

Case Study

Dam Monitoring Tailings Dam Santiago, Chile

GeoSIG
swiss made to measure

In Cooperation With
GeoSIG Partner

GeoMediciones
Instrumentación de Obras Civiles

Background

Anglo American plc is a multinational mining company that is one of the world's largest producers of copper.

Los Bronces is Anglo American's open-cut copper and molybdenum mine — one of the largest copper reserves in the world, located approximately 65 km northeast of Santiago, Chile, at an altitude of around 4,000m above sea level in the Andes Mountains. After being crushed, the ore is fed by conveyor to a grinding plant at Confluencia. After being made into slurry, the product is transported by pipeline to Las Tórtolas — a flotation plant, where it is processed. Las Tórtolas is located 45km from Santiago at about 750m above sea level. This complex also includes a tailings dam, which is used to store by-products of mining operations. The dam was recently raised as part of the complex's expansion, allowing more recycled water to be used in production. Management and storage of mine process waste is an important aspect to the design and operation of a mine. This is why Anglo American sought to install a seismic network for their tailings dam.

Challenge

Chile is in the Ring of Fire. As a consequence of the March 1965 earthquake, the Chilean authorities issued in 1970 a norm to regulate the design, construction, and operation of sand tailings dams (Decree No. 86). This norm required deployment of strong motion instrumentation on tailing dams. The object of this project was to monitor the behaviour of the main wall (Muro Principal) of the Las Tórtolas tailings dam as well as a second wall to the west (Muro Oeste).

Solution

Our Partner, GeoMediciones of Chile (www.geomediciones.cl), with more than 43 years experience in the industry, is a leader in civil works instrumentation and an integrator of solutions and technologies. They have achieved a strong position in seismic monitoring systems and associated solutions in Chile and the surrounding region.

Installing a seismic network enables the two walls to be monitored with data transferred to the intranet of the company so that essential people (with the right permissions) can gain access to the data event at real time.

For the main wall, a GMSplus and AC-73-DH were installed; they transfer the data to an instrumentation server located in the main wall booth ("Caseta Muro Principal") by Wi-Fi. On "Muro Oeste", AC-73 and AC-73-DH are connected by cable ethernet to the instrumentation server, which in turn is connected to the company's intranet by fiber optic. From the data server located in the server room in the IT office, GeoDAS software downloads any new data from the instrumentation server, then shares the event files on a Share Point, which is only accessible from the company's intranet (and by the client, via VPN). GeoDAS is a graphical Microsoft Windows-based application. It provides the most comprehensive, intuitive and versatile features available in the earthquake, seismic, structural, dynamic and static monitoring and measuring industry. Fundamentally the program is used for instrument configuration and for acquisition of data provided by any standard GeoSIG instrument.

Another solution using GeoSIG instruments, effectively showing that quality and reliability can also be cost-effective.

Product links

[GMSplus](#)

[AC-73](#)

[AC-73-DH](#)

[GeoDAS](#)



The main wall and west wall of the tailings dam are continually monitored.



Las Tórtolas is a flotation plant located 45km from Santiago at about 750m above sea level. This complex also includes a tailings dam, which is used to store byproducts of mining operations. Satellite image (above) and map (below) by Google maps.

