

**Project title:** Advice for Preparation of Strata Control and Monitoring Plan (SCAMP) for the Depillaring of XV/4-S Panel in XV Seam of Jamadoba Colliery, Tata Steel Limited

**Project No.:** CNP/4912/2019-20

**Executive Summary:** Extraction of 9.29m thick XV seam, at 1 & 2 Incline of Jamadoba Colliery of M/s Tata Steel Limited, has been planned in two lifts (3.0m in the bottom along floor and 4.5m in the top along roof) in conjunction with hydraulic sand stowing using SDLs, in panel no. XV/4-S. In this mine, the seam dips at 1 in 5 along N43°30'E. In XV/4-S panel, jhama and coal are mixed and the seam is developed along the floor into pillars of 33m × 35m centre to centre, with 4.2m wide and 2.4m height roadways. The depth of the bottom section development workings in this panel varies from 121m to 153m. The seam is overlain by virgin XVA seam of 0.55m thick at a parting of 47.65m and caved goaf of XVI seam at a parting of 88.41m. All underlying seams are virgins. The age of the bottom section workings of XV seams in the proposed depillaring panel is around nine years and the development was done by drilling and blasting method. The immediate roof consists of coal in the bottom section and carbonaceous shale in the top section. The adjusted RMRs of the carbonaceous shale roof and the coal roof are 58.5 and 45 respectively.

In view of the above, the mine management of Tata Steel Limited requested Director, CSIR-CIMFR, Dhanbad for advice to prepare the strata control and monitoring plan (SCAMP) for the extraction operation of XV/4-S panel at Jamadoba Colliery. Accordingly, the study has been undertaken for the preparation of SCAMP including stability analysis of the surrounding rock mass, support design, and effect of extraction on the overlying seam and on the surface.

Three-dimensional numerical modelling has been carried out to understand the stress regimes and the failure characteristics of the surrounding rock mass during extraction operation with hydraulic sand stowing. The modelling is done as per the lithology, the physico-mechanical properties and the geomining conditions provided by the mine management. The support system is designed based on the rock load heights of the immediate roof rock above the developed gallery, junction, split gallery and slice with

	<p>the help of safety factor (SF) contours in the roof of the openings from the results of numerical modelling. The anchorage strength of full column resin grouted bolt (1.8m grouted length) is considered as 16t. The safety factor of the support system is kept at more than 2.0. The strata control and monitoring plan is suggested with suitable geotechnical instruments. The details of the above are discussed in the respective sections of this report.</p>
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