

GEOLOGY OF LONGWALL 19A

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IMC Technical Services

Summary

Longwall 19A is planned to be developed for future extraction, including Maingate (MG) 19A¹ roadways between Wongawilli Creek and Sandy Creek in Dendrobium Area 3A and this panel is located immediately south of Longwall 19. Previous panels in Area 3A were developed from South Mains with Longwall's 6, 7 and 8 being extracted towards the east. MG19 was developed from Wongawilli Mains development panel to the east between 20 and 23 cut troughs (CT) with Longwall extraction planned towards the west. LW19A will have a similar geometry and orientation to LW19.

In general, the geology is reasonably well understood, although some geological features are known to occur to the south and west of Longwall 19A that are likely to affect mining operations. Extensive exploration activities have been undertaken to increase the understanding of geology in Dendrobium Area 3A. The Longwall 19A panel is covered by a significant amount of geological data along its entire length including:

- Numerous 2D seismic lines and surface geological mapping;
- Underground geological mapping; and
- Aeromagnetic and related remote sensing surveys.

Surface Vertical boreholes		Underground Inseam (UIS) boreholes
S1099	S1907	MG8-A11-IS3
S1388	S1934	MG8-A11-IS4
S1720	S2562	MG8-A19-IS6
S1722	S2563	MG8-A19-IS7
S1738	S2564	MG8-A19-IS8
S1879	S2566	MG19-B2-IS1 (multiple legs)
S1885		MG19-B2-IS2 (multiple legs)
S1887		MG19-B2-IS3 (multiple legs)
S1888		MG19-C9-IS1
S1890		MG19-C9-IS2 (multiple legs)
S1904		MG19-C9-IS3 (multiple legs)

¹ Refer to Longwall 19A Subsidence Management Plan – Plan 1 (DEN-01-8238A rev 0) for mine layout detail.

Additional surface drilling is planned and will add further confidence in the geology of MG19A.

STRUCTURE

From the geological data available for Longwall 19A, including from MG19 and South Mains, no significant faulting is expected. The panel is orientated mostly across strike and as such is expected to be relatively flat with the seam dipping gently to the northwest at dips of $\sim 2^\circ$. Seam elevations are 54 m above mean sea level (amsl) at MG19A panel entry from where the seam is expected to consistently and gently rise to a maximum of 72m amsl around the southeast corner of the proposed installation face.

The main geological structures that are expected to impact mining will be igneous in nature rather than fault related. The Dendrobium Nepheline Syenite sill largely determines the length of the LW19A block and even at the current planned length there are portions of sill expected to intrude into the MG19A gateroad development as well as the longwall block itself. Current in-seam and surface drilling data indicates the sill will be present in the upper sections of the Wongawilli Seam above the working section at the base of the seam over a large portion of the proposed panel. This area is shown in orange hatched polygon in Figure 1 below. However, the sill is expected to migrate down into the working section over portions of the LW19A panel and affect parts of the MG19A development panel between CT's 11-14 as well as the adjacent longwall block itself. This area is highlighted by the red hatched polygon in Figure 1 below. This intrusion has been exposed in several other locations at Dendrobium and has been successfully managed previously.

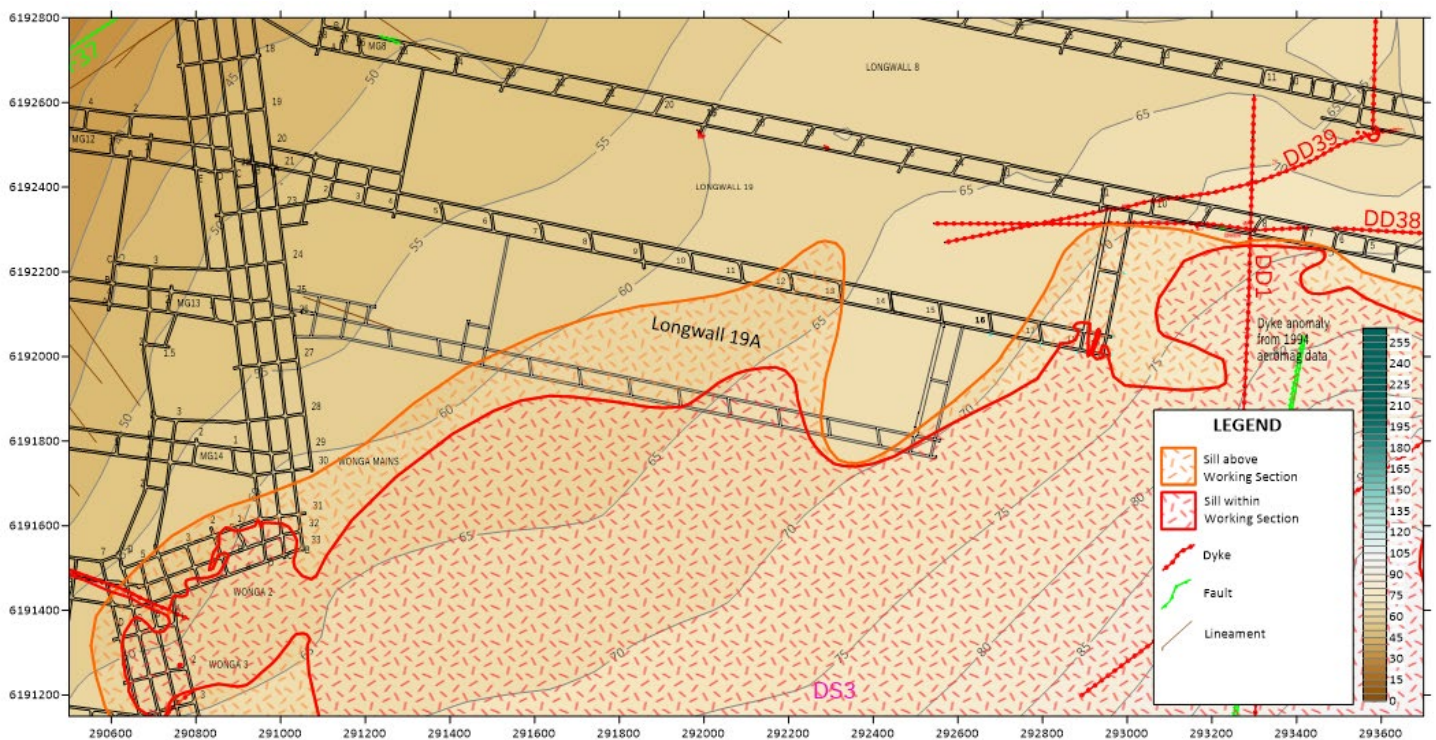


Figure 1 – Geological Structure and seam Floor Contours

Two thin dykes have been mapped in MG8, DD38 and DD39 and have been projected into the LW19 block but were not identified in MG19 so are not expected to be present in LW19A. DD1 is a prominent aeromag dyke but it occurs to the east of any proposed workings for LW19.

Mining conditions in MG19 have been excellent with little roof deformations and no significant roof falls. There is a prominent NW-SE joint orientation which is consistent for surface lineaments but these joints have no impact on roof conditions or water make.

DEPTH OF COVER

Depth of cover for the general area around LW19A ranges from 240 to 365 m, with the highest values in the center of the panel around 12-13 CT (Figure 2) and another high point towards the south western corner of the panel at around 7CT. Depths of cover then drop off to 240 m under Wongawilli Creek in the west, although the longwall panel is generally more than ~400m from the bottom of the creek. For the longwall panel itself the depth of cover ranges 285 to 360m.

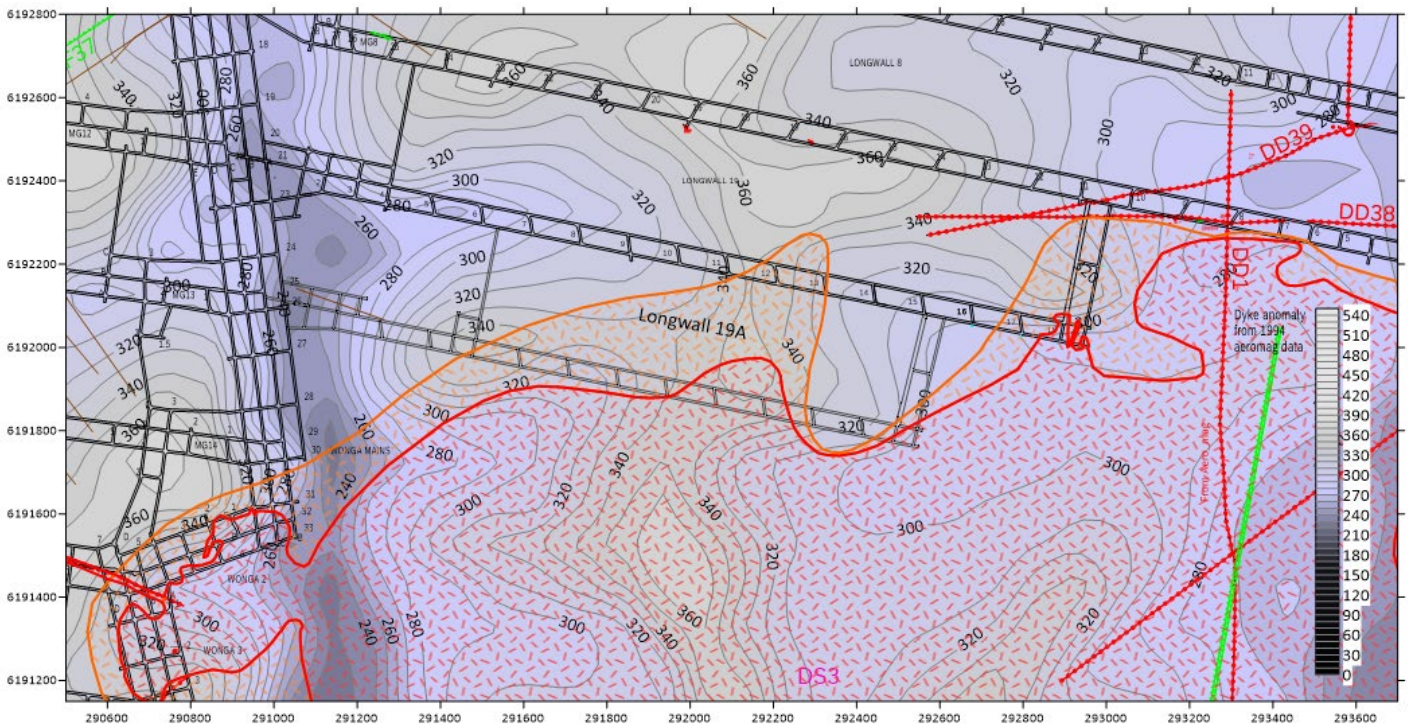


Figure 2 – Depth of Cover

SEAM THICKNESS

Seam thickness for MG19A is dependent on the chosen working section. The traditional working section is up to the 2nd Machine Band (WW2M) which in Area B is typically around 3.9m. In Area 3A this working section is thinner due to the lack of the basal WW12 ply in the working section, and ranges from 3.3 to 3.6 m. An additional coal ply occurs above the WW2M called the WW2L and this ply is being considered to be included as part of the working section for LW19A to compensate for the thinner seam thickness in Area 3A compared with Area 3B. Figure 3 below shows the working section thickness of the full working section (WF Section) option which includes the WW2L ply. The thickness ranges 3.9-4.1m when this ply is included. The thinner seam seen just south of MG19A is due to a sill intrusion in the working section.

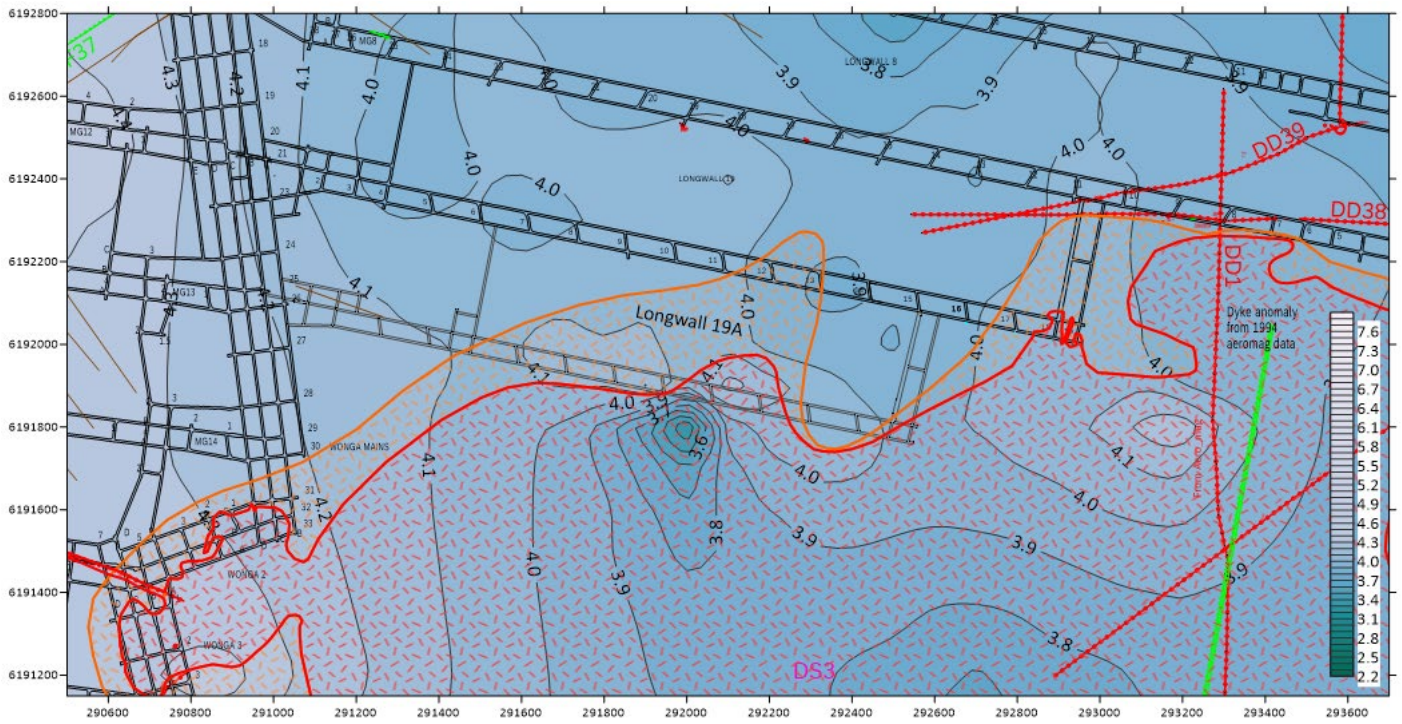


Figure 3 – Seam Thickness (WF Working Section)

CONCLUSION

The level of geological structure present within the Longwall 19A block is expected to be low from the exploration data currently available. Mining conditions are expected to be similar to those previously experienced in Area 1, 2, 3A and 3B but some impacts from the Dendrobium Nepheline Syenite sill are expected for a central portion of the panel where the sill occurs in the working section. Minor impact may be seen from areas where the sill is present in the upper portions of the Wongawilli seam above the working section. Some additional surface drilling is planned to add to the understanding of this sill. Other than the sill no other faults or dykes have been identified.