Geotechnical and Hydrological Challenges in Neyveli Lignite Mines, Tamil Nadu – N. Periyasamy Formerly General Manager/Geology Dept, NLC India Limited (*E: periyasamy.nlc@gmail.com*)

Neyveli is situated in the Cuddalore district of Tamil Nadu, 200 kms south of Chennai. The Government of India in 1956 formed Neyveli Lignite Corporation Limited (NLC) for commercial exploitation of lignite presently named as NLC India Ltd., a NavRatna company. Since then NLC has achieved the objectives it had set for itself fulfilling its Corporate mission to be the leader in the industry. Comprising of three opencast mines and four pit head Thermal Power Stations., NLCIL's growth is sustained and its contribution to India's development - social & economic - is significant.

Mining is the central activity of NLCIL and lignite is the basic raw material for power generation. Mining was primarily manual at the earlier stages. As the mineral requirement grew mechanization was required to achieve higher output. Opencast mining offers the possibilities of higher output through the deployment of large machineries. NLC's total lignite mining capacity stands as on date as 28.5 MT/annum and power generation capacity as 2990MW.

For removal of overburden, lignite of Neyveli permits NLCIL to deploy BWE with localized blasting of overburden. The lignite production mainly depend on the removal of overburden soil of 80 to 100 mt above lignite seam. To feed lignite to power station we need continuous lignite production. Neyveli soil is very sticky and overlying strata contains water. Plying of dumpers will be difficult in these conditions. BWE-conveyor-spreader combination is most suitable for continuous production.

The lignite mines are located in the Neyveli hydro-geological basin. Detailed hydrological study has indicated the presence of three prominent multi-layered aquifers system in the area viz: i. Un-confined aquifer (water table aquifer), ii. Semi-confined aquifer above the lignite seam and iii. confined aquifer below lignite seam.

Mining of lignite from NLC's mines is faced with a unique hydrological problem due to the powerful aquifers existing below lignite seam exerting an upward pressure, if not controlled it could jeopardize the entire mining operations. Therefore, the depressurization of this aquifer is essential during mining to maintain the pressure head constantly at the lignite bottom through pumping operations from strategically located pumping wells established in the lignite mines/ excavation zone.

The removal of overburden and lignite production in Neyveli Lignite Mines facing certain geo-technical & hydrological challenges: (1) Sporadic boulders and thin band of hard ferruginous damages the BWE teeth/bucket. (2) Marcasite damages the BWE teeth/bucket and affect the production. (3) Alluvial clay chocks the bucket in the excavators during wet seasons. (4) Water oozing / seeping from the overburden benches will contribute to the failure of bench walls leading to slope stability problem. (5) Aquifer with a high confining pressure below lignite seam will exert heavy pressure and create "heaving" and "bursting" of the mine floor and ultimately leading to flooding in mine.

DOI: 10.1007/s12594-019-1315-5

ANNOUNCEMENTS

NATIONAL SEMINAR ON SEDIMENTATION, TECTONICS, MINERAL RESOURCES AND SUSTAINABLE DEVELOPMENT AND 36th CONVENTION OF INDIAN ASSOCIATION OF SEDIMENTOLOGISTS

Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy (DAE) proposes to organize a two day National Seminar on the theme "Sedimentation, Tectonics, Mineral Resources and Sustainable Development" in association with Indian Association of Sedimentologists (IAS) during November 7-8, 2019 at AMD, Hyderabad. The seminar will provide a platform to academicians, professors and researchers to come together on a common platform and discuss various issues concerning sedimentary process, mineral resources and its conservation for sustainable development. For further details, please contact Dr. D.K. Sinha, Additional Director (Op-1), Atomic Minerals Directorate for Exploration and Research (AMD), Department of Atomic Energy, 1-10-153-156, AMD Complex, Begumpet, Hyderabad - 500 016. Email: convener-36ias.amd@gov.in

INGWC-2020: THIRD INDIAN NATIONAL GROUNDWATER CONFERENCE

The Centre for Water Resources Development and Management (CWRDM) is organizing the 3rd Indian National Groundwater Conference (INGWC-2020) to discuss the 'Groundwater Resources Management for Sustainable Development with the Special Emphasis on Coastal and Urban Environment' at CWRDM, Kozhikode, Kerala, India during 18th to 20th February 2020 (Pre-conference workshop on 'Groundwater Modeling' will be held on 17th February). The seminar will have different themes and offer inter disciplinary plenary lectures, invited talks, parallel oral and poster presentations. The conference brochure is available at CWRDM website (http://www.cwrdm.org/3rd-indian-national-groundwater-conference-ingwc-2020). For further details, please contact: **C.M. Sushanth**, Convener, INGWC-2020, CWRDM, Kozhikode. Phone:+91-495-2351854 (O); +91-99447162144 (M); Email: ingwc2020@gmail.com. **Dr. M. Thangarajan**, Conference Advisor, INGWC-2020, Former Director Grade Scientist (SG), NGRI, Hyderabad. Phone: 91-9700217685 (M); Email: karvimrajan@gmail.com. **C. Mayilswami,** Secretary, AGGS. Phone: +91-9952446416 (M); Email: ceemayil@gmail.com.

"Printed by M. Nagaraju and Published by R.H. Sawkar on behalf of the Geological Society of India, No.63, 12th Cross, Basappa Layout, Gavipuram, Bengaluru - 560 019 and Printed at M/s Driti Enterprises, No.117/19. Cauverynagar Main Road, B.S.K. 3rd Stage, Bengaluru - 560 085 and Published at the Geological Society of India, No.63, 12th Cross, Basappa Layout, Gavipuram, Bengaluru - 560 019" – *Editor:* B. Mahabaleswar.