

Mount Marrow

Mine Remediation Trial on the Caledonian No.3 Colliery in Mt Marrow, QLD.



150+

Total Lineal Meters Drilled

6

Boreholes Investigated

27 m

Maximum Drilling Depth

3

Days of Investigation

PROJECT OVERVIEW

The Mount Marrow trial investigated abandoned underground mine workings beneath a proposed residential development at 433 and 435 Thagoona Haigslea Road, Mount Marrow, Queensland. The site is underlain by the Caledonian No.3 Colliery, a historical bord-and-pillar coal mine extracted from the four-foot seam at depths of 15 to 27 metres below ground level. DGSA was engaged by Atrio Property to undertake a field investigation and grouting trial to assess subsurface conditions and determine the viability of full remediation ahead of planned development.

THE CHALLENGE

Historical mining records indicated that the Caledonian No.3 Colliery was mined using the bord-and-pillar method, with 5 to 6 metre wide roadways supported by timber props in a four-foot coal seam. The age and condition of these workings, and the extent of any voids or collapse, were unknown. Any residual voids within the collapsed workings posed a risk of progressive subsidence to the proposed residential lots above. Before any remediation design could be committed, the nature of the mine workings required direct field assessment: including the extent of collapse, the height of any remaining void space, and the volume of grout likely to be required per treatment location.



Drilling operations, Mt Marrow QLD

SITE GEOLOGY

The site overburden consists predominantly of clay to depths ranging from 12 to 33 metres, with interbedded coal seams encountered at varying depths across the borehole array. Mining depths to the four-foot seam ranged from approximately 15 metres in the shallower eastern boreholes to over 25 metres in the western areas. The absence of competent rock cover above the workings was noted across all holes, with overburden consisting of clay tailings without a rockhead horizon, increasing subsidence sensitivity.

PROJECT SNAPSHOT

CLIENT

Atrio Property

COLLIERY (MINE SEAM)

Caledonian No.3 (Four-foot seam)

LOCATION

Mt Marrow, Queensland

OUR SERVICES PROVIDED

Borehole Investigation for Mine Remediation
Grout Block Construction Trial

BOREHOLES DRILLED

6 no.

TOTAL DRILLING

153 Lineal Meters

MAXIMUM DRILL DEPTH

27 m

GROUT AND AGGREGATE VOLUME

6 m³ Grout placed as trial

VOIDS CONFIRMED

3 of 6 boreholes

Our Solution



Mine Remediation Trial

Six boreholes (BH1 to BH6) were drilled using DGSA's Hutte HBR605 dual rotary drill rig with 114 mm casing and a 76 mm drill bit, using water as the flushing medium. Boreholes were positioned on a grid across the mine plan overlay to intersect planned roadways, targeting locations representative of both open and collapsed conditions. Depths ranged from 18 metres (BH3) to 33 metres (BH6). Drill logs were completed for each hole recording material type, water return, and indicators of void or resistance change at depth. Following casing extraction, a borehole camera was lowered into each hole to visually confirm subsurface conditions. CCTV findings identified open void conditions at BH1 (0.25 m void at 21.4 to 21.65 m), BH2 (0.5 m void at 22.0 to 22.5 m), and BH4 (0.8 m void with timber blockage at 25.8 m). BH3, BH5, and BH6 showed collapsed rubble without visible open void.

Borehole BH4 was selected as the grouting trial location, being the deepest borehole with the most clearly confirmed void and rubble condition. One truck load of 5 MPa readymix grout (6 m³, mix code DGS55270, 270 mm slump) was placed via tremie through the drill casing. The full 6 m³ load was discharged without a measurable pressure increase at the pump, confirming the void at BH4 accepted the full volume and that significant unfilled void space remains within the collapse. Casings were subsequently extracted and the borehole grouted to ground level.



Drilling in operation, Mt Marrow QLD



Grouting in operation, Mt Marrow QLD



Borehole inspection, Mt Marrow QLD



BH4 CCTV, Mt Marrow QLD



BH2 CCTV, Mt Marrow QLD

Verification

CCTV camera inspection was conducted in all six boreholes following drilling to directly confirm the presence and extent of voids within the collapsed mine workings. Footage confirmed open void conditions in three of the six boreholes drilled: BH1 and BH2 each revealed voids of 0.25 m and 0.5 m respectively within collapsed rubble at depths of approximately 21 to 22 m, while BH4 exposed an 0.8 m void blocked by timber and collapse debris at 25.8 m depth. The remaining three boreholes showed fully collapsed rubble without visible open void, which DGSA considers consistent with possible pillar interception given the imprecision inherent in historical mine plan overlays. Six UCS specimens were cast from the trial grout placement at BH4 for 7-day and 28-day testing to confirm grout mix compliance.

OUTCOME

The trial confirmed that the Caledonian No.3 Colliery workings underlying the site are predominantly collapsed, with significant voids present within the collapsed rubble and little to no rock cover above the workings. CCTV confirmed open void conditions in three of the six boreholes, and the grouting trial at BH4 demonstrated that grout volumes will be substantial, with a full 6 m³ truck load accepted without pressure build-up. DGSA's trial has generated the field data necessary to inform a full remediation design, including treatment grid spacing, grout volumes per location, and the confirmation that grout cone construction is a viable treatment methodology for this site.