

Table 1.1: Chemical impacts of different types of mining and mineral processing operations.

Operation Type	Chemical Treatment on Site?	Acidity	Alkalinity	Radioactivity (U, Th, Ra)	As	Hg	Heavy Metals	CN
Diamond (kimberlite)	Yes	No	No	Sometimes	No	No	No	No
Diamond (alluvial)	No	No	No	Sometimes	No	No	No	No
Gold / Silver (mine)	Yes	Yes	No	Yes	Sometimes	No	Sometimes	Yes
Gold (alluvial workings)	Yes	No	No	Sometimes	No	Yes	Sometimes	No
PGE Mine	Yes	Yes	No	Sometimes	No	No	Yes	No
PGE Smelter	Yes	Yes	No	Sometimes	No	No	Yes	No
Iron (mine)	No	Yes	No	No	No	No	Yes	No
Iron (furnace)	No	Yes	No	No	No	No	Yes	No
Chrome (mine)	No	No	Yes	Sometimes	No	No	Yes	No
Chrome (small scale working)	No	No	Yes	Sometimes	No	No	Yes	No
Chrome (smelter)	Yes	Yes	No	Sometimes	No	No	Yes	No
W (mine)	No	No	No	Yes	No	No	Yes	No
Ni-Co (mine)	Yes	Yes	No	Sometimes	Sometimes	No	Yes	No
Ni-Co (smelter)	Yes	Yes	No	Sometimes	Sometimes	No	Yes	No
Copper (mine)	Yes	Yes	No	Sometimes	No	No	Yes	No
Copper (smelter)	Yes	Yes	No	Sometimes	No	No	Yes	No
Pb, Zn, Sb or Sn (mine)	Yes	Yes	No	No	No	No	Yes	No
Pb, Zn, Sb or Sn smelter	Yes	Yes (Zn)	No	No	No	No	Yes	No
Dimension Stone (quarry)	No	No	No	No	No	No	No	No
Coal (mine or open pit)	No	Yes	No	Sometimes	No	No	No	No
Coking Plant	No	Yes	No	Sometimes	No	No	No	No
Sulphur / Pyrite	Yes	Yes	No	Sometimes	No	No	Yes	No
Manganese	No	No	Sometimes	No	No	No	Sometimes	No
Vanadium	Yes	Yes	No	No	No	No	Yes	No
Phosphate	Yes	Yes	No	Sometimes	No	No	Sometimes	No
Andalusite	No	No	No	No	No	No	No	No
Fluorspar	Yes	No	Sometimes	No	No	No	No	No
Other Industrial Minerals (quarry)	No	No	Sometimes	Sometimes	No	No	No	No
Vermiculite	Yes	No	Sometimes	Sometimes	No	No	No	No
Chrysotile asbestos	Yes	No	Sometimes	Sometimes	No	No	Sometimes	No
Gemstones (mine or open pit)	No	No	No	No	No	No	No	No
As, Bi, Cd, Hg, Sb	Yes	Yes	No	Sometimes	Sometimes	Sometimes	Yes	No
Other minor metals	Sometimes	Yes	No	Sometimes	No	No	Sometimes	No

Table 1.2: Physical impacts of different types of mining and mineral processing operations.

Operation Type	Salinization	Siltation	Water Use	Area Affected	Large Pits	Diversion s	Deveget.
Diamond (kimberlite)	Possible	Yes	Medium	Local	Locally	Locally	No
Diamond (alluvial)	Possible	Yes	Medium	Local	Locally	Yes	Yes
Gold / Silver (mine)	Possible	Yes	High	Local	Locally	Locally	No
Gold (alluvial workings)	Possible	Yes	Low	Regional	Locally	Yes	Yes
PGE Mine	Possible	Possible	Medium	Mine environs	No	No	No
PGE Smelter	Possible	Possible	Low	Local	No	No	No
Iron (mine)	Possible	Possible	Medium	Local	Yes	No	No
Iron (furnace)	No	No	Medium	Local	No	No	No
Chrome (mine)	No	No	Medium	Mine environs	Locally	No	No
Chrome (small scale working)	No	Yes	Low	Regional	Locally	No	Yes
Chrome (smelter)	No	No	Medium	Local	No	No	No
W (mine)	Possible	Possible	Low	Mine environs	Locally	Locally	No
Ni-Co (mine)	Possible	Possible	High	Mine environs	Yes	Locally	No
Ni-Co (smelter)	No	No	Medium	Local	No	No	No
Copper (mine)	Possible	Possible	High	Mine environs	Yes	Locally	No
Copper (smelter)	No	No	Medium	Local	No	No	No
Pb, Zn, Sb or Sn (mine)	Possible	Possible	High	Mine environs	Locally	Locally	No
Pb, Zn, Sb or Sn smelter	Possible	Possible	Low	Local	No	No	No
Dimension Stone (quarry)	No	Yes	Low	Local	Yes	Yes	Yes
Coal (mine or open pit)	Yes	Possible	Medium	Local	Yes	Yes	No
Coking Plant	Possible	Possible	Low	Local	No	No	No
Sulphur / Pyrite	Possible	Possible	Medium	Local	No	No	No
Manganese	No	Yes	Medium	Mine environs	Yes	No	Yes
Vanadium	Yes	Yes	High	Regional	Locally	No	No
Phosphate	Yes	Yes	High	Regional	Yes	No	No
Andalusite	No	Yes	Low	Local	Locally	No	Locally
Fluorspar	Yes	Possible	Low	Local	Locally	No	No
Other Industrial Minerals (quarry)	Possible	Possible	Low	Mine environs	Yes	Locally	Locally
Vermiculite	Possible	Yes	Low	Mine environs	Locally	No	Locally
Chrysotile asbestos	Possible	Yes	Low	Mine environs	Locally	No	No
Gemstones (mine or open pit)	Possible	Possible	Low	Mine environs	Locally	Locally	Locally
As, Bi, Cd, Hg, Sb	No	Possible	Low	Local	Locally	Locally	No
Other minor metals	No	Possible	Medium	Mine environs	Locally	Locally	No

Table 1.3: Criteria for classification of impact size / significance for different types of mine and/or mineral processing operation.

Operation Type	High Impact	Medium Impact	Low Impact
Diamond	None	Over 20,000 t p.a. worked or alluvial	Other
Gold / Silver (mine)	Over 20t produced AND/OR Arsenic AND/OR Antimony present	Other	None
Gold (alluvial workings)	All	None	None
PGE Mine	Over 100kg produced	Over 10 kg produced	Other
PGE Smelter	All	None	None
Iron (mine)	None	Over 2 Mt produced	Other
Iron (furnace)	None	All	None
Chrome (mine)	None	Over 1 Mt produced	Other
Chrome (small scale working)	None	Continuous seam mining	Other
Chrome (smelter)	All	None	None
W (mine)	None	None	All
Ni-Co (mine)	AMD or Arsenic possible	AMD or As unlikely, over 10,000 t produced	Other
Ni-Co (smelter)	All	None	None
Copper (mine)	Over 50,000t produced	Over 30,000 t produced	Other
Copper (smelter)	All	None	None
Pb, Zn, Sb or Sn (mine)	AMD possible and/or Sb present	AMD unlikely, Pb or Zn and/or Sb possible OR over 10,000 t produced	Other
Pb, Zn or Sn smelter	All	None	None
Dimension Stone (quarry)	None	Large operators present	Other
Coal (mine or open pit)	Over 10Mt produced	Other	None
Coking Plant	None	All	None
Sulphur / Pyrite	All	None	None
Manganese	None	Over 100,000 t p.a. produced	Other
Vanadium	AMD possible and Va contamination of ground water and/or surface water	AMD present, no contamination of ground or surface waters	Other
Phosphate	Over 50,000 t p.a. produced	Over 5,000 t p.a. produced	Other
Andalusite	None	Large operators present	Other
Fluorspar	Fluoride contamination of seepage	Fluoride in dust; no seepage	Other
Other Industrial Minerals (quarry)	AMD possible	Over 500,000 t produced	Other
Vermiculite	Large operators present	Over 50,000 t p.a. produced	Other
Chrysotile asbestos	None	Over 5,000 t p.a. produced	Other
Gemstones (mine or open pit)	None	More than 1,000t produced OR alluvial deposit	Other

As, Bi, Cd, Hg, Sb	All	None	None
Other minor metals	None	AMD possible OR over 1,000t produced	Other