

Our ref: RB/NL05100-203/0001

Date: 20 May 2022

Your ref:

Rob Duncan
Rob Duncan Planning Consultancy Ltd
70 Ferndale Road
Lichfield
WS13 7DL

Dear Rob,

New Industrial Unit, Vulcan Refractories: Mine Entry Best Plot

Further to recent correspondence on the matter, please see the findings of our mine entry best fit assessment in relation to a proposed industrial unit at Brookhouses Industrial Estate, Draycott Close Road, Cheadle, ST10 1PN. The assessment has been carried out in general accordance with our email proposal, dated 21 March 2022.

Background and scope of works

It is understood that a new industrial building for the storage of raw materials and finished produce is being proposed in the southern part of the existing Vulcan Refractories site, with an associated access route off Keates Way. The current proposed layout, of which has been used in this assessment, is shown in Hewitt & Carr Architects drawing entitled 'Site Plan As Proposed', reference AL(0)01, dated March 2022 (revision unknown).

This letter report follows Wardell Armstrong's (WA) production of a Coal Mining Risk Assessment (WA report reference NL05100-203, dated 17 March 2022) in which a single mine entry (adit) was identified by the Coal Authority (CA) close to the northern area of the proposed building. The purpose of this report is to verify the record and position of the mine entry reported by the CA (CA mine entry reference 399342-058), to assess its "best plot" location by using the original source record documentation and discuss the findings and implications of this assessment.



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This study is exclusively confined to the direct risk of the proposed industrial building (as shown on the Hewitt & Carr Architects drawing reference AL(0)01 and WA drawing NL05100-203-001) associated with CA mine entry reference 399342-058 only. Other risks related to potential coal mining at the site (e.g., shallow underground mining) are not discussed within this report.

Data Sources

The following sources of information have been used and relied upon to produce this report:

- CA Consultants Mining Report, reference 51002994018001, dated 11 March 2022;
- CA Mine Entry Datasheets Report, reference 51003064029001, dated 27 April 2022;
- WA Coal Mining Risk Assessment, reference NL05100-203, dated 17 March 2022;
- Published Geological Survey of Great Britain 1:10,560 Geological Map SJ 94 SE, published in 1981;
- British Geological Survey (BGS) Geoindex online service (<http://mapapps2.bgs.ac.uk/geoindex/home.html>), accessed 09 May 2022 (datasets available under the Open Government Licence v3.0); and
- CA interactive online viewer (<https://mapapps2.bgs.ac.uk/coalauthority/home.html>), accessed 09 May 2022 (datasets available under the Open Government Licence v3.0).

Geology

The BGS records the site to be underlain by superficial deposits of Glacial Till overlying solid geology of the Pennine Middle Coal Measures Formation (mudstone, siltstone, sandstone and coal seams). The Four Foot (4FT) coal seam is recorded to sub-crop close to/within the site, however, its location is recorded in two different positions as noted by BGS and CA. No artificial deposits (Made Ground) are recorded by the BGS, however, the presence of such material cannot be discounted.

There is a borehole directly to the east of the site on the opposite side of a stream (c.25m from the proposed industrial building), as noted on the BGS Geoindex online service. Borehole reference SJ94SE83 records Made Ground to a depth of 2.50m below ground level (bgl) underlain by a mixture of clay, silt, sand and gravel to 4.80m bgl. The log then records “highly weathered mudstone” from 4.80m bgl to the base of the borehole at 6.45m bgl. Another borehole, SJ94SE84 (c.100m south of borehole SJ94SE83) records Made Ground to 4.80m bgl also underlain by “highly weathered mudstone” to the base of the borehole at 6.45m bgl.



Mine Entry Identity

The CA Mine Entry Datasheets report identified the published 1:10,560 geological map SJ 94 SE (six-inch geological survey map) as the original and only source record for the mine entry. WA hold this map within its mapping archive and has been viewed as part of this assessment. The published geological survey map positively identifies a mine adit in the general area of Vulcan Refractories.

In addition, the CA Mine Entry Datasheets report provides a ‘probable adit azimuth’ of 259. No further information relating to the mine entry was reported by the CA.

“Best Plot” Location

The CA reports show the approximate position of mine adit 399342-058 to be located on the western edge of the stream which is present directly to the east of the site. This is located approximately c.11m northeast of the proposed industrial unit. Our assessment of the most likely “best plot” location of the mine entry/adit (based on review of the published geological survey map) shows it to be c.18m north to northeast of the proposed industrial unit, appearing to be located within the stream/just off the eastern bank of the stream. Both the CA position and WA best plot locations in relation to the proposed development footprint are shown on WA Drawing NL05100-203-001.

It should be noted that several inaccuracies within the source record (the geological survey map) may be present, as it is considered unlikely that the mine entry/adit is located within the stream itself, close to the streams eastern bank with the adit direction heading west (therefore across the stream). The adit symbol on the map is also large and may therefore reduce the accuracy of precise adit entry point, and it is possible that the adit symbology may have also been used incorrectly (the entry point is on the centre point of the end line opposite to the arrow, not the centre of the adit symbol itself). Finally, due to local development since the geological survey was produced, there are few local references which could be identified in order to georeference the map. This therefore presents additional inaccuracy with the WA best plot location.

As there is only a single source record for this mine adit, it is also possible that the CA recorded position is not entirely within the correct position (also due to the reasons noted above) and may be subject to human error during identification during geological mapping itself (as shown on the geological survey map) and digitalisation onto CA servers used for its reports.



As a matter of professional judgement, having regard to the apparent quality and reliability of the source information and our experience involved in locating former mine entries/adits, it is expected the mine entry/adit would be within an 10m radius (departure) of our “best plot” position.

Status

The CA reports to have no record of what steps, if any, have been undertaken to stabilise the mine entry/adit. Therefore, in the absence of any record of stabilisation works being carried out to this mine entry/adit following its abandonment, it cannot be regarded as stable. Should movement of the mine entry/adit infill material (if present) or covering occur (including migration of the open void to the surface), surface ground loss (collapse) could be experienced.

Area at Risk

The potential area at risk is assessed in the same means as shallow mine workings. As per shallow mine workings, collapse of strata above the roof of the entry/adit as well as the roadway (the route between the entrance and the underground workings), can result in a total loss of support at the surface. As a result, severe subsidence can be experienced within a localised area or region and could cause a crown hole to form at the surface (including catastrophic collapse).

The result of our assessment notes that the mine entry/adit entrance is unlikely to pose a direct risk to the proposed development at our best plot location, however, the roadway may pose a risk depending on its location relative to the proposed development footprint.

As there are no available abandonment plans relating to this mine entry/adit, the position of the associated roadway is unknown. From reviewing published geological information, the location of local coal seams are not linear and are present to the west and south of the site. Therefore, it is possible that the adit roadway is not linear and could turn and go underneath the proposed development footprint. As such, the proposed development area should be considered at potential risk of the adit roadway being present at shallow depth. The adit would generally present a risk at shallow depths to the site, approximately in the order of 25m-30m below ground level.

WA cannot discount the further possibility of additional unrecorded mine entries/adits being present within the proposed development area or within the local vicinity. Should any



evidence of an unrecorded mine entries or adits be identified, specialist advice should be sought.

Recommendations

Whilst a 'probable adit azimuth' is recorded by the CA, due to the nature of the closest coal seam, it is possible that the adit does not exist in a straight line and could turn and go underneath the proposed industrial building footprint. Therefore, there remains a risk to the development footprint. It is recommended that further investigation is undertaken to locate the mine entry/adit, which may involve one or a combination of the below options:

- A site walkover to identify any evidence of a potential mine entry/adit; and/or
- If there is direct access into the adit, a CCTV survey or laser scan survey of the mine entry/adit to confirm its location relative to the surface and the proposed development; and/or
- The drilling of 'probe holes' on a grid layout at close spacing (say 1m) to depths potentially to 30m bgl (subject to confirmation before investigation) along the northern and eastern boundaries of the proposed industrial unit to intersect the mine entry/adit. This could be coordinated as part of other mining related investigations at the site (such as investigation into the presence of shallow coal mine workings/coal seams. See WA's Coal Mining Risk Assessment for more details).

Should the mine entry/adit be located within or within influencing distance of the proposed industrial building, then further works involving treatment and stabilisation should be undertaken to enable development. Should the mine entry/adit not be located within the WA best plot location or the possible departure area, the Coal Authority location should be used in the next instance.

Conclusion

Examination of the source record confirms the existence of a mine entry/adit. In the absence of details of any stabilisations works being undertaken, the mine entry/adit must be regarded as potentially unstable. The potential of there being further unrecorded mine entries and adits also cannot be discounted.

It is recommended that the mine entry/adit is investigated to confirm its location in respect to the proposed development and treated and stabilised if found. Should the mine entry/adit not be located in respect to the proposed development, we would still recommend in any instance that the mine entry/adit is located, stabilised and treated in respect to the larger Vulcan Refractories site to prevent any future potential collapses.



Should you have any further questions with regards to the above, then please do not hesitate to contact me.

Yours sincerely
for Wardell Armstrong LLP

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