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Redevelopment of Hornsby Quarry by Hornsby Shire Council (2019SNH025)

Observations on a recent visit to the quarry by a representative of the Geological Society of Australia

Background

Following submissions put to the Sydney North Planning Panel at public hearing on May 6 2020 by various groups including the Geological Society of Australia (GSA), planning approval for the proposed redevelopment of the former Hornsby Quarry was deferred pending satisfactory resolution of several issues broadly including access to and visibility of the diatreme exposed in the eastern face of the quarry (see Appendix herein). Subsequently an invitation was extended to the Geoheritage Subcommittee of the NSW Division of GSA by Craig Clendinning (Project Manager, Major Projects in the Design & Construction section of Hornsby Shire Council) to participate in a field visit to the quarry site, now partly infilled by spoil obtained during construction of the North Connex tunnel. This site inspection was conducted on the afternoon of Wednesday June 10, from 1.30 – 3 pm. Due to COVID-19 restrictions, and Council WHS requirements, only two persons (the driver and one passenger) were permitted per vehicle. Ellen Robertshaw (Planning Consultant engaged by Council to independently assess the Development Application prepared by Hornsby Council on the redevelopment for the quarry site) drove a second car, thus providing an opportunity for John Martyn, local geologist and member of STEP (which had also put in a submission to the Planning Panel) to participate in the field inspection.

Observations

The eastern face of the quarry exposes a near-complete cross section through the dish-shaped beds of the diatreme, together with the contact with the enclosing Hawkesbury Sandstone. The site, even after having been infilled to RL53 (about half its depth), is immense. The eastern face had been cleaned of nearly all the excess spoil, which was delivered by a mobile conveyer system that discharged directly over this face. Only small pockets of pebble- and cobble-size white Hawkesbury Sandstone remained in crevices on the face, contrasting with the dark grey volcanoclastic breccia forming the diatreme layers. The compacted spoil material infilling the void occupied two planar levels on the floor of the quarry. The higher layer, adjacent to the eastern quarry face, is approximately 5 m higher than the planar level extending to the south to the low point of the quarry void. Craig Clendinning informed us that Council's plan was to excavate the higher level, removing about 5 m depth of spoil which would be redistributed over the lower level. This redistribution of the spoil would have the effect of creating, at RL48, a lower level adjacent to the eastern face that would be the site of

a water retention area, forming a lake that would be a central feature of the proposed redevelopment. The effect on the diatreme cross section would be to initially expose a further 5 m at the base of the section where more of the dish beds would appear to be flattening out in the centre of the visible structure. However, the depth of water in the lake may somewhat reduce this additional exposure. The important point is that the Council is not wanting to cover up any more of the significant features of the diatreme, but is intent on actively increasing the visibility of the dish beds.

There are two bench levels retained from the original quarrying operations still exposed across the eastern face. The lower one is perhaps 5-10 m above the current infill level of RL53, while the higher bench is at RL88. We were subsequently driven from the quarry floor up an access road to a point where we could easily walk along the bench at RL88. This bench has a constant width of several metres, with a 35 m dropoff into the quarry (directly above the proposed water feature). Craig discussed Council's preliminary plans to construct an accessible raised boardwalk along this bench, flanked on one side by a safety fence adjacent to the cliff edge, and on the other by a chainlink (or similar) fence that would permit largely unrestricted visibility of the bedding comprising the diatreme but preventing visitors from actually touching or closely examining the rock face. This barrier was necessary to prevent vandalism of the beds, and as a safety measure to guard against rocks from the face being dislodged (and potentially being thrown over the edge into the water below).

I enquired as to whether some system, such as a lockable gate in the chainlink fence, might be able to be installed to permit strictly controlled access to the rockface for authorised groups. This could allow university geology students, geoscientists or participants in organised local and international scientific excursions, to examine the component clasts in the rock face at close quarters (with hand lens), to undertake limited scientific sampling for Council-approved research purposes, or simply to take close-up photographs of the structure and lithology of diatreme the beds (Fig. 1). Though no commitment could be given, Craig thought that this idea would be worthy of consideration by Council.

There were other safety aspects to protect visitors to the site that were brought to my attention. Several trees, some of considerable height, are growing in precarious positions right on the edge of the quarry void. With almost no ground support evident, these trees could readily fall in a storm, or simply topple over without warning, dislodging large rocks on to the bench below. Council would need to remove these trees for public safety. Other, smaller, trees and vegetation that were growing on the benches could also be considered for removal, not so much for safety as to enhance the view of the diatreme cross section from within the quarry void and to clear the path for the accessible boardwalk to be constructed.

Impressions gained from the site visit

This was my first visit into the quarry site since 1978, when I inspected the eastern face of the quarry (at that time owned and being actively operated by Farley & Lewers) when I was compiling a report on the geoheritage of NSW for the Heritage Commission. I compared the photo I took then (Fig. 2) with that taken on this visit (Fig. 3) and was surprised that the appearance of the cross section through the diatreme was so similar. Essentially the final level proposed for the quarry floor in the redevelopment will be entirely comparable with the exposure more than four decades ago. The depth to which the diatreme cross section has been visible has certainly been greater in the past prior to dumping of spoil into the quarry void, but

the practicality of the situation is that the extent to which the dish structure of the diatreme is currently exposed is as good as can be reasonably expected.

I was particularly encouraged by Council's plans to permit public access along the bench at RL88 by providing a safe, accessible boardwalk. This would be an ideal place to install an interpretative sign drawing the public's attention to the national (and international) significance of the site. The Geological Society of Australia would be able to direct Council to experts who could assist in the wording and images for such an interpretative sign, as per the recommendation by the Sydney North Planning Panel in their deferral of the development application (see Appendix).

Conclusions

It is apparent that Council now recognises the geoheritage significance of its own "Jurassic Park" (a reference to the known age of the diatreme) which is right in its backyard. As the centrepiece of the redevelopment of the old Hornsby Quarry it will no doubt be a remarkable tourist drawcard if properly protected, allowing public (and restricted research/educational) access with suitable interpretation.

While the field inspection focused on the east face (which prominently displays the dish structure, surge deposits, rock lenses, breccia layers, lapilli, amongst other geological attributes), it should be noted that some of the other quarry faces potentially display volcanogenic phenomena that complement or add to those mentioned previously. In particular, the adjoining face extending to the south is significant in showing the contact between the diatreme and the sedimentary rocks of the Sydney Basin through which it intruded. Previous geological investigations of the entire site have revealed the presence of slumped bedding, sandstone dykes, surge- and pebble-rich layers, and a great variety of ejecta associated with the violent intrusion, including basalt bombs with chilled margins, lithic fragments of charcoal in breccia layers, accretionary lapilli, and xenoliths. As many of these unusual geological features were recorded when the quarry was operational, it is unknown what remains of them, or whether new structures and volcanogenic phenomena will be revealed as covering vegetation and unstable spoil heaps are removed during redevelopment of the site. It is therefore vitally important, as recommended by the Sydney North Planning Panel (see Appendix), that Council maintains liaison with the Geological Society of Australia who can contact experts to advise on preservation and interpretation of these features as they are revealed, so fully developing the potential of the Hornsby Diatreme as a nationally (and internationally) significant educational, geoheritage and geotourism site.

Dr Ian Percival

representing the Geoheritage Subcommittee,
NSW Division, Geological Society of Australia
Sydney, 14th July, 2020