

Open Pit Mining



Open pit mining is used to extract ore in rock bodies that are at or close to the surface of the Earth. Large-scale equipment - drills, shovels, and trucks - are used to make operations efficient and economical. When they move in, the ore is dug up and sent to a mill for processing and reclamation procedures are initiated.



1 – In an open pit operation a rotary drill is used to drill holes that are ~30cm in diameter and ~15m deep. The holes are commonly filled with ANFO (short for ammonium nitrate fuel oil) explosives.



2 – The blast pattern – drill hole location and spacing and location - depends on the type of rock mined and overall mine plan. The depth of the hole will determine the height of the bench in the pit, generally 12-13m.



3 – Blasting! Explosives in the drill hole are detonated, breaking up the rock into smaller pieces that can be transported for further processing. Depending on the size of the mine, availability of equipment, and capacity of the mill, blasting may be scheduled every day or every 2-3 days.



4 – Large electric or hydraulic shovels scoop up blasted rock and load into haul trucks. Today trucks are very large, carrying 80-200+ tonnes per load. It may take only 2-3 shovels full to load a haul truck, then an empty one is ready to take its place.



5 - Haul trucks loaded with ore transport it to a primary crusher which crushes the ore to pieces less than 30 cm.



6 - There are different styles of primary crushers (e.g. jaw, gyratory, cone) which all use heavy steel parts that move together to break up the rock. Crushed ore must be hauled by truck or conveyed to a mill for further processing.



7 - Haul trucks also transport waste rock from a blast out of the pit to a waste rock dump.



8 – The location of waste rock dumps is determined in the original mine design. They are generally located on the margins of an active pit, but later on can be situated in an inactive pit, as shown here.



9 – Waste rock dumps are built up to specific dimensions. When reached that size and shape, they must be reclaimed ([hyperlink to Mine site reclamation](#)), re-sloped if necessary and re-vegetated.