。胜任人在进行储量估算与类别划分时，应充分理解本规则中各类储量定义的实质，特别是经济合理性和参考点的相关要求。

7.4 确定储量类别，首先取决于对应资源量的可靠程度，其次应考虑各转换因素的不确定性。控制资源量只能转换为可信储量；探明资源量可转换为证实储量或可信储量。若某些转换因素存在不确定性，探明资源量仅可转换为可信储量；在这些不确定性得以消除后，探明资源量方可转换为证实储量。控制资源量不得直接转换为证实储量（见图 1）。

7.5 资源量转换为储量必须以预可行性研究或可行性研究为基础。预可行性研究、可行性研究应确定一个技术可行、经济合理的开采方案。

7.6 储量估算并非精确计算，所报告的矿石量及品位数据应四舍五入至适当的有效数字，以反映估算中存在的相对不确定性。

8 报告的总体要求

8.1 公开报告勘查靶区、勘查结果、资源量和储量，须对矿化类型和矿化性质进行描述。

8.2 企业须报告对矿床经济价值有实质性影响的所有相关信息。若资源量或储量发生任何实质性变化，企业应及时予以披露。

8.3 企业须每年对其勘查靶区、勘查结果、资源量、储量进行审核并发布公开报告，报告中应注明资源量、储量的基准日期。公开报告的信息应力求全面系统并须声明企业持有该项目的权益比例。

8.4 公开报告应包括可能影响工作安全与环境条件的重要有害元素、污染物或矿物的信息。

8.5 公开报告中应包括关键风险分析与评估，包括但不限于矿体的几何形态、品位（质量）、重量、所含金属或矿产品等方面的风险，也应对资源量转换为储量过程中因转换因素不确定性所带来的风险进行评估。

技术报告中应描述估算中存在的 uncertainty。如存在显著不确定性，公开报告中应予以说明，并在资源量和储量的类别确定中体现其相对不确定程度。

9 报告勘查靶区

9.1 勘查靶区是指在特定地质背景下对矿床勘查潜力的陈述或预测。因勘查工作程度尚不足以支持资源量估算，其吨位和品位（质量）应以范围值表示。

9.2 企业在评述勘查战略时可提及靶区规模与类型，但不得以可能被误解为资源量或储量估算的方式表述勘查靶区规模相关信息。

公开报告中关于勘查靶区和勘查潜力的表述应避免被误解为资源量或储量的估算。

9.3 任何涉及勘查靶区潜在数量与品位的陈述须以范围表达，且须详细解释该范围的假设依据，吨位、品位或质量，以及范围的估算程序。

该类陈述应简要说明其所涉潜在的数量和品位属概念性质，因勘查程度不足尚无法估算资源量，且无法保证进一步勘查必然能获得资源量。

9.4 详细介绍勘查靶区时，须具体论述地质背景和勘查计划、已经完成的勘查工作，以及是否开展以下工作：

- 矿化露头检查和采样分析；
- 地表化探和物性采样分析；
- 地表和地下地球物理测量；
- 钻孔、浅井和坑道等工程实施情况。

还应详细说明验证勘查靶区前景的具体勘查计划和预计完成时间。

9.5 鉴于支撑数据的不确定性，勘查靶区公开报告中，不准以“标题声明”形式报告其吨位或品位。为避免误导，亦不得使用“金属量”或“矿物量”等术语。

9.6 如本规则第 2.1 和第 5.3 款所述，应以“如未包括，须说明原因”原则，对本规则表 1 中第 1 部分和第 2 部分所列全部内容作出明确评述，以确保投资者、潜在投资者及其专业顾问能够获取胜任人的专业意见。

10 报告勘查结果

10.1 勘查结果指在勘查工作中产生的、可供投资者使用，但不作为资源量或储量报告组成部分的数据与信息。

10.2 勘查结果通常在勘查早期阶段进行报告，此时采样数据尚不足以对矿产资源的矿石量和品位作出合理估算，如矿化露头、单孔见矿、地球物理测量或选冶试验结果等。

勘查结果不属于资源量或储量报告中的组成部分，且不得以任何方式暗示已发现具潜在经济价值的矿化。

10.3 公开报告勘查结果时，须包含充分信息，以便投资者对其重要性作出客观、

审慎的判断。

10.4 勘查结果的公开报告应包括以下内容：勘查条件、取样类型与方法、样品尺寸与重量、矿化空间分布及其相对位置、数据分析与处理方法等内容，以及表 1 所列对评估具实质性影响的其他信息。

不得选择性报告信息，如单一化验值、单个钻孔、淘洗精样、表生富集土壤或矿点样品分析结果等。

在勘查结果的公开报告中，不得明示或暗示已发现具有潜在经济价值的矿化。

10.5 如本规则第 2.1 款和第 5.3 款所述，应依据“如未包括，须说明原因”原则，对本规则表 1 中第 1 部分和第 2 部分所列全部内容作出明确评述，以确保投资者、潜在投资者及其专业顾问能够获取胜任人的专业意见。

11 报告资源量

11.1 “资源量”是指富集或赋存在地壳中具有经济意义的物质，其形态、品位（质量）及数量具备最终经济开采的合理预期。资源量的位置、数量、品位（质量）、连续性及其他地质特征，需通过取样等具体地质依据和认识予以确认、估算或解释。

11.2 公开报告中，所有用于支持经济可行性的假设均须明确声明。为估算资源量所作的任何原始数据调整，如异常品位处理，也应明确声明并描述其方法。

11.3 所有报告的各种别资源量均须满足最终经济开采具备合理预期的基本条件，即经济开采的可能性大于不可能性。

11.4 根据本规则，不满足最终经济开采的合理预期的非经济矿化估算不得称为资源量（或储量）。

11.5 公开报告资源量仅允许使用图 1 所示的资源量类别。不得使用本规则未定义的资源量类别。

在矿化或矿床类型相似的可比生产矿山中采用的标准，可作为资源量类别划分的参考。

仅当各类别的资源量分别列示后，方可汇总报告，不得直接报告总资源量。除非

同时列明矿产资源的矿石量和品位数据，否则不得单独报告资源的金属量或矿物量。

胜任人须按表 1 要求，明确阐述资源量的最终经济开采合理预期，并从技术与经济角度说明所选边界品位的确定依据。

若在判断资源量的合理预期时采用未经验证的方法，胜任人须在公开报告中对该方法进行论证。

不得使用“矿石量”“储量”等暗示技术与经济可行性的术语描述资源量。

11.6 “推断资源量”是资源量的一部分，其数量和品位（或质量）是根据有限的地质依据和取样工程数据估算。地质依据足以推断但无法证实地质体及品位（质量）的连续性。

推断资源量可靠程度低于控制资源量，不得转换为储量。可以合理预期大部分推断资源量经进一步勘查可能升级为控制资源量。

11.7 若所报告的资源量以推断资源量为主，则须披露充足信息，以便投资人、潜在投资者及其专业顾问评估相关风险。如推断资源量的估算采用了超出预设采样间距的外推和矿化类型考量，须详细说明以下内容：

- 从已知采样点外推的最大距离；
- 基于外推数据所得的推断资源量占比；
- 外推距离确定依据；
- 附图标明推断资源量及外推区域；
- 声明推断资源量不可纳入储量。

推断资源量估算的可靠程度不足以支持应用技术和经济参数来将其纳入矿山生产计划，不得直接转换为储量（见图 1）。在开展技术和经济研究中涉及推断资源量时，需予以特别关注。

11.8 “控制资源量”是资源量中的一部分，其数量、品位（质量）、密度、形态及物理特征的估算有充分的可靠性，足以支持全面应用转换因素编制矿山生产计划和矿床经济可行性评价。

其所依据的勘查、采样和分析测试数据详实可靠，可推定观察点或取样点间的地质与品位（质量）的连续性。

控制资源量的可靠程度低于探明资源量，仅可转换为可信储量。

当数据的类型、质量、数量和分布足以可靠解释地质结构并推定矿化连续性时，方可划分为控制资源量。

控制资源量估算的可靠程度足以支持在如第 13.1 款和第 13.4 款定义的技术经济研究中使用转换因素。

11.9 “探明资源量”是资源量中的一部分，其数量、品位（或质量）、密度、形态及物理特征的估算可靠程度高，足以应用转换因素来支持详细的矿山生产计划和矿床最终经济可行性评价。

其所依据的勘查、采样和分析测试数据详实可靠，可确定观察点或取样点间的地质和品位（质量）的连续性。

探明资源量的可靠程度高于控制资源量和推断资源量，可转换为证实储量或可信储量。

根据胜任人的意见，如果数据的类型、质量、数量和分布可使吨位和品位估算误差控制在有限范围内，且其变动对项目的潜在经济可行性不造成实质性影响，则该部分资源量可以划分为探明资源量。

探明资源量估算的可靠程度，需满足第 13.1 款和第 13.4 款所定义的技术经济研究中，作为转换因素使用的条件。

11.10 首次报告资源量，或资源量估算结果较上一报告发生实质性变化时（包括类别调整），须详细说明变化依据，以便投资者充分知悉。

11.11 如本规则第 2.1 款和第 5.3 款所述，应依据以“如未包括，须说明原因”原则，对本规则表 1 中第 1 部分至第 3 部分所列全部内容作出明确评述，以确保投资者、潜在投资者及其专业顾问能够获取胜任人的专业意见。

11.12 不得在公开报告中将资源量与储量相加。

12 报告储量

12.1 “储量”是探明资源量、控制资源量中的经济可采部分，包括开采过程中可能混入的贫化物质，并已扣除矿石损失。储量估算须基于合理的转换因素，并经预可行性研究或可行性研究论证其技术可行性和经济合理性。研究应表明，在出具报告时，该部分资源量具备经济可采价值。

定义储量时须明确其参考点，通常为矿石运送至选矿厂的位置。当参考点不同于常规的情形下，如直接对应可销售产品，应特别说明，以确保投资者、潜在投资者及其专业顾问充分了解。

基于可靠程度，储量可以分为可信储量和证实储量。

本规则要求，至少要经过预可行性研究，满足矿山生产计划的技术可行性和经济合理性，且已考虑所有实质性转换因素，方可将资源量转换为储量。

如上所述，储量估算属综合性工作，需开展详尽的工程地质研究、采矿方法比选、开采设计、排产计划、经济与财务分析等所有转换因素的应用及其他相关因素的考量。不得将资源量简单乘以一定系数作为储量予以报告。

12.2 “可信储量”是控制资源量中的经济可采部分，或在某些情况下为探明资源量的经济可采部分。其转换因素的确定程度低于证实储量。

12.3 “证实储量”是探明资源量中的经济可采部分，其转换因素具较高的确定程度。

12.4 公开报告储量时，须明确列示其类别（证实储量或可信储量）。不得使用本规则未定义的储量类别。

仅当各类别储量分别列示后，方可汇总报告，不得直接报告总储量。除非同时列明吨位和品位数据，否则不得单独报告储量的金属量或矿物量。

若存在矿化类型或矿床类型相似、具高度可比性的生产矿山，其实际参数可作为储量类别划分的参考。

12.5 首次报告储量，或储量估算结果较上一报告发生实质性变化时（包括类别

调整），须详细阐述预可行性研究或可行性研究的关键假设和结果。同时，须在公开报告中充分说明变化原因。

在储量估算过程中，如果调整了任何估算参数，如面积、厚度、矿化品位等，须公开说明调整内容及依据。

如本规则第 2.1 款和第 5.3 款所述，应依据以“**如未包括，须说明原因**”原则，对本规则表 1 中第 1 部分至第 4 部分所列全部内容作出明确评述，以确保投资者、潜在投资者及其专业顾问能够获取胜任人的专业意见。

12.6 公开报告储量时，应披露所有转换因素的详细信息（如表 1 第 4 部分所示）。报告储量时，须明确说明储量估算的参考点，以及采矿贫化和采矿损失。

12.7 若重新估算表明其某部分储量不再具备经济可行性，应将其重新归类为资源量，或从资源量或储量中剔除。

12.8 根据定义，推断资源量一般是对储量的补充，但作为贫化物质，不应纳入储量估算。

12.9 不得将储量与资源量合并报告。

12.10 **矿山服务年限研究是对现存运营项目的设计和财务、经济的研究，须对所有转换因素进行系统评估（研究程度至少达到预可行性级别），以证明延续开采的经济合理性。**

本规则允许以计划的矿山服务年限为基础，在矿山设计或规划中包含部分推断资源量，但须全面披露其使用情况并说明对结果的影响。

应用于推断资源量的转换因素与假设须反映其对地质依据不足和可靠程度较低的风险分析。

在计划的矿山服务年限内，不包含推断资源量时，资源量转换为储量具备经济可行性。

若开采计划中包含推断资源量，须提供包含与不包含该类资源量方案评价结果的对比分析，合理解释包含推断资源量的依据（包括风险评估），同时列明推断资

源量所占比例。

13 技术经济研究

13.1 “技术经济研究”包括概略研究、预可行性研究和可行性研究。

公开报告可以包括但不限于概略研究、预可行性研究和可行性研究中的信息或以该研究成果为支持。

13.2 “概略研究”是指对矿产资源开采的潜在可行性进行的粗略技术与经济研究。概略研究包括对实际假设的转换因素进行评估，同时对生产相关的其他因素也进行适当评估，以合理判断项目是否可以推进至预可行性研究阶段。

概略研究的可靠程度低于预可行性研究。

概略研究不可作为储量估算的依据。

若概略研究中利用了部分推断资源量，须公开说明其占比和利用顺序。

概略研究须同时发布警示性声明。

警示性声明示例如下：

“本报告中提到的概略研究属初步技术经济简略评估，尚不足以支持储量估算或确定经济合理性的开发方案，且不保证其结论最终可实现。”

13.3 “预可行性研究”是就矿业项目开发进行技术可行性和经济合理性的初步研究。其内容确定初步开采方法（地下开采方法或露天开采境界）、选矿工艺，并基于合理假设的转换因素和其他相关因素进行财务分析。通过上述分析，胜任人以判断是否把全部或部分资源量转换为储量。预可行性研究的可靠程度低于可行性研究。

预可行性研究对各项转换因素进行系统的研究，进而确定有多少探明资源量和控制资源量能转换为储量。

通过预可行性研究确定了优选的的采选方法，基础设施需求及处理能力，但尚未确定最终方案。同时对环境和社会经济影响也应进行详细评价。预可行性研究应着重指出最终研究阶段需进一步完善的工作方向。

13.4 “可行性研究”是对矿产项目开发进行技术可行性和经济合理性的详细研

究。其内容包括对转换因素和其他各项相关运营因素进行详细评价与财务分析，证明项目是经济合理的（经济上可开采）。可行性研究的结果可以用于作为项目投资人或金融机构作出推进或融资开发项目的决策依据。可行性研究的可靠程度高于预可行性研究。

“融资可行性研究”和“最终可行性研究”视为等同于本条定义的可行性研究。

可行性研究须采用更严格的标准完成包括采矿、加工选冶、基础设施等，并作为投资决策和支持项目融资的基础。社会、环境和政府审批、许可及协议等已落实，或接近最终确定。

可行性研究对所有转换因素（见表1中第4部分所述）的描述应较预可行性研究更为详尽，还可更加详细说明采矿生产进度计划、施工和达产计划，以及项目执行计划等项目实施情况。

13.5 资源量转换为储量须全面考虑所有转换因素，并至少经过预可行性研究，并确定技术可行性和经济合理性的采矿计划。

14 报告特定的资源量和储量

14.1 本规则适用于报告所有具有潜在经济价值的矿化物质，包括矿化回填物、残留矿体、矿柱、低品位矿化、矿堆、废石等。该类矿化物质作为资源量时须具备合理的最终经济开采预期，作为储量时须具备合理的采选预期。除非另有声明，本规则所有其他条款（包括图1）同样适用。

胜任人须全面系统论证这些矿化物质的经济可采性，合理分类并单独报告。

14.2 报告煤炭资源量和储量。

除非另有声明，本规则第1至13条和表1均适用于煤炭资源量和储量报告。

煤炭公开报告的要求与其他矿产的要求总体相同，同时应考虑煤炭的特殊性及煤炭相关专业术语。

本规则所定义的“资源量”“储量”等术语及其分类分级也适用于煤炭报告。也可以用“煤炭资源量”和“煤炭储量”及相应的次级分类术语。

“可销售煤炭储量”是指经过洗选或提质处理的煤炭，为考虑采矿贫化与加工因素后转换的储量，应与煤炭储量一起发布，但不可替代煤炭储量。同时，须说明预测洗煤产出率的依据。

除非煤样分析数据明确证实具有特定结焦性，否则不得使用“炼焦煤”“冶金煤”等术语或提及结焦性。

14.3 报告非金属及建材矿产勘查结果、资源量与储量。

本规则主要条款适用于报告非金属及建材矿产特性、资源量和储量，报告中应体现反映各类非金属及建材矿产特性和品质的具体指标。对有特定工业要求的非金属及建材矿产，在报告资源量或储量时，须包含对应矿产的工业要求。

品质和市场竞争力等因素对非金属及建材矿产至关重要，应在报告储量时予以充分考虑。

15 报告金属当量

15.1 以金属当量（某一主金属的当量品位）形式报告多金属矿床的勘查结果、资源量、储量时，须详细说明各金属组分对净值的贡献及所有实质性影响因素。

15.2 为遵循“透明性、实质性、胜任性”三原则，所有涉及金属当量的公开报告至少应包括以下信息：

- 参与金属当量计算各金属品位；
- 拟采用各金属的商品价格。披露现货价格同时要披露计算金属当量所采用的价格。如实际价格属商业敏感信息不便披露，应以叙述形式代替数据形式披露相关信息，以便投资者了解定价方法；
- 拟采用各金属的选矿回收率及其设定依据（选冶试验、矿物学分析、类似矿床参数等）；
- 明确声明所有金属元素具备合理的回收和销售潜力；
- 金属当量计算公式。

15.3 金属当量一般应以贡献最大的金属为基准，如不是，须明确地解释选用其

他金属的理由。

15.4 须采用各金属相应的选冶回收率计算可回收金属当量。

15.5 如无法获取合理的选冶回收率，不得以金属当量形式报告估算结果。

16 矿产品价格与市场

16.1 用于确定资源量、储量的矿产品价格和销售量预期必须基于前瞻性估计，反映企业合理且有依据的短期与长期预期。该类预期的依据一般包括共识预测、三年滑动平均值、销售合同或其他价格分析（不适合公开披露的情况见第 16.4 款和第 16.5 款）。

16.2 为体现储量的经济可行性，只有探明资源量和控制资源量可结合转换因素和预期价格转换为经济可行的储量。

16.3 一般需要在公开报告中披露用于储量估算的矿产品的价格，可包括披露成本（或其他转换因素）。

16.4 如无适用的证券法或其他法规强制要求，且涉及长期合同销售（价格是保密的），可不披露价格。

16.5 当披露估算中采用的长期价格或成本假设对企业业务不利时，可不披露，例如与第三方竞标销售合同、产权收购或协议谈判等情形。

17 许可及法律要求

17.1 在发布储量时，应排除因未能获得相关许可而对采矿造成影响等已知的实质性障碍。

17.2 胜任人应基于专业意见，明确获得开采所需许可证、附属权利（包括水或其他设施）及其他授权的合理预期，可及时获得许可并维持后续生产，其他生产环节如选矿和销售同样适用。

17.3 企业必须完成所有法律和许可要求的审查并记录存档。同时，须遵守当地环境法律规定和审批程序要求。

17.4 为确保所有许可、附属权利和授权均能达到预期的合理目标，企业须掌握取得各项许可、附属权利和授权所应遵循的程序。早期成功获得必要的许可证可提高后续许可的可能性。

17.5 如需许可证，但尚未掌握获得许可证程序，则成功获得许可的预期可能降低，须如实披露所存在的获得必要的法律权利或许可风险。

17.6 法律和许可环境的变化可能影响储量估算。障碍发生或消除时，则应对储量估算作出相应调整。

17.7 须披露前任业主或土地所有者的土地使用费或权益金等附加权益条款。

17.8 法律与许可审查资料应完整存档或作为附件，必要时可在保密前提下提供给监管机构或审计机构。

18 可持续发展考量

公开报告中，应讨论在矿床开发、生产和关闭后，可能对环境、社区和政策治理（ESG）、健康及安全等方面的影响。这些影响将涉及到雇员、承包商、周边社区和消费者。

19 特别说明

本规则不涵盖矿业资产商业价值的评估。依本规则编制的勘查靶区、勘查结果，以及资源量、储量估算结果，可用于后续的估值或评价。

20 附则

20.1 本规则由中国矿业权评估师协会负责解释。

20.2 本规则自发布之日起执行。

表 1 报告编制内容查对清单

表 1 是编制勘查靶区、勘查结果、资源量和储量报告时应参考的内容清单。为遵循本规则各项原则，胜任人应在报告中依据“如未包括，须说明原因”的原则，对表 1 相关部分予以说明，以确保投资者明确所涉内容是否经过研究确认无重大影响，或属于尚未处理或解决的事项。

在报告所有结果和估算时，胜任人应对所有可能影响投资者或潜在投资者及其专业顾问理解或解释的各方面内容给予充分说明，特别是某些信息的缺失或说明的不充分，可能影响公众对项目的认知或估值时，须明确陈述。

表 1 所列各项准则的顺序和分组体现了勘查与评价项目的一般系统方法。第 1 部分“采样技术与数据”适用于后续所有部分，前面各部分内容同样适用于其后各部分，在估算和报告时应一并考量。

胜任人应负责综合考虑清单中的所有条目，以及适用于具体项目或作为研究的补充查对内容。清单所列各条目的重要性，取决于项目设立时所处的相关法律和经济条件。

某些情况下，公开报告可合理剔除某些具有商业敏感性信息。由发布公开报告的企业作出剔除商业敏感性信息的决定，并以企业所在司法管辖区的相关法规为依据。

若公开报告剔除了商业敏感性信息，则报告应提供摘要信息（例如，若采纳的经济参数具有商业敏感性，则应说明其推导方法）及相关背景，以便投资者或潜在投资者及其专业顾问充分知悉相关情况。

第一部分 采样方法和数据

(本部分的内容适用于后续所有部分)

标准	说明
采样 (技术) 方法	<ul style="list-style-type: none"> - 采样的方式和质量 (如刻槽、随机捡块或适用于所调查矿产的行业标准测试工具, 如伽马测井仪或手持式 X 荧光分析仪等)。采样方式不限于上述所列。 - 说明为确保样品代表性及测试工具或测试系统的校准而采取的措施。 - 确定矿化所依据的各个方面对公开报告具有实质性意义。若采用了“行业标准”开展工作, 任务就相对简单 (如“采用反循环钻进取得了 1 米进尺的样品, 从中取 3 公斤粉样, 以制备 30 克火法试样”)。若未采用“行业标准”, 则需要更详细的解释, 如粗粒金本身存在的取样问题。不常见的矿种或矿化类型 (如海底结核), 可能需要报告详细信息。
钻探 (技术) 方法	<ul style="list-style-type: none"> - 钻探类型 (如岩芯钻、反循环钻、无护壁冲击钻、气动回转钻、螺旋钻、班加钻、声波钻等) 及其详细信息 (如岩芯直径、三套管或标准管、采用反循环钻等预开孔后施工的岩芯钻探进尺、可取样钻头或其他钻头、岩芯是否定向, 若是, 采用什么方法, 等等)。
钻探样品 采取率	<ul style="list-style-type: none"> - 记录和评价岩芯 (岩屑) 样品采取率的方法以及评价结果。 - 为最大限度提高样品采取率和保证样品代表性而采取的相应措施。 - 样品采取率和品位之间相关性, 是否由于颗粒粗细不同造成选择性采样, 并导致样品出现偏差。
编录	<ul style="list-style-type: none"> - 岩芯 (岩屑) 样品的地质和工程地质编录是否足够详细, 以支持相应资源量的估算、采矿和选冶研究。 - 编录是定量的还是定性的。岩芯 (或槽探、刻槽等) 照片。 - 总长度和已编录样段所占比例。
二次取样 (技术) 方法和样品制备	<ul style="list-style-type: none"> - 若为岩芯, 是切开还是锯开, 是取芯 1/4、1/2 还是全部。 - 若非岩芯, 是刻槽缩分取样、管式取样还是旋转缩分等取样, 是取湿样还是干样等。 - 对所有类型的样品, 说明制备方法的性质、质量和适用性。 - 二次取样阶段为最大限度确保样品代表性采取的质量控制程序。 - 为保证样品能够代表所采集的原位物质而采取的措施, 如现场重复取样或另一半取样的结果。 - 样品大小是否与所采样目标矿物的粒度相适应。

标准	说明
分析数据和实验室测试质量	<ul style="list-style-type: none"> - 所采用的分析和实验室程序的性质、质量和适用性，采用的是部分样品分析还是全样品分析。 - 对地球物理仪器、光谱分析仪、手持式 X 射线荧光分析仪等，用于判定分析的参数，包括仪器的品牌和型号、读取次数、所采用的校准参数及其依据等。 - 所采用的质量控制程序的性质（如标准样，空白样，副样，内、外检样）以及是否确定了准确度（即无偏差）及精度的合格标准。
取样和分析测试的核实	<ul style="list-style-type: none"> - 独立第三方或其他企业人员对重要样段完成的核实。 - 验证孔的使用。 - 原始数据记录、数据录入流程、数据核对、数据存储（物理和电子形式）规则。 - 论述对分析数据的任何调整。
数据点位置	<ul style="list-style-type: none"> - 资源量估算中所使用的钻孔（孔口和测斜）、探槽、矿山工程和其他位置的准确性及质量。 - 所使用的坐标系统。 - 地形控制测量的质量和完备性。
数据密度和分布	<ul style="list-style-type: none"> - 勘查结果报告的数据密度。 - 数据密度和分布是否达到资源量和储量估算及分类所要求的地质和品位连续性。 - 是否对样品数据进行了组合。
取样方位与地质构造的关系	<ul style="list-style-type: none"> - 结合矿床类型，对已知可能的构造及其延伸，取样方位能否做到无偏取样。 - 若钻探方位与关键成矿构造方位之间的关系可能导致取样偏差，且这种偏差具有实质性影响，就应予以评估和报告。
样品安全性	<ul style="list-style-type: none"> - 为确保样品安全性而采取的措施。
审定或核查	<ul style="list-style-type: none"> - 对取样技术和数据的审定或核查结果。

第二部分 报告勘查结果

(第一部分相关内容适用于本部分)

标准	说明
矿业权与土地权状况	<ul style="list-style-type: none">- 矿业权类型、检索名称(号码)、位置和所有权,包括同第三方达成的协议或重要事项,如合资、合作、开采权益等。- 区内居民权益、历史古迹、野生动物保护区或国家公园、环境背景值等。- 报告编制时的持有的许可权的安全性、以及取得该地区经营许可证的已知障碍。
以往完成的勘查工作	<ul style="list-style-type: none">- 对以往完成的勘查工作和成果进行了解和评价。
地质	<ul style="list-style-type: none">- 地质背景、矿化类型和矿床类型。
钻孔信息	<ul style="list-style-type: none">- 简要说明对了解勘查结果具有实质意义的所有信息,包括列表说明所有实质性钻孔的下列信息:<ul style="list-style-type: none">• 钻孔坐标;• 钻孔孔斜和方位角;• 见矿厚度和深度;• 孔深;• 孔底坐标。- 若因为此类信息不具备实质性影响而将其排除在报告之外,且排除此类信息不会影响对报告的理解,则胜任人应当对前因后果做出明确解释。
数据汇总方法	<ul style="list-style-type: none">- 报告勘查结果时,加权平均方法、特高品位处理方法以及边界品位一般都具有实质性影响,应加以说明。- 若汇总的样段是由长度小、品位高或长度大、品位低的样段组成,则应对这种汇总方法进行说明,并详细列举一些使用这种汇总方法的典型实例。- 应明确说明用于报告金属当量值的假设条件。
矿化体真厚度和见矿厚度之间的关系	<ul style="list-style-type: none">- 若矿化几何形态与钻孔之间的角度已知,则应报告其特征。- 若真厚度未知,只报告见矿厚度,则应明确说明其影响(如“此处为见矿厚度,真厚度未知”)。

标准	说明
图表	<ul style="list-style-type: none"> - 报告一切重大的发现，都应包括相关的平面图和剖面图（附比例尺）及见矿间隔表，包括但不限于钻孔开孔位置的平面图及相应剖面图。
均衡报告	<ul style="list-style-type: none"> - 若无法综合报告所有勘查结果，则应报告代表性的低、高品位和厚度，避免对勘查结果做出误导性报告。
其他重要勘查数据	<ul style="list-style-type: none"> - 应报告有意义并具有实质性影响的其他找矿数据，包括但不限于： <ul style="list-style-type: none"> • 地质观测数据； • 地球物理测量结果； • 地球化学测量结果； • 大样的规格及处理方法； • 选冶试验结果； • 堆比重、地下水、岩石力学和岩石性质； • 潜在有害或污染物质。
后续工作	<ul style="list-style-type: none"> - 计划的后续工作性质和范围（例如对侧向延伸、垂向延深或大范围扩边钻探而进行的验证）。 - 在不具备商业敏感性的前提下，应明确图示潜在延伸区域，包括主要的地质解译和未来钻探区域等。

第三部分 估算和报告资源量

(第一部分和第二部分中相关内容也适用于本部分)

标准	说明
数据库完整性	<ul style="list-style-type: none"> - 为确保数据在原始采集和用于资源量估算之间不会由于转录或输入之类的错误而被损坏所采取了何种措施。 - 所使用的数据验证程序。
实地考察	<ul style="list-style-type: none"> - 对胜任人已完成的现场考察过程及所得结果的评述。 - 若未开展实地考察，应说明原因。
地质解释	<ul style="list-style-type: none"> - 矿床地质解释的可靠程度（或不确定性）。 - 所用数据类型和使用的假设条件。 - 若对资源量估算还有其他解释，其结果如何。 - 对影响和控制资源量估算的地质因素的使用。 - 影响品位和地质连续性的因素。
规模	<ul style="list-style-type: none"> - 资源量空间分布范围和变化情况，以长度（沿走向或其他方向）、平面宽度，以及埋深和赋存标高来表示。
估算和建模方法	<ul style="list-style-type: none"> - 所采用估算方法的特点和适用性以及主要假设条件，包括特高品位处理、矿化域确定、内插参数确定、采样数据点的最大外推距离的确定等。若采用计算机辅助估算方法，应说明所使用的计算机软件和使用参数。 - 如果有核对估算、以往估算、矿山生产记录情况，是否在本次资源量估算中适当考虑到这些数据。 - 副产品回收率的确定。 - 对有害元素或其他具有经济影响的非品位变量（如可造成矿山酸性排水的硫）的估计。 - 若采用块模型插值法，须说明矿块大小与取样工程平均距离之间的关系以及样品搜索方法和参数。 - 确定选择性开采单元建模时考虑的因素。 - 变量之间的相关性特征。 - 说明如何利用地质解释成果来约束资源量估算。 - 论述采用或不采用低品位；以及特高品位处理的依据。 - 所采用的验证、检查流程，模型数据与钻孔数据之间的对比，以及是否采用了调整数据（若有）。

标准	说明
湿度	<ul style="list-style-type: none"> - 吨位估算是在干燥还是自然湿度条件下进行，以及确定水分含量的方法。
边际参数	<ul style="list-style-type: none"> - 所选边界品位（质量）参数的依据。
采矿因素或假设	<ul style="list-style-type: none"> - 对可能的采矿方法、最小采矿范围和内部（外部）采矿贫化的假设。在判定最终经济开采合理预期的过程中，始终需要考虑潜在的采矿方法，但在估算资源量时，对采矿方法和参数所做的假设有可能不严谨，则在报告时应解释采矿假设的依据。
加工选冶因素或假设	<ul style="list-style-type: none"> - 可选性假设或预测的依据。在判定最终经济开采合理预期的过程中，始终需要考虑潜在的加工选冶方法，但在报告资源量时，如果加工选冶处理工艺和参数所做的假设有可能不严谨，则应在报告时解释加工选冶参数假设的依据。
水文地质、工程地质因素或假设	<ul style="list-style-type: none"> - 最终经济可采合理预期相关的水文地质和工程地质假设。
环境因素或假设	<ul style="list-style-type: none"> - 对潜在废弃物和工艺残留物处置方案的假设。在判定最终经济开采合理预期的过程中，始终需要考虑采矿和加工过程中产生的潜在环境影响。 - 虽然在此阶段，对潜在环境影响（尤其是对新建项目）的判定可能不一定很深入，但仍需报告这些潜在环境影响的初步研究达到的程度。若没有考虑这方面的因素，则应对环境假设做出解释。
体积密度	<ul style="list-style-type: none"> - 体积密度是假设的还是测定的。若为假设的，要指出其依据。若为测定的，要指出所使用的方法，是含水还是干燥、测量频率、样品的性质、大小和代表性。 - 必须采用能够充分考虑空隙（晶洞、孔隙率等）、水分以及矿床内岩石与蚀变带之间差异性的方法来测量大样的体积密度。 - 论述在体积密度估值过程中对不同矿（岩）体重值估算的假设条件。

标准	说明
资源类别划分	<ul style="list-style-type: none"> - 将资源量划分为不同可靠程度的依据。 - 是否充分考虑到所有相关因素（即吨位 / 品位估算的相对可靠程度、输入数据的可靠性、地质连续性的可靠程度和金属价值、数据的质量、数量和分布）。 - 结果是否恰当地反映了胜任人对矿床的认识。
审定或复核	<ul style="list-style-type: none"> - 资源量估算结果的审定或复核结果。
相对准确性 / 可靠程度论述	<ul style="list-style-type: none"> - 适当情况下，对胜任人认定为合适的资源量估算手段或方法，估算结果的准确性和可靠程度做出说明。例如，使用统计学或地质统计学方法，在给定的可靠程度范围内，对资源量的相对准确性进行定量分析；或者，倘若认为这种方法不适用，则对可能影响估算的相对准确性或可靠程度的因素进行定性论述。 - 这类说明应具体阐明相对准确性或可靠程度是与整体还是与局部估算相关；若为局部估算，则应说明与技术 and 经济评价相关的吨位。相关文件记录应包括所做的假设及所采用的程序。 - 若有生产数据，应将上述估算的相对准确性和可靠程度的声明与生产数据加以对比。

第四部分 估算和报告储量

(第一部分、第二部分、第三部分中相关内容也适用于本标准)

标准	说明
用于储量转换的资源量估算	<ul style="list-style-type: none">- 描述用作转换储量所依据的资源量估算结果。- 明确说明所报告的资源量是在储量之外，还是包括储量在内。
实地考察	<ul style="list-style-type: none">- 评述胜任人已开展的实地考察及所取得的认识和结论。- 若未开展实地考察，应说明原因。
研究状况	<ul style="list-style-type: none">- 为将资源量转换为储量而开展的研究类型和研究程度。- 本规则规定，将资源量转换为储量时，至少应开展预可行性研究级别的研究。- 此类研究应已开展，并已确定技术上可行、经济上合理的采矿计划，而且已考虑了所有实质性的转换因素。
边际参数	<ul style="list-style-type: none">- 确定边界品位或品质参数的依据。
采矿因素或假设	<ul style="list-style-type: none">- 预可行性或可行性研究中所采用的用以将资源量转换为储量的方法和假设（是通过优化应用各种适当因素，还是通过初步或详细设计）。- 选定的采矿方法和包括预先剥离、开拓工程等相关设计的选择依据、性质和适用性。- 工程地质参数（如边坡角、采场大小等）、品位控制和生产勘探所作的假设。- 就露天境界和坑内采场优化所作的主要假设和所用的资源量模型。- 所使用的采矿贫化率。- 所使用的采矿回收率。- 所使用的最小可采厚度。- 采矿研究中使用推断资源量的方式，以及研究结果对纳入推断资源量的敏感性。- 选定的采矿方法对基础设施的要求。

标准	说明
选冶因素 或假设	<ul style="list-style-type: none"> - 所推荐的选冶工艺流程及其对矿化类型的适用性。 - 选冶工艺流程是经过验证的成熟方法，还是新方法。 - 所开展选冶试验工作的性质、数量和代表性，以及根据选冶工艺流程划分的矿石空间分布及其矿石回收性能特征。 - 对有害元素的假设或允许量。 - 是否已有大样试验或工业试验工作，说明此类样品对整个矿体的代表性。 - 对于规范定义的矿物，储量估算是否是基于适当工艺矿物学分析来满足规范要求。
环境	<ul style="list-style-type: none"> - 采矿和加工过程对环境潜在影响的研究达到何种程度。应报告详细的废石特性信息，以及潜在的堆场选址及设计方案；适当情况下，还应报告选冶尾矿储存和废石场的审批状态。
基础设施	<ul style="list-style-type: none"> - 是否存在适当的基础设施：厂房建设用地、电、水、交通运输（尤其是对于大宗矿产品）、住宿场所等是否可用；或是否方便获取此类基础设施。
成本	<ul style="list-style-type: none"> - 研究中预测的投资成本来源或所作假设。 - 运营成本估算方法。 - 为处理有害元素准备的款项。 - 研究中使用的汇率的依据。 - 运输费用的来源。 - 对熔炼与精炼费用、未达到质量要求的罚款等的预测依据或来源。 - 应支付的所有者权益份额或金额。
收入因素	<ul style="list-style-type: none"> - 与收入因素相关的来源或假设，包括精矿品位、金属或矿产品价格、汇率、运输和处理费用、罚款、净冶炼厂返还（NSR）等。 - 主产品、矿物和副产品的金属或矿产品价格假设的来源。
市场评估	<ul style="list-style-type: none"> - 特定矿产品的供需和库存情况、消费趋势和未来可能影响供需的因素。 - 客户和竞争对手分析，产品的潜在市场预测。 - 价格和产量预测，及预测依据。 - 对工业矿物而言，签订供货合同之前先了解客户在规格、试验和收货方面的要求。

标准	说明
经济	<ul style="list-style-type: none"> - 研究中用以计算净现值 (NPV) 的输入数据, 以及这些经济数据的来源和可靠程度, 包括预估的通胀率、贴现率等。 - NPV 的范围及其对重大假设和数据变动的敏感性。
社区	<ul style="list-style-type: none"> - 与关键利益方签署的协议以及取得社区经营许可事项的状态。
其他	<ul style="list-style-type: none"> - 若相关, 下列各项内容对项目及储量估算与分级。 - 任何已识别出的具有实质意义的自然风险。 - 实质性法律协议和市场营销安排的状态。 - 对项目生存具有关键影响的政府协议和审批的状态, 如采矿许可证等。必须有合理的依据可以预期, 能够在预可行性或可行性研究提出的预期时限内取得所有必要的政府审批手续。强调并论述储量开采所需的、依赖于第三方的悬而未决实质性事项。
类别划分	<ul style="list-style-type: none"> - 将储量分类为不同可靠程度的依据。 - 结果是否恰当地反映了胜任人对矿床的认识。 - 由探明资源量 (若有) 转换的可信储量的比例。
审核或复核	<ul style="list-style-type: none"> - 储量估算的审定或复核结果。
相对准确性 / 可靠程度论述	<ul style="list-style-type: none"> - 适当情况下, 对胜任人认定为合适的储量估算的手段或方法、以及准确性和可靠程度做出说明。例如, 在给定的可靠程度范围内, 使用统计或地质统计学方法, 对储量的相对准确性进行定量分析; 或者, 倘若认为这种方法不适用, 则对可能影响估算的相对准确性或可靠程度的因素进行定性论述。 - 具体阐明估算是整体还是局部估算; 若为局部估算, 则应说明与技术 and 经济评价相关的吨位。相关文件记录应包括所做的假设及所采用的程序。 - 对准确性和可靠程度的讨论, 应延伸至具体讨论所采用的、可能对储量盈利性产生实质性影响或在目前研究阶段仍然存在不确定领域的转换因素。 - 若有生产数据, 应将上述估算相对准确性和可靠程度的说明与生产数据进行对比。本条并非所有情况都适用。

附录 1

胜任人同意书指南

技术报告名称和作者。

胜任人姓名及在企业中的职务，企业名称和地址。

胜任人的会员注册信息。

胜任人的专业背景、资格和相关经验。

胜任人承担的工作或服务，现场考察的详细情况，在本技术报告中，胜任人负责的具体内容。

胜任人声明：

1. 本人系在中国矿业权评估师协会登记备案的“胜任人”。
2. 本人确认，与本报告有关的任何重大事实或重大变更均已如实反映于报告中；并知悉，对该等内容的遗漏可能导致报告产生误导。
3. 本人声明，本报告已公允、客观地呈现胜任人或编者的专业观点。
4. 本人独立 / 不独立于（发布人名称）。
5. 本人已审阅并理解《固体矿产资源储量报告规则》，且本技术报告系根据该规则的相关要求编制。
6. 本人确认，除已披露的情形外，未在（项目 / 矿山详细内容）或（发布人名称）中获取直接或间接利益；或，本人声明作为（发布人名称）或项目 / 矿山的（雇员 / 股东 / 董事或其他利益方）涉及相关利益。
7. 截至技术报告生效之日，据本人所知所信，本报告中包含了所有为避免误导所必需的科学与技术信息。

地点：

日期：

胜任人（签名）：

合规性声明指南

本指南适用于勘查结果的公开报告、初次或已发生实质性变化的勘查靶区、勘查结果、资源量或储量的公开报告，以及企业年度报告。

合规声明建议采用以下形式（请删除不适用的条目）：

“本公开报告所载信息基于（插入胜任人姓名）编制的报告。该胜任人为中国矿业权评估师协会的高级会员，或是被认可专业组织的成员”。

- 如果胜任人是企业的全职员工：“（胜任人的姓名）是（企业名称）的全职雇员。”
- 如果胜任人不是企业的全职员工：“（胜任人的姓名）由（胜任人的雇主名称）聘用。”
- 应一并报告胜任人与发布公开报告的企业之间的关系应与胜任人的详细信息。

概述并澄清任何可能被投资者视为利益冲突的事项。

对于所有公开报告：

“（胜任人姓名）在所涉及的矿化类型、矿床类型及相关工作任务方面具备充分经验，符合中国矿业权评估师协会关于胜任人的资格要求。（胜任人的姓名）同意本公开报告依现有形式和内容，引用其编制或指导完成的全部信息及工作成果。”

若后续公开报告援引此前已发布的勘查结果或资源量或储量估算公开报告：

此前报告中已获胜任人书面同意将其研究成果纳入该报告，后续报告以演示形式或公告形式向公众再次发布该信息时，须注明报告的名称、日期及公开来源，以便公众查阅。声明建议如下：

“本信息援引自（日期）编制的题为《（报告标题）》的报告，原文可见于（网站名称）。企业确认，未发现任何对原报告所含信息构成重大影响的新信息或数据，且就资源量或储量估算而言，原估算所依据的重要假设与技术参数仍然适用，未发生实质性变化。企业同时确认，本公告所引用的胜任人研究成果在其形式和内容与原报告保持一致，未作实质性修改。”

附录 3

技术报告编写指南

封面：

报告名称
报告提交单位
报告提交日期

扉页：

报告名称
报告提交单位
单位法人代表
报告编写单位
单位法人代表

报告编写责任栏

责任内容	责任人姓名	职业资格	工作内容	签字
数据与信息收集分析				
数据与信息核实				
主编				
各章节编写				
同行审核				

生效日期

合规性声明页

胜任人声明页

尽职调查详细总结

如果开展了尽职调查，以总结的形式提供调查基本信息和主要结论。

实地考察详细总结

如果开展了实地考察，以总结的形式提供基本信息和主要结论。

免责声明

目录

技术报告应包括表 1 所涉及的所有内容，包括插图、插表。

技术报告须附有清晰的地质图、必要的平面图和剖面图以及相关数据表格，不得以附图或附表形式另行提交。图件比例尺应能清晰反映要素，并标注制图日期、图例、制图人及资料来源，同时应包含线段比例尺和指北箭头。所有技术报告均应附地理位置图和构造纲要图，并附包括更详细的专项图件，以充分展示文字描述所涉重要特征。

详细摘要

应简要总结技术报告的重要信息，包括但不限于位置信息、项目权证、勘查、开发和运营、地质和矿化特征、开发条件、资源量和储量估算，以及胜任人的结论和建议。

报告正文

报告正文应遵照本规则对勘查结果、资源量和储量报告的总体要求，主要章节应包括：

1. 项目概况

主要介绍项目许可情况、项目所在国家与地理位置、行政区划、基础信息来源、胜任人现场调查或参与野外工作情况、其他专家或第三方参与情况、免责声明。

2. 交通及自然地理

地形、海拔、气候、交通状况、动植物分布、矿产资源概况、与最近城市的距离。

3. 项目历史

矿权变更情况、勘查和开采历史、前人资源量和储量估算、历史生产情况。

4. 基础资料评价

对各种勘查项目、数据和信息（地质、地球物理、地球化学、填图、槽探、钻探、取样、分析测试等）、质量保证和质量控制（包括内检和外检）、数据库结构、数据验证、样品采集和测试结果等进行一般性审查和评论。

5. 成矿地质条件、矿化和矿床类型

矿化地质背景（区域地质和矿床地质、矿化特征及主要控矿因素、地质模型、矿化和矿床类型）

6. 加工选冶

矿石加工、选冶及回收率。

7. 开采技术条件

水文地质、工程地质及其他开采条件、环境地质勘查结果。

8. 经济可采预期研究

通过概略研究或或与之相当的技术经济评价，确认资源具备最终经济可采合理预期，该预期为资源量估算参数的基本前提。

9. 资源量估算

估算与建模方法、关键假设与参数、资源量分类依据及资源量报告，并与以往估算结果进行对比。

10. 转换因素及可行性评价

对各项转换因素开展系统研究，包括矿山采矿设计和排产、加工选冶评价、项目基础设施、市场研究及合同、环境影响评价、法律和许可、税费制度，社区影响、风险分析、资本和运营成本、经济分析、政策分析等。

11. 储量估算

采矿方法说明、关键假设与参数、储量分类依据及储量报告、储量估算结果及不确定性分析，开采风险评估。

12. 结论与说明

总结相关成果，并对报告中存在的问题予以说明。

13. 建议

提出后续工作建议。

14. 风险提示

识别并提示项目可能存在的主要风险。

15. 参考文献

列出所有引用的参考文献。

16. 附件

列出所有支撑性信息文件。

The Chinese Code for Reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves

(The CAMRA Code)

CHINA ASSOCIATION OF MINERAL RESOURCES APPRAISERS

2025

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1. Foreword

The Chinese Code for Reporting on Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves (the CAMRA Code or the Code) is drafted based on The Classification For Mineral Resources And Mineral Reserves (GB/T17766-2020) of the People's Republic Of China and the International Reporting Template for the public reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves (2019) of Committee For Mineral Reserves International Reporting Standards (CRIRSCO).

1.1 The China Association of Mineral Resources Appraisers (CAMRA) is a national self-regulated organisation of mineral industry with enforceable disciplinary processes including the powers to suspend or expel a member. It serves as the National Reporting Organisation (NRO) that formulates the CAMRA Code, also as the Professional Organisation (PO) with responsibilities under its Article of Association to provide services including but not limited to deliver professional development programs (PDP) to its members.

1.2 The CAMRA Code sets out minimum standards and guidelines for Public Reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves in the capital and stock markets in China.

1.3 This edition of the CAMRA Code includes the text part, Table 1 Check List for Assessment, Reporting Criteria and:

- Appendix 1: Guideline on Competent Person's Consent Form,
- Appendix 2: Guideline on Compliance Statements,
- Appendix 3: Guideline on Technical Reports.

1.4 The Code is binding on the members of CAMRA.

1.5 A total of 17 Definitions in the CAMRA Code are:

Competent Person*	Clause 4.1	Page 3
Technical Report	Clause 5.1	Page 3
Public Reports*	Clause 5.2	Page 4
Modifying Factors*	Clause 6.3	Page 5
Exploration Target*	Clause 9.1	Page 8
Exploration Results*	Clause 10.1	Page 9
Mineral Resource*	Clause 11.1	Page 9
Inferred Mineral Resource*	Clause 11.6	Page 10
Indicated Mineral Resource*	Clause 11.8	Page 11
Measured Mineral Resource*	Clause 11.9	Page 11

Mineral Reserve*	Clause 12.1	Page 12
Probable Mineral Reserve*	Clause 12.2	Page 13
Proved Mineral Reserve*	Clause 12.3	Page 13
Life of Mine Plan*	Clause 12.10	Page 14
Scoping Study*	Clause 13.2	Page 14
Pre-Feasibility Study*	Clause 13.3	Page 15
Feasibility Study*	Clause 13.4	Page 15

CRIRSCO Standard Definitions, as agreed at the 2023 AGM are marked, with an asterisk*

1.6 Important terms and their definitions are highlighted in **bold text**. Ordinary code clauses are in normal text and the guidelines are placed after the respective Code Clauses using *italics*.

2. Principles

2.1 The principles governing the operation and application of the CAMRA Code are **Transparency, Materiality and Competence**.

Transparency requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, so as to understand the report and not to be misled.

Materiality requires that a Public Report contains all relevant information which investors, potential investors and their professional advisers would reasonably require, and reasonably expect to find in the Public Report, for the purpose of making a reasonable and balanced judgment regarding the Exploration Targets, Exploration Results, Mineral Resources or Mineral Reserves that have been reported.

Competence requires that the Public Report be based on work that is the responsibility of a suitably qualified and experienced person (referred to herein as Competent Person) who is a member of a Professional Organisation with an enforceable code of ethics and disciplinary process, which includes the powers to suspend or expel a member.

3. Scope

The CAMRA Code is applicable to all minerals defined in Clause 6.2、 9.1 and 10.1, for which Public Reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves is required in capital and stock markets in China. It is also recommended and encouraged for the estimation, evaluation and reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves for other purposes.

4. Competent Person

4.1 A Competent Person is a minerals industry professional, who is a senior member or fellow of the CAMRA, or of other Recognized Professional Organisations (RPOs) as accepted and included in a list available on CAMRA website. These organisations have enforceable disciplinary processes including the powers to suspend or expel a member.

A Competent Person must have a minimum of five years relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking.

The key qualifier in the definition of a Competent Person is the word 'relevant'. Determination of what constitutes relevant experience can be a difficult area and common sense has to be exercised. For example, in estimating Mineral Resources for vein gold mineralisation, experience in a high nugget, vein-type mineralisation (such as tin, uranium, etc) may be relevant, whereas experience in (say) massive base metal deposits may not be.

4.2 Capability Requirements

- A Competent Person must be a minerals industry professional, with a university degree or equivalent accreditation.
- A Competent Person must have a minimum ten years of experiences in mineral exploration, Mineral Resources estimation, or Mineral Reserves estimation, mine construction, mineral extraction, mineral project assessment and evaluation, or other relevant professional fields.
- A Competent Person must have good reputation and spirit of teamwork in the industry, without any bad records.

4.3 If the Competent Person is preparing documentation on Exploration Targets or Exploration Results, the relevant experience must be in exploration.

If the Competent Person is estimating, or supervising the estimate of Mineral Resources, the relevant experience must be in the estimate, assessment and evaluation of Mineral Resources.

If the Competent Person is estimating, or supervising the estimate of Mineral Reserves, the relevant experience must be in the estimate, assessment, evaluation and economic extraction of Mineral Reserves.

5. Type and Responsibility of Reports

5.1 **Technical Report is a documentation prepared in support of a Public Report, detailing Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves estimates, on which a Public Report on Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves is based, must be prepared by, or under the directions of, and signed by, a Competent Person.** The Technical Report must provide a fair representation of the matters being reported. CAMRA does not mandate the disclosure of Technical Report, and it is up to the company to decide whether to disclose.

5.2 Public Reports are reports prepared to inform investors or potential investors and their professional advisers on Exploration Targets, Exploration Results, Mineral Resources or Mineral Reserves. They include, but are not limited to company reports, media releases, information memoranda, technical papers, social media announcements, website postings and public presentations.

It is recognised that companies can be required to issue reports into more than one regulatory jurisdiction, with compliance standards that may differ from The CAMRA Code. Such reports should include a statement alerting the readers to this situation. When the members of CAMRA are required to report in other jurisdictions, they are obliged to comply with the requirements of those jurisdictions.

The CAMRA Code has covered most situations likely to be encountered in the reporting of Exploration Targets, Exploration Results, Mineral Resources and Mineral Reserves, inevitably there will be situations when doubt exists as to the appropriate procedure to follow. In such cases, users of the CAMRA Code and those compiling reports under the Code should comply with the three principles of the CAMRA Code.

5.3 Principles for Technical Report and Public Reporting: Table 1 provides a checklist or reference of criteria which must be considered by the Competent Person(s) when preparing the Technical Report and Public Report. Reporting on an 'if not, why not' basis is required, preferably as an appendix to the Public Report. The Competent Person(s) must address the completion status for each item. If there are any items that have not been accomplished, the reason must be given.

Reporting on an '**if not, why not**' basis is to ensure that it is clear to readers whether items have been considered and deemed of low consequence or are not yet addressed or resolved.

For the purposes of compliance with the CAMRA Code, the phrase 'if not, why not' means that each item listed in the relevant section of Table 1 must be discussed and if it is not discussed then the Competent Person must explain why it has been omitted from the documentation.

5.4 Responsibility for Public Report: A Public Report concerning a company's Exploration Targets, Exploration Results, Mineral Resources and/or Mineral Reserves is the responsibility of the company acting through its Board of Directors. Any such report must be based on, and fairly reflect the Technical Report and information prepared by or under the direction of and signed by the Competent Person(s).

A company issuing a Public Report shall make publicly available the name(s) of the Competent Person(s). This information must include whether the Competent Person is a full-time employee of the company, and, if not, name the Competent Person's employer, and the relationship with the company. Any potential for a conflict of interest between the Competent Person or a related party must be disclosed. Any other relationship between the Competent Person and the company must be disclosed.

The issue of a Public Report requires written consent of the Competent Person(s), prior to release of the report, as to the form and context in which it appears.

When a company re-issues information previously released with the written consent of the Competent Person(s), it must state the name of the original report, the released date, the name(s) of the Competent

Person(s) responsible for the original report, and state the source of the original report for public access. In these circumstances the Company is not required to obtain the Competent Person’s prior written consent as to the form and context in which the information appears, provided:

- The company confirms in the subsequent public presentation that it is not aware of any new information or data that materially affects the information included in the relevant market announcement. In the case of estimates of Mineral Resources or Mineral Reserves, the company confirms that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed.
- The company confirms that the form and context in which the Competent Person’s findings are presented have not been materially modified. Note that for the subsequent public presentation it is the responsibility of the company acting through its Board of Directors to ensure the form and context has not been materially altered.

6. Defined Terminologies and Categories

6.1 Public Reports dealing with Exploration Results, Exploration Targets, Mineral Resources or Mineral Reserves must only use the defined terms set out in Figure 1 and Clause 1.5.

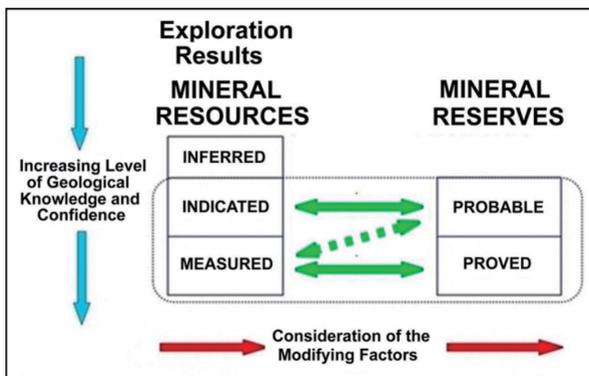


Figure 1. Relationship between Exploration Results, Mineral Resources and Mineral Reserves

6.2 A mineral is material of economic interest, when used in the context of Mineral Resource and Reserve determination, includes mineralization, including dumps and tailings, mineral brines, and other resources extracted on or within the earth’s crust. It does not include oil and gas resources resulting from oil and gas producing activities, gases (e.g., helium and carbon dioxide), geothermal fields, or water.

6.3 **Modifying Factors** are considerations used to assess and estimate Exploration Targets, Mineral

Resources and/or Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governance (ESG), and regulatory factors.

6.4 The categories to be used for Mineral Resources and Mineral Reserves in Public Reports and Technical Reports are given in Figure 1. The Mineral Resources are sub-divided in the order of increasing geological confidence into Inferred, Indicated and Measured categories. The Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proved Mineral Reserves.

Measured Mineral Resources may convert to either Proved Mineral Reserves or Probable Mineral Reserves. The Competent Person may convert Measured Mineral Resources to Probable Mineral Reserves because of uncertainties associated with some or all of the Modifying Factors, which are taken into account in the conversion from Mineral Resources to Mineral Reserves. This relationship is shown by the broken arrow in Figure 1.

7. The Principles and Guidance on Mineral Resources and Mineral Reserves Estimates

7.1 The choice of the appropriate category of Mineral Resources can only be the Inferred Mineral Resources, Indicated Mineral Resources and Measured Mineral Resources as shown in Figure 1. The appropriate Mineral Resources category must be determined by a Competent Person.

The reasonable classification of Mineral Resources depends on the quantity, distribution, and quality of available data and the confidence level of the data. It must be determined by Competent Person according with the definition of every category of Mineral Resources in this Code. The Competent Person should take into consideration the style of mineralisation, scale and cut-off grade when assessing geological and grade continuity.

The estimation of Mineral Resources should be based on the data and information of exploration, sampling and testing. Not only the scale of the mineralisation should be determined, but also the mineralisation delineated by the grade threshold in the mineralisation area should be taken into account, and the scale, location, and the continuity of the mineralisation should be determined. It is necessary to analyse the realistic economic extraction according to the reasonable technical and economic hypotheses.

7.2 Mineral Resource estimates are not precise calculations. The estimate results are dependent on the interpretation of limited information on the location, shape, and the continuity of the mineralisation and the sampling and testing results available. Reporting of tonnage and grade should be rounded to the appropriate significant figure. In the case of Inferred Mineral Resources, the terms like 'approximately' should be used to reflect the uncertainty.

Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Mineral Resources estimates. The statement should specify whether it relates to global (whole of resource) or local estimates (a subset of the resource for which the accuracy and/or confidence might differ

from the whole of the resource), and, if local, state the relevant tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided (refer to Table 1).

7.3 The choice of the appropriate category of Mineral Reserves can only be the Probable Mineral Reserves and Proved Mineral Reserves as shown in Figure 1. The appropriate Mineral Reserves category must be determined by a Competent Person. The nature of the definitions of Mineral Reserves should be carefully considered when the Competent Person estimates and classifies the Mineral Reserves, especially the economically mineable and the requirement of reference point.

7.4 The determination of the category for the Mineral Reserves depends on primarily the relevant level of confidence to the Mineral Resources, such as Indicated Mineral Resources can only be converted into Probable Mineral Reserves; and then, the uncertainty of each Modifying Factor should be taken into account. If there is uncertainty in some Modifying Factors, the Measured Mineral Resources can only be converted into Probable Mineral Reserves; if the uncertainty of each Modifying Factor can be eliminated, the Measured Mineral Resource can be converted into Proved Mineral Reserve. Under no circumstances can Indicated Mineral Resources be converted directly to a Proved Mineral Reserves (see Figure 1).

7.5 The conversion of Mineral Resources to Mineral Reserves must be based on a studies at Pre-Feasibility or Feasibility level. The Pre-Feasibility Study or Feasibility Study shall determine a technically viable, economical and reasonable extraction plan of reserves.

7.6 Mineral Reserves estimates are not precise calculations. Reporting of tonnage and grade should reflect the relative uncertainty of the estimate by rounding to appropriate significant figures.

8. Reporting General

8.1 Public Reporting of Exploration Targets, Exploration Results, Mineral Resources or Mineral Reserves must include a description of the type and nature of mineralisation.

8.2 The mining company must report relevant information that can materially affect the economic value of the deposit. Any material change in the Mineral Resources or Mineral Reserves must be reported by the mining company in a timely manner.

8.3 Companies must review and report on Exploration Targets, Exploration Results, Mineral Resources and/or Mineral Reserves annually and the effective date must be shown. The reporting information of companies should be systematic and comprehensive, and the companies' interests holding in the project must be declared.

8.4 The presence of materially deleterious elements, contaminants, or minerals that may affect workplace safety and environmental conditions should be reported in Public Reports.

8.5 Public reports should include risk analysis, assessment of key risks in terms of geometry, grade/quality, weight, or metal or mineral products contained, as well as risks associated with uncertainty of

Modifying factors.

This estimate of uncertainty should be described in the Technical Report. If there is uncertainty, it should be explained in the Public Report, and the relative size of the uncertainty should also be reflected in the choice of the appropriate category of Mineral Resources and Mineral Reserves.

9. Reporting of Exploration Targets

9.1 An Exploration Target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade or quality, relates to mineralisation for which there has been insufficient exploration to estimate Mineral Resources.

9.2 It is recognised that it is common practice for a company to comment on and discuss its exploration strategy in terms of target size and type. Any such information relating to Exploration Target size must not be expressed in a way that could be confused as an estimate of Mineral Resources or Mineral Reserves.

Descriptions of Exploration Targets or exploration potential in Public Reports should be expressed so as not to misrepresent them as an estimate of Mineral Resources or Mineral Reserves.

9.3 Any statement referring to potential quantity and grade of the Exploration Target must be expressed as a range and must include a detailed explanation of the basis for the assumptions made and procedures used to estimate the range of tonnage and grade or quality, and extent.

There must also be a proximate statement that the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to estimate a Mineral Resource, and that it is uncertain if further exploration will result in the estimation of a Mineral Resource.

9.4 The detailed explanation of the basis for the statement of a target must specifically discuss the geological setting and exploration strategy, exploration activity already completed and the presence of or lack of the following attributes:

- mineralised outcrops and assays,
- surface geochemical and physical sampling results,
- surface and subsurface geophysical survey results,
- drill holes, test pits, and underground workings.

Proposed exploration activities designed to test the validity of an Exploration Target should be detailed and include the timeframe within which they are expected to be completed.

9.5 Given the level of uncertainty surrounding the supporting data, an Exploration Target tonnage or grade must not be reported as a 'headline statement' in a Public Report. For the same reason to avoid being misleading, the reporting of 'contained metals' or 'contained minerals' is not allowed in a Public Report for Exploration Targets.

9.6 As noted in Clauses 2.1 and 5.3, the benchmark of Materiality is that which investors, potential

investors or their advisers would reasonably expect to see explicit comment on from the Competent Person, thus the reporting of all relevant criteria in Section 1 and Section 2 of Table 1 on an **'if not, why not'** basis is required.

10. Reporting of Exploration Results

10.1 Exploration Results include data and information generated by mineral exploration programs that might be of use to investors, but which do not form part of a declaration of Mineral Resources or Mineral Reserves.

10.2 Reporting of Exploration Results is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of tonnage and grade to be made. Examples include discovery outcrops, single drill hole intercepts or the result of geophysical surveys and results of metallurgical testwork.

Exploration Results may not be part of a formal declaration of Mineral Resources or Mineral Reserves and must not be presented in a way that unreasonably implies the discovery of potentially economic mineralisation.

10.3 Public Reports of Exploration Results must contain sufficient information to allow an objective and balanced judgement of their significance.

10.4 Reports must include relevant information such as exploration conditions, the sampling type and methods, the sample intervals and locations, the distribution, dimensions and relative location of all relevant data, data analysis and processing methods, and other information required in Table 1 that are material to an assessment.

A report cannot be made on selective information such as isolated assays, isolated drill holes, assays of panned concentrates or supergene enriched soils or surface samples, etc.

In the Public Report of Exploration Results, it is not allowed to express or imply that any potential economic mineralisation has been discovered.

10.5 As noted in Clauses 2.1 and 5.3 the benchmark of Materiality is that which investors, potential investors or their advisers would reasonably expect to see explicit comment on from the Competent Person, thus the reporting of all relevant criteria in section 1 and section 2 of Table 1 on an **'if not, why not'** basis is required.

11. Reporting of Mineral Resources

11.1 A 'Mineral Resource' is a concentration or occurrence of 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 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. Mineral Resources are sub-divided, in order of increasing geological confidence into Inferred, Indicated and Measured categories.

11.2 Any hypotheses made in the Public Report that determines the economic viability should be clearly stated. Any adjustment made to the data for the purpose of estimate of Mineral Resources, for example the treatment of outlier grades, should be clearly stated and described in the Public Report.

11.3 All reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for economic extraction (i.e., more likely than not), regardless of the classification of the Mineral Resource.

11.4 Estimates of non-economic mineralisation (where there are no reasonable prospects for economic extraction) do not qualify as Mineral Resources (or Mineral Reserves) under the definitions of this CAMRA Code.

11.5 Public Reports of Mineral Resources must be categorised as per Figure 1 above. Mineral Resource categories not defined in the CAMRA Code are not allowed in a Public Report.

Practical criteria successfully adopted in a comparable operating mine with similar style of mineralisation or type of deposit may be used as guidance for Mineral Resources categorisation.

Categories must not be reported in a combined form unless details for the individual category are also provided. Mineral Resources must not be reported in terms of contained metal or mineral content unless the tonnage and grade are also reported.

In a Public Report, the Competent Person(s) must be guided by the requirements of Table 1 to clearly explain the reasonable prospects of economic extraction. When disclosing a reasonable prospect, the basis for selected cut-off grade must also be explained from both technical and economic aspects.

Where untested practices are applied in the determination of reasonable prospects of a Mineral Resource, the use of the proposed practices for reporting of the Mineral Resource must be justified by the Competent Person in the Public Report.

The words 'ore' and 'reserves' must not be used in describing Mineral Resource estimates as the terms imply technical feasibility and economic viability and are only appropriate when all relevant Modifying Factors have been considered.

11.6 An 'Inferred Mineral Resource' is that part of 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 infer but not demonstrate geological and grade or quality continuity.

An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and 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.

11.7 Where the Mineral Resource is mainly an Inferred Mineral Resource, sufficient information must be provided in the Public Report so that readers can weigh and evaluate the relevant risks. In circumstances

where the estimation of Inferred Mineral Resources is presented on the basis of extrapolation beyond the nominal sampling spacing and taking into account the style of mineralisation, the report must contain sufficient information to inform the readers of:

- the maximum distance that the resource is extrapolated beyond the sample points,
- the proportion of the resource that is based on extrapolated data,
- the basis on which the resource is extrapolated to these limits, and
- a diagrammatic representation of the Inferred Mineral Resource showing clearly the extrapolated part of the estimated resource.
- Inferred Mineral Resources must not be converted to Mineral Reserves and must not be stated as part of the Mineral Reserve.

Confidence in the estimate is usually not sufficient to allow the results of the application of technical and economic parameters to be used for planning. For this reason, there is no direct link from an Inferred Mineral Resource to any category of Mineral Reserves (see Figure 1). Caution should be exercised if this category is considered in technical and economic studies.

11.8 An ‘Indicated Mineral Resource’ is that part of 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.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to demonstrate geological and grade (or quality) continuity between points of observation.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

Mineralisation may be classified as an Indicated Mineral Resource when the nature, quality, amount and distribution of data are such as to allow confident interpretation of the geological framework and to assume continuity of mineralisation.

Confidence in the estimate is sufficient to allow application of Modifying Factors within a Technical and Economic Study as defined in Cluses 13.1 to 13.4.

11.9 A ‘Measured Mineral Resource’ is that part of 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.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade (or quality) continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an

Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

Mineralisation may be classified as a Measured Mineral Resource when the nature, quality, amount and distribution of data are such as to leave no reasonable doubt, in the opinion of the Competent Person determining the Mineral Resource, that the tonnage and grade of the mineralisation can be estimated to within close limits, and that any variation from the estimate would be unlikely to significantly affect potential economic viability.

Confidence in the estimate is sufficient to allow application of Modifying Factors within an Technical and Economic Study as defined in Cluses 13.1 to 13.4.

11.10 When reporting a Mineral Resource estimate for the first time or when those estimates have materially changed since the last Public Report (including category changes), the basis for the changes must be explained in detail, so that investors can fully understand the changes.

11.11 As noted in Clauses 2.1 and 5.3 the benchmark of Materiality is that which investors, potential investors or their advisers would reasonably expect to see explicit comment on from the Competent Person, thus the reporting of all relevant criteria in section 1, section 2 and section 3 of Table 1 on an 'if not, why not' basis is required.

11.12 Mineral Resources must not be aggregated with Mineral Reserves.

12. Reporting on Mineral Reserves

12.1 A '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 application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the readers is fully informed as to what is being reported.

Mineral Reserves can be sub-divided, in order of increasing levels of confidence, into Probable and Proved Categories.

To convert Mineral Resources to Mineral Reserves, the CAMRA Code requires that at least a Pre-Feasibility Study has been carried out that have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.

As above defined and described, Mineral Reserve estimate is a comprehensive working program involving detailed geotechnical study, mining method trade-off study, mining design, mining scheduling,

economic and finance analysis and so on to apply all the Modifying Factors and other relevant factors, it is prohibited in The CAMRA Code to estimate and report Mineral Reserves simply by multiplying a ratio with any category of Mineral Resources.

12.2 A ‘Probable Mineral Reserve’ is 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.

12.3 A ‘Proved Mineral Reserve’ is the economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors.

12.4 Public Reports of Mineral Reserves must specify one or more of the categories of ‘Probable’ and ‘Proved’. The reporting of Mineral Reserves categories outside of the CAMRA Code is not allowed.

Categories must not be reported in a combined form unless details for the individual categories are also provided. Mineral Reserves must not be reported in terms of contained metal or mineral content unless corresponding tonnages and grades are also presented.

Practical criteria successfully adopted in a highly comparable operating mine with similar style of mineralisation or type of deposit may be used as guidance for Mineral Reserves categorisation.

12.5 When reporting a Mineral Reserve estimate for the first time or when those estimates have materially changed since the last Public Report (including classification changes), it is necessary to elaborate the key hypotheses and results of the Pre-Feasibility or Feasibility Study. The reasons for the material changes compared to the previous estimates must be described and fully clarified in Public Reports.

Any adjustment to the estimate of Mineral Reserves from reconciliation with production data should be clearly stated in a Public Report and the nature of the adjustment or modification should be described.

As noted in Clauses 2.1 and 5.3 the benchmark of Materiality is that which investors, potential investors or their advisers would reasonably expect to see explicit comment on from the Competent Person, thus reporting of all relevant criteria in section 1, section 2, section 3 and section 4 of Table 1 on an ‘**if not, why not**’ basis is required.

12.6 In reporting of Mineral Reserves, information on all Modifying Factors must be included in Public Reports (as outlined in Table 1, section 4).

When reporting Mineral Reserves, the reference point at which Mineral Reserves, as well as the diluting materials and allowances for losses must be stated.

12.7 Should re-estimation indicate that any part of the Mineral Reserve is no longer economically viable, such Mineral Reserve must be re-classified as Mineral Resources or removed from the Mineral Resource/ Mineral Reserve statements.

12.8 Inferred Mineral Resources are by definition generally additional to Mineral Reserves except where included as dilution in the Mineral Reserves.

12.9 Mineral Reserves estimates must not be aggregated to Mineral Resources estimates to report a single

combined figure.

12.10 A Life of Mine Plan (LoMP) is a design and financial/economic study of an existing operation in which appropriate assessments have been made of all Modifying Factors, which are considered in sufficient detail (to a minimum of Pre-Feasibility level) to demonstrate that continued extraction is reasonably justified.

It is accepted that mine design and planning in a Life of Mine Plan (LoMP) may include a proportion of Inferred Mineral Resources. If this category is considered in mine design, mine planning or economic studies, the results of which are publicly reported, full disclosure must be made and the effect on the results of the studies must be stated.

Modifying Factors and assumptions applied to the Inferred Mineral Resources must reflect a risk analysis considering their lower geological knowledge and confidence.

A LoMP must be economically viable without Inferred Mineral Resources to support the declaration of Mineral Reserves.

Where a material amount of mining in the mine plan includes Inferred Mineral Resources, a comparison of the results with and without these Inferred Mineral Resources must be shown, and the rationale (including a risk assessment) behind their inclusion must be explained and the proportion of Inferred Resources included in the LoMP reported.

13. Technical and Economic Studies

13.1 Technical and Economic Studies include Scoping Study, Pre-Feasibility Study and Feasibility Study.

Public Reports may include, but not be limited to, information included in or supported by Scoping Studies, Pre-Feasibility Studies, Feasibility Studies.

13.2 A ‘Scoping Study’ is an order of magnitude technical and economic study of the potential viability of Mineral Resources. It includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate and provide justification for further investigation and technical work, and more comprehensive technical studies.

A Scoping Study is at a lower confidence level than a Pre-Feasibility Study.

A Scoping Study must not be used as the basis for estimation of Mineral Reserves.

If the outcome of a Scoping Study is partially supported by Inferred Mineral Resources, the Public Report must state the proportion and relative sequencing of the Inferred Mineral Resources within the Scoping Study.

For all Scoping Studies, the company must include a cautionary statement in the same paragraph as or immediately following the disclosure of the Scoping Study.

An example of cautionary statement as follow:

“The Scoping Study referred to in this report is based on low-level technical and economic assessments, it is insufficient to support estimate of Mineral Reserves or to provide assurance of an economic extraction case at this stage, or to provide certainty that the conclusions of the Scoping Study will be realised.”

13.3 A ‘Pre-Feasibility Study’ is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where the preferred methods of extraction and beneficiation have been determined. It includes a financial analysis based on reasonable and demonstrated assumptions on the Modifying Factors and the evaluation of any other relevant factors which are sufficient for a Competent Person to determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting. A Pre-Feasibility Study is at a lower confidence level than a Feasibility Study.

A Pre-Feasibility Study is a systematic study on all material Modifying Factors in order to determine how much available Measured and Indicated Mineral Resources can be converted to Mineral Reserves.

The Pre-Feasibility Study will identify the preferred mining, processing, and infrastructure requirements and capacities, but will not yet have finalised these matters. Detailed assessments of environmental and socio-economic impacts and requirements will also be well advanced. The Pre-Feasibility Study will highlight areas that require further refinement within the final study stage.

13.4 A Feasibility Study is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable Modifying Factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that economic extraction is reasonably justified. The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a Pre-Feasibility Study.

Terms such as “Bankable Feasibility Study” and “Definitive Feasibility Study” are noted as being equivalent to a Feasibility Study as defined in this Clause.

A Feasibility Study is of a higher level of confidence than a Pre-Feasibility Study and would normally contain mining, infrastructure and process designs completed with sufficient rigor to serve as the basis for an investment decision or to support project financing. Social, environmental and governmental approvals, permits and agreements will be in place, or will be approaching finalization within the expected development timeframe.

The Feasibility Study will contain the application and description of all Modifying Factors (as outlined in Table 1, section 4) in a more detailed form than that in the Pre-Feasibility Study, and may address implementation issues such as detailed mining schedules, construction ramp up, and project execution plans.

13.5 It is necessary that at least a Pre-Feasibility Study has been carried out that has determined a mine

plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.

14. Reporting on specific Mineral Resources and Mineral Reserves

14.1 The CAMRA Code applies to the reporting on all potentially economic mineralised substance, including mineralised fill, remnants, pillars, low-grade mineralisation, stockpiles, dumps and tailings (remnant materials), where there are reasonable prospects for economic extraction in the case of Mineral Resources, and where extraction is reasonably justifiable in the case of Mineral Reserves. Unless otherwise stated, all other Clauses of the CAMRA Code (including Figure 1) apply.

The Competent Person should demonstrate the commercial extraction of those mineralised material systematically and comprehensively, classify them reasonably and report them separately.

14.2 Reporting on Coal Resources and Reserves.

Unless otherwise stated, Clauses 1 to 13 of the CAMRA Code (including Figure 1) apply to this item. Table 1 should also be taken into account in the preparation of reporting Coal Resources and Reserves.

For purposes of Public Reporting, the requirements for coal are generally similar to those for other minerals, while at the same time the specifics of coal should be considered, and related terms of coal should be used.

The terms of ‘Mineral Resource(s)’ and ‘Mineral Reserve(s)’, and the subdivisions as defined above also apply to coal reporting, but they can also be replaced by the terms ‘Coal Resource(s)’ and ‘Coal Reserve(s)’ and other corresponding subdivisions.

“Marketable Coal Reserves” refers to coal product that has been beneficiated or improved in quality when modifications due to processing have been considered in addition to mining factors, such as dilution. This reserve must be published in conjunction with Coal Reserves, but not a substitute for Coal Reserves reports. The basis for the predicted yield to achieve Marketable Coal Reserves must be stated.

No reference should be made to the terms like ‘coking coal’ and ‘metallurgical coal’, or coking properties, unless specific coking properties are demonstrated by analytical results of samples.

14.3 Reporting on Exploration Results, Mineral Resources and Mineral Reserves for non-metallic and building materials.

The principles of the CAMRA Code apply to the reporting on information and estimate results of non-metallic and building materials. Specific parameters and assumptions reflecting the mineral characteristics and quality of various non-metallic and building materials should also be reported. For these non-metallic and building materials defined for specific industrial requirements, the Mineral Resources or Mineral Reserves estimate reported must include the specific industrial requirements.

Such factors as quality and marketing viability for non-metallic and building materials are very important and should be carefully considered when reporting Mineral Reserves.

15. Reporting on Metal Equivalents

15.1 The reporting of Exploration Results, Mineral Resources and/or Mineral Reserves for polymetallic deposits in terms of metal equivalents (a single equivalent grade of one major metal) must show details of all material factors contributing to the net value derived from each constituent.

15.2 The following minimum information must accompany any Public Report that includes reference to metal equivalents, in order to conform to the principles of Transparency, Materiality and Competence:

- individual grades for all metals included in the metal equivalent calculation,
- assumed commodity prices for all metals. The actual assumed prices should be disclosed. It is not sufficient to refer to a spot price without disclosing the price used in calculating the metal equivalent. However, where the actual prices used are commercially sensitive, sufficient information must be disclosed, perhaps in narrative rather than numerical form, for investors to understand the methodology used to determine these prices,
- assumed metallurgical recoveries for all metals and discussion of the basis on which the assumed recoveries are derived (metallurgical test work, detailed mineralogy, similar deposits, etc),
- a clear statement that it is the company's opinion that all the elements included in the metal equivalents calculation have a reasonable potential to be recovered and sold; and,
- the calculation formula used.

15.3 In most circumstances, the metal chosen for reporting on an equivalent basis should be the one that contributes most to the metal equivalent calculation. If this is not the case, a clear explanation of the logic of choosing another metal must be included in the report.

15.4 Estimates of metallurgical recoveries for each metal must be used to calculate meaningful metal equivalents.

15.5 Reporting on the basis of metal equivalents is not appropriate if metallurgical recovery information is not available or not able to be estimated with reasonable confidence.

16. Commodity Pricing and Marketing

16.1 Commodity prices and sales volume expectations used for the determination of Mineral Resources and Mineral Reserves must be based on forward-looking estimates reflecting the company's reasonable and supportable short- and long- term expectations as supported by available evidence, which may include consensus forecasts, three-year trailing averages, sales contracts, or other price analyses (see Clauses 16.4 and 16.5 below for cases where public disclosure is not appropriate).

16.2 To demonstrate the economic viability of a Mineral Reserve, the estimated prices, combined with Modifying Factors, must be applied to only Measured and Indicated Mineral Resources.

16.3 Disclosure in Public Reports of the commodity prices and sometimes also the costs (including other Modifying Factors) used for Mineral Reserves estimation is generally required.

16.4 In the absence of applicable securities or other laws to disclose prices, there may be cases, such as when a product is sold under long-term contract, the terms of which are confidential, where there are valid commercial reasons for non-disclosure of prices.

16.5 Similarly, where disclosure of the long-term price and/or cost assumptions used in the estimation would be detrimental to the company's business, such as when bidding for sales contracts or property acquisitions or negotiating agreements with third parties, non-disclosure may be justifiable.

17. Permitting and Legal Requirements

17.1 For the declaration of Mineral Reserves, there must be no known material obstacles to mining, arising from the failure to obtain relevant permits.

17.2 There must be a reasonable expectation by the Competent Person, often through reliance on legal and permitting experts, that all permits, ancillary rights (including water or other property rights) and authorisations required for mining, and to the extent applicable, processing and marketing, can be obtained in a timely fashion, and maintained for ongoing operations.

17.3 The company must complete a review of all legal and permitting requirements and document the findings. Local environmental laws and processes must be taken into account.

17.4 To demonstrate reasonable expectation that all permits, ancillary rights and authorisations can be obtained, the company must show understanding of the procedures to be followed to obtain such permits, ancillary rights and authorisations. Demonstrating earlier success in obtaining the necessary permits can be used to document the likelihood of future success.

17.5 If permits are required, but there is no defined procedure to obtain such permits, reasonable expectation of success may be difficult to support. Information that materially increases or decreases the risk that the necessary legal rights or permits will be obtained must be disclosed.

17.6 It is recognised that the legal and permitting environment may change over time and that such changes could have an impact on the Mineral Reserve estimate. If it is determined that obstacles arise or are eliminated, the Mineral Reserve estimates must be adjusted accordingly.

17.7 Royalty terms and clawback rights of former claim/land holders must be disclosed.

17.8 Information relating to the review of legal and permitting issues must be documented either in full or by reference. The information may remain confidential to the company. However, when required, it may be released to regulators or auditors on a confidential basis.

18. Sustainability Considerations

Public Reports should discuss environmental, social, governance (ESG) and health and safety impacts that are expected during development, operation and after closure. These impacts will affect employees, contractors, neighbouring communities, and customers.

19. Special Notes

The Code does not cover reporting on project valuation or appraisal from a business perspective. The Exploration Targets, Exploration Results and estimates of Mineral Resources and Mineral Reserves, as defined in the CAMRA Code, may be used by others to prepare subsequent project valuations or appraisals.

20. Supplementary Provisions

20.1 CAMRA will be in charge of the interpretation of the CAMRA Code.

20.2 These rules shall take effect from the date of publication.

TABLE 1 - CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA

Table 1 provides, in a summary form, a checklist of the criteria which should be considered when preparing reports on Exploration Results, Mineral Resources and Mineral Reserves. In the context of complying with the principles of the Code, comment on the relevant sections of Table 1 should be provided on an 'if not, why not' basis within the Competent Person's documentation where required according to the specific requirements of Clauses 9.6, 10.5, 11.11, and 12.5 for material projects in the Public Report. This is to ensure that it is clear to the investor whether items have been considered and deemed of low consequence or have yet to be addressed or resolved.

The Competent Person must provide adequate comments on all matters that may affect a reader's understanding or interpretation of the results or estimates being reported. It is unacceptable that the Competent Person remain silent on any material aspect for which the presence or absence of comment could affect the public perception or value of the mineral occurrence.

The order and grouping of criteria in Table 1 reflects the normal systematic approach to exploration and evaluation. Criteria in section 1 'Sampling Techniques and Data' apply to all succeeding sections. In the remainder of the table, criteria listed in preceding sections would often also apply and should be considered when estimating and reporting.

It is the responsibility of the Competent Person to consider all the criteria listed below and any additional criteria that should apply to the study of a particular project or operation. The relative importance of the criteria will vary with the particular project and the legal and economic conditions pertaining at the time of determination.

In some cases it will be appropriate for a Public Report to exclude some commercially sensitive information. A decision to exclude commercially sensitive information would be a decision for the company issuing the Public Report, and such a decision should be made in accordance with any relevant corporation's regulations in that jurisdiction.

In cases where commercially sensitive information is excluded from a Public Report, the report should provide summary information (for example the methodology used to determine economic assumptions where the numerical value of those assumptions are commercially sensitive) and context for the purpose of informing investors or potential investors and their advisers.

TABLE 1

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	Explanation
<p><i>Sampling techniques</i></p>	<ul style="list-style-type: none"> – <i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i> – <i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i> – <i>Aspects of the determination of mineralisation that are Material to the Public Report. In cases where ‘industry standard’ work has been done this would be relatively simple (eg ‘reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay’). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</i>
<p><i>Drilling techniques</i></p>	<ul style="list-style-type: none"> – <i>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or double tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</i>
<p><i>Drill sample recovery</i></p>	<ul style="list-style-type: none"> – <i>Method of recording and assessing core/chip sample recoveries and results assessed.</i> – <i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i> – <i>Indicate whether there is a correlation or bias between sample recoveries and the assay results.</i>

Criteria	Explanation
Logging	<ul style="list-style-type: none"> – Whether core/chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resources estimation, mining studies and metallurgical studies. – Whether logging is qualitative or quantitative. Drill core (or costean, channel, etc) photography. – The total length and percentage of the relevant intersections that has been logged.
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> – If core, whether cut or sawn and whether quarter, half or full core taken. – If non-core, whether riffled, tube, or rotary split sampled, etc and whether the samples are wet, moist or dry. – For all sample types, the nature, quality, and appropriateness of the sample preparation technique. – Quality control procedures adopted on each sub-sampling stage to maximize representativeness of samples. – Measures taken to ensure that the sampling is representative of in situ material collected, such as field duplicate/the other half sampling. – Whether sample sizes are appropriate to the grain size of the material being sampled.
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> – The nature, quality and appropriateness of the assaying and laboratory procedures and whether the technique is considered partial or total digestion. – For geophysical instruments, spectrometers, handheld XRF instruments, etc, the parameters used to determine and analyze, including the brand and the model of the instrument, reading times, calibrations factors applied, their derivation, etc. – Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, internal and external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.
Verification of sampling and assaying	<ul style="list-style-type: none"> – The verification of significant intersections by independent or alternative company personnel. – The use of twinned holes. – Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic format) protocols. – Discuss any adjustment to assay data.

Criteria	Explanation
<i>Location of data points</i>	<ul style="list-style-type: none"> – Accuracy and quality of surveys used to locate the drill holes (collar and down-hole surveys), trenches, mine workings etc used in the Mineral Resources estimation. – Specification of the coordinate system used – Quality and adequacy of the topographic survey.
<i>Data spacing and distribution</i>	<ul style="list-style-type: none"> – Data spacing for reporting on Exploration Results. – Whether the data spacing and distribution are sufficient to appropriately support the degree of geological and grade continuity for the Mineral Resources and Mineral Reserves estimation and classifications. – Whether sample compositing has been applied.
<i>Orientation of data in relation to geological structures</i>	<ul style="list-style-type: none"> – In regards to the type of the deposit, whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known. – If the relationship between the drilling orientation and the orientation of key mineralised structures is generally considered to have introduced a sampling bias. Thus, it should be assessed and reported if such bias has a substantial impact.
<i>Sample security</i>	<ul style="list-style-type: none"> – The measures taken to ensure sample security.
<i>Audits or reviews</i>	<ul style="list-style-type: none"> – The results of audits or reviews of sampling techniques and data.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	Explanation
<i>Mineral concession and land tenure status</i>	<ul style="list-style-type: none"> - <i>Type, reference name/number of the concession, the location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, royalties etc.</i> - <i>Rights and interests of residents in the area, historical sites, ecological Red-line areas, environmental settings, etc.</i> - <i>The security of the concession held at the time of the preparation of the report, and any known impediments to obtaining a license to operate in the area.</i>
<i>Exploration done by other parties</i>	<ul style="list-style-type: none"> - <i>Acknowledgement and appraisal on the exploration by other parties.</i>
<i>Geology</i>	<ul style="list-style-type: none"> - <i>Geological background, mineralisation style and deposit type.</i>
<i>Drill hole Information</i>	<ul style="list-style-type: none"> - <i>A summary of all material information to the understanding of the exploration results, including a tabulation listing the following information on all material drill holes:</i> <ul style="list-style-type: none"> • <i>3 dimensional coordinates of the drill hole,</i> • <i>hole dip and azimuth,</i> • <i>down hole length and interception depth,</i> • <i>hole length.</i> - <i>If such information is excluded from the report, the Competent Person should clearly explain the justification of non-materiality and non-detraction from the understanding of the report.</i>
<i>Data aggregation methods</i>	<ul style="list-style-type: none"> - <i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade cuts (e.g. cutting of high grades) cutoff grades generally Material and should be stated.</i> - <i>Where aggregated intercepts are composed of short lengths of high-grade, and longer lengths of low- grade, the aggregation method should be explained and some typical examples of using such aggregation method should be shown in detail.</i> - <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i>

Criteria	Explanation
<i>Relationship between true widths and downhole intercept lengths</i>	<ul style="list-style-type: none"> - If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. - If only the downhole intercepts is reported but the true thickness is unknown, there should be a clear statement provided (e.g. 'downhole length, true widths not known').
<i>Diagrams</i>	<ul style="list-style-type: none"> - Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. There should include, but not limited to a plan view of drill hole collar locations and appropriate sectional views.
<i>Balanced reporting</i>	<ul style="list-style-type: none"> - If it is not practicable to report all Exploration Results, the representative reporting of both low and high grades and/or widths should be made to avoid misleading reporting of Exploration Results.
<i>Other substantial exploration data</i>	<ul style="list-style-type: none"> - Other exploration data, if meaningful and material, should be reported, including, but not limited to, <ul style="list-style-type: none"> • geological observations, • geophysical survey results, • geochemical survey results, • bulk samples – the size and method of treatment, • metallurgical test results, • bulk density, groundwater, geotechnical and rock characteristics, • potential deleterious or contaminating substances.
<i>Further work</i>	<ul style="list-style-type: none"> - The nature and scale of planned follow-up work (e.g. tests for lateral or depth extensions or large-scale step-out drilling). - Diagrams clearly highlighting the potential extension areas, including major geological interpretation and future drilling areas, provided that this information is not commercially sensitive.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	Explanation
<i>Database integrity</i>	<ul style="list-style-type: none"> – Measures taken to ensure that the data has not been corrupted during the process of transcription or keyboarding between the data acquisition and its use for estimation of Mineral Resources. – Data verification and/or validation procedures used.
<i>Site visits</i>	<ul style="list-style-type: none"> – Comment on any on-site investigation undertaken by the Competent Person and the outcome of those visits. – If no site visits have been taken, it should be explained why this is the case.
<i>Geological interpretation</i>	<ul style="list-style-type: none"> – The reliability (or uncertainty) of the geological interpretation of the mineral deposit. – Nature of data used and of assumptions made. – The effect, if any, of alternative interpretations on Mineral Resource estimation. – The use of geology in guiding and controlling of Mineral Resource estimation. – The factors that affect the continuity both of the grade and geology.
<i>Dimensions</i>	<ul style="list-style-type: none"> – The extent and variability of the Mineral Resources are represented by length (along strike or other direction), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.

Criteria	Explanation
<i>Estimation and modelling techniques</i>	<ul style="list-style-type: none"> – <i>The nature and appropriateness of the estimation techniques applied as well as the key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from the data points. If the computer-assisted estimation method is used, the computer software and parameters used should be described.</i> – <i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account for such data.</i> – <i>Determination or assumptions on the recovery rate of by-products.</i> – <i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. Sulfur that can cause acid drainage in mines).</i> – <i>In case of block model for interpolation, the relationship between block size and the average sampling spacing, as well as data searching parameters must be described.</i> – <i>Determine the factors to be taken into account when modeling the selective mining units.</i> – <i>Correlations between different variables.</i> – <i>How the geological interpretation was used to control the Mineral Resource estimation.</i> – <i>Discussion of the basis for using or not using grade cutting or capping.</i> – <i>The process of validation and checking, the comparison between the model data and drilling data, and whether the reconciliation data (if there is any) has been used.</i>
<i>Moisture</i>	<ul style="list-style-type: none"> – <i>Whether the tonnage estimate is carried out on a dry basis or natural moisture conditions, and the method of determining the moisture content.</i>
<i>Cut-off parameters</i>	<ul style="list-style-type: none"> – <i>Basis of the adopted cut-off grade(s) or quality parameters applied.</i>

Criteria	Explanation
<i>Mining factors or assumptions</i>	<ul style="list-style-type: none"> – Assumptions made regarding possible mining methods, minimum dimensions, and internal (or external, if applicable) mining dilution. It is always necessary as part of the process of determining reasonable prospects for economic extraction to consider potential mining methods, but the assumption made on mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation on the basis of the mining assumptions made.
<i>Metallurgical factors or assumptions</i>	<ul style="list-style-type: none"> – The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation on the basis of the metallurgical assumptions made.
<i>Hydrogeology, geotechnical factors or assumptions</i>	<ul style="list-style-type: none"> – Hydrogeology, geotechnical assumptions made in regards to reasonable prospects for economic extraction.
<i>Environmental factors or assumptions</i>	<ul style="list-style-type: none"> – Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for economic extraction to consider the potential environmental impacts of the mining and processing operation. – While at this stage the determination of potential environmental impacts, particularly for a greenfield project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered, this should be reported with an explanation on the environmental assumptions made.

Criteria	Explanation
<i>Bulk density</i>	<ul style="list-style-type: none"> – <i>Whether the bulk density is assumed or determined. If it is assumed, the basis of the assumptions should be reported; if it is measured, the method should be stated, such as wet or dry, the measuring frequency, the nature, size, and the representativeness of the samples.</i> – <i>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.</i> – <i>Discuss the assumptions for bulk density estimates used in the evaluation process of the different materials.</i>
<i>Classification</i>	<ul style="list-style-type: none"> – <i>The basis for classifying the Mineral Resources into different confidence categories.</i> – <i>Whether all relevant factors (i.e. relative confidence in tonnage/grade estimation, the reliability of input data, confidence in continuity of geology, quality, quantity and distribution of the data) have been taken into account.</i> – <i>Whether the result appropriately reflects the Competent Person’s view on the deposit.</i>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> – <i>The results of any auditing or reviews of the Mineral Resources estimates.</i>
<i>Discussion on the relative accuracy/ confidence</i>	<ul style="list-style-type: none"> – <i>Where applicable a statement on the relative accuracy and confidence level in the Mineral Resources estimate using an approach or procedure are deemed by the Competent Person to be appropriate. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</i> – <i>The statement should specify whether it relates to global or local estimates, and, if local, state the tonnages relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i> – <i>These statements of the relative accuracy and confidence of the estimate should be compared with production data, where available.</i>

Section 4 Estimation and Reporting of Mineral Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	Explanation
<i>Mineral Resources estimate for conversion to Mineral Reserves</i>	<ul style="list-style-type: none"> – Description of the Mineral Resource estimate used as a basis for the conversion to the Mineral Reserves. – Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Mineral Reserves.
<i>Site visits</i>	<ul style="list-style-type: none"> – Comment on any site visit by the Competent Person as well as the outcome and the conclusions from the visits. – If no site visit has been undertaken, the reasons should be presented.
<i>Study status</i>	<ul style="list-style-type: none"> – The type and level of study taken to convert Mineral Resources to Mineral Reserves. – The CAMRA Code requires that at least Pre-Feasibility level of study has been taken when Mineral Resources are converted to Mineral Reserves. – Such study will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.
<i>Cut-off parameters</i>	<ul style="list-style-type: none"> – The basis of the cut-off grade(s) or quality parameters applied.

Criteria	Explanation
<p><i>Mining factors or assumptions</i></p>	<ul style="list-style-type: none"> – <i>The method and assumptions used as reported in the Pre-Feasibility or Feasibility Studies to convert the Mineral Resource to a Mineral Reserve (i.e. either by optimal application of appropriate factors or by preliminary or detailed design).</i> – <i>The mining methods selected and the basis, nature, and the appropriateness of mining parameters set by design, including pre-stripping, engineering, etc.</i> – <i>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.</i> – <i>The principal assumptions made and Mineral Resource model used for optimizing the pit and stope (if appropriate).</i> – <i>The mining dilution factors used.</i> – <i>The mining recovery factors used.</i> – <i>The minimum mining width used.</i> – <i>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to the Inferred Mineral Resources inclusion.</i> – <i>The infrastructure requirements of the selected mining methods.</i>
<p><i>Metallurgical factors or assumptions</i></p>	<ul style="list-style-type: none"> – <i>The metallurgical process proposed and the appropriateness to the style of mineralisation.</i> – <i>Whether the metallurgical process is well-tested technology or novel in nature and if novel, justification of its use in Mineral Reserves estimation.</i> – <i>The nature, quantity and representativeness of metallurgical test work undertaken, as well as the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.</i> – <i>Assumptions or allowances made for the deleterious elements.</i> – <i>Whether there exists any bulk sample or pilot test and the extent to which such samples represent the whole orebody.</i> – <i>For minerals that are defined by a specification, has the Mineral Reserve estimation been based on the appropriate mineralogy to meet the specifications?</i>

Criteria	Explanation
<i>Environmental</i>	<ul style="list-style-type: none"> – <i>The status of studies of potential environmental impacts of the mining and processing process. Details of the characteristic of the waste rock should be reported, as well as the potential dumping site and the design scheme of tailings dam and waste rock dumps should be considered; where applicable, the status of approvals for processing residual storage and waste dumps should be reported.</i>
<i>Infrastructure</i>	<ul style="list-style-type: none"> – <i>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labor, accommodation; The ease with which the infrastructure can be provided or accessed.</i>
<i>Costs</i>	<ul style="list-style-type: none"> – <i>The derivation or assumptions made regarding projected capital costs in the study.</i> – <i>The methodology used to estimate operating costs.</i> – <i>Allowances made for the content of deleterious elements.</i> – <i>Basis for exchange rates used in the study.</i> – <i>Derivation of transportation costs.</i> – <i>Forecasting basis or data source for treatment and refining costs, as well as penalties for failure to meet specification requirements, etc.</i> – <i>The payable share or amount of owner’s interests, after allowances made for royalties payable, both government and private.</i>
<i>Revenue factors</i>	<ul style="list-style-type: none"> – <i>The derivation or assumptions made regarding revenue factors, including head grade, metal or mineral commodity price(s), exchange rates, transportation and treatment costs, penalties, net smelter returns (NSR), etc.</i> – <i>The basis for assumptions made for metal or mineral commodity price(s) of the principal metals and co-products.</i>
<i>Market assessment</i>	<ul style="list-style-type: none"> – <i>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.</i> – <i>Analysis on the customers and competitors along with the identification of likely market windows for the product.</i> – <i>Prices and output forecasts and the basis for these forecasts.</i> – <i>For industrial minerals, the customer specifications, testing, delivering, and acceptance requirements prior to a supply contract.</i>

Criteria	Explanation
<i>Economics</i>	<ul style="list-style-type: none"> – <i>The input data used for calculating the net present value (NPV) in the study, as well as the source and confidence of these economic inputs, including estimated inflation, discount rate, etc.</i> – <i>Ranges of NPV and sensitivity to variations in the significant assumptions and inputs.</i>
<i>Social</i>	<ul style="list-style-type: none"> – <i>The status of agreements with key stakeholders and matters leading to the social license to operate.</i>
<i>Other</i>	<ul style="list-style-type: none"> – <i>Explain whether there exists any impact of the following items on the project and/or on the estimation and classification of the Mineral Reserves:</i> – <i>Any identified material naturally occurring risks.</i> – <i>The status of material legal agreements and marketing arrangements.</i> – <i>The status of governmental agreements and approvals that is critical to the viability of the project, such as mining permit, and governmental and statutory approvals. There must be reasonable grounds to expect that all necessary government approvals will be received within the timeframe anticipated in the Pre-Feasibility or Feasibility Study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the Mineral Reserves is contingent.</i>
<i>Classification</i>	<ul style="list-style-type: none"> – <i>The basis for the classification of the Mineral Reserves into varying confidence categories.</i> – <i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i> – <i>The proportion of Probable Mineral Reserves that have been derived from Measured Mineral Resources (if any).</i>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> – <i>The results of any audit or reviews of Mineral Reserve estimates.</i>

Criteria	Explanation
<p><i>Discussion on relative accuracy/ confidence</i></p>	<ul style="list-style-type: none"> <li data-bbox="351 220 999 491">– <i>Where appropriate, a statement of the relative accuracy and confidence level in the Mineral Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion on the factors that could affect the relative accuracy and confidence of the estimate.</i> <li data-bbox="351 499 999 627">– <i>The statement should specify whether it relates to global or local estimates, and, if local, state the tonnages relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i> <li data-bbox="351 635 999 762">– <i>Accuracy and confidence discussions should extend to Modifying Factors that may have a material impact on Mineral Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</i> <li data-bbox="351 770 999 898">– <i>It is recognised that this may not be possible or appropriate in all circumstances. These statements regarding the relative accuracy and confidence of the estimate should be compared with production data where available.</i>

Appendix 1

Guideline on Competent Person's Consent

Title and authors of the Technical Report.

Competent Person's name and position in his/her company, the company name and address.

Competent Person's registration information.

Competent Person's professional background, qualifications and relevant experience.

The work or service undertaken by the Competent Person, the details of the site visits, the description on the specific tasks that the Competent Person is responsible for.

Competent Person's statements:

1. I am a 'Competent Person' as defined in the CAMRA Code.
2. I believe that all significant facts or changes on the subject matter of the report have been reflected in the report and understand that the omission of any of these elements could result in the report being misleading.
3. I declare that this report appropriately reflects the Competent Person's/author's view.
4. I am dependent/ independent of [name of issuer].
5. I have read and understand the CAMRA Code and the Technical Report has been prepared in compliance with the CAMRA Code.
6. I do not have, nor do I expect to receive, a direct or indirect interest or any benefits from the [project/ mine in details] or [name of issuer] or I am an [employee/shareholder/director or other interest party] in respect of the issuer [name of issuer] or the project/mine.
7. At the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

(Venue)

(Date)

(Signed)

(Name of Competent Person)

Appendix 2

Guideline on Compliance Statements

For Public Reports on Exploration Results, initial or materially changed reports of Exploration Targets, Exploration Results, Mineral Resources or Mineral Reserves or company annual reports:

Appropriate forms of compliance statements should be as follows (delete the clause which does not apply):

‘The information in this Public Report is based on information compiled by [insert name of Competent Person]). The Competent Person is a Senior Member / Fellow of the CAMRA or a member / fellow of Recognised Professional Organisation (RPO).’

- If the Competent Person is a full-time employee of the company:
‘[name of Competent Person] is a full-time employee of the [name of company].’
- If the Competent Person is not a full-time employee of the company:
‘[name of Competent Person] is employed by [name of Competent Person’s employer].’
- The relationship between the Competent Person and the issuer should be fully disclosed together with the Competent Person’s details. This declaration should outline and clarify any issues that could be perceived by investors as a conflict of interest.

For all public reports:

‘[name of Competent Person] has sufficient experience that is relevant to the mineralisation and deposit under consideration and to the work that is being undertaken, and is qualified as the Competent Person defined by the CAMRA Code. [name of Competent Person] consents to be included in the Public Report the matters based on his/her information in the form and context of the Public Report.’

For the subsequent Public Report based on a previously issued Public Report that refers to the Exploration Targets, Exploration Results or estimation of Mineral Resources or Mineral Reserves:

Where a Competent Person has previously issued the written consent to the inclusion of their findings in a Public Report, a company re-issuing that information to the public whether in the form of a presentation or a subsequent announcement shall state the Public Report name, date and source of the original report for public access.

‘The information is extracted from the Public Report entitled [report title] issued on [date] and is

available for access on [website name]. The company confirms that it is not aware of any new information or data that can materially affect the information included in the original disclosure. In the case of estimation of Mineral Resources or Mineral Reserves, all material assumptions and technical parameters underpinning the estimation in the relevant disclosure continue to apply and have no material changes. The company confirms that the form and context in which the Competent Person's findings are presented and have not been materially modified from the original disclosure.'

Appendix 3

Guideline on Technical Report

Front page:

Name of Technical Report

Company or Institution that submits the Technical Report

Submit date of Technical Report

Title Page:

Name of Technical Report

Company or Institution that submits the Technical Report

Legal Representative of the company or institution that submits the Technical Report

Company or Institution that prepares the Technical Report

Legal Representative of the company or institution prepares the Technical Report

Responsibilities for preparing Technical Report

Responsibility	Name	Professional qualification	Main work	Signature
Data and information collecting and analysis				
Verification on the collected data and information				
Leading author				
Co-authors for each chapter or section				
Peer reviewers				

Effective date:

Compliance Statement Page

Competent Person Statement Page

A detailed summary of the due diligence

If due diligence has been carried out, provide the basic information and main conclusions of the due diligence in the form of a summary.

A detailed summary of the site visits

If site visits have been conducted, provide the basic information and main conclusions of the site visits in the form of a summary.

Disclaimer

Table of Contents

The technical report should show all the contents listed in Table 1, including diagrams and data form.

Technical reports must be accompanied by legible geological maps, the necessary plan maps, the sections and data tables. All geological maps, plan maps, sections should be prepared at an appropriate scale to distinguish important features. Maps must be dated and include a legend, author or information source, a scale bar or grid form, and an arrow indicating north. A Technical Report must be accompanied by a location map and a structure outline map. In addition, a Technical Report must include more detailed special maps that show all material features described in the text.

Executive Summary

Briefly summarize the important information in the Technical Report, including the location and concession certificate, exploration, development and operations, geology and mineralisation, the development conditions, the status of Mineral Resource and Mineral Reserve estimates, and the Competent Person's conclusions and recommendations.

Main Body

The main body shall follow the overall requirements in this Code upon Exploration Results, Mineral Resources or Mineral Reserves. The main content includes but not limited to the following:

1. Project Outline

Introduce the main contents on permit; project location and country; sources of basic data; site visits or field work involvement of the Competent Person; the information of other experts or third-party involved; disclaimers.

2. Transportation, Physiography, Climate, Local Resources

Topography, elevation, climate, transportation, fauna and flora, distance to the nearest city.

3. Project History

Concession, exploration and mining history, previous Mineral Resource and Mineral Reserve estimates, historical production.

4. Survey work and data information

The general review and comments on various exploration programs, data and information (geology, geophysics, geochemistry, mapping, trenching, drilling, sampling, assaying, etc), quality assurance and quality control (including internal and external check assays), database formation, data verification, sampling and assay results etc.

5. Geological Setting, Mineralisation Style and Deposit Types

Geological setting of mineralisation (regional geology and mineral deposit geology, mineralisation characteristics and main controlling factors, geological models, mineralisation style and deposit types).

6. Processing and Beneficiation

Processing, beneficiation, recovery rate.

7. Mining Technical Conditions

Hydrogeology; geotechnical and other mining conditions; environmental geology.

8. Study on economic extraction prospects

It is necessary to make sure the reasonable prospects for economic extraction of resources by Scoping Study or its equivalent technical and economic study. Only those that have a “reasonable prospects for economic extraction” can be considered as the Mineral Resources, that is, “reasonable prospects for economic extraction” is the basic criterion to determine the parameter of Mineral Resource estimates.

9. Mineral Resource Estimate

Estimate and modelling techniques, key assumptions, parameters, and methods. Mineral Resource classification criteria, reasonable prospects for economic extraction, Mineral Resource statement, comparison to previous estimates.

10. Modifying Factors and feasibility evaluation

To study the Modifying factors, including mining design and scheduling, evaluation of processing and metallurgy, project infrastructure, market research and contracts, environmental impact studies, legal and permitting, taxes and fees, social or community influence, risk analysis, capital and operating costs, economic analysis, policy analysis etc.

11. Mineral Reserve estimate

Mining method summary, key assumptions, parameters, and methods; Mineral Reserve classification criteria; Mineral Reserve statement; mining risks assessment.

12. Conclusions and Illustration

Summarize the relevant results and illustrate the issues being reported.

13. Recommendations

Provide recommendations on further work.

14. Risk warning

15. References

List all references cited in the Technical Report.

16. Appendices

Attach any supporting information.