

What is open-cut mining?

Every day millions of items are used that have been made from minerals. From an iPod to computers to electric cars these items are made by mining and processing minerals into metals and other materials.

Open-cut mining is one method used to extract these minerals from the earth.

Open-cut mining is used when the minerals are found over a large area and relatively close to the surface. The open cut mine is dug downwards in benches or steps which slope towards the centre of the pit. To uncover the minerals the land is first cleared of vegetation as when a new building like a house, school, factory or shop is constructed but in the case of open-cut mining, the top soil is removed and stockpiled for later use in the rehabilitation process.

Once the topsoil has been removed, if the next layer is waste rock, this is also removed and placed in a spoil pile for either later use to fill the pit or to use in new land forms. From there the mineralised ore is removed. Explosives are used to break the ore which is then scooped up by front end loaders or electric shovels, loaded onto large trucks and taken to the processing plant.

Mining continues until the pit becomes too deep, too expensive or too difficult to mine by this method. Zinc, copper and coal are just some of the mineral resources mined by open-cut mining.

How are the impacts of open-cut mining managed?

During and after mining, the land undergoes various stages of rehabilitation. Waste rock dumps can be covered with topsoil and revegetated while after mining the pit or void can be filled in, using waste rock or it can be used as a water catchment area as a lake or dam.



Open-cut mining Ernest Henry Copper and Gold Mine, Cloncurry
Source: Xstrata Copper

Sometimes a new industry can be created from the pit as in the case of aquaculture or the local community may request the pit be used for

another purpose such as motor cross. Tailings is the waste material left over after the mineral has been extracted from the ore. It is usually composed of fine dust and remains of chemicals. This material is deposited in a tailings dam which is then layered with clay, topsoil and vegetation.

Monitoring of this area occurs after mining has finished.



Open-cut coal mining Bowen Basin Central Queensland
Source: Qld Resources Council

Impact	Steps taken to reduce impacts
The land is changed significantly as a result of open-cut mining.	Top soil is removed and reused later in rehabilitation. Land forms are recontoured to resemble the natural landscape.
Large pits are created from open-cut mining.	Pits can be filled in, used as storage areas for water or other uses as determined by consultation with the local community.
Waste rock is generated from mining.	Waste rock is collected in stockpiles, which are later contoured, covered with topsoil and revegetated.
Tailings or waste from mineral processing is collected in tailings dams.	Tailings dams can eventually be covered with clay, topsoil and revegetated. Monitoring of the tailings occurs post mining.
Dust is emitted from tailings dams, open-cut mine stockpiles and trucks carrying ore.	Water trucks using recycled water whenever possible are used on mine sites to suppress the dust.
Vehicles on mine sites emit greenhouse gases.	Vehicles with more efficient engines that use less fuel can be used.

Links

Find out about [careers](#) in the open-cut coal mining industry.

Last updated February 2010.