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## Voluntary Auditor's Report

Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara,  
Western Australia

10 March 2023



# Document Information

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Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia

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0	24 February 2023	Emma Del Borrello / Jeremy Hogben	Jeremy Hogben	Jeremy Hogben	Draft for client review
1	10 March 2023	Emma Del Borrello / Jeremy Hogben	Jeremy Hogben	Jeremy Hogben	Final

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Senversa acknowledges the traditional custodians of the land on which this work was created and pay our respect to Elders past and present.



# Executive Summary

Mr Jeremy Hogben of Senversa Pty Ltd (Senvessa) is pleased to present Roy Hill Pty Ltd (Roy Hill) on behalf of Hancock Prospecting Pty Ltd (HPPL) with this Voluntary Auditor's Report (VAR). The VAR was prepared associated with assessment of asbestos as part of the Mulga Downs Iron Ore Mine Project. The site is bound by the Development Envelope and Conceptual Footprint of the proposed Mulga Downs Iron Ore Mine and Groundwater Borefield.

Because the Development Envelope is located proximal to the former Wittenoom asbestos mine and associated registered contaminated sites, Roy Hill is required to further assess for the presence of asbestos at the site in the context of the proposed mining operations, assess relevant risk and to develop appropriate management strategies for implementation during the construction and operation phases for the mining project. Relevant commitments in this regard were made in the *Environmental Scoping Document – Mulga Downs Iron Ore Mine* (Roy Hill, August 2022) associated with the environmental approval process for the mine development.

The Department of Water and Environmental Regulation (DWER) has recommended that the assessment be subject to audit including the production of a Voluntary Auditor's Report. This VAR has been prepared in accordance with the *Contaminated Sites Act, 2003* (CS Act) relevant DWER [formerly Department Environment Regulation (DER)] guidance including *The Western Australian Contaminated Sites Auditor Scheme* (DER 2016b) and *Requirements for Mandatory Auditors' Reports* (DER 2016c). This audit was undertaken to independently assess the quality and veracity of the assessment undertaken to date.

The purpose of the VAR is to:

- provide auditor opinion in relation to the quality and validity of assessment work completed with regards to asbestos contamination at the site;
- draw conclusions in relation to risks or potential risk represented by contamination and the suitability of relevant land for its current or proposed use;
- make recommendations regarding any further assessment or remediation that may be required; and
- make recommendations regarding classification or updates to classifications of relevant land parcels.

JBS&G prepared a Sampling and Analysis Quality Plan (SAQP) and subsequently undertook a Preliminary Environmental Site assessment (PESA) to assess the asbestos contamination status of the site.

The assessment identified that asbestos impacts were likely limited to building materials within ancillary station infrastructure such as tank stands and bore infrastructure, the existing and classified asbestos contaminated area (registered ID 7303) associated with the former Mulga Downs homestead, the possible deposition of asbestos as a result of erosion from the Wittenoom mine area, and/or the potential importation of asbestos to the site for various reasons (including as a construction base for infrastructure or as dumped waste).

The assessment involved a site inspection, sampling of building material suspected as containing asbestos, a detailed desktop assessment designed to identify areas where erosional deposition may have occurred, and the sampling of selected areas where such deposition was considered most likely.

Minor quantities of asbestos were identified within building materials. These were considered low risk and readily manageable. The site inspection did not include assessment of the classified asbestos impacted area within the Development Envelope, but photographs of this area and some additional details were subsequently supplied by Roy Hill.



The desktop assessment concluded that it was very unlikely the site was impacted by asbestos related to erosional deposition and the selected sampling undertaken did not identify evidence of this to an extent that represented a potential risk.

The site inspection did not identify any other evidence of asbestos.

The PESA recommended that a management plan be prepared as a basis to manage both identified and potentially unidentified asbestos at the site associated with proposed development. Auditor review and ultimate endorsement of the management plan will occur subsequent to finalisation of this VAR.

The auditor concludes that asbestos investigation works undertaken at the site provide largely adequate characterisation of forms of asbestos previously identified and suspected at the site and that asbestos appears unlikely to represent an unacceptable risk for the proposed development. The auditor notes that due to the considerable size of the site, the sampling undertaken was limited and judgementally tailored based on a lines of evidence approach in relation to the likely contamination status of the site. This approach is considered to be consistent with DoH 2021 guidelines.

The auditor agrees with the recommendation to prepare an asbestos management plan associated with redevelopment of the site.

The auditor considers that it is not necessary to notify the site for classification under the CS Act, since no contamination has been identified (with the exception of existing classified sites) that represents a potentially unacceptable risk to identified receptors.



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# List of Acronyms

Acronym	Definition	Acronym	Definition
<b>ACM</b>	Asbestos containing material	<b>m AHD</b>	Metres Australian Height Datum
<b>AHD</b>	Australian Height Datum	<b>m bgl</b>	Metres below ground level
<b>AMP</b>	Asbestos Management Plan	<b>mg/kg</b>	Milligrams per kilogram
<b>CoPC</b>	Contaminant of potential concern	<b>NATA</b>	National Association of Testing Authorities
<b>CSM</b>	Conceptual site model	<b>NEPC</b>	National Environment Protection Council
<b>DER</b>	Department of Environmental Regulation	<b>NEPM</b>	National Environment Protection Measure
<b>DMP</b>	Department of Mines and Petroleum	<b>PESA</b>	Preliminary Environmental Site Assessment
<b>DoH</b>	Department of Health	<b>QA</b>	Quality assurance
<b>HPPL</b>	Hancock Prospecting Pty Ltd	<b>QC</b>	Quality control
<b>KIOMIP</b>	Koodaierie Iron Ore Mine and Infrastructure Project	<b>SAQP</b>	Sampling Analysis and Quality Plan
<b>LOR</b>	Limit of reporting	<b>SPR</b>	Source-Pathway-Receptor
<b>m</b>	Metre	<b>VAR</b>	Voluntary Audit Report
<b>m3</b>	Cubic metres	<b>WAMA</b>	Wittenoom Asbestos Management Area





# 1.0 Introduction

## 1.1 Audit Details

Mr Jeremy Hogben (the auditor) of Senversa Pty Ltd (Senvessa) is pleased to present Roy Hill Pty Ltd (Roy Hill) with this Voluntary Auditor's Report (VAR) associated with assessment of asbestos as part of the Mulga Downs Iron Ore Mine Project. The site is bound by the Development Envelope and Conceptual Footprint of the proposed Mulga Downs Iron Ore Mine and Groundwater Borefield. The site location and boundary are shown on **Figure 1**.

Because the Development Envelope is located proximal to the former Wittenoom asbestos mine and associated registered contaminated sites, Roy Hill on behalf of Hancock Prospecting Pty Ltd (HPPL), is required to further assess for the presence of asbestos at the site in the context of the proposed mining operations, assess relevant risk and to develop appropriate management strategies for implementation during the construction and operation phases for the mining project. Relevant commitments in this regard were made in the *Environmental Scoping Document – Mulga Downs Iron Ore Mine* (Roy Hill, August 2022) associated with the environmental approval process for the mine development.

The Department of Water and Environmental Regulation (DWER) has recommended that the assessment be subject to audit including the production of a voluntary auditor's report. This VAR has been prepared in accordance with the *Contaminated Sites Act, 2003* (CS Act) relevant DWER [formerly Department Environment Regulation (DER)] guidance including *The Western Australian Contaminated Sites Auditor Scheme* (DER 2016b) and *Requirements for Mandatory Auditors' Reports* (DER 2016c). This audit was undertaken to independently assess the quality and veracity of the assessment undertaken to date.

Audit details, as defined under DER (2016), are provided in **Table 1.1**.

**Table 1-1: Mandatory Audit Details**

<b>Site Auditor</b>	Mr Jeremy Hogben
<b>Date of WA Auditor Accreditation</b>	6 December 2006
<b>Commencement Date of Audit</b>	14 February 2023
<b>Reason for Audit</b>	Provide auditor review of asbestos assessments conducted within the site as part of regulatory permitting for the proposed Mulga Downs Iron Ore Mine and associated borefield.
<b>Site Address / Mining Tenements</b>	Mulga Downs (M47/1621, E47/2117, L45/316, L45/380, L45/384 and E47/2044) Mt Florance Pastoral Station (E47/1315) Mt Hooley Pastoral Station (E47/1315)
<b>Property Description</b>	The site is located within the Mulga Downs Pastoral Station and encompasses an area of 40,653 hectares (ha). The Development Envelope includes the Mine Area to the east and Mulga West borefield located approximately 7 km to the west of the Mine Area. The Development Envelope excludes the Mulga Homestead, a registered contaminated site.
<b>Local Government Authority</b>	Shire of Ashburton
<b>Proposed Land Use</b>	Borefield and mine site.





## 1.2 Background

The Mulga Downs Pastoral Station located 180 km northwest of Newman lies within the Chichester Ranges and Hamersley Ranges and slopes down towards the Fortescue River Valley (**Figure 1, Appendix A**). Historical mining of asbestiform minerals, in the form of crocidolite or 'blue' asbestos, within the nearby Wittenoom and Yampire Gorges has resulted in widespread presence of asbestiform minerals to soils due to storage of asbestos containing tailings, usage of tailings in service infrastructures (e.g., roads and airstrips), along with erosion and deposition via drainage lines to the Fortescue River Valley.

Three registered contaminated sites are present within and in the vicinity of the Mulga Downs Pastoral Station and include the Wittenoom Asbestos Management Area (WAMA) to the south west, the Mulga Downs Homestead (ID: 20175) and an approximate 4 hectare land parcel to the south of the Mulga Downs Homestead associated with abandoned infrastructure (ID: 73903). These three land parcels are classified as '*Contaminated – remediation required*' under the CS Act and are shown in **Figure 2, Appendix A**. Site classification relates to asbestos contamination identified in soils.

HPPL have identified a proposed Development Envelope and Conceptual Construction Footprint for the proposed Mulga Downs Iron Ore mine site and associated borefield (the site). To facilitate regulatory approvals, specifically approval under Part IV and Part V of the WA *Environmental Protection Act 1986* (the EP Act), DWER indicated to HPPL that asbestos contamination assessment, including assessment of asbestiform minerals in soils in drainage areas (shown in **Figure 3, Appendix A**), would be required. This was reflected in commitments made by HPPL in *Environmental Scoping Document – Mulga Downs Iron Ore Mine* (Roy Hill, August 2022). DWER also recommended that an audit of the asbestos assessment would be prudent but did not formally require this pursuant to r31(1)(d) of the *Contaminated Sites Regulation 2006*, meaning the commissioned audit remains voluntary at this stage.

JBS&G initiated a Preliminary Environmental Site Assessment (PESA) comprising three reported Phases:

- Phase 1: Desktop Assessment and development of a Sampling Analysis and Quality Plan (SAQP).
- Phase 2: Site investigation works and preparation of the PESA report.
- Phase 3 (where required): Additional site investigation works to inform preparation of an Asbestos Management Plan (AMP).

The first two phases have been completed and are the subject of this VAR. A draft AMP has been provided for auditor review and will be finalised with auditor endorsement subsequent to issue of this VAR.

## 1.3 Purpose of Audit

The purpose of the VAR is to:

- provide auditor opinion in relation to the quality and validity of assessment work completed with regards to asbestos contamination at the site;
- draw conclusions in relation to risks or potential risk represented by contamination and the suitability of relevant land for its current or proposed use;
- make recommendations regarding any further assessment or remediation that may be required; and
- make recommendations regarding classification or updates to classifications of relevant land parcels.



## 1.4 Limitations of the Audit

All of the information and opinions provided in this VAR are based on a review of the information provided in the reports cited in **Section 3.0**. The auditor has not inspected the site specifically associated with this audit.

The auditor assumes no responsibility or liability for any errors or omissions in the information provided in the reports reviewed and the analytical data presented to the auditor.

The overall purpose of this VAR is to assess the risk associated with the subject site on human health and the environment (and proposed management measures); no other warranties expressed or implied are made. Any subsequent changes to the site and/or the finished levels following issuing of this VAR are outside the scope of the audit.

Given the limited timeframe available for the audit, the auditor has not undertaken a site visit prior to preparation of his VAR.

## 1.5 Guidelines Used

The auditor has based the technical review on professional experience and relevant published guidelines that include but are not limited to:

- DWER Contaminated Sites guidelines series, including:
  - Assessment and Management of Contaminated Sites (DWER, 2021).
  - Identification, Reporting and Classification of Contaminated Sites *in Western Australia* (DER, 2017).
  - The Western Australian Contaminated Site Auditor Scheme (DER, 2016b).
  - Requirements for Mandatory Auditors' Reports (DER, 2016a).
- Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated in Western Australia (Department of Health, 2021). (DoH 2021)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM), as amended May 2013 (National Environment Protection Council [NEPC], 1999).



## 2.0 Site Identification

Identification details relating to the site are provided below in **Table 2.1**.

**Table 2-1: Site Identification Details**

### Site Identification Details

<b>Site Name</b>	Development Envelope and Conceptual Footprint of the Mulga Downs Iron Ore Mine and Mulga West Borefield.
<b>Legal Description</b>	Mulga Downs (M47/1621, E47/2117, L45/316, L45/380, L45/384 and E47/2044) Mt Florance Pastoral Station (E47/1315) and Mt Hooley Pastoral Station (E47/1315) ( <b>Figure 1, Appendix A</b> ).
<b>Current Site Classification</b>	Portions of the site including a discreet area associated with the Mulga Downs Homestead and the Wittenoom Asbestos Management Area (WAMA) are classified as ' <i>Contaminated – remediation required</i> '.  The site classifications pertain to the identification of free asbestos fibres to surface soils around abandoned infrastructure.
<b>Site Owner</b>	Hancock Prospecting Pty Ltd.
<b>Site Occupier</b>	Hancock Prospecting Pty Ltd.
<b>Historical Land Use</b>	Pastoral station since 1891.
<b>Current Land Use</b>	The current site layout is depicted in <b>Figure 1 (Appendix A)</b> .
<b>Local Government Authority</b>	Shire of Ashburton.
<b>Zoning</b>	Rural, other purposes infrastructure and Public purposes water and drainage.



## 3.0 Audited Documentation

The two reports listed below form the basis for this VAR:

- Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment – Scoping Document, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia, JBS&G Australia Pty Ltd, 9 March 2023 (JBS&G 2023a).
- Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia, JBS&G Australia Pty Ltd, 9 March 2023 (JBS&G 2023b).



## 4.0 Site Characteristics

### 4.1 Site Description and Land Use

The site boundary, as defined by the Development Envelope and Conceptual Construction Footprint, covers an area of approximately 40,653 ha. The site is located on the Mulga Downs Pastoral Station, which has been in operation since 1891, and at present is intended to comprise the Mine Area to the east and the Mulga West borefield approximately 7 km to the west. Consistent with the zoning of rural and public purposes for water and drainage land use, a number of structures associated with the historical use of the Mulga Downs Pastoral Station have been identified across the site including windmills, dams, water bores and associated infrastructure, shown in **Figure 4**.

The surrounding land uses include the following.

- Unallocated Crown Land (vacant open bush).
- Youngaleena Community to the south and Wirrimurra Community to the east.
- Pastoral leases including Mulga Downs, Mt Florance and Hooley Pastoral Stations.
- Karijini National Park immediately to the south.
- Auski Roadhouse to the south east.
- Mungaroona Range to the north.

The majority of the Wittenoom Asbestos Management Area (WAMA) is located immediately to the south of the site (noting that the two intersect in a narrow portion west of the Mulga Downs Homestead), along with the former Wittenoom town site 13 km south of the site. Non-technical summary reports prepared by GHD (2006), and referenced in the PESA, indicate that mine waste tailings containing asbestos were used as part of construction of roads and airstrip that serviced the Mulga Downs Pastoral Station, as well within built structures. Loose asbestos fibres have been identified at the Mulga Downs Homestead, which is excluded from the site, and informed the classification of '*Contaminated – remediation required*' of the land parcel pertaining to the homestead located to the north.

A meeting between HPPL, JBS&G and DWER was held on 13 July 2022. Information provided by DWER subsequent to the meeting indicated that the presence of asbestos on the Mulga Downs Pastoral Station was the result of known and suspected utilisation of asbestos material sourced from historical mining locations in the Wittenoom, Yampire and other gorges in the vicinity of the site. Additionally, DWER is reported to have communicated the requirement for assessment for asbestiform minerals due to the likelihood of natural erosion and dispersion of asbestiform minerals from the gorges. Dumping of asbestos wastes including tailings and ACM were reported to have also occurred at the site.

The auditor has reviewed the site description, site history and reported land uses at the site and is satisfied that the site has been largely accurately described and potentially contaminating activities have been appropriately considered. The auditor notes that the site description omits to identify an area south of the Mulga Downs Homestead that is associated with storage of old infrastructure and has been classified as '*Contaminated – remediation required*' due to the presence of asbestos.

### 4.2 Topography and Drainage

The site is located on the northern reaches of the Fortescue Valley and is bound by the Chichester Range to the north and Hamersley Range to the south. Ground elevation is reported to range between 390 and 410 mAHD. The Fortescue Valley is characterised as comprising low-lying hills which rise between 30 and 40 m above the adjacent river flood plain level.



Incised drainage pathways are present throughout the Chichester Range and Hamersley Ranges which discharge into alluvial fans which exit into the Lower Fortescue River Valley to the south of the site. Drainage lines identified within the Hamersley Range are reported to receive drainage flow from incised drainage lines present throughout larger gorges such as the Wittenoom Gorge and Kalamina Gorge which may potentially result in erosion and deposition of naturally occurring asbestiform minerals from the Wittenoom Gorge. However, it was considered in the PESA that the potential for asbestiform minerals to be present north of the Lower Fortescue River to be low within the context of the topographical and surface water drainage setting.

The auditor is satisfied with the description of the topography and drainage of the Site summarised in the PESA report. The auditor considers this description usefully informs the assessment of the likely distribution of asbestos from the Wittenoom mining area.



## 4.3 Geology

Regional geology is reported to comprise the Fortescue and Hamersley Groups. The Jeerinah Formation and Marra Mamba Iron Formation are noted to outcrop to the northern side of the Fortescue Valley. The underlying Brockman Iron Formation forms the Hamersley Ranges to the south. The Fortescue Valley is infilled with Tertiary deposits comprising alluvium, colluvium, pisolites, clays and calcrete which overly a lateritic hardcap development of Tertiary age. The Wittenoom Formation is reported to subcrop beneath the valley floor. Mineralisation was reported to be primarily associated with the Nammuldi Member of the Marra Mamba Formation, with some mineralisation noted in the Tertiary deposits (Mine Earth Pty Ltd 2021).

Asbestiform minerals, in the form of crocidolite asbestos (or 'blue' asbestos), has been identified within banded iron formations of the Hamersley Basin (DMP 2015) and is reported to be typically associated with the Dales Gorge Member of the Brockman Iron Formation. The orebody to be targeted as part of mining operations is reported to be located within the Marra Mamba Iron formation which lies above the Brockman Iron Formation. The PESA reports that exploration drill holes were terminated at intersection of the Brockman Iron Formation, due to consideration that potential for natural asbestiform minerals to be encountered within the Brockman Iron Formation. No records or information was available at the time of the PESA as to whether exploration drill holes encountered or terminated due to interception of natural asbestiform minerals.

Due to the shallow nature of soil investigation works undertaken at the site, site specific geology reported in the PESA did not encounter the underlying regional geology. Shallow soils (0.0 to 0.3 m) encountered were described as red coarse-grained sands.

The auditor is satisfied with the geological summary provided and consideration given to the presence and likelihood for interception of asbestiform minerals within the regional geology. Soil investigation works were surficial only and did not encounter regional geology, however shallow soils encountered are considered consistent with anticipated overlying soils of the reported geological setting.

## 4.4 Hydrogeology

Due to the nature of the investigation, the hydrogeological setting of the site was not detailed.

The auditor notes that the primary objective of the PESA was to identify the nature and extent and potential risks associated with asbestos contamination at the site. As such, the auditor is satisfied that due to the nature of this investigation, the hydrogeological setting is not considered an important consideration for the investigation.

## 4.5 Conceptual Site Model

Detailed information on the environmental setting, and Conceptual Site Models (CSMs) for the Site, have been established in the PESA and SAQP referenced in **Section 3.0**. The most current, detailed CSM and relevant Source-Pathway-Receptor (SPR) linkages are provided in the PESA (JBS&G 2023b) reviewed as part of this VAR and summarised in the following sections.

### 4.5.1 Sources

The following identified and potential sources of asbestos contamination were identified in the SAQP and PESA.

- Deposited natural asbestiform minerals via surface water run off and airborne migration and deposition within the Lower Fortescue River Valley, which falls within the southern portion of the site. Investigation within these areas was not undertaken as part of the PESA (JBS&G 2023b).





- Historical use of asbestos containing materials within anthropogenic landforms, for example roadways, foundations, and built structures at the site.
- Historical dumping of asbestos containing tailings and ACM waste within and in the vicinity of the site.
- Drill cuttings containing natural asbestiform minerals resultant from exploration drilling.

#### 4.5.2 Exposure Pathways and Transport Mechanisms

Transport mechanisms identified within the CSM (JBS&G 2023b) include:

- Surface water entrainment and deposition of asbestiform minerals and tailings from the WAMA, Lower Fortescue Valley and Hamersley Ranges.
- Airborne migration and deposition of asbestiform minerals and tailings from the WAMA, Lower Fortescue Valley and Hamersley Ranges.
- Lateral surface migration of potential asbestiform minerals in drill cuttings resultant from explorational drilling undertaken at the site.
- Historical dumping of ACM and asbestos containing tailings.

The primary exposure pathway was reported to be inhalation of respirable asbestos fibres.

#### 4.5.3 Receptors

The following receptors were reported.

- Current on-site workers and site visitors.
- Future excavation/maintenance workers operating within the vicinity of ancillary infrastructure associated with proposed construction and operation of the site.
- Future excavation/maintenance workers operating within mine pits and resource areas as part of proposed mine operations at the site.

#### 4.5.4 Potentially Complete Source-Pathway-Receptor Linkages

The revised CSM presented in the PESA (JBS&G 2023b) indicates the following potentially complete SPR linkages:

- Disturbance of deposited natural asbestiform minerals as part of operations resulting in possible generation of airborne fibres and inhalation by current and future site workers and site visitors, including excavation and maintenance workers operating within the vicinity of ancillary infrastructure.
- Inhalation of asbestos fibres resulting from the disturbance of dumped asbestos wastes including tailing and ACM.

The presented CSM is considered to adequately consider the site setting, potential contamination sources, identified receptors, and complete and incomplete SPR linkages.



## 5.0 Documents Reviewed

The documents listed in **Table 5.1** below have been critically and independently reviewed as part of the audit process and should be read in conjunction with this VAR.

Summaries of the documents are presented in this section, together with auditor commentary. Relevant figures showing pertinent information have been extracted from the associated documents and presented in **Appendix A**.

It is noted that a copy of the SAQP was included as an appendix to the PESA but was titled incorrectly. Further, most of the content of the SAQP is repeated in the PESA and is otherwise largely superseded by the PESA. Although the SAQP is dated later than the PESA it clearly preceded it and so has been described first below.

**Table 5-1: Documents Reviewed**

Document Date	Author	Document Type	Title	Reference
9 March 2023	JBS&G	Report	Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment – Scoping Document, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia	54533/146,642 (Rev1)
9 March 2023	JBS&G	Report.	Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia	54533/147,801 (Rev C)

### 5.1 Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment – Scoping Document, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia (JBS&G 2023a)

Phase 1 of the PESA comprised a desktop assessment and preparation of a SAQP to guide the site investigation works.

#### 5.1.1 Objectives and Scope of Work

The overarching project objective reported by JBS&G was to assess the potential presence or absence of natural asbestiform minerals within the site boundary to inform appropriate management through development and operational activities. Specific objectives related to identification of areas of asbestos contamination, assess potential risks to identified receptors and provide information to allow the development of an Asbestos Management Plan (AMP) for the site.



The auditor is satisfied that the objectives of the SAQP were clearly stated and appropriate. The scope of works was also considered suitable to guide the preparation of a SAQP to inform investigation.

### 5.1.2 Previous Investigations and Regulatory Approval Review

The following two investigation reports relating to natural asbestiform minerals within the vicinity of the site were reviewed.

- GHD (2006) *Management of Asbestos Contamination in Wittenoom, Non-Technical Summary*. November 2006.
- Rio Tinto (2017) *Koodaideri Iron Ore Mine and Infrastructure Project: Asbestos Environmental Management Plan*.

Additionally, Ministerial Statement 999, relating to the Koodaiderie Iron Ore Mine and Infrastructure Project (KIOMIP), was reviewed as part of the SAQP and PESA. The Ministerial Statement is reported to outline conditions for the KIOMIP, including the following requirements that:

- asbestos is managed within the WAMA so as to not increase the spread of asbestos in the environment, resulting in adverse effects on public health; and
- an Asbestos Baseline Survey Plan be implemented prior to the commencement of ground disturbing activities.

The following key conclusions were made from review of these documents.

- The most significant source and migration pathway of asbestiform minerals within the WAMA was via erosion by water. It was noted by JBS&G that the distribution of asbestiform minerals was unclear however could potentially be present within proximity of the site.
- The sampling approach adopted by Rio Tinto for the Koodaideri AMP targeted potential diffuse source contamination via surface water flow pathways. JBS&G adopted a similar sampling approach as part of the SAQP.

The auditor is satisfied that the review and summary of previous investigations and regulatory approval documents was appropriate.

### 5.1.3 Conceptual Site Model

The Conceptual Site Model presented in the SAQP was as per the Conceptual Site Model presented in the PESA, summarised in **Section 4.5**.

The auditor is generally satisfied that the Conceptual Site Model presented was appropriate and considered all viable sources, transport and exposure pathways, receptors and SPR linkages based on the presented site setting, noting the minor deficiencies identified in **Section 4.5.4**.

### 5.1.4 Sampling and Analysis Rationale and Methodology

Due to the considerable size of the site, a targeted investigation was proposed to investigate ACM within built structures at the site, presence of natural asbestiform minerals within soils and areas of dumping of asbestos wastes.

The three following data gaps were identified by JBS&G in the SAQP to guide the targeted investigation.

- Where is anthropogenic ACM utilised in built form?
- Where has anthropogenic ACM been disposed of within the site?
- Where are diffuse natural asbestiform minerals in the site?

The assessment framework outlined the following.



- requirements for field personnel,
- data quality objectives (DQOs),
- methodologies for visual inspection and sampling of built structures,
- methodologies for judgemental soil sampling,
- sampling methodologies for ACM and fibrous asbestos (FA),
- laboratory analytical schedule for samples,
- decontamination procedures,
- Quality Assurance and Quality Control (QAQC) procedures, and
- waste management, and
- asbestos management procedures during site assessment.

The auditor considers the components of the SAQP framework listed suitable to guide the site investigation works and is compliant with relevant DoH 2021 and DWER 2021 guidelines. The auditor provided comments for consideration relating to additional areas for assessment in planned future investigations, included in **Appendix B**.

## 5.2 Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia (JBS&G 2023b)

The PESA was initiated based on the planning outlined in the SAQP, as summarised below.

### 5.2.1 Objectives

The overarching project objective and scope of work was as per those reported in the SAQP.

The auditor is satisfied that the objectives of the PESA were clearly stated and appropriate to guide the investigation.

### 5.2.2 Scope of Work

The scope of work outlined comprised three phases including a desktop study and preparation of a SAQP (Phase 1), targeted asbestos investigation guided by the SAQP (Phase 2) and additional investigation and preparation of an AMP (Phase 3), not undertaken as part of the PESA. Phases 1 and 2 are summarised below.

#### **Phase 1**

- Desktop study including review of publicly available information and historical information provided by HPPL, including earlier environmental investigations.
- Data interpretation and review of previous environmental investigations within the context of asbestos at the site.
- Development of a SAQP to inform site investigation works and preparation of a PESA report.

#### **Phase 2**

- Site inspection to visually identify asbestiform minerals and ACM.
- Collection of targeted soil samples from potential source areas identified within the SAQP.
- Laboratory analysis of representative soil samples.
- Comparison of laboratory results to adopted assessment criteria.



- Preparation of a PESA report outlining considerations of the intrusive investigation and laboratory analysis.
- Provision of recommendations relating to the development of a risk management plan, where unacceptable risks to human health and the environment have been identified. Where applicable consideration was also given to the potential for unexpected finds for construction and operation.
- Soil investigation included advancement of soil bores within the off-site drainage area to the north-east and comparison of reported hydrocarbon and PFAS concentrations to Tier 1 risk assessment criteria for commercial/industrial land use.

The scope of work undertaken was consistent with the SAQP with any minor deviations described and justified.

### 5.2.3 Findings

Key findings from the PESA (JBS&G 2023b) are summarised as follows:

- Site structures including tank pads, groundwater bores and auxiliary concrete structures, were visually assessed for ACM. Asbestos was identified in samples collected from concrete at three separate bore locations. The potential for asbestos fibre release from disturbance of potential ACM was considered minor due to the small size and scale of observed infrastructure.
- A single loose fibre bundle of crocidolite asbestos was identified in one soil sample and was below adopted assessment criteria. Asbestos was not identified in the remainder of samples.
- Historical dumping of asbestos tailings and ACM has been reported as possible within the site, however, was not observed during the site inspection. It was concluded that whilst dumping of asbestos containing waste at the site cannot be discounted, the potential unacceptable risk to receptors from dumping of asbestos containing waste was considered low and could be managed under a site AMP.
- It was considered unlikely that an unacceptable risk would be posed to identified site receptors from the presence of asbestos at the site.

The auditor considers that the findings presented in the PESA are suitable interpretations of data and results collated through investigation works. The auditor's initial review of the PESA (included in **Appendix B**) identified some potential deficiencies and potential opportunities to improve the assessment, including additional assessment and/or sampling to the south of the former homestead and confirmatory sampling within the area of the site intersecting the WAMA. The revised PESA report provides adequate description of the registered contaminated site associated with the former laydown area and appropriate consideration with regards to further investigation in the small portion of the site which intersects the WAMA and areas south of the former homestead.

### 5.2.4 Recommendations

Based on the findings of the PESA, JBS&G recommended the preparation and implementation of an AMP to mitigate potential fibre release from structures during operations and detail the appropriate procedures for decommissioning and removal of structures from the site.

Further to the AMP, due to the potential presence of dumped asbestos containing waste it was recommended that an unexpected finds procedure is prepared detailing management measures to be implemented in the event that tailings or other asbestos containing wastes are identified or suspected at the site.

The auditor considers the recommendations provided appropriate.



## 6.0 Basis for Adoption of Assessment Criteria

A Tier 1 health and risk assessment was undertaken as a part of the PESA (JBS&G 2023b). As part of the Tier 1 screening risk assessment, site analytical data was compared to generic assessment levels to identify presence and concentrations of asbestos that may pose a risk to human health. If concentrations were identified to be below the adopted assessment levels, it is unlikely to present an unacceptable risk. If one or more assessment levels are exceeded, then further investigation may be required to assess the potential risk.

The following documents have been consulted in adoption of assessment criteria for FA and AF at the site to achieve project objectives.

- *Assessment and management of contaminated sites* (DWER 2021).
- *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated in Western Australia* (Department of Health, 2021).
- *National Environment Protection (Assessment of Site Contamination) Measure (as amended and 2013)* (ASC NEPM) (NEPC 1999).

The criterion value of 0.001 % asbestos weight/weight (w/w) for FA / AF, provided in DoH 2021, was adopted for the assessment of potential unacceptable risks posed to identified receptors under a commercial / industrial land use.

JBS&G noted that no accepted methodology or assessment criteria were available for free asbestos fibres in soils and that consisted with the approach provided in DoH 2021, potential unacceptable risks to identified receptors would be assessed based on presence or absence of asbestos fibres identified in soils.

The auditor considers that the fibrous asbestos assessment criteria adopted were appropriate for the assessment of contamination at the site, based on the identified receptors and ongoing land use.



## 7.0 Current Site Status

Based on the findings of the PESA completed by JBS&G, the current site status with regards to asbestos in built structures and fibrous asbestos in soils above adopted assessment criteria is summarised as follows.

- Asbestos was identified within material samples collected from three of eight structures sampled.
- One loose crocidolite asbestos fibre bundle was identified in 1 of 60 samples collected across the site. Fibrous asbestos concentrations were below the adopted DoH 2021 criterion of 0.001 %w/w.
- It is noted that samples were not collected within areas where the WAMA extends on to the site, nor within the boundary of the registered contaminated site (ID: 73903).

Soil sample locations relating to the asbestiform mineral soil investigation are shown in **Figure 5, Appendix A**.





## 8.0 Auditor's Assessment

### 8.1 Quality and Completeness

The scope of work subject to audit was undertaken by JBS&G in a staged approach, consistent with the approach recommended in the ASC NEPM and *Contaminated sites guidelines*.

The auditor has critically and independently reviewed the reports listed in **Section 3.0** and provided correspondence with review comments as described in **Section 8.5**, with relevant documentation provided in **Appendix B**.

The auditor is satisfied that the overall quality and completeness of the assessment is adequate to form the basis for site characterisation and risk assessment.

There is limited discussion regarding community consultation and stakeholder engagement in the various reports. However, the auditor is satisfied the ongoing stakeholder consultation is being undertaken by HPPL consistent with the requirements of DWER 2021 and DoH 2021.

### 8.2 Assessment of Risk to Human Health and the Environment

The auditor is satisfied that the assessment of human health risk for the site undertaken to date has been adequate.

The auditor considers that the findings of the audited reports demonstrate that the asbestos impacts on-site should not pose unacceptable risk to human and public health values based on the site's proposed ongoing use for commercial/industrial purposes, managed under an appropriate AMP.

### 8.3 Expert Support

No members of the auditor's expert support team were used during the audit process. General audit support was provided by Emma Del Borrello (Associate).

### 8.4 Audit Correspondence

Copies of key correspondence relevant to the audit is provided is presented in **Appendix B**.



## 9.0 Auditor's Conclusions and Recommendations

### 9.1 Consultant's Conclusions

Asbestos investigations undertaken at the site comprised both asbestos in built form assessment and targeted investigation of asbestiform minerals within key potential depositional areas identified in the SAQP.

ACM was reported to be present within built structures at the site. Built structures identified and suspected to contain were not considered to pose unacceptable risk to identified receptors and it was suggested that ACM in these structures could be appropriately managed under an AMP.

Historical asbestos waste which was reported to have previously been identified at the site was not encountered during the site investigations. JBS&G did not discount the presence of asbestos wastes at the site however, it was suggested that these occurrences of asbestos waste could be managed under Unexpected Finds procedures within the AMP.

With consideration to the key findings, and identification of asbestiform minerals in 1 of 60 soil samples collected at the site, it was concluded unlikely that an unacceptable risk would be posed to identified site receptors from the identified presence of asbestos at the site.

The auditor concurs with the conclusions presented by the consultant and considers that they are reasonable and justifiable, and address identified data gaps.

### 9.2 Consultant's Recommendations

The PESA (JBS&G 2023b) recommended the preparation and implementation of an AMP to prevent the release of asbestos fibres during mine operation from structures identified and suspected to contain ACM and asbestos waste. It was also recommended that an Unexpected Finds procedure be incorporated into the AMP to manage potential unexpected finds of asbestos tailings or ACM waste.

The auditor concurs with the recommendations presented by the consultant.



### 9.3 Regulation and Guideline Compliance

The auditor is satisfied that the information contained in the reports referenced as the subject of the audit in **Section 3.0** is complete, accurate and sufficiently compliant with the requirements of the ASC NEPM, DWER 2021 and DoH 2021 guidelines, and other relevant published technical guidance as set out in this VAR.

### 9.4 Summary of Auditor's Conclusions and Recommendations

The auditor concludes that asbestos investigation works undertaken at the site provide largely adequate characterisation of forms of asbestos previously identified and suspected at the site and that asbestos appears unlikely to represent an unacceptable risk for the proposed development. The auditor notes that due to the considerable size of the site, the sampling undertaken was limited and judgementally tailored based on a lines of evidence approach in relation to the likely contamination status of the site. This approach is considered to be consistent with DoH 2021 guidelines.

The auditor agrees with the recommendation to prepare an AMP associated with redevelopment of the site.

The auditor considers that, it is not necessary to notify the site for classification under the CS Act, since no contamination has been identified (with the exception of existing classified sites), that represents a potentially unacceptable risk to identified receptors.

### 9.5 Assumptions and Uncertainties

Conclusions made in this report are subject to the following assumptions:

- The auditor has not attended the site and full reliance has been made on provided documentation.
- Targeted soil sampling was undertaken at the site. Additional areas of asbestos contamination may be present at the site.
- Potential sources and receptors of significance have not been excluded from the CSM, however complete SPR linkages are proposed to be managed under a site AMP.

Whilst it is acknowledged that uncertainties in the data may exist and/or remain even after additional assessment, the auditor considers that they are likely not great enough to affect the overall assessment of risk for the site.



## 10.0 Limitations

This report has been prepared in accordance with our understanding and interpretation of current regulatory standards.

The following principles are an integral part of site contamination assessment practices and are intended to be referred to in resolving any ambiguity or exercising such discretion as is appropriate.

Area	Inherent Uncertainties and Limitations
<b>Consultants Limitations</b>	The auditor has prepared this document in good faith but is unable to provide certification outside of areas over which he had some control or is reasonably able to check. The consultants have included limitations in their report and the Audit must also be subject to those limitations.
<b>Elimination of Uncertainty</b>	Some uncertainty is inherent in all site investigations. Furthermore, any sample, either surface or subsurface, taken for chemical testing may or may not be representative of a larger population or area. Professional judgment and interpretation are inherent in the process, and even when exercised in accordance with objective scientific principles, uncertainty is inevitable. Additional assessment beyond that which was reasonably undertaken may reduce the uncertainty.
<b>Failure to Detect</b>	Even when site investigation work is executed competently and in accordance with the appropriate Australian guidance, such as the National Environmental Protection (Assessment of Site Contamination) Amendment Measure ('the NEPM'), it must be recognised that certain conditions present especially difficult target analyte detection problems. Such conditions may include, but are not limited to, complex geological settings, unusual or generally poorly understood behaviour and fate characteristics of certain substances, complex, discontinuous, random, or heterogeneous distributions of existing target analytes, physical impediments to investigation imposed by the location of services, structures and other man-made objects, and the inherent limitations of assessment technologies.
<b>Limitations of Information</b>	The effectiveness of any site investigation may be compromised by limitations or defects in the information used to define the objectives and scope of the investigation, including inability to obtain information concerning historic site uses or prior site assessment activities despite the efforts of the user and assessor to obtain such information.
<b>Chemical Analysis Error</b>	Chemical testing methods have inherent uncertainties and limitations. Senversa routinely seeks to require the laboratory to report any potential or actual problems experienced, or non-routine events which may have occurred during the testing, so that such problems can be considered in evaluating the data.
<b>Level of Assessment</b>	The investigation should not be considered to be an exhaustive assessment of environmental conditions on a property. There is a point at which the effort of information obtained, and the time required to obtain it outweigh the benefit of the information gained and, in the context of private transactions and contractual responsibilities, may become a material detriment to the orderly conduct of business. If the presence of target analytes is confirmed on a property, the extent of further assessment is a function of the degree of confidence required and the degree of uncertainty acceptable in relation to the objectives of the assessment.
<b>Comparison with Subsequent Inquiry</b>	The justification and adequacy of the investigation findings in light of the findings of a subsequent inquiry should be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made.
<b>Data Useability</b>	Investigation data generally only represent the site conditions at the time the data were generated. Therefore, the usability of data collected as part of this investigation may have a finite lifetime depending on the application and use being made of the data. In all respects, a future reader of this report should evaluate whether previously generated data are appropriate for any subsequent use beyond the original purpose for which they were collected or are otherwise subject to lifetime limits imposed by other laws, regulations or regulatory policies.
<b>Nature of Advice</b>	The investigation works herein are intended to develop and present sound, scientifically valid data concerning actual site conditions. Senversa does not seek or purport to provide legal or business advice.



## 11.0 References

*Contaminated Sites Act 2003.*

*Contaminated Sites Regulations 2006.*

Department of Environmental Regulation (DER) 2016a, *Requirements for Mandatory Auditors' Reports*, Contaminated Sites Guidelines series, (Former) Department of Environment Regulation, State of Western Australia, Perth.

DER 2016b, *The Western Australian Contaminated Sites Auditor Scheme*, Contaminated Sites Guidelines series, (Former) Department of Environment Regulation, State of Western Australia, Perth.

Department of Health (DoH) 2021 *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.*

Department of Mines and Petroleum 2015 *Management of Fibrous Minerals in Western Australian Mining Operations*. Second Edition.

Department of Water and Environmental Regulation (DWER) 2017, *Identification, Reporting and Classification of Contaminated Sites in Western Australia*, Contaminated Sites Guidelines series, Department of Water and Environmental Regulation, State of Western Australia, Perth.

DWER 2021. *Assessment and Management of Contaminated Sites*. Contaminated Sites Guideline. November 2021.

*Environmental Protection Act 1986 (WA).*

GHD 2006, *Management of Asbestos Contamination in Wittenoom, Non-Technical Summary*. November 2006. Document Reference: 61/17763/63134).

JBS&G 2023a, *Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment – Scoping Document, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia*, JBS&G Australia Pty Ltd. 9 March 2023. Revision 1. Document Reference: 54533/146, 642.

JBS&G 2023b, *Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia*, JBS&G Australia Pty Ltd, 9 March 2023. Revision C. Document Reference: 54533/147, 801.

Mine Earth Pty Ltd 2021, *Mulga East Phase 1 Waste Rock Characterisation Assessment*. 14 October 2021.

NEPC 1999, *National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM)*, as amended May 2013, National Environment Protection Council, Commonwealth of Australia, Canberra.

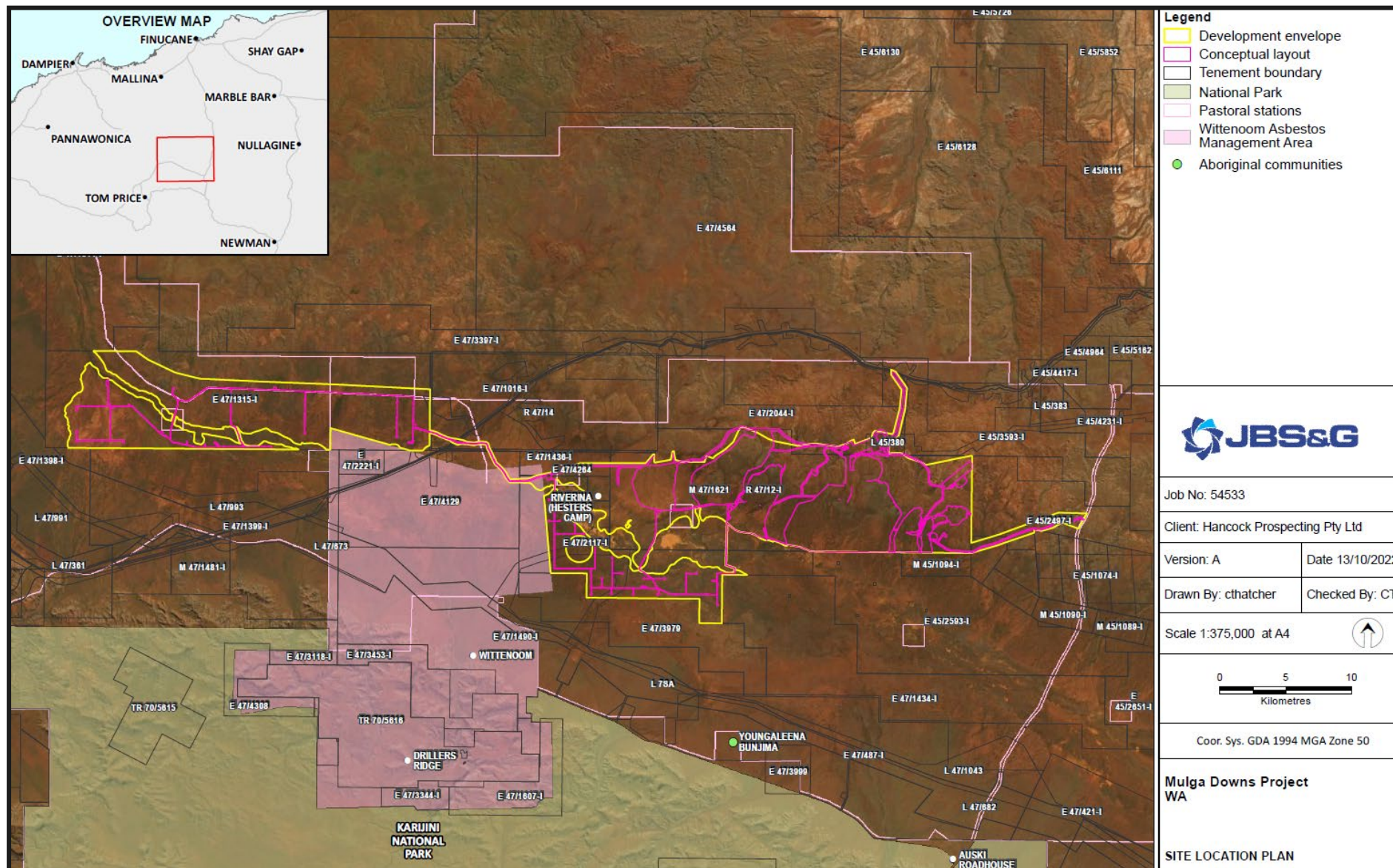
Rio Tinto (2017) *Koodaideri Iron Ore Mine and Infrastructure Project: Asbestos Environmental Management Plan*.

Roy Hill (2022) *Environmental Scoping Document – Mulga Downs Iron Ore Mine*



## Appendix A: Figures





### Figure 1: Site Location

Source: JBS&G (2022a)



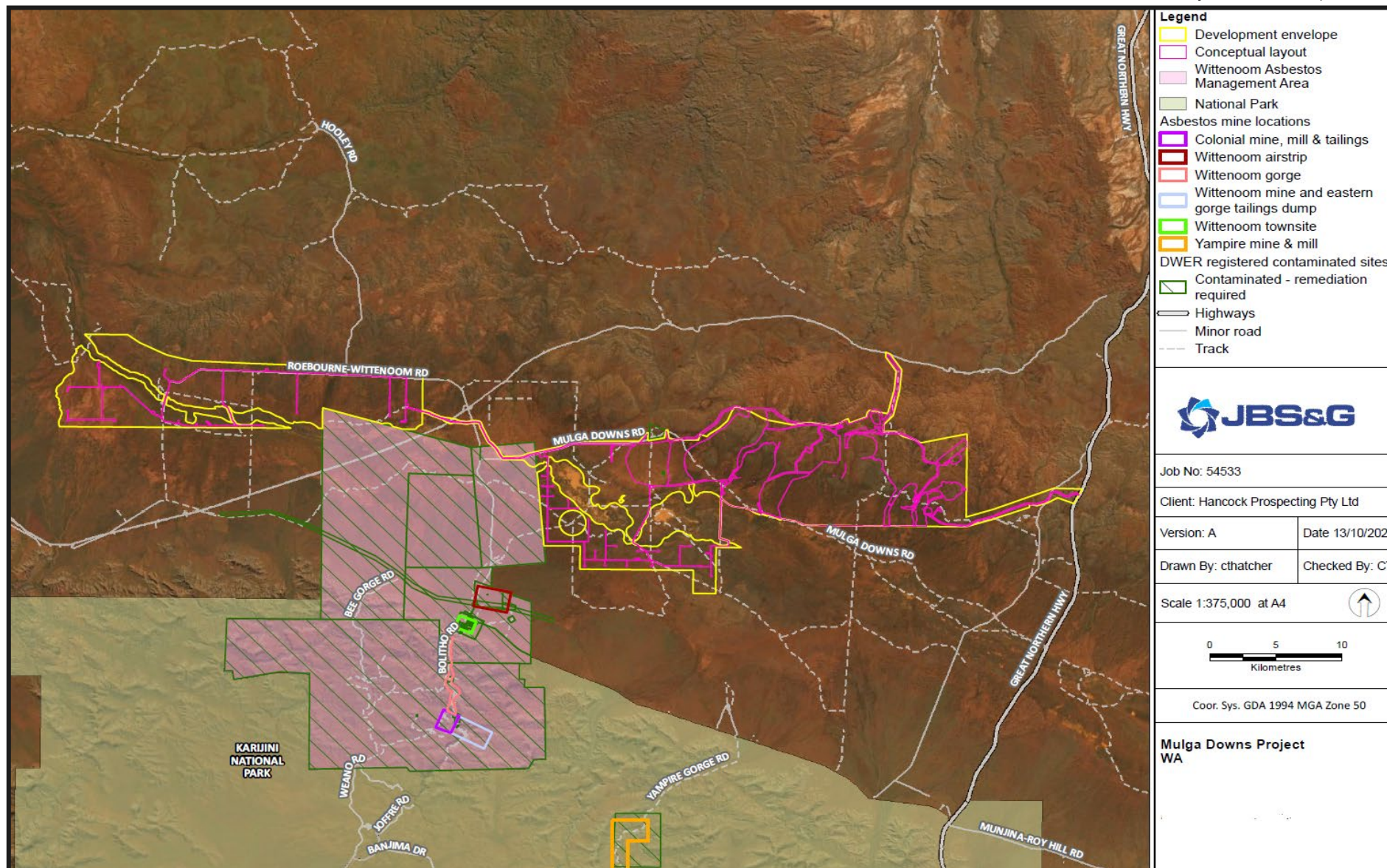


Figure 2: Surrounding Land Uses and Registered Contaminated Sites



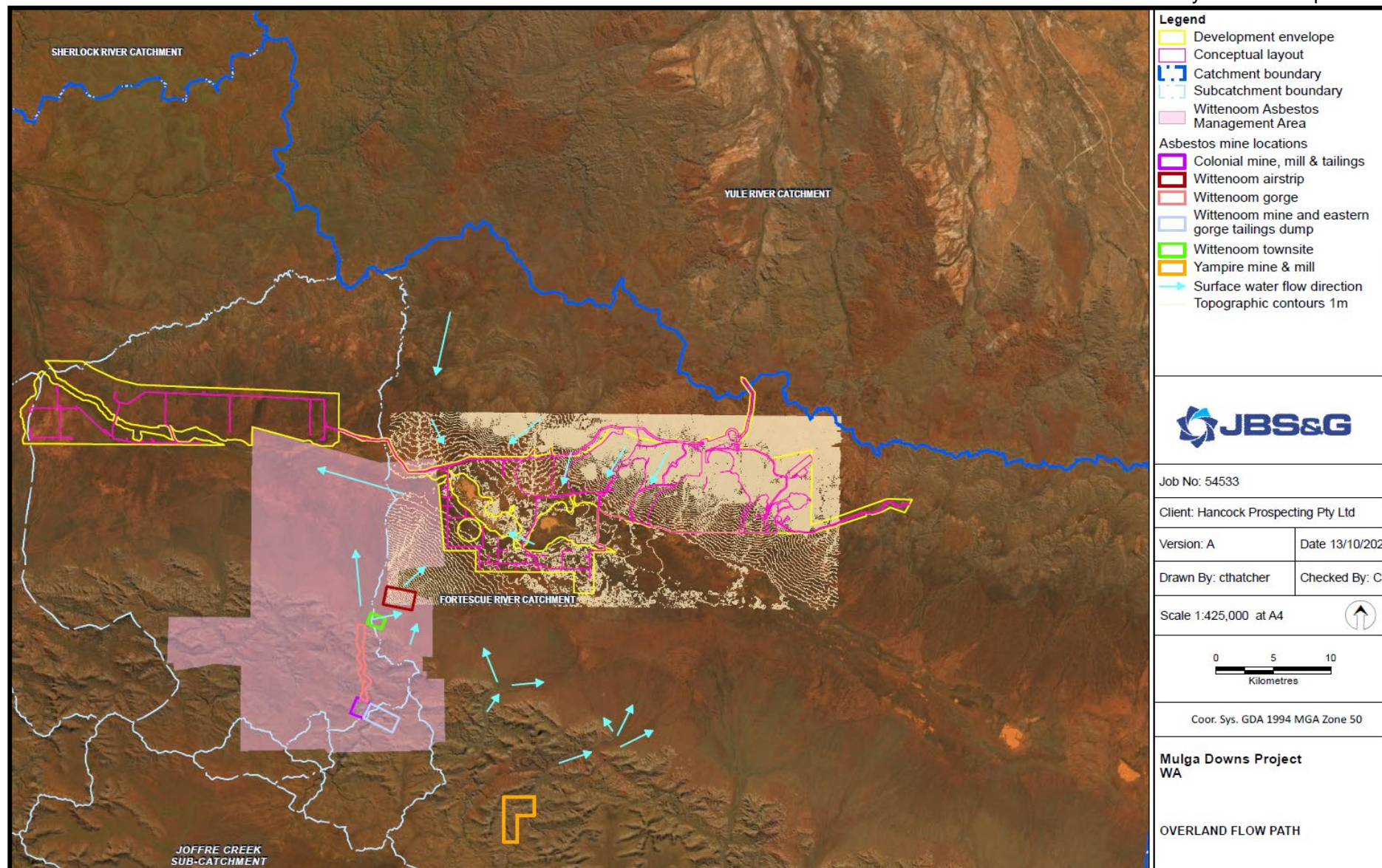


Figure 3: Site Topography and Overland Flow Pathways

Source: JBS&G (2022a)





Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station,  
Pilbara, Western Australia  
Voluntary Auditor's Report

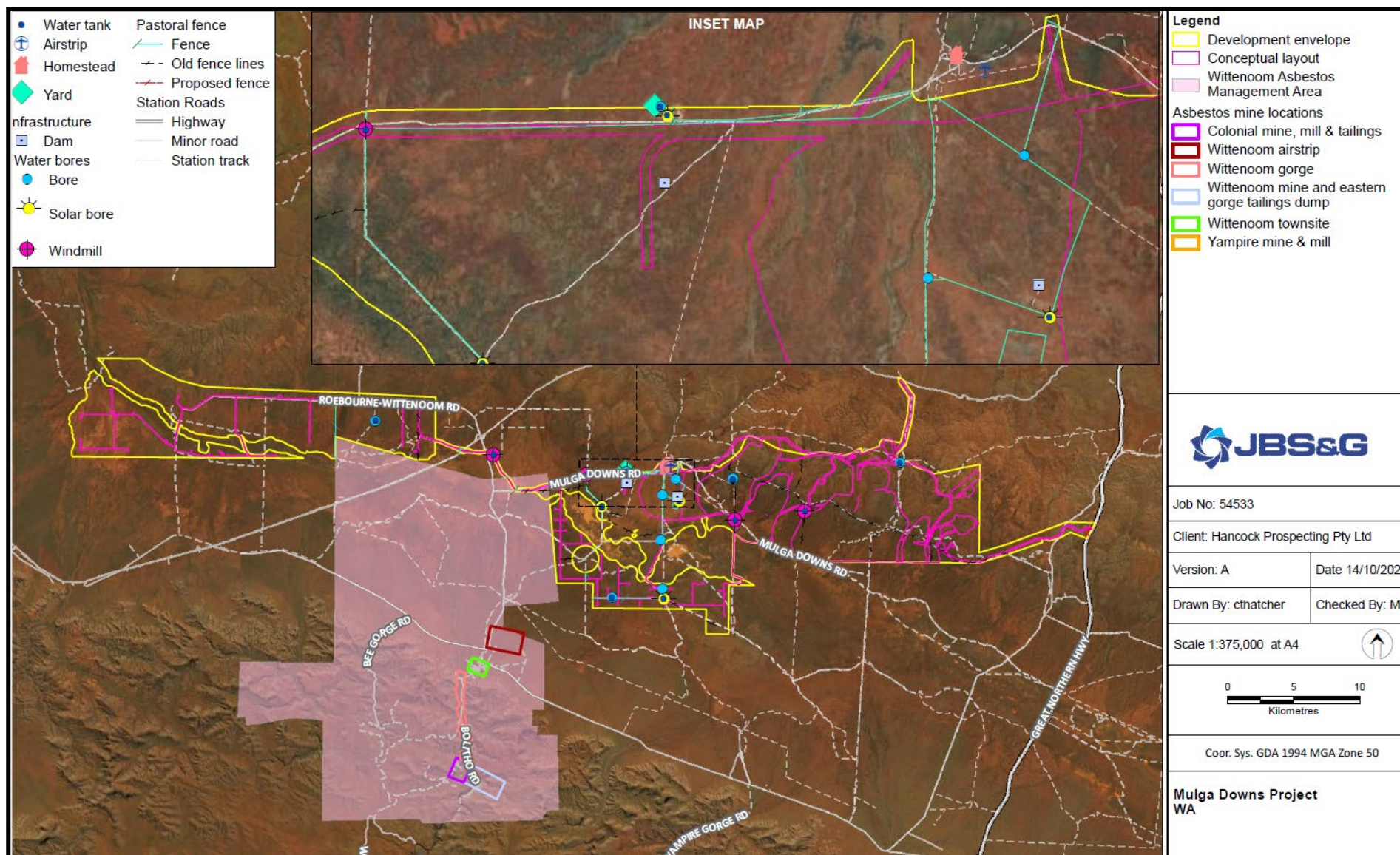


Figure 4: Site Features Identified During Site Inspection

Source: JBS&G (2022a)



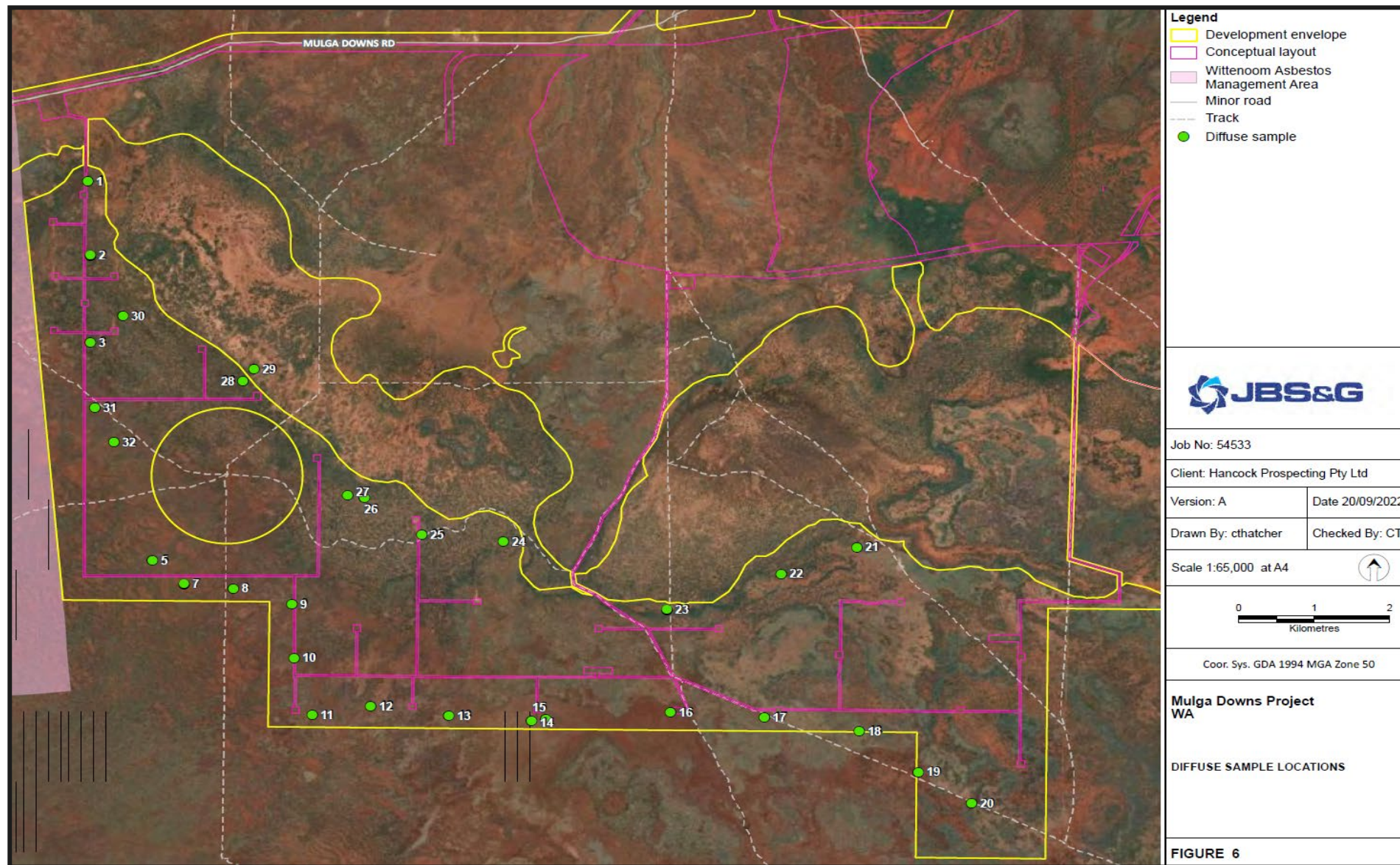


Figure 5: Asbestiform Mineral in Soil Sample Locations



## Appendix B: Audit Correspondence

## Emma Del Borrello

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**From:** Jeremy Hogben  
**Sent:** Monday, 20 February 2023 2:42 PM  
**To:** Allen Qin  
**Cc:** sarah.blake@royhill.com.au; rdercole@jbsg.com.au; Emma Del Borrello  
**Subject:** Mulga Downs Asbestos Assessment

Hi Allen

As discussed on Thursday, please find herein auditor comments on the asbestos assessment completed by JBS&G associated with the development envelope for the proposed Mulga Downs Iron Ore Mine.

The following documents were reviewed:

- Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment – Sample and Analysis Quality Plan, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia, JBS&G Australia Pty Ltd, 18 October 2022.
- Asbestiform Mineral and Asbestos Containing Material, Preliminary Environmental Site Assessment, Mulga Downs Iron Ore Mine and Borefield, Mulga Downs Station, Pilbara, Western Australia, JBS&G Australia Pty Ltd, 14 October 2022.

It is noted that a copy of the Sampling and Analysis Quality Plan (SAQP) was included as an appendix to the Preliminary Environmental Site Assessment (PESA) but was titled incorrectly.

The two documents are of sound quality and have been prepared consistent with relevant guidance. Because most of the content of the SAQP is repeated in the PESA and is otherwise largely superseded by the PESA review none of the comments provided are specific to the SAQP.

The PESA identifies various minor structures within the site (such as bores and tanks) and variously identifies some associated building material that contains asbestos. It is agreed that in its existing form this material does not represent an unacceptable health risk and that it may be readily managed associated with future site development/operation.

The report appropriately considers the potential for both naturally occurring asbestos to be present and for asbestos to have migrated onto the site (via wind and water erosion) from nearby abandoned asbestos mines (in particularly their tailings dumps). The possibility of asbestos containing tailings to have been imported to the site is also recognised.

Whilst it remains possible that naturally occurring asbestos could be encountered in shallow formations on site (noting that asbestos has apparently been associated with borrow pits developed in the area associated with the Gudai-Darri Rail corridor), it is accepted that formations most likely to contain asbestos have been identified as present at depth (associated with the Brockman Iron Formation) and will be avoided associated with mine development.

The assessment includes a thorough and logical development of evidence related to the potential migration of asbestos from the former asbestos mining areas south of the Fortescue River Valley that includes consideration of prevailing winds and mapping of topography and potential surface water flow paths. The assessment correctly identifies the potential for asbestos to have migrated onto the site via wind and surface water transport from these areas to be low and confirmatory sampling of areas considered most likely to be impacted via these means if operable did not identify significant asbestos concentrations which convincingly supports this conclusion.

The PESA indicates that a Site Management Plan (SMP) related to asbestos management should be developed and that a key component of this plan would be the management protocols for unexpected finds. The auditor concurs with this.

The most obvious deficiency in the assessment is its failure to identify, describe and account for an area south of the former Mulga Downs homestead that is registered as an asbestos contaminated site on DWER's Contaminated Sites Database. The report should be updated to include relevant information and considerations in this regard.

Whilst the extent of sampling that is adequate to support the broader notion that the site is unlikely to be contaminated by asbestos is somewhat subjective, JBS&G may wish to consider whether there is value in undertaking sampling similar to that already completed within the site in the vicinity of the former Mulga Downs homestead. Given the homestead is a registered contaminated site where asbestos containing tailings are understood to have been used, it seems to follow that the same logic that the original sampling was founded upon may also apply to areas in the vicinity of the homestead. Granted, the homestead may be a less significant potential source of asbestos migration but it is also closer and up gradient of the site meaning migration of materials from the homestead to the site is perhaps more likely here than other areas assessed.

Further, given that portions of the development envelope pass through the Wittenoom Asbestos Management Area (WAMA- a registered asbestos contaminated site) there may be value in collecting samples from this area to demonstrate that areas within the development envelope that intersect the WAMA are not unacceptably impacted by asbestos.

It is understood from discussion with Roy Hill that stakeholders have raised questions as to whether additional sampling, particularly of roads with the development envelope, should be undertaken, noting that tailings are understood to have been used at the Mulga Downs homestead as base for infrastructure such as the airport, helipad etc and may have been used as road base elsewhere. It is recognised that JBS&G acknowledged this potential and visually inspected roads at the site without identifying mine tailings. It seems that if additional sampling is undertaken at the site, this aspect could be readily included to address stakeholder concerns.

I trust this reflects the main points discussed on Thursday and is otherwise clear. I would be pleased to discuss any aspect as required.

Cheers



**Jeremy Hogben**  
Senior Principal

M: +61 419 122 534

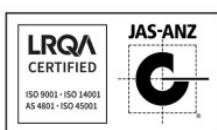
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Comment Number	Section	Auditor Comment - VAR 24/02/2023	JBS&G response - 7/3/2023
1	4.1	The auditor has reviewed the site description, site history and reported land uses at the site and is satisfied that the site has been largely accurately described and potentially contaminating activities have been appropriately considered. The auditor notes that the site description omits to identify an area south of the Mulga Downs Homestead that is associated with storage of old infrastructure and has been classified as 'Contaminated – remediation required' due to the presence of asbestos.	The reports are being updated to include additional detail regarding the classified area to the south of the homestead.
2	4.2	The auditor is satisfied with the description of the topography and drainage of the Site summarised in the PESA report. The auditor considers this description usefully informs the assessment of the likely distribution of asbestos from the Wittenoom mining area.	Noted
3	4.3	The auditor is satisfied with the geological summary provided and consideration given to the presence and likelihood for interception of asbestiform minerals within the regional geology. Soil investigation works were surficial only and did not encounter regional geology, however shallow soils encountered are considered consistent with anticipated overlying soils of the reported geological setting.	Noted
4	4.4	The auditor notes that the primary objective of the PESA was to identify the nature and extent and potential risks associated with asbestos contamination at the site. As such, the auditor is satisfied that due to the nature of this investigation, the hydrogeological setting is not considered an important consideration for the investigation.	Noted
5	4.5.4	The presented CSM is considered to adequately consider the site setting, potential contamination sources, identified receptors, and complete and incomplete SPR linkages. The auditor notes that the CSM does not recognise the contaminated laydown area within the site or explicitly address the potential for migration of asbestos from the Mulga Downs Homestead area.	The reports are being updated to include consideration to the potential for migration of asbestos from the Mulga Downs Homestead and contaminated laydown area. Consistent with previous discussions, while we agree that additional sampling can assess any uncertainty, we consider that the additional information provided to date does not indicate that the Mulga Downs Homestead and contaminated laydown are significant sources of asbestos contamination at the site. The reports will be updated to discuss this further.
6	5.1.1	The auditor is satisfied that the objectives of the SAQP were clearly stated and appropriate. The scope of works was also considered suitable to guide the preparation of a SAQP to inform investigation.	Noted
7	5.1.2	The auditor is satisfied that the review and summary of previous investigations and regulatory approval documents was appropriate.	Noted
8	5.1.3	The auditor is generally satisfied that the Conceptual Site Model presented was appropriate and considered all viable sources, transport and exposure pathways, receptors and SPR linkages based on the presented site setting, noting the minor deficiencies identified in Section 4.5.4.	See associated response above.
9	5.1.4	The auditor considers the components of the SAQP framework listed suitable to guide the site investigation works and is compliant with relevant DoH 2021 and DWER 2021 guidelines. The auditor has provided comments for consideration relating to additional areas for assessment in planned future investigations, included in Appendix B.	Noted. See associated response above. At this stage we do not propose to complete any further investigation.
10	5.2.1	The auditor is satisfied that the objectives of the PESA were clearly stated and appropriate to guide the investigation	Noted
11	5.2.2	The scope of work undertaken was consistent with the SAQP with any minor deviations described and justified.	Noted
12	5.2.3	The auditor considers that the findings presented in the PESA are suitable interpretations of data and results collated through investigation works. The auditor's initial review of the PESA (included in Appendix B) identified some potential deficiencies and potential opportunities to improve the assessment, including additional assessment and/or sampling in the vicinity of the former homestead and confirmatory sampling within the area of the site intersecting the WAMA. The need to describe and assess the infrastructure laydown area classified as a contaminated site was also identified.	See associated response above.
13	5.2.4	The auditor considers the recommendations provided appropriate. The auditor has provided advice for consideration regarding further investigation to address potential areas of suspected or identified asbestos at the site (included in Appendix B).	Noted. See associated response above.
14	6	The auditor considers that the fibrous asbestos assessment criteria adopted were appropriate for the assessment of contamination at the site, based on the identified receptors and ongoing land use.	Noted
15	8.1	The scope of work subject to audit was undertaken by JBS&G in a staged approach, consistent with the approach recommended in the ASC NEPM and Contaminated sites guidelines. The auditor has critically and independently reviewed the reports listed in Section 3.0 and provided correspondence with review comments as described in Section 8.5, with relevant documentation provided in Appendix B. The auditor notes that the PESA has not been finalised at the time of VAR preparation and that additional assessment is required. The auditor is otherwise satisfied that the overall quality and completeness of the assessment is adequate to form the basis for site characterisation and risk assessment. It is noted that a number of comments were provided by the auditor for consideration and inclusion in future investigation works to further address data gaps. There is limited discussion regarding community consultation and stakeholder engagement in the various reports. However, the auditor is satisfied the ongoing stakeholder consultation is being undertaken by Roy Hill consistent with the requirements of the Contaminated Sites Guidelines.	Noted. See associated response above. At this stage we do not propose to complete any further investigation.
16	8.2	The auditor is satisfied that the assessment of human health risk for the site undertaken to date has been adequate. The auditor considers that the findings of the audited reports demonstrate that the asbestos impacts on-site site should not pose unacceptable risk to human and public health values based on the site's proposed ongoing use for commercial/industrial purposes, managed under an AMP. It is noted that further risk assessment is being considered for the vicinity of the former homestead and the WAMA and is required for registered contaminated sites located within the site boundary.	Noted. See associated response above. At this stage we do not propose to complete any further investigation. The study boundaries of the investigation were limited to the Development Envelope and specifically outside the WAMA. Recent information provided by the client suggest that ground disturbance within the WAMA may be considered as part of the wider development, in which case further investigation should be considered.

# Senversa Pty Ltd

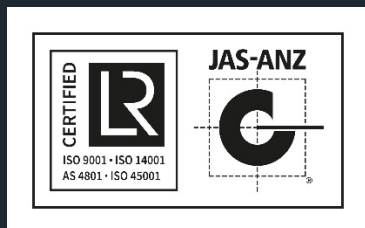
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