RITE GEOSYSTEMS

ENCARDIO RITE METASENSING FOR MEGA STRUCTURES

Project Dossier

PROJECT DOSSIER

MURI ALUMINA REFINERY

RED MUD DYKE-SLOPE MONITORING

PROJECT OVERVIEW

In the Alumina refinery plant at Muri, red mud (bauxite residue) generated from the plant is stored in a red mud pond lined with impervious clay to prevent leakage. The dykes of red mud pond are given a slope by earth filling to protect the dykes from erosion and to give stability to the dykes.
The dykes around the red mud pond required slope stabilization. For this, the dykes as well as the groundwater around the red mud disposal area required regular monitoring. Encardio-rite was entrusted the monitoring works for the slope monitoring as well as ground water monitoring.

Project	**Red Mud Pond of Muri Alumina Refinery - Hindalco Aluminium Plant**
Location	Ranchi, Jharkhand, India
Client	Hindalco Industries Limited
Duration	2021

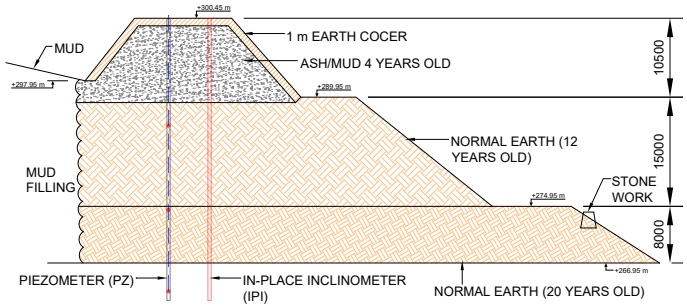
Monitoring solution

The real-time safety monitoring of red mud pond/dyke involved instrumentation to provide immediate warning for slope stability and ground water pressures.

Turnkey services

Encardio-rite was awarded the sub-contract for monitoring works of the project. Scope of works included:

- Supply and installation of geotechnical instruments as per approved drawings & methodology, specifications for work and instructions of Hindalco's Project Manager
- Supply and commissioning of wireless (GSM/GPRS) data logger
- Monitoring and reporting in initial phase
- Real time database management system



TYPICAL CROSS SECTION FOR RED MUD DYKE

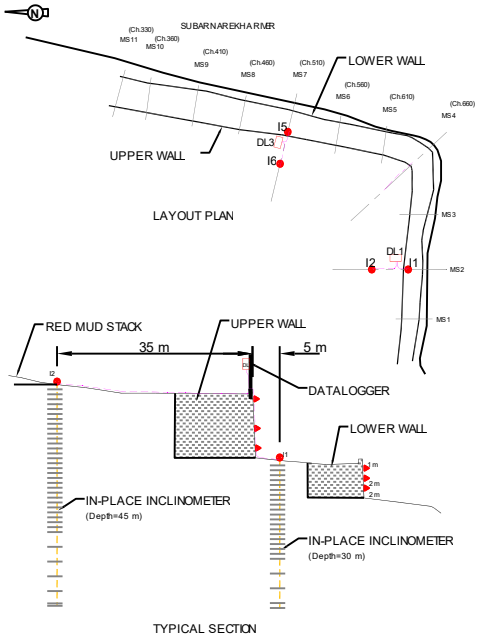
Typical schematic showing slopes of red mud dump (dyke), with In-place inclinometer and piezometer location

INSTRUMENT USED

- **In-place Inclinometer** for monitoring sub-surface lateral movement/deformation surrounding slope of dyke.
- **Piezometer f**or monitoring sub-surface water pressures at different depths, for slope stability evaluation
- Portable readout units
- **Datalogger** to collect data from all of the above instruments and transfer to central server

Over hundred IPI sensors were used for monitoring slope stability. The gage length of the sensors were decided depending on the borehole location, dyke height and depth up to which the movement was expected. Sensors were placed at 1 m gage length up to the depth of 20 m to 30 m. Below this depth, sensors were placed at 3 m gage lengths. A typical layout of IPI and Piezometer is shown in adjacent schematic. All the instruments were installed successfully and are giving reliable data at pre-set frequency.

Monitored data is available online through Encardio-rite's in-house developed DRISHTI, a web based data management system. The data is available in near real time to the stakeholders on their laptops and mobile phones.



TYPICAL SECTION

Typical layout showing locations of IPI

In-place inclinometers being installed at red mud pond/dyke area of Muri Alumina Refinery

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Encardio-Rite Electronics Pvt. Ltd. A-7, Industrial Estate, Talkatora Road, Lucknow, UP-226011, India | geotech@encardio.com | T: +91 522 2661039-320