Douglas PARTNERS | GROUNDED EXPERTISE

Department of Energy Mines Industry Regulation & Safety
Mineral House
100 Plain Street
East Perth, WA 6004
Attention: Ben Darby
Email: mani.thimmarayan@dmirs.wa.gov.au

Project 224768.00
31 July 2024
R.001.Rev1
DJB

Report on Subsidence Risk
Reids Ridge Abandoned Mine Site
Yalgoo-Ninghan Road, Paynes Find WA

1. Introduction

This report presents the results of a desktop study and geotechnical investigation undertaken for the main shaft, secondary shaft ('Rose Marie' shaft) and surrounding area at the abandoned Reids Ridge mine site located within the dead mining tenement M59/117, 55 km west of Paynes Find in the Karara Rangelands Park. The purpose of this report is to detail relevant site conditions, discuss geotechnical hazards and define subsidence risk zones in the vicinity of the main shaft.

The investigation was commissioned in a letter from the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) (letter Ref: DMIRS23250) and was undertaken in accordance with Douglas' proposal dated 21 September 2023 and the conditions outlined in the acceptance letter.

It is understood that the information and comments contained in this report will be communicated to any person accessing the site, particularly those involved in any part of the rehabilitation efforts for the area.

The desktop study and investigation were undertaken with the view to address the following:

- Geotechnical hazards across the site.
- Instability surrounding the existing shaft crests.
- Existing subsidence.
- Potential future subsidence risk zones.
- Defining "no go areas" and appropriate set back distances or areas.
- Defining minimum controls or protocols for works and personnel access, to occur within or adjacent to, the subsidence risk zones.
- Defining activities can be conducted and within which distances of the hazards. Activities are likely to include:
    - Demolition of the headframe and removal of all surface infrastructure;
    - Rehabilitation works to the shafts;

- Environmental investigations across the site, including drill rigs and test pitting with excavators; and
- Rehabilitation works to the tailings storage area, heap leach and the former processing plant site and other hard stand areas.

The details of the investigation are presented in this report, together with comments and recommendations on the items listed above.

This subsidence risk report addresses the immediate surrounding of the main shaft of Reids Ridge mine. Therefore:

- Comments regarding subsidence risk at other mining areas within dead tenement M59/117 are provided under separate cover in 'Commodore and Other Legacy Shafts Assessment Report'; and
- This report only includes selected results that are relevant to its scope (i.e. subsidence risk). Further details on the existing conditions of the mining features discussed in this report are included in 'Reids Ridge Underground Mine Geotechnical Assessment Report' under separate cover.

2. Site Description and Results of Desktop Study

Reids Ridge mine is located within the Karara Rangelands Park, 7 km north-northwest of Warriedar homestead and approximately 55 km west of Paynes Find, WA. Three main areas of historical mining activity are present within the same dead mining tenement M59/117: Reids Ridge, Commodore and Reids North. The mined mineral was predominately gold.

A review of available literature indicates that mining in the area begun in the 1910's, with records of gold produced from the nearby Commodore starting in 1910 and production from Reids Ridge (formerly known as 'Rose Marie Gold Mine') starting in 1936. The Reids Ridge mine has been worked intermittently up to relatively recent times, with refurbishment of the headframe and associated infrastructure reported to have occurred approximately 20 years ago to remove underground mined ore and provide access for exploration drill rigs.

Reids Ridge comprises a 'Main Shaft' and a ventilation shaft ('Rose Marie' shaft). Several survey plans (by Engineering Construction Surveys) dated between 1983 and 1988 and a 1990 mining exploration report indicate that the main shaft is 167 m deep. Six lateral working levels (1A, 1, 2, 3, 4 and 5) exist, with the shallowest one (Level 1A) at -36 m depth (or -34 m, on some drawings) and the deepest one at -159 m.

The targeted lode is near vertical (dipping 80 degrees East), described to be between 1 m and 2 m wide, trending NNE. Therefore, lateral workings are aligned with the lode on a bearing of approximately 30 degrees to the north.

Drawing 1 appended reproduces a longitudinal section attached to a Notice of Intent (Gilbert Gokus Joint Venture, 2005) outlining the scope to reactivate operations of the existing Reids Ridge underground mine in 2005. The interest of this drawing includes that it forms the most complete longitudinal mapping of the mine developments identified during this study, and it shows two near vertical stopes above Level -36 m that are not shown on former survey plans but whose evidence was observed during the field work for this study. It is noted that further

proposed underground developments are also shown; their completion (or otherwise) post 2005 are unknown but would have involved deeper levels with no impact for this study. The accuracy of this longitudinal section is uncertain because its source is unreferenced, however it is noted that this longitudinal mapping is consistent with previous referenced surveys and field results made during this study.

Drawing 2 appended shows an aerial view of the Reids Ridge mine site and relevant features discussed in this report. A plan view showing the underground developments of the mine available from survey plans prior to 1985 is given in Drawing 1.

The 'Rose Marie' shaft is located 51 m north-northeast of the Reids Ridge main shaft along the lode. The various plans reviewed for this study indicate that this shaft links to Reids Ridge Level 1A (Drawing 1). At the time of the investigation, the Rose Marie shaft was covered with a dilapidated ventilation fan supported by rotting timber. Other than evidenced by this residual piece of infrastructure (dilapidated fan) and four steel star pickets, this shaft was mostly masked at ground surface at the commencement of this study, thus forming a significant safety risk.

Approximately 2.5 m away to the north of the main shaft, a 7 m long, 2 m to 3.5 m wide, near vertical open void is aligned with the NNE trending lode, between the main shaft and Rose Marie shaft. This void is largely blocked with fallen disused mining equipment at depth of about 3 m. Its location and size are consistent with the northern stope shown in the 2005 longitudinal section (Drawing 1). A secondary horizontal shallow void is visible in the northern face of this stope and follows the NNE direction of the lode towards Rose Marie shaft. The visible ground cover above this secondary void partially comprises bedrock and is 1.7 m thick. The visible horizontal extent of the secondary void is approximately 5 m towards the Rose Marie Shaft.

Subsidence of the ground is evident over a 7.5 m length, 2 m width, and up to about 1 m depth, on the opposite and southwestern side of the main shaft and is considered to form likely evidence of a former stope aligned with the lode to the south of the main shaft, thus also corroborating the 2005 longitudinal section (Drawing 1). The subsidence was located within an area of mine waste rock, approximately 1 m to 2 m thick and covering an area of between 400 m^2 and 500 m^2 adjacent to the main shaft.

Another unnatural rectangular depression, about 150 mm deep and located under a disused grizzly screen, was identified during Douglas' field assessment between the northern open stope and Rose Marie shaft.

The 1:100,000 Ninghan geological sheet indicates that Reids Ridge and Rose Marie mines are located within colluvium adjacent to both:

- Archaen basalt (symbol *ANOs-bb*) of the Norie Group, described as '*locally pillowed; thin hyaloclastic or siltstone horizons, metamorphosed*', and
- Archaean gabbro (*AAAWog*) of the Warriedar Suite described as '*Gabbro; locally includes layers of leucogabbro, gabbronorite, dolerite, minor pyroxenite and pegmatite gabbro; metamorphosed*'.

The literature (WATKINS K, 1990) indicates the non-mineralised bedrock at Reids Ridge is 'metabasalt'. Observation of the ground profile within the open northern stope during the geotechnical field work indicates that the weathered bedrock at Reids Ridge and Rose Marie occurs near ground surface. Weathered bedrock is visible at ground surface in places in proximity

of these shafts. Stockpiles of waste rock excavated from Reids Ridge observed during the geotechnical field work comprised rock material of very high strength or stronger.

3. Field Work Methods

Field work to assess the condition of the Reids Ridge mine, Rose Marie shaft and surrounding area was undertaken from 15 to 19 of April 2024 and comprised:

- Inspecting the main shaft, open stope and Rose Marie shaft from ground surface, by an experienced Geotechnical Engineer and a Principal Geotechnical Engineer from Douglas.
- Exposing the Rose Marie shaft by removing the dilapidated ventilation fan and associated wooden cover, using a backhoe.
- Exposing the rectangular depression located under a disused grizzly screen, identified between the northern open stope and Rose Marie shaft during the geotechnical field work.
- Excavating a trench to expose the ground conditions across the subsided zone to the south of the main shaft, where a 2005 longitudinal section (Drawing 1) shows a possible former stope.
- Targeted test pitting at a location to the east of the main shaft, following the identification during the field work of a geophysical anomaly at this location.
- Photos and video footage within all open voids (Reids Ridge main shaft, northern stope and Rose Marie shaft) and surrounding area.
- LiDAR scanning of the two open shafts and open stope and their surrounds.
- Geophysical survey of the area surrounding the shafts and stopes to assess the subsurface profile for potential anomalies that may be indicative of voids related to mine activity.
- Monitoring for noxious or flammable gases within features; and
- A walkover survey, of the surroundings of the main shaft, looking for relevant signs of nearby mine activities and assessing the potential for interconnectivity or relationship with mine.

The LiDAR scanning was undertaken using a Hovermap Platform and utilised Simultaneous Localisation and Mapping (SLAM) based LiDAR technology. Data were collected using a combination of hand-held and winch mounted scanning methods that were subsequently stitched together into a single, spatially correct model to provide accurate data on the spatial relationship between the features as well as dimensions and volumes of each feature. Douglas Partners engaged the services of specialist contractors, MineLiDAR to undertake this work.

A geophysical survey comprising two methods was undertaken in the vicinity of the shafts and open stope of Reids Ridge.

The methods used comprised:

- Electrical Resistivity Tomography (ERT) – to obtain subsurface electrical resistivity models to a target depth of 15 m; and
- Ground Penetrating Radar (GPR) using both 300 MHz and 80 MHz antennas to obtain high resolution subsurface reflection imagery to a target depth of 10 m.

The data was collected then results analysed by specialist geophysical consultants GBGGroup.

The gas monitoring was undertaken using a Ventis MX4 portable multi gas monitor with pump attachment capable of detecting carbon monoxide, hydrogen sulphide and oxygen concentrations and the lower explosives limit (LEL). The unit was lowered to depths up to 20 m air was sampled directly into the unit.

4. Discussion of Field Work Observations and Results

4.1 Appreciated of Ground Conditions and Geotechnical Risks

Natural ground conditions for this site comprise relatively shallow (e.g. generally anticipated within 2 m of the surface) bedrock. Natural ground conditions can generally be considered as competent for the support of typical structural loads and typical mobile plant such as excavators, (say, up to 20 tonne), loaders and trucks.

Owing to the competent ground conditions, geotechnical risk in the context of personnel and plant moving and working in the surrounding area of the mine voids is considered to include:

- Instability of the ground in proximity to existing excavations and shafts;
- Collapse of ground/sudden subsidence of shallow voids or lateral workings with insufficient thickness and strength of overlying ground; and
- Collapse/sudden subsidence of backfill historically placed within mine voids intersecting ground surface.

4.2 Existing Conditions and Subsidence

Review of desktop information, visual field observations, photos, video recordings, LiDAR data and geophysical survey interpretation indicates that that no high-risk areas for ground instability are located to the east or west of the lode alignment passing by the main shaft and Rose Marie shaft. It is considered that subsidence risk is limited to be along or close to this alignment between the main shaft and Rose Marie shaft and near the ground surface depression to the south of the main shaft. The condition of the various existing features along this alignment in the vicinity of the main shaft are detailed in the sections below and the location and extent of the features are shown on Drawing 2, appended.

Reids Ridge Main Shaft

The Reids Ridge main shaft is a deep vertical shaft, flooded at depth, approximately 2.4 m long by 1.5 m wide in plan view at its opening at ground surface. The shaft collar is formed of concrete and steel beams (at RL 323.5 m AHD) which support a steel headframe (approximately 12 m high) and hoist. At the time of investigation, the shaft opening was mostly blocked at ground surface by a skip suspended just above collar level by its cable running through the headframe pulley and then to the hoist. Below this, a hinged metal plate covered much of the northern half of the shaft opening. The southern half of the shaft was open at collar level (i.e. no steel cover), but from a depth of approximately 5 m, it was mostly blocked by timbering support, platforms, and fallen debris.

Based on the alignment in plan view of the stopes (that would target the lode), the shaft appears to have been sunk within the lode at ground level. As such, owing to the dipping of the lode to the east, any lateral workings associated with this mine would extend to the east of the shaft,

which is consistent with the information from the survey plans reviewed during this study (Drawing 1). Results of the field investigation (Lidar and video recordings) indicate that the internal faces of the main shaft are fully lined with timber lagging to a depth of 19 m, at which depth, the dip of the lode appears to exit the vertical shaft's footprint, resulting in the widening of the shaft to chase the lode on the hanging wall on the eastern side of the shaft footprint from -19 m depth down to Level 1A at approximately -34 m.

A lateral void, 2 m wide and extending to the south of the shaft over a distance of 7.5 m horizontally, can be seen from a depth of -17.9 m and appears to be associated with the southern stope shown on available desktop information and also evidenced by a depression at ground surface. This southern stope was discussed in Section 2 above and is further discussed in the next section. The bottom of the connection between the southern stope and the shaft is at a depth of -22.1 m (resulting in a connecting height of about 4 m between these two features).

The roof of Level 1 is visible in the eastern face of the shaft at a depth of -46.8 m (RL 276.7). Groundwater was encountered slightly below at a depth of -49.2 m (RL 274.3) which is above the base of the lateral working Level 1. No measurements or observations was possible below water level, however, reviewed desktop information indicates a total shaft depth of -167 m, resulting in more than 115 m depth of shaft and lateral developments being flooded.

At the time of the investigation, vehicular access to the edge of the main shaft opening at ground surface was practically impossible owing to the headframe structure. Pedestrian access to the edge of the partially unprotected shaft opening was possible.

The results of the field assessment, notably the video recordings, indicate that the shaft and internal timbering reinforcement are overall in reasonable conditions, apparently stable with no evidence of significant deterioration. The shaft collar is considered in good conditions for the purpose of this study, with no notable cracking or deformation of the concrete and steel, and no loss of level. Therefore, in the absence of evidence of instability from the results of this study, both the shaft and its collar are considered stable for access at ground surface in their vicinity. Suitable set back distances for various access types are discussed in Section 4.3 of this report.

Southern Stope

A test trench was excavated during the field work for this study across the subsidence located to the south of the main shaft. This trench exposed natural strong ground on each side of the subsidence envelope, and rocky fill within the subsidence envelope, with a relatively sharp and vertical interface between the two material types. The results of this field testing are therefore consistent with a previous stope intersecting ground surface at this location, and subsequently backfilled with likely rocky fill that has subsided over time. The occurrence of a backfilled stope at this location is consistent with both the desktop information discussed in Section 2 that shows the existence of a stope intersecting ground level in 2005, and results of observations (video and Lidar) made within the shaft discussed in the previous section of this report and showing a lateral opening linking the shaft between depths of -18 m and -22 m approximately. Based on desktop information, the depth of this stope prior to backfill was up to -51 m, i.e down to Level 1 of the underground mine.

At the time of the investigation, vehicular access to this feature that is on the top of mine rock waste would be difficult, but not entirely precluded. Pedestrian access was available.

The quality and stability of the backfill are unknown. Therefore, this feature should be considered instable and not accessed. Safe set back distances are recommended in Section 4.3 of this report.

Northern Stope

Survey plans indicate the northern stope extends from the surface vertically down to Level 1A at -36 m depth, laterally connecting other stopes via lateral workings and winzes to Level 4 at -131 m depth. Available plans (e.g. Drawing 1) also indicate a link between the main shaft and the northern stope, however evidence of this was not observed in video footage recorded from the main shaft. LiDAR data collected within the main shaft indicates possible void to the north of the main shaft from between depths of approximately 6 m and 16 m (which is consistent with the 2005 longitudinal section in Drawing 1), however this part of the shaft is tightly lined with wooden lagging that strongly masked such a void and mostly precluded Lidar data acquisition behind the lagging.

The northern stope was open at the surface for a length of 7.0 m and a width ranging between 2.0 m and 3.5 m. From a depth of 2.5 m however, the stope width narrows to 1.0 m. A secondary horizontal void, with an opening that was 0.6 m high was visible from a depth of 1.7 m on the northern wall of the stope. Owing to the geometry of the narrow opening, limited data could be obtained within this secondary void, however LiDAR data indicates it extends at least 5 m to the north along the lode alignment and to a depth of at least 4.1 m (RL 319.4) (See Drawing 2).

At the time of investigation waste and debris such as pieces of metal, a ladder and wooden pallets had fallen into the northern stope. A gap within the debris allowed a tape measure to be lowered to a depth of -24.4 m (RL 299.1 m).

At the time of the field work, access to the northern stope was deterred along its eastern long side by a rock waste bound, along its northern long side by disused mining equipment (mostly a tank), on its southern short side by the headframe, and on its northern short side by a large bush (all visible on the aerial photo on Drawing 2).

Considering the near verticality and relatively narrow width of this stope and the strength of the ground and shallow bedrock, the risk of subsidence in the vicinity of this feature is considered very low to barely credible along its long sides (east and west) and its southern side. Some risk of subsidence exists, specifically under vehicular traffic (noting access to such trafficking is currently limited and unlikely based on current site conditions) on its northern side in the lode alignment towards the grizzly feature, owing to a relatively shallow horizontal working following this alignment. The main risk posed by this northern stope is considered to be trip and fall. Suitable set back distances for various access types are discussed in Section 4.3 of this report.

Grizzly Shaft

A previously unnamed feature, therefore referred to in this report as the ‘Grizzly Shaft’, was identified during the field work of this study located 19 m north-northeast of the main shaft, along the lode alignment, between the northern stope and the Rose Marie shaft.

At the time of the investigation, a steel metal mining grate/grizzly screen was positioned over this 1.2 m by 1.2 m depression, approximately 150 mm depth. Following excavation of this depression to a depth of 1.8 m using a backhoe during the geotechnical field work, the feature was interpreted as a backfilled shaft. The excavation was terminated due to the maximum reach of

the plant available at the time of the investigation and the narrowness of the feature. The base of the feature is likely deeper than 1.8 m.

No evidence of lateral workings was visible within the excavated depth of the Grizzly Shaft, nor was there any evidence of subsidence in the immediate area surrounding this feature.

At the time of the investigation, vehicular access over the Grizzly Shaft envelope was restricted by a piece of disused mining equipment (a grizzly screen), which also mostly deters pedestrian access over the feature. This piece of equipment was replaced after the geotechnical field work, as a satisfactory temporary protection measure until a more permanent rehabilitation is implemented.

Owing to no documentation of a shaft between the Main Shaft and the Rose Marie shaft and from observations made on site, it is considered that the Grizzly Shaft is possibly a relatively shallow exploration shaft to assess the lode at that location. Owing to the strength of the ground and shallow bedrock in the vicinity of this feature, risk of subsidence on its eastern, western and northern sides is considered barely credible to very low. It is considered prudent to assume that a risk of subsidence may exist on its southern side, mostly for vehicular access, owing to the existence of a shallow horizontal working heading from the northern slope towards the Grizzly Shaft, discussed in the previous section of this report. Owing to the unknown quality, thickness and stability of the backfill within this mining feature, a risk of subsidence must be assumed across the feature envelope covering about 1.2 m by 1.2 m. Suitable set back distances for various access types are discussed in Section 4.3 of this report.

Rose Marie Shaft

The Rose Marie shaft is understood to be the historical shaft for the Reids Ridge mine. The shaft is vertical to a depth of 20.2 m (RL 302.7) then head to the south on a 45° angle to the vertical. LiDAR data captured information 7 m past the 45° bend. Survey plans indicates it links an underground stope of the Reids Ridge mine near Level 1A (-36 m). The historical Rose Marie shaft appears to have been repurposed as a ventilation shaft for Reids Ridge, as indicated by the dilapidated ventilation fan covering the shaft at commencement of the geotechnical field investigation.

The shaft opening is 1.2 m by 0.9 m in plan view, however at a depth of 0.5 m, the shaft widens up to 2.6 m (possibly from some shallow collapse) before returning to relatively consistent shaft dimensions of approximately 1.2 m x 1.8 m from a depth of 1.0 m.

The shaft was apparently hand excavated through hard rock and, aside from some timbering at the opening of the shaft, is freestanding without any internal support. From video observation, the ground profile is interpreted to be weathered rock. The shaft is considered to be in relatively good condition and stable, except its upper meter from ground surface.

At the commencement of the investigation, the shaft was greatly unmarked (other than the disused ventilation shaft and four steel star-pickets), masked by a rotten timber cover and unprotected (without any bunds), resulting in significant safety risk to public. During the geotechnical field work, the shaft was opened (thus made visible), a bound of rock fill was placed around it and flagging and signage were placed to form a provisional measure prior to permanent rehabilitation solution, to deter vehicular and pedestrian access to this feature and therefore to significantly decrease the risk this feature posed to the public.

Owing to the strength of the ground and shallow bedrock in the vicinity of this feature, risk of subsidence or collapse beyond 1.5 m on all sides of this feature is considered barely credible to very low provided a suitable set back distance is met for various types of access, as further discussed in Section 4.3 of this report.

4.3 Risk Zoning and Recommended Setbacks

For the purpose of future personnel and plant undertaking work in the vicinity of the Reids Ridge mine, several setback zones have been defined and are listed in Table 1 below. This table include typical setback for each defined zone. Table 1 must be read in conjunction with Drawing 3 appended that shows the extent of the zones, considering site conditions specific to each feature.

Table 1: Definition of Risk Zones

Zone	Definition	Typical Setback Distance (m)[1]	Allowable Activity
Subsidence Risk / Existing Void	This area is considered to possibly undergo sudden subsidence that is not possible to predict or quantify	0	None (strictly no access)
No-Go Area (Without Protective Equipment)	No plant access. No personnel without fall arrestor equipment should enter this area. While this area coincides with the possible subsidence risk zones, it also includes area near existing excavations where the fall risk exists or excessive loading from mobile plant may induce localised instability of the ground.	<2	Personnel with suitable safety equipment (fall arrestor harness) can operate in this area for the purpose of spotting other activities or visual assessment of features.
Pedestrian Acceptable Zone	This area is considered safe for pedestrian and light, hand-held equipment.	2-4	Personnel with hand tools and other light plant (say <300 kg)
Plant Acceptable Zone	This area is considered safe for pedestrians and plant up to 20 tonne excavators.	>4	All personnel, vehicles and plant up to 20 t.

Notes [1]: These distances are a general guide. Reference must be made to Drawing 3 for the layout to account for areas where lateral workings or voids are not visible from surface and other specific site conditions.

It is noted that these zones may be removed or altered following further rehabilitation work at the mine.

5. References

Department of Mines. (1954). *List of Cancelled Gold Mining Leases Which Have Produced Gold.* Perth, Western Australia: William C Brown, Government Printer.

Gilbert Gokus Joint Venture. (2005). Notice of intent, Reids Ridge Mine - Payne's Find WA.

IVANIC, T. (2018). Ningham, WA Sheet 2339. Geological Survey of Western Australia, 1:100 000 Geological Series.

Unreferenced. (1990). *Reids Ridge Project, Non Statutory Report: Geological Report for the Year Ending 21/12/1990, M59/117 (Mineral Exploration Report, sourced from WAMEX register).*

WATKINS K, H. A. (1990). *Geological Evolution and Mineralization of the Murchinson Province Western Australia.* Perth: Geological Survey of Western Australia.

6. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Yalgoo-Ninghan Road, Paynes Find WA in accordance with Douglas' proposal dated 21 September 2023 and acceptance received via letter from the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) (letter Ref: DMIRS23250). This report is provided for the exclusive use of Department of Energy Mines Industry Regulation & Safety for this project only and for the purposes as described in the report. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

Damian Jagoe-Banks
Geotechnical Associate

Fred Verheyde
Geotechnical Principal

Attachments: About this Report

Drawing 1: Mine Longitudinal Section (from Gilbert Gokus JV, 2005) and Composite Plan

Drawing 2: Reids Ridge Mine Features

Drawing 3: Subsidence, Personnel and Plant Risk Zones

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

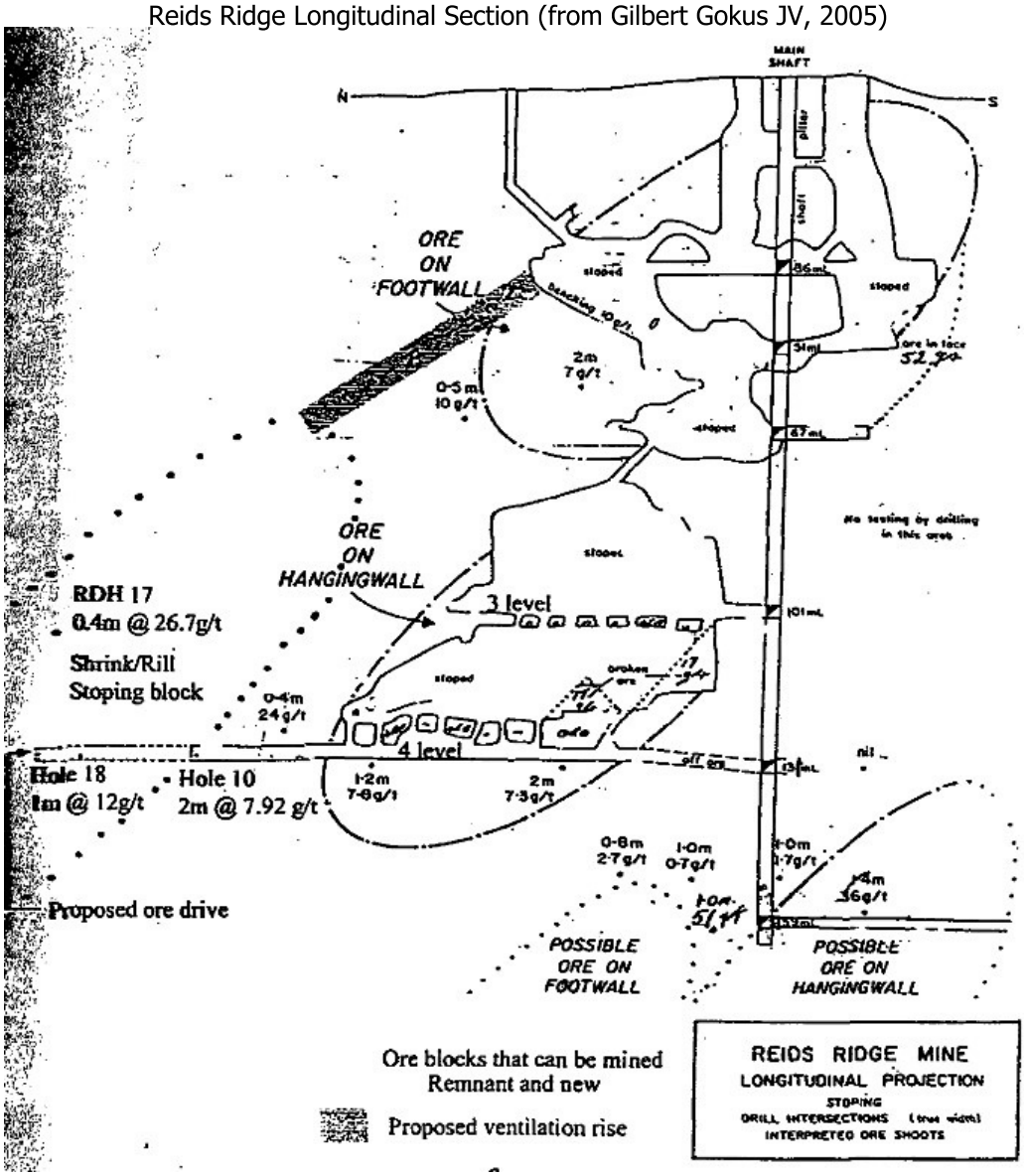
Site Inspection

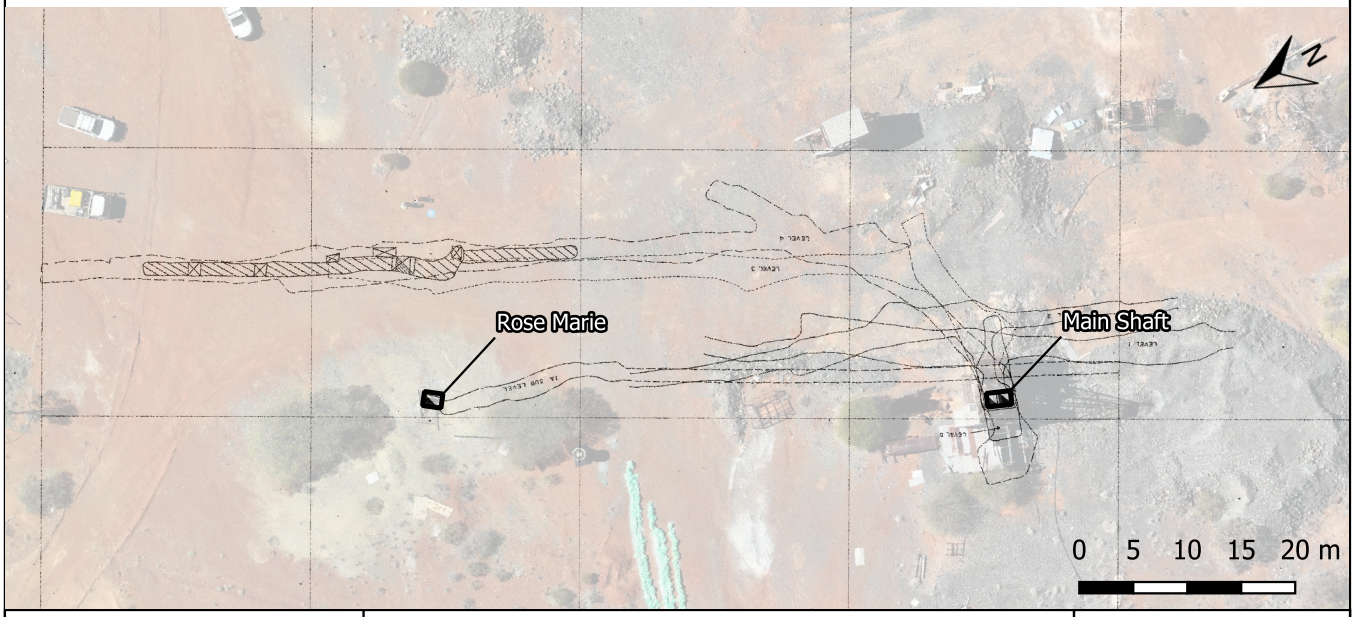
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

intentionally blank

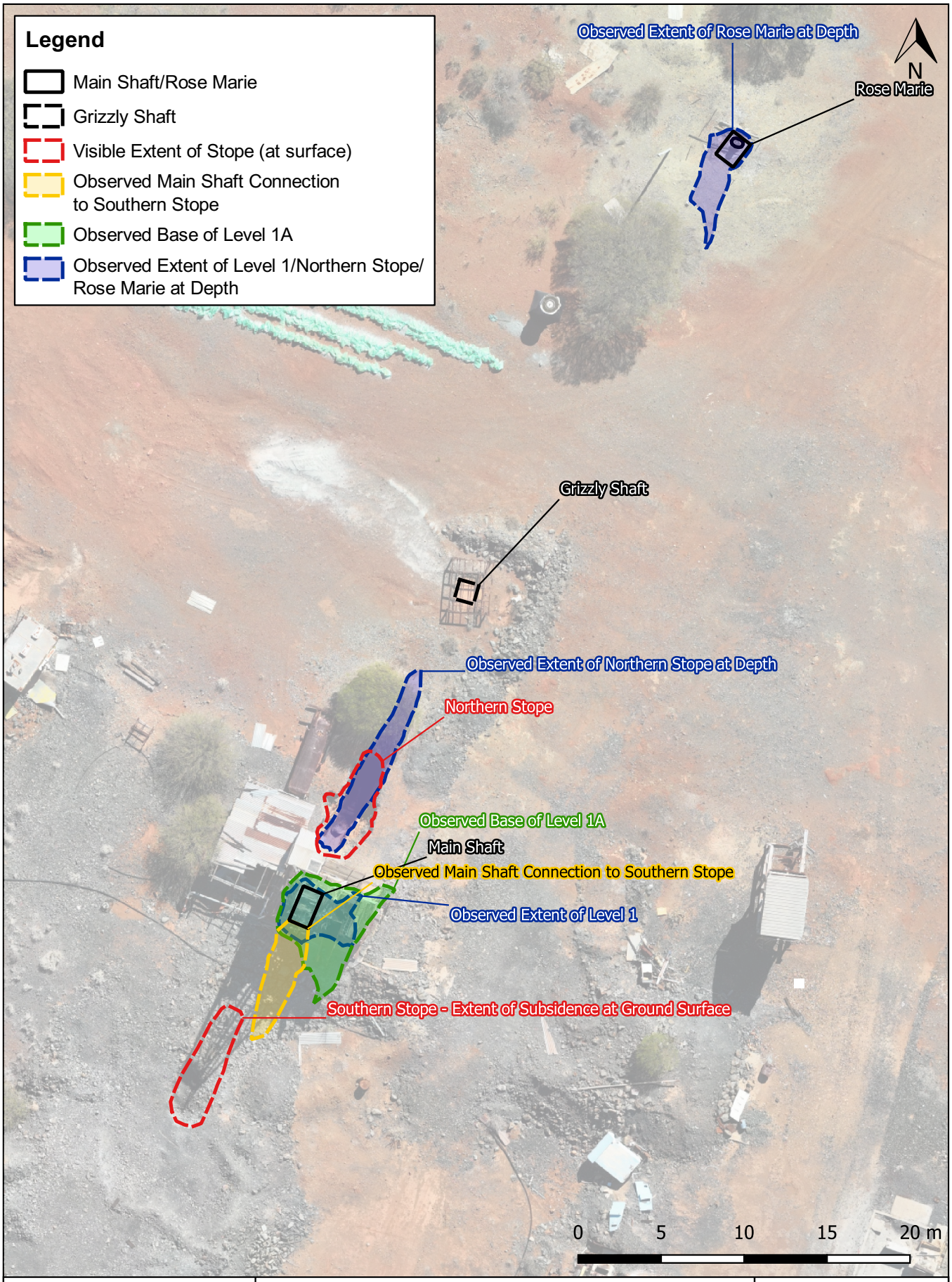
intentionally blank

Reids Ridge Longitudinal Section (from Gilbert Gokus JV, 2005)

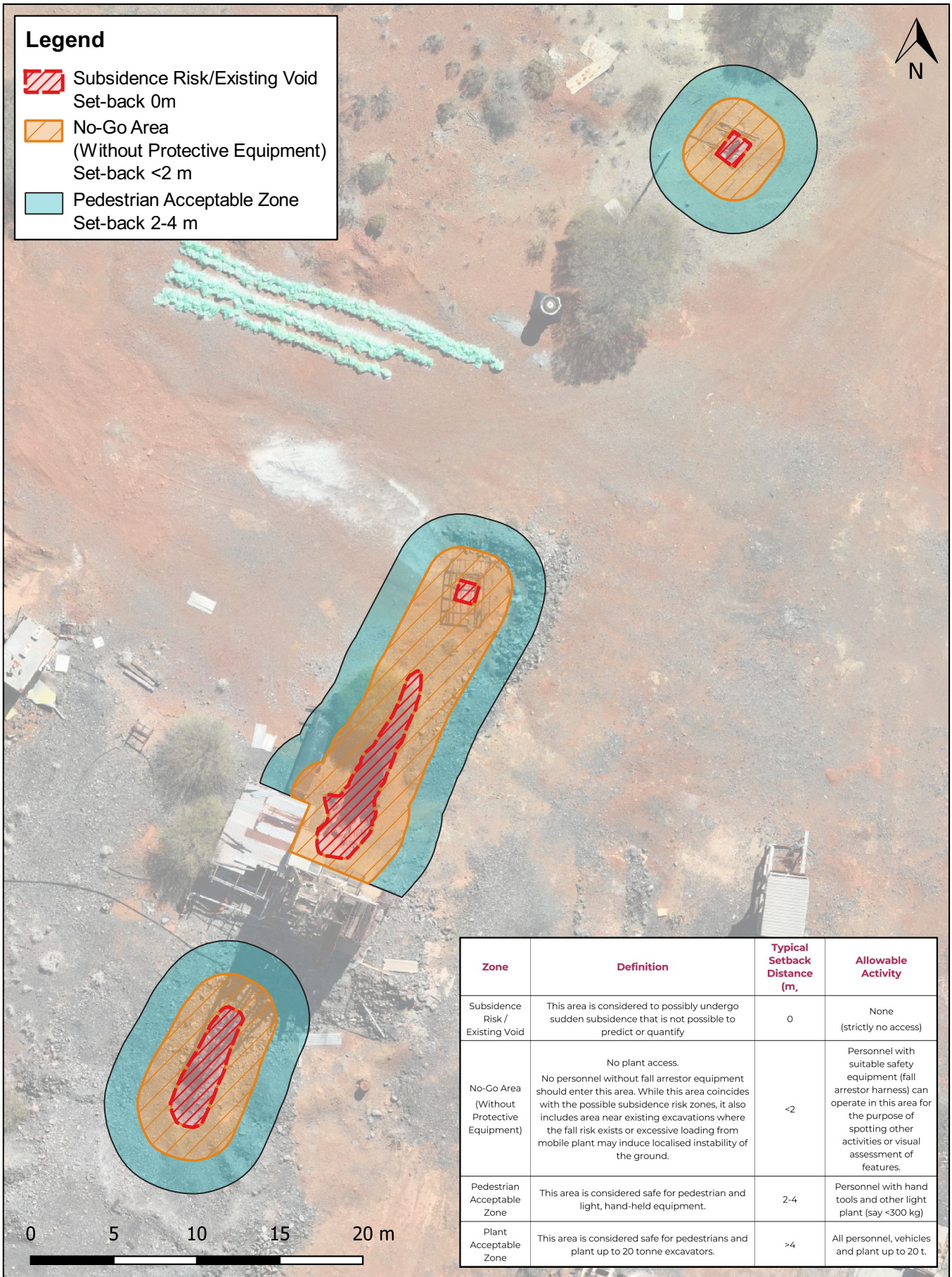




Douglas PARTNERS	**Mine Longitudinal Section and Composite Plan**	PROJECT: 224768.00
	Subsidence Risk	Drawing No: 1
	Reids Ridge Abandoned Mine Site, WA	REV: 0
	CLIENT: DEMIRS	DATE: 21/6/2024



Douglas PARTNERS	**Reid Ridge Mine Features**	PROJECT: 224768.00
	Subsidence Risk	Drawing No: 2
	Reids Ridge Abandoned Mine Site, WA	REV: 0
	CLIENT: DEMIRS	DATE: 21/6/2024



Zone	Definition	Typical Setback Distance (m,	Allowable Activity
Subsidence Risk / Existing Void	This area is considered to possibly undergo sudden subsidence that is not possible to predict or quantify	0	None (strictly no access)
No-Go Area (Without Protective Equipment)	No plant access. No personnel without fall arrestor equipment should enter this area. While this area coincides with the possible subsidence risk zones, it also includes area near existing excavations where the fall risk exists or excessive loading from mobile plant may induce localised instability of the ground.	<2	Personnel with suitable safety equipment (fall arrestor harness) can operate in this area for the purpose of spotting other activities or visual assessment of features.
Pedestrian Acceptable Zone	This area is considered safe for pedestrian and light, hand-held equipment.	2-4	Personnel with hand tools and other light plant (say <300 kg)
Plant Acceptable Zone	This area is considered safe for pedestrians and plant up to 20 tonne excavators.	>4	All personnel, vehicles and plant up to 20 t.

Douglas PARTNERS

Subsidence, Personnel and Plant Risk Zones

Subsidence Risk

Reids Ridge Abandoned Mine Site, WA

CLIENT: DEMIRS

PROJECT: 224768.00

Drawing No: 3

REV: 0

DATE: 30/7/2024