8 June 2022

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Director
Resource Assessments
Department of Planning, Industry and Environment
GPO Box 39
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Dear Jessie,

Appin Mine - Longwalls 709 to 711 and 905 Extraction Plan

I refer to the Bulli Seam Operations (BSO) Project Approval Condition 5, Schedule 3 requiring the development of an Extraction Plan which must be approved by the Secretary prior to Illawarra Metallurgical Coal (IMC) undertaking secondary extraction at Appin Mine.

South32 met with the Department, Independent Advisory Panel and Subsidence Advisory NSW on 27 May 2022 to discuss residual matters associated with the Longwalls 709 to 711 and 905 Extraction Plan (Extraction Plan). The following information is provided to address these.

GHD 2021 Report

Appin Area 7 and 9 Proposed Longwalls Landslide Risk Assessment relating to Mine Subsidence Influences was prepared by GHD to support the Extraction Plan. Section 3 of this report details the assessment methodology and process undertaken to initially categorize landslide risks to properties and features within the Extraction Plan area. From the review of various formats of data and preliminary observations across the Extraction Plan area, the residential sites identified as being within 'steep slope' terrain have been categorised to develop a preliminary appraisal of the existing landslide hazards, site susceptibility and potential impact of mine subsidence upon the existing landslide risk levels.

These categories ranged from Category A (*No apparent slope issue relevant to the house structure – not likely to require assessment for slope instability*) through to Category F (*Sites close to the Razorback escarpment, or on or close to steep mid to lower slopes of the escarpment or steeply sloping ridges forming the foot-slopes of the escarpment – these will be the sites requiring detailed LRM assessment*). It should be noted that if a site or features line of sight was obscured during the visual observation stage of the risk assessment and a reliable preliminary assessment could not be made, than it was categorised as requiring further assessment.

Private Property Subsidence Management Plan

Sites and features which have been categorised as requiring further assessment are reviewed in detail and the findings of these assessments included in the private Property Subsidence Management Plan (PSMP). IMC contracts qualified third party consultants to undertake assessments to inform the PSMP for baseline assessment and monitoring throughout active subsidence. A summary of the assessments and management process which will be undertaken for the 11 houses identified as Category F in GHD (2021)[1] is as follows:

- Structural Assessment - a pre-mining inspection of the property and any dwellings is undertaken by a suitability qualified structural engineer. This report is used as a baseline for the condition of the property (including photographs) and to refer to during active subsidence and post active subsidence to determine if any impacts related to mining have occurred. The structural assessment will indicate if there are any opportunities to complete early structural works to the property to mitigate potential impacts and ensure the property remains safe and serviceable (An example is enclosed *5 Gibraltar Drive Pre-Mining Structural Assessment.pdf*).

- Geotechnical Assessment - a pre-mining inspection of the property and any dwellings will be undertaken by a suitability qualified geotechnical engineer. The purpose of the assessment is to investigate slope risk and condition of existing ground surface features within the property boundary and to identify any existing hazards, as well as potential new hazards that may be created as a result of possible mining induced surface movement; including, subsidence influence, tilting impacts, strain, strength reduction of a slope profile, water concentration and regional landslide processes and mechanisms. A qualitative risk assessment will be undertaken to assess the potential risk of slope instability to the property during the mining influence period. This is then used to assess acceptability and appropriate treatments and/or monitoring requirements for the identified slope hazards. (An example is enclosed *860 Menangle Road - Geotechnical Assessment.pdf*).

- Survey of ground and residence – a pre-mining high resolution 2D survey will be undertaken of the property and residence. Fixed survey marks are placed on the grounds and structures to capture a pre-mining baseline profile. During active subsidence and post mining, repeat surveys of the fixed marks will indicate the magnitude of subsidence experienced at the property. This will also inform the structural and geotechnical assessments. (An example is enclosed *Property Monitoring Survey Report - 210811 - 5 Gibraltar Drive.pdf*).

In cases where monitoring is required to manage subsidence and landslide risk to features which may be impacted by subsidence, IMC will use the following monitoring methods (where landowner access is granted) to monitor and manage risks where appropriate:

- Routine visual structural and/or slope assessment as described above.
- Routine high resolution 2D survey as described above.
- Real time 3D Global Navigation Satellite System (GNSS) monitoring – GNSS units provide the absolute positions (vertical and horizontal) and are measured at regular intervals (nominally every 10 seconds) which are used to calculate four-hour running averages .
- Inclinometer monitoring - inclinometers are instruments for measuring relative horizontal displacements affecting the shape of a guide casing embedded in the ground or structure. Inclinometer probes usually measure displacement in two perpendicular planes; therefore, displacement magnitudes and directions (vectors) can be calculated.

[1] Other properties within the Extraction Plan Study Area will be subject to the same assessments if the pre mining site inspection indicates that detailed assessment is required due to predicted subsidence impacts or potential landslide risks.

The pre-mining assessments are used to inform and establish set of monitoring triggers and management actions for each property. The monitoring data which is routinely collected is assessed by the IMC Structural Review Group to determine the trigger level and if additional monitoring, management or mitigation measures are required to keep properties safe and serviceable.

IMC Built Structures Management Plan

IMC has a Built Structures Management Plan for each active longwall at Appin Colliery. The objectives of the Management Plan are to establish procedures to measure, control, mitigate and repair impacts that might occur to structures:

- ensure the safety and serviceability of all building structures and infrastructure. Public safety is paramount. Ensure that the health and safety of people who may be present in structures are not put at risk due to mine subsidence;
- avoid disruption and inconvenience or, if unavoidable, keep to minimal levels;
- monitor ground movements and the conditions of the building structures and associated infrastructure during mining;
- establish procedures to measure, monitor, control, mitigate and repair building structures and associated infrastructure;
- initiate and coordinate action to mitigate or remedy potential significant impacts that are expected to occur to the building structures;
- provide a plan of action in the event that the impacts of mine subsidence are greater than those that are predicted;
- establish a clearly defined decision-making process to ensure timely implementation of risk control measures for high consequence but low likelihood mine subsidence induced hazards that involve potential serious injury or illness to a person or persons at the properties that may require emergency evacuation, entry restriction or suspension of work activities;
- provide a forum to report, discuss and record impacts to the surface. This will involve IMC, the affected landowner and/or resident, relevant government agencies and consultants, as required; and
- establish lines of communication and emergency contacts.

In addition, specific Management Plans also exist for significant infrastructure e.g., the Main Southern Rail, Public Roads.

IMC Structural Review Group (SRG)

As part of the Built Structures Management Plan the SRG meets regularly to review the results of all the subsidence monitoring associated with the active longwalls at Appin Colliery, currently Longwall 904 and 709.

The SRG consists representatives of the specialist consultants that inspect/measure/report on the monitoring. The SRG reviews the monitoring data in relation to all built features e.g., private property, public roads, as well as natural features (e.g., steep slopes and cliff lines). The SRG review and issue a weekly report to the Resource Regulator. The Resource Regulator maintains oversight of potential subsidence impacts through this process and maintains the authority under the *Mining Act 1992* to halt or stop mining if an impact, realized or predicted occurs. The weekly report reviews the progress of the longwall, the latest available monitoring data and the response to triggers due to movement or rainfall. An example of a Longwall 904 Weekly Report is enclosed *MSEC1175 – Appin LW 904 Structures Monitoring Review Report R20*. The report includes 19 figures and a location plan.

The BSO Project Approval provides subsidence impact performance measures (Condition 3, Schedule 3). In order to mitigate the potential subsidence impacts and environmental consequences from the mining of Longwalls 709 to 711 and 905; monitoring and recording will be undertaken prior to mining, throughout the extraction and at the completion of subsidence.

In the event a subsidence impact is recorded, consideration would be given to implementing appropriate management, remediation and/or mitigation measures in consultation with relevant stakeholders.

If the subsidence impact performance measures are exceeded, IMC will notify the appropriate stakeholders and implement the Contingency Plan as described in the Built Features Management Plan.

SA NSW Data Provision

IMC will provide subsidence data relevant to private property claims to SA NSW as requested.

Should the Department require additional information or further discussion please contact the undersigned.

Yours sincerely

Gary Brassington
Approvals Manager
South32 Illawarra Metallurgical Coal