Project 14 - Major mining, on-site extraction and processing of metal ores or coal

Comments: This can be both open pit and underground mines.

CATEGORY	FACTOR	COMMENTS
AIR	carbon monoxide (CO)	greenhouse gases, reference 1
	carbon dioxide (CO2)	
	cyanides	hazardous substances, hazardous waste constituents, priority toxic pollutants, human health, aquatic life
	chlorine (Cl) and compounds	hazardous substance, poison, toxic, aquatic life, human health, reference 3
	heavy metals:	others may be present depending on the composition of the ore, and the ore being mined, reference 2
	lead (Pb)	toxic, metabolic poison
	mercury (Hg)	natural vegetation, human health, fauna
	nickel (Ni)	carcinogen, hazardous substance, hazardous waste constituents, priority toxic pollutant, human health, aquatic life
	zinc (Zn)	carcinogen, hazardous substance, hazardous waste, priority toxic pollutant, human health, aquatic life, flora, fauna
	copper (Cu)	destroys agricultural crops
	cadmium (Cd)	carcinogen, priority pollutant, hazardous substance, flora, fauna, human health
	hydrogen cyanide	hazardous substance, hazardous waste, poison gas, flammable gas, human health, reference 3
	hydrogen fluoride	hazardous substance, hazardous waste, corrosive material, human health
	hydrogen sulphide	hazardous substance, hazardous waste, flammable gas, poison, human health, aquatic life
	persistent organic pollutants	reference 4
	poly-aromatic hydrocarbons (PAH)	carcinogenic, hazardous waste, priority toxic pollutant, human health, flora, fauna, aquatic life
	methane (CH4)	explosive, climate affecting, reference 1
	mercaptans	human health, odour
	non-methane volatile organic compounds (NMVOC)	greenhouse gases, volatile, flora, human health, aquatic life, reference 1
	oxides of nitrogen (NOx) / NxO	acid rain, flora, human health, aquatic life, reference 1
	oxides of sulphur (SOx)	
	phosgene	hazardous substance, hazardous waste, poison gas, human health, no criteria set for water, reference 3
	other hazardous substances	human health
	particle emissions	human health, climate change, historical sites
	oil vapour	
	odour	human health
	noise	
	vibration	
	steam (waste heat)	climate change
WATER	chlorides	hazardous substance, poison, aquatic life, human health
	cyanides	hazardous substances, hazardous waste constituents, priority toxic pollutants, human health, aquatic life
	chlorine (Cl) and compounds	hazardous substance, poison, toxic, aquatic life, human health, reference 3
	heavy metals:	others may be present depending on the composition of the ore, and the ore being mined, reference 2
	lead (Pb)	toxic, metabolic poison

CATEGORY	FACTOR	COMMENTS
	mercury (Hg)	natural vegetation, human health, fauna
	nickel (Ni)	carcinogen, hazardous substance, hazardous waste constituents, priority toxic pollutant, human health, aquatic life
	zinc (Zn)	carcinogen, hazardous substance, hazardous waste, priority toxic pollutant, human health, aquatic life, flora, fauna
	copper (Cu)	destroys agricultural crops
	cadmium (Cd)	carcinogen, priority pollutant, hazardous substance, flora, fauna, human health
	nutrients	water quality, aquatic life
	tars	water quality, aquatic life, human health
	other hazardous substances	
	suspended solids	water quality, aquatic life
	dissolved solids	
	total solids	
	dissolved oxygen	
	temperature	
	change in pH	
	colour	
	odour	
	tailings pond slurries	
	lowering of ground water level for mining purposes	water quality, aquatic life, flora
CLIMATE	changes in ambient air temperature	
	particle emissions	
	mists	
	greenhouse gases	CO, CO2, NOx, NxO, SOx, nmVOCs
FLORA	changes in natural vegetation	emissions, project location, water level
	disturbance of aquatic habitat	
	disturbance of plant habitat	
	disturbance of natural vegetation	
	decrease in biodiversity	emissions, project location
	impact of threatened species	emissions, project location, water level
	changes in species population	
	changes in aquatic food web	
	changes in mammal food web	
	impact on protected areas	
FAUNA	migratory changes - birds	pollutants, project location
	migratory changes - mammals	
	disturbance of wildlife habitat	
	decrease in biodiversity	
	impact on threatened species	
	changes in species population	
	impact on threatened area	
	changes in mammal food web	
SOIL	soil acidification	heavy metals, other pollutants
	soil contamination	
	erosion	changes in natural landscape
	changes in moisture content	changes in water table
	wastes /by-products	

CATEGORY	FACTOR	COMMENTS
LANDSCAPE	land use changes	
	visual aspects	
	physical composition	
	impact on sensitive lands	
	surface requirements - open pit	relocation of settlements, rivers etc
	subsidence	damage to buildings, monuments, roadways, water courses
	tilt of surface	damage
	dump zones from washery tailings	water, soil, human health, flora, fauna
HISTORICAL MONUMENTS	changes to historical sites	acid rain, soiling, staining
	palaeontological sites	
	archaeological sites	
HUMAN HEALTH & SAFETY	changes in ambient noise levels	
	changes in disease incidence	lung disease, blood disorders, respiratory disease, cancer
	deterioration of general state of health	
	risk of spills	
	risk of surface water contamination	
	risk of ground water contamination	
	risk of explosions	
CULTURAL HERITAGE	cultural changes	
	land use changes	
	way of life	
	resettlement of homes, towns	
	re-routing of roadways, rivers, streams	
SOCIO-ECONOMIC	changes to well being of life	
	changes to quality of life	
	quality of recreational facilities	
	quantity of recreational facilities	
	present use of natural resources	
	potential use of natural resources	
	employment opportunity	
	economic development - transboundary	

References

1. Proceedings of the EMEP Workshop on Emission Inventory Techniques, Regensburg, Germany, 2-5 July, 1991, EMEP/CCC-Report 1/91
2. Economic Commission for Europe Convention of Long-range Transboundary Air Pollution, Task Force on Heavy Metal Emissions, June 1994
3. Economic Commission for Europe, Convention on the Transboundary Effects of Industrial Accidents
4. Economic Commission for Europe, State of Knowledge Report of the UN ECE Task Force on Persistent Organic Pollutants
5. Recommendations to ECE Governments on the Prevention of Water Pollution from Hazardous Substances