# Sediment-hosted copper

**Province:** **Basin**

**Potential:** **Certainty:**

**Notes:**

| Critical Elements (Assessment Criteria) | Identified | Not Identified, but likely | Unlikely | Weig |
|---|---|---|---|---|
| **Setting** | | | | |
| • Intracratonic rift. Fault bounded graben/trough, or basin margin or epicontinental shallow-marine basin near palaeo-equator. | | | | |
| • Sedimentary basin with red-bed sandstone sequences, with anoxic sequence of carbonaceous pyritic shales, green/grey shales, and sandstone overlying the red-bed sequence. | | | | |
| **Source (fluid, metal, energy)** | | | | |
| *Fluids*<br>• Evaporite deposits within basin.<br>• Metamorphism<br>*Metals*<br>• Labile constituents such as mafic rock fragments and minerals (eg. Hornblende, pyroxenes, biotite) in the red beds are the most likely source of the metals (Cu ,Co).<br>*Energy*<br>• Diagenesis<br>• Fluid circulation driven by gravity, hydrostatic head or tectonic activity | | | | |
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| **Fluid pathway** | | | | |
| • Permeable, aquifers - red-bed sandstones and/or fault zones.<br>• Sandstone aquifers adjacent to basement highs. Basement high localises the fluid pathway.<br>• Fault zones | | | | |
| **Trap (any of the following)** | | | | |
| • Reductants such as pyrite, carbonaceous material, $H_2S$ or hydrocarbons<br>• Reducing conditions could be provided by upward moving $H_2S$ or 'sour gas' from underlying oil, gas fields.<br>• Permeable zones proximal to basement highs. | | | | |
| **Signs of mineralising process (any of the following, but if occurrences have been identified the level of certainty increases)**<br>• Presence of copper mineralisation over broad areas within (or adjacent to) the sedimentary basin<br>• Known deposits of sediment hosted copper<br>• Geochemical and geophysical signatures. | | | | |
| • Palaeoproterozoic (post 2.3 Ga) to Neoproterozoic (especially in Australia). Also Phanerozoic (mainly Permian but as young as Miocene overseas). | | | | |
| **Preservation** | | | | |
| • Maintenance of reduced state of host rock essential to preserve the deposit. | | | | |

Kirkham, R.V., 1996: Sediment-hosted stratiform copper; in Geology of Canadian Mineral Deposit Types, (ed.) O.R Eckstrand, W.D.Sinclair & R.I. Thorpe; Geological Survey of Canada, Geology of Canada, no. 8, p. 223-240.