## 8.4 5G

5G is the future. The benefit of using 5G has been introduced in section 3.13. It is possible to use 5G to cover surface and the underground mine. One network can meet all requirements. A simple 5G network for underground mine is depicted in figure ?. The underground part has three levels.

The Base Band Unit (BBU) is located on surface. The BBU is connected to Remote Radio Unit (RRU) in underground, each level deploys one RRU. For a short tunnel (less than 100m, such as the tunnel on the left hand side of level 3), RRU can directly cover the whole area. For a long tunnel, Bi-directional Amplifier (BDA) is needed. Power injector is also required to provide the power to BDA through the leaky feeder cable. In that way, the whole underground mine can be covered by a 5G network. BBU and RRU are all need power supply.

For a more complicated scenario, each level can deploy one BBU, and each BBU can connected to several RRU, with the extension of the antenna using leaky feeder cable, everywhere underground can be covered.

