Intended for
Transport for NSW

Document type
Final

Date
August 2022

2 COPPER CREEK ROAD, CAPTAINS FLAT
INTERIM ENVIRONMENTAL MANAGEMENT PLAN

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2 COPPER CREEK ROAD, CAPTAINS FLAT
INTERIM ENVIRONMENTAL MANAGEMENT PLAN

Project name	**Captains Flat Station Masters Cottage Interim Environmental Management Plan**
Project no.	**318001412**
Recipient	**Transport for New South Wales**
Document type	**Environmental Management Plan**
Report ref.	**318001412**
Description	**The report describes environmental management procedures to minimise risks from contaminated soil, dust and paint at the former Station Masters Cottage located at 2 Copper Creek Road, Captains Flat.**

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Revision	Date	Prepared by	Checked by	Approved by	Description
Draft / Rev 0	18/05/2022	J Cowburn	S Maxwell	F Robinson	For client review
Final / Rev 1	27/07/2022	J Cowburn	S Maxwell	F Robinson	For issue
Final / Rev 2	19/08/2022	J Cowburn	S Maxwell	F Robinson	For issue

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CEnvP Certification No. SC400100

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1. INTRODUCTION

Ramboll Australia Pty Ltd (Ramboll) was commissioned by Transport for NSW (TfNSW) to prepare an interim environmental management plan (IEMP) for the management of risks associated with heavy metals contamination identified by Ramboll (2021a) at the former Station Masters Cottage located at 2 Copper Creek Road, Captains Flat NSW (the site). As an interim management measure, the former residents have been relocated and the site is now vacant.

The site is located adjacent to a former mine load-out facility and rail corridor on the Country Regional Network (CRN). The former load-out facility and surrounding rail corridor was deemed significantly contaminated by the NSW EPA in April 2021.

As the owner of the adjacent rail corridor TfNSW will retain responsibility for ensuring that this EMP is implemented, under agreement with the land owner to manage the site and through delegation to rail corridor manager for the CRN (UGL Regional Linx (UGL)). Further detail on roles and responsibilities is presented in **Section 2**.

A site locality plan is presented in **Figure 1, Appendix 1**.

1.1 Purpose

The purpose of this EMP is to provide interim management measures to mitigate risks from exposure to contamination onsite until a long-term remedial strategy is implemented. This plan shall be integrated within UGL management systems for the CRN. UGL will be responsible for its implementation.

Development and implementation of this EMP is an element of a Voluntary Management Plan agreed to with the NSW EPA and is a legal requirement.

This EMP contains controls that do not require human intervention (other than periodic inspection and maintenance) once installed for future workers or residents at the site Public services (power, water, communications) have been identified passing underground through the site (Ramboll 2020a). Specific controls are to be established by public service providers to address risks to utility workers.

This EMP has been prepared in general accordance with the relevant legislation and industry standards, with reference to the NSW Environment Protection Authority (EPA) *Preparing Environmental Management Plans for Contaminated Land Practice Note* (NSW EPA 2022) and SafeWork NSW guidance.

1.2 Site Description

The site is a residential block comprising the former Station Master's Cottage and a detached garage and shed. The main residence comprises a single-story weatherboard house with brick pier foundations. An outdoor veranda is attached to the rear of the house. The backyard is fully fenced with the front yard and driveway not currently fenced off from the rail corridor.

Site details are summarised in **Table 1-1**.

Table 1-1: Site Identification

Information	Description
Street Address:	2 Copper Creek Road, Captains Flat NSW
Identifier:	Lot 1 Deposited Plan (DP) 572636
Site Area:	Approximately 1,380 m^2
Local Government:	Queanbeyan–Palerang Regional Council
Owner:	Private Owner
Current Site Use:	Residential (not currently occupied)

1.3 Current Site Use

Until recently, the site was used as private residence. After the adjacent rail corridor was deemed significantly contaminated by the NSW EPA (Declaration Number: 20211105) on 25 June 2021, the residents were relocated as an interim management measure.

Surrounding land use includes:

- North: Copper Creek, Captains Flat Road, Miners Road
- East: Rail corridor, former goods shed, Miners Road, Captains Flat Sewage Treatment Plant, residential community of Captains Flat
- South: Captains Flat Rail Corridor and former Ore Loadout Facility, processing area of the Former Lake George Mine
- West: Captains Flat Rail Corridor, Copper Creek, large lot residential properties

1.4 Topography and Hydrology

The site slopes gently down to the north-west, the surrounding site topography is characterised by a moderate north facing slope intersected by a moderate – steep gully directing Copper Creek which flows north-east to the Molonglo River. Topographical contours are presented on **Figure 1, Appendix 1**.

1.5 Geology

The regional geology of the Captains Flat area is characterised by a well-defined north-south trending graben[1] (2 to 8 km wide), bounded by two horsts[2] at its southern and northern ends. The horsts comprise tightly folded Middle to Upper Silurian felsic pyroclastics, volcanogenic sediments and shales. Faults at the boundaries of these structures have the potential to be preferential pathways for groundwater (GHD, 2018). Review of the Department of Regional NSW interactive GIS portal MinView[3] indicates the Narongo Fault passes through the site orientated north – south between Copper Creek Road and Copper Creek.

1.6 Hydrogeology

A review of the Bureau of Meteorology's National Groundwater Information System (BOM, 2019) indicated that no registered groundwater bores are located within 1 km of the site.

[1] A graben is a valley caused by the downward displacement of a section of the earths crust. These are produced by parallel faults.

[2] A horst is a raised block of land bounded by parallel normal faults. Horsts are bits of land which have either been lifted or has remained stationary while the land on either side (graben) have fallen.

[3] https://minview.geoscience.nsw.gov.au/#/?lon=149.4385&lat=-35.59053&z=18&bm=bm1&l=ge611:n:100,ge610:n:100,ge69:n:100,ge68:n:100,ge67:n:100,ge66:n:100,ge65:n:100,ge64:n:100,ge63:n:100,ge62:n:100,ge61:n:100,ge612:y:100,hi1:n:25,wa1:y:100,ut1:y:50,ad0:y:100 accessed 27/09/2021.

The Hydrogeology Map of Australia (Geoscience Australia, 2000) indicates the site is within an area of fractured or fissured aquifers of low to moderate productivity.

1.7 Residual Contamination

The Lake George Mine now forms part of the NSW Government Legacy Mines Program (former Derelict Mines Program) and is a known source of heavy metal contamination and acid mine drainage (AMD) impacting the surrounding area (NSW Department of Resources and Geoscience 2020).

Recent investigations of the Captains Flat former Station Masters Cottage (Ramboll, 2022; Ramboll, 2021a) have identified potential risks to human health and the environment associated with contamination onsite relating to the Lake George (legacy) mine and the historic loadout of ore from the mine by rail. The Detailed Site Investigation (DSI) (Ramboll, 2022) identified lead as a contaminant of concern for human health and arsenic, lead, nickel and zinc as the contaminants of concern for the environment.

1.7.1 Soil

The DSI (Ramboll, 2022) identified lead contamination throughout the site in surface and near surface soils. Concentrations of lead found to exceed human health criteria were generally found in soils less than 0.3 metres below ground level (mbgl).

Concentrations of arsenic, copper, lead and zinc were found in exceedance of ecological criteria at multiple locations. The exceedances were generally in soils less than 0.1 mbgl.

Visual observations such as evidence of erosion from the adjacent contaminated rail corridor in conjunction with elevated lead concentrations identified in the adjacent rail corridor and load-out facility (Ramboll, 2021b), and elevated contaminant concentrations in upgradient groundwater suggest that contaminants have migrated to the site.

Lead concentrations exceeded the adopted Health Investigation Level for low density residential land use (HIL A – NEPM 2013) in 29 of 61 samples. Arsenic concentrations exceeded the adopted human health assessment criteria in one sample. Overall, lead is considered the primary driver of potential risks to human health.

Arsenic, copper, lead, and zinc exceeded the adopted urban residential and public open space Ecological Investigation Level (NEPM 2013) at multiple locations.

TRH F3 and BaP were detected at concentrations below human health and/or ecological criteria. No other contaminants were detection at levels above LOR.

The distribution of contaminant concentrations adopted human health and ecological criteria are shown in **Figure 2, Appendix 2**.

1.7.2 Groundwater

Three groundwater monitoring wells were sampled as part of the DSI (Ramboll, 2021b) that are relevant to the site. GW101 on site, GW103 upgradient and GW10 downgradient. Groundwater elevation across the three monitoring wells ranged from 860.25 m above Australian Height Datum (m AHD) and 861.54 m AHD. Interpreted groundwater elevation contours are shown on **Figure 3, Appendix 1.** Based on the contoured water levels, the inferred flow direction was in a north-west direction. This flow direction generally correlates with the topography of the site.

The following groundwater quality parameters were observed:

- pH range between 3.98 and 6.28
- Electrical conductivity (EC) range between 1035 µS/cm and 2567 µS/cm
- Dissolved oxygen range between 1.52 mg/L and 4.04 mg/L
- Redox potential range between -96.7 mV and 137.9 mV

Generally, the groundwater was characterised as freshwater, neutral to acidic pH, slightly aerobic conditions and a slightly reducing environment.

The analytical results identified exceedances of recreational and drinking water guidelines (ANZG 2018) for cadmium, iron, lead, manganese, nickel, selenium, and zinc. Exceedances of ecological criteria for 95% species protection (ANZG 2018). were observed for cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium and zinc.

Upgradient concentrations of heavy metals were generally reported as higher than downgradient concentrations indicating that the contamination was not related to on-site contamination sources.

1.7.3 Indoor Dust and Paint

Lead loadings ($\mu g/m^2$) were observed above dust guidelines for residential interiors (US EPA 2020) in five of nine swab samples and lead concentrations (mg/kg) exceeded HIL A (NEPM 2013) in two of two vacuum samples. Paint sampling was limited but did indicate the presence of lead. The presence of lead in paint may have contributed to the presence of lead in internal dust and soils however it was insignificant compared to the contribution from the adjacent mine and rail corridor.

1.8 Air Quality Monitoring

An air quality monitoring (AQM) network has been established within Captains Flat targeting metals identified as CoPC from historic mining in the area. The AQM network consists of total suspended particulate (TSP) monitoring using high-volume air samplers (HVAS; Hi-Vol 3000) at five locations around Captains Flat. A meteorological station is maintained at one location (MET)

to inform movement and dispersion of air. The network was established 22 June 2021 and it is anticipated will run for at least 12 months.

AQM 2 and MET are located within the site and supplement Tier 1 risk assessment with lines of evidence particularly relevant to potential ongoing migration of lead in airborne dust and subsequent human exposure via inhalation and/or deposition to receivers in the adjacent rail corridor.

To date, lead concentrations have been reported below adopted assessment criteria for human health indicating low risk of contaminant migration via airborne dust over the monitoring period. It is noted however that meteorological variability may significantly affect movement of airborne dust and that the monitoring period to date does not include hotter drier months (outside of La Nina conditions) when more airborne dust may be expected.

1.9 Operation of the EMP

The requirements of this EMP apply to the management of contamination on site and the potential for contaminant migration to and from the site.

This EMP applies currently and will remain in place until a long-term plan is developed and implemented or until the site has been remediated and validated.

2. MANAGEMENT FRAMEWORK

2.1 Roles and Responsibilities

All site personnel (including TfNSW, UGL and their contractors) have a responsibility for protecting human health and the environment. The key roles and responsibilities for this EMP are presented in **Table 2-1**. TfNSW is ultimately responsible for developing a process to ensure this EMP is implemented at the site.

Table 2-1: Roles and Responsibilities

Role	Responsibility
TfNSW Project Manager – Land Management (or appointed delegate)	• Maintain ultimate responsibility for the implementation of this EMP for the site (including through appointment of contractors as appropriate) • Responsible for revisions and amendments to this EMP if site conditions change • Track all management of the revisions and amendments, and ensure amendments are communicated to all stakeholders • Undertake all stakeholder management including liaison with regulatory bodies and follow-up of all external complaints • Transfer responsibility for implementation as required.
Environment Manager and UGL Property Manager	• To engage consultants and contractors as required for maintenance work • Ensure any site workers and contractors understand the requirements of this EMP • To ensure that all employees, contractors and consultants engaged in activities at the site are inducted to this EMP and are aware of their specific responsibilities under the EMP • To implement controls to mitigate risks associated with exposure of members of the public to site contamination • To ensure compliance to the requirements of this EMP through surveillance and monitoring of consultants and contractors completing maintenance work • Review effectiveness of this EMP following any incident or any other event that suggests this EMP is ineffective • Undertake corrective actions to rectify non-conformances or complaints (in conjunction with WHS Representative) • Provide advice on environmental issues and incidents as necessary • Undertake monitoring and reporting requirements outlined in this EMP • To maintain records that demonstrate the implementation of this EMP • Ensure utility owners are aware of the EMP requirements for entering the site
UGL Property Manager, nominated supervisor and all site personnel	• Implement EMP controls during all maintenance work at the site • Monitor and report (where relevant) on environmental and safety hazards, impacts or improvements to work activities • Immediate reporting of all non-conformances or complaints to UGL or concerns regarding the implementation of this EMP • Undertake corrective actions to rectify non-conformances or complaints (in conjunction with Site Supervisor) • To take reasonable care for their own health and safety and for the health and safety of their co-workers. With specific regard for this EMP all workers have a responsibility to implement controls as relevant to their site duties and to report any non-conformances with this plan to the UGL Project Manager / Site Supervisor

2.2 Legislative and Regulatory Framework

This EMP has been prepared to address the requirements of relevant legislation and codes. The key pieces of legislation applicable to this EMP are:

1. *NSW Work Health and Safety Act 2011* (WHS Act)
2. NSW Work Health and Regulation 2017
3. *Protection of the Environment Operations Act 1997*
4. Protection of the Environment Operations (Waste) Regulation 2014
5. *Contaminated Land Management Act 1997*

The key codes of practice are:

1. NSW EPA Preparing environmental management plans for contaminated land practice note (NSW EPA 2022)
2. SafeWork NSW Lead Guidance
3. SafeWork Australia Code of Practice Managing Risks of Hazardous Chemicals in the Workplace
4. NSW EPA LeadSmart – Work Smart: Tradespeople and Mining Industry Workers
5. NHMRC Managing Individual Exposure to Lead in Australia – A Guide for Health Practitioners 2016
6. Workplace Exposure Standards for Airborne Contaminants (SafeWork NSW 2018)

2.3 Periodic Review

This EMP must be reviewed routinely from date of issue or when:

- Requested by a health and safety representative from UGL
- Contaminated material is removed, disturbed, sealed or enclosed
- Changes to land use occur
- When a longer-term lead management plan is in place
- Remediation has been completed and validation has concluded long term management is not required.
- At least annually

2.4 Non-Compliance and Corrective Actions

Where non-compliances and/or corrective actions are identified these must be communicated to the UGL Site Supervisor and the UGL Environment Manager. Corrective actions should be administered by the UGL Site Supervisor. Where a non-compliance with controls listed in **Table 3-1** is identified, corrective action must be implemented immediately.

2.5 Record Keeping

UGL are the current operators of the CRN and shall keep records of the inductions, monitoring and inspections (as required in **Section 4)**, corrective actions and reports prepared for the Site. If the CRN operator changes the responsibility should be transferred to the new contractor responsible for the CRN operations. These records should be evaluated and used for completing the review of this EMP.

3. MANAGEMENT ACTIVITIES

Soils, internal dust, and paint onsite contains concentrations of heavy metals which exceed the adopted human health and ecological criteria and subsequently have the potential to harm human health or the environment. In addition, groundwater beneath the site contains concentrations of heavy metals exceeding human health and ecological criteria. Exceedances of all media are discussed in **Section 1.7** The distribution of identified contamination is defined by exceedances of adopted assessment criteria presented on **Figure 2**, **Appendix 1** and identify the presence of elevated lead in shallow soils across the site and elevated lead throughout building interiors.

3.1 Hazard Identification

Lead is known to cause health effects in humans, especially children and developing foetuses. SafeWork NSW recognises that females with childbearing capacity are the most sensitive receptor at work sites.

Migration of metals into the environment, soils, groundwater and surface water, may cause environmental harm.

The primary routes of exposure relevant to human health are through ingestion following direct contact or inhalation of soil, dust and paint. Primary routes of exposure leading to ecological uptake in the receiving environment are through from dust generation and the transport of soils or dissolved contaminants with surface and groundwater. Activities causing soil disturbance and dust generation at the site can exacerbate the movement of contaminated soils.

SafeWork NSW definitions of lead risk work is provided in **Appendix 2** of this EMP.

3.2 Management Strategy

Section 17 of the WHS Act requires risks to health and safety be eliminated so far as is reasonably practicable. The SafeWork Australia code of practice for managing risks of hazardous chemicals in workplace provides a hierarchy of control measures. This includes (most preferred to least preferred) eliminate hazard, substitution, isolation and implementing engineering controls. SafeWork NSW also advocates elimination of the hazard as the most preferred method of control.

The site management strategy is to isolate the contaminant and implement engineering controls until such time as hazard elimination through site remediation can be completed or a permanent management solution implemented.

This strategy is considered appropriate for mitigating potential impacts to both human health and the environment. As the mode of exposure is increased with disturbance of soils, existing dust and paint, measures are also aimed at minimising dust generation and surface water runoff from site.

3.3 Hazard Mitigation

The principal hazard mitigation measure is to restrict access to the contaminated area by creating an exclusion zone until such time as the area is remediated and risks are documented to be acceptable. Where access is required, strict management controls are to be implemented.

Hazard mitigation measures are provided in **Table 3-1** to be protective of ecology through all works (including those completed by UGL or utility workers) and to be protective of human health. Specific controls are to be established by UGL or utility workers to address scope specific risks as these work scopes are understood. These specific controls are to be include the hazard mitigation measures outlined below as a minimum requirement.

Table 3-1: General Hazard Mitigation Measures

Category	General Requirements
Exclusion	
Exclusion Zones	Prohibit use of site for residential purposes. The site will be demarcated as an exclusion zone through construction of rural fencing and application of signage. The site should only be accessed by persons inducted to this EMP or by utility managers working under an EMP developed specifically for the works they are undertaking. The exclusion zone should be maintained including signage that reads: DANGER DO NOT ENTER Induction to Environmental Management Plan required. Contact the CRN – South Superintendent or Facilities Manager for further information via the CRN UGLRL Hotline: 1300 661 390 (a map will be presented defining the exclusion zone)
Works that do not require soil disturbance or dust generation (including grounds maintenance if this can be completed without generating dust)	
Engineered controls	Groundcover by maintaining existing vegetation and pre-existing paved surfaces to prevent dust generation on-site. Where there is no groundcover, implement erosion controls to control dust generation.
Administrative controls for onsite workers / other persons	Induction to this EMP. Vehicles taken to site shall not contain baby equipment, child car seats etc and should be kept free of other personal items to the extent practical. Preferentially, vehicles should be left in the adjacent carpark
PPE	Standard rail corridor access PPE requirements.
Facilities	Where works are required onsite toilet facilities and wash up areas for decontamination are to be provided.
Soil disturbance and/or dust generation activities Note: Minor soil disturbance (less than 5 m^3) can occur through implementation of all controls defined below. If larger soil disturbance is required a specific EMP must be developed for the proposed scope of work. Specific EMPs must integrate all controls contained within this document in addition to controls required to address the specific risk.	

Category	General Requirements
Mandatory administrative controls for any soil disturbance	• If excavation of contaminated soils is required excavation must be completed so that visible airborne dust is not generated. Excavation should not occur on windy days; dust must be suppressed during excavation e.g., through use of a water cart. The details of this EMP must be communicated to all onsite persons including external contractors • Any soil disturbance works shall occur under the supervision of the UGL Environment Manager or a delegated representative and should be preferentially completed using machinery with an enclosed cabin/s • Personnel decontamination shall occur after leaving excavations areas by removing/washing/cleaning dusty work clothes, boots, shoes, tools, phones, hands/face/any other exposed body area. Cleaning should occur using a damp cloth/mop • Hands should be washed before eating or drinking, smoking or shewing gum • Eating or drinking should be conducted in a clean dust free location • Fingernails and toenails should be kept short • Showering should occur before returning home. Work gear should be kept separately from other clothing and washed separately.
Administrative controls - Machinery Operators	Where machinery is floated to site a staging area must be established within a clean area of the site where loading and unloading from the float can safely occur. Machinery should by preference be selected with capacity for • An enclosed cabin • Cabin air circulation system (air conditioning) equipped with high efficiency filter and • Cabin seals in good condition to eliminate cabin dust intrusion At completion of works all soil must be removed such that machinery is free of site materials when entering the staging area for loading.
Administrative controls – Workers outside assisting excavation	Workers outside machinery should be used minimally. These workers should maintain a 20 m exclusion zone from areas where excavation is occurring, ideally upwind and adhere to all general requirements described above.
PPE	The following rail corridor compliant PPE shall be worn at all times – full length clothing (sleeves and trousers / overalls), orange high visibility upper clothing or vest, safety (steel capped) boots, protective eyewear, hard hat and gloves. A P2 dust mask shall be worn by all persons onsite during excavation who are outside machinery with enclosed cabins. If workers are required within the 20 m exclusion for excavation works disposable coveralls should also be worn.

3.4 Communications and Notifications

The following stakeholders are identified and should be notified of site contamination and controls defined here-in:

- UGL rail/maintenance workers
- UGL contractors
- The NSW EPA
- SafeWork NSW should be notified if the work involves or is likely to involve lead risk work
- The current site owner.

Notification shall include provision of a copy of this EMP.

4. SUMMARY MONITORING AND VERIFICATION REQUIREMENTS

Monitoring is required until a permanent remediation solution is identified. A summary of the monitoring requirements is outlined in **Table 4-1.**

Table 4-1: Summary of interim monitoring requirements

Element	Frequency	Reference
Monitoring to ensure fencing is substantially intact and signage remains clear	Quarterly	Section 3.3
Monitoring to ensure >80% groundcover is maintained	Quarterly	Section 3.3

Monitoring to ensure that the controls described within this plan are maintained will include completion of the checklist presented as **Appendix 3**. Monitoring records will be stored in the UGL management system for the CRN.

5. LIMITATIONS

This document is issued in confidence to Transport for NSW for the purposes of informing management of risks to rail/maintenance workers and members of the public associated with contaminated soil within the rail corridor at Captains Flat, NSW. It should not be used for any other purpose.

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6. REFERENCES

ANZG (2018) *Australian Water Quality Guidelines*

Bureau of Meteorology (2019) *Australian Groundwater Explorer – National Groundwater information System.*

Department of Environment Climate Change and Water (2009) *NSW Waste Classification Guidelines*

Department of Infrastructure, Planning and Natural Resources (2004) *Guideline for the Preparation of Environmental Management Plans*

Geoscience Australia (2000), *Hydrogeology Map of Australia*, 2000

NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure*

NHMRC *Managing Individual Exposure to Lead in Australia – A Guide for Health Practitioners 2016*

NSW EPA (2022) Preparing Environmental Management Plans for Contaminated Land Practice Note

NSW EPA *LeadSmart – Work Smart: Tradespeople and Mining Industry Workers* http://leadsmart.nsw.gov.au/wp-content/uploads/2016/09/LeadSmart-Brochure-Working.pdf accessed 11/04/2022.

NSW EPA (2022) Preparing environmental management plans for contaminated land practice note www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/contaminated-land/22p3473-emps-for-contaminated-land-practice-note.pdf?la=en&hash=CBC7F6F0E1997C8B5229A83A2407AEC7F7E5E31B accessed 11/04/2022.

Ramboll. (2021a). 2 Copper Creek Road, Captains Flat: Environmental Site Assessment.

Ramboll. (2021b). Captains Flat Rail Corridor Detailed Site Investigation.

Ramboll. (2021c). Captains Flat Air Quality Monitoring Report June - December 2021.

Ramboll. (2022). Captains Flat Station Masters Cottage - Detailed Site Investigation.

SafeWork NSW (2016*) NSW Code of Practice Managing Risks of Hazardous Chemicals in the Workplace*

SafeWork Australia (2018) *Workplace Exposure Standards for Airborne Contaminants*

USEPA (2020) Protect your family from lead in your home

APPENDIX 1
FIGURES

Aerial photography by metromap, flown 01.03.2021

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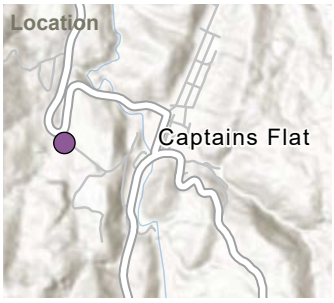
1:2,000

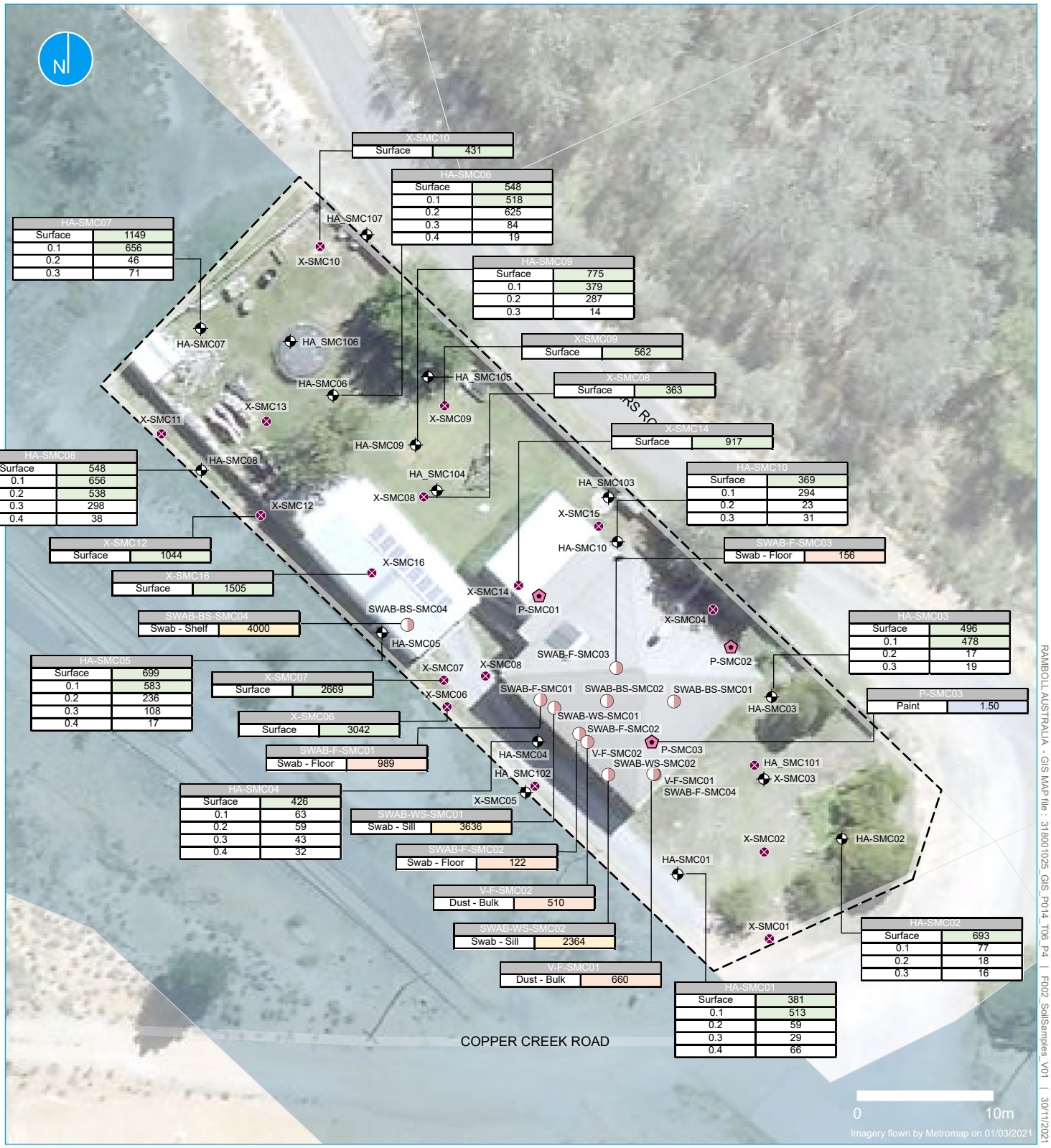
Key

- Area of assessment
- Rail corridor
- Creek
- Contour line 2m



RAMBOLL AUSTRALIA - GIS MAP file : 318001025_GIS_P014_T06_P4 | F001_Site_V01 | 30/11/2021

Figure 1 | Site Locality
Detailed Site Investigation : 2 Copper Creek Road, Captains Flat



RAMBOLL AUSTRALIA - GIS MAP file : 318001025_GIS_P014_T06_P4 | F002_SoilSamples_V01 | 30/11/2021

A4
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Key

- Area of Assessment
- Rail corridor

Sample locations

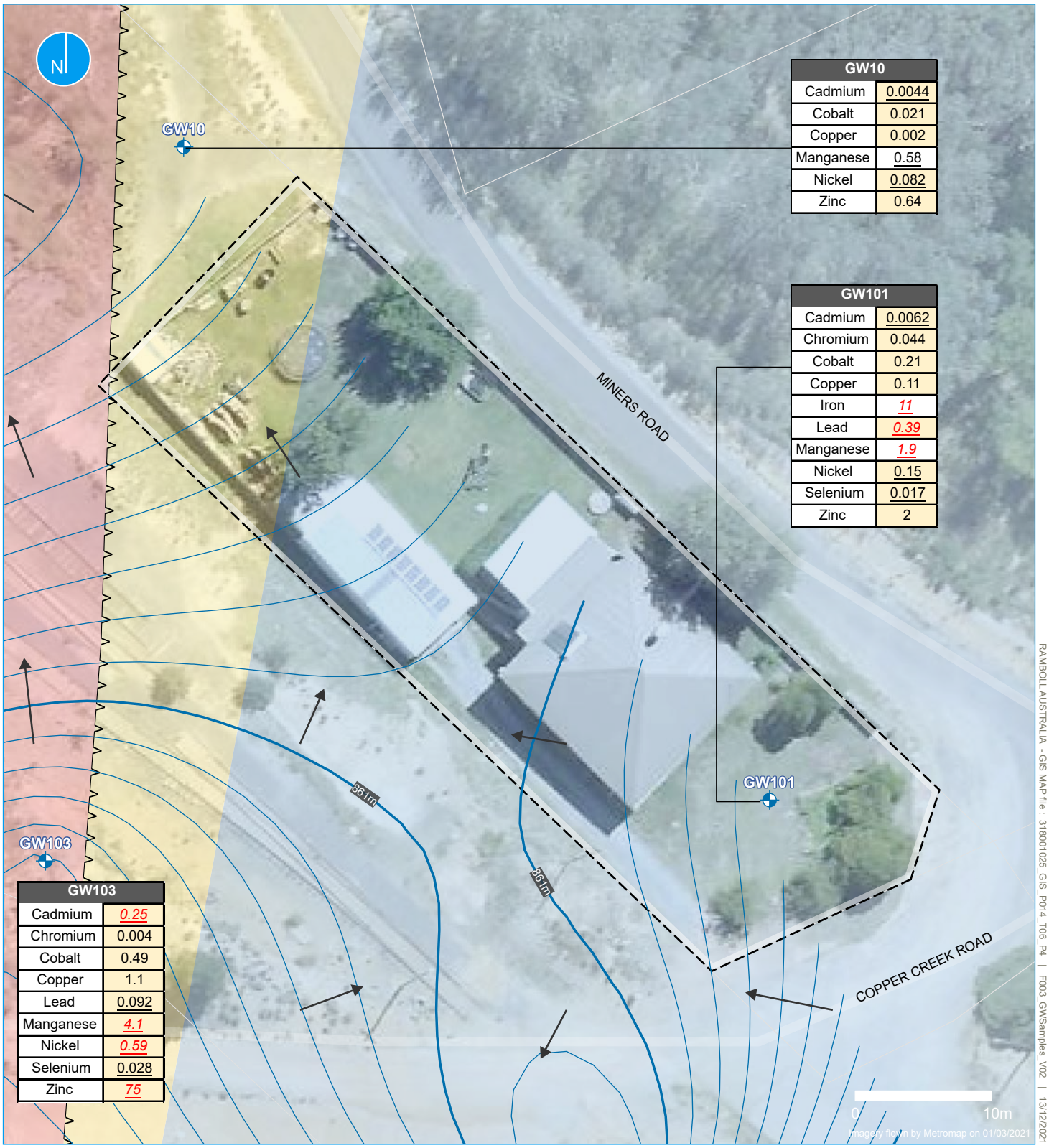
- Dust interior
- Paint
- Hand auger
- XRF

Exceedance Criteria

Dust and Paint (Pb)	
HIL A - Dust	>300 (mg/kg)
Swab - Floors	>108 (ug/m3)
Swab - Sill/Shelves	>1076 (ug/m3)
Paint	>0.1 (%)

Soil (Pb)	
HIL A	>300 (mg/kg)

Figure 2 | Soil Sampling Locations and Lead Exceedances
Detailed Site Investigation : 2 Copper Creek Road, Captains Flat



GW10	
Cadmium	0.0044
Cobalt	0.021
Copper	0.002
Manganese	0.58
Nickel	0.082
Zinc	0.64

GW101	
Cadmium	0.0062
Chromium	0.044
Cobalt	0.21
Copper	0.11
Iron	11
Lead	0.39
Manganese	1.9
Nickel	0.15
Selenium	0.017
Zinc	2

GW103	
Cadmium	0.25
Chromium	0.004
Cobalt	0.49
Copper	1.1
Lead	0.092
Manganese	4.1
Nickel	0.59
Selenium	0.028
Zinc	75

Key

- Area of Assessment
- Groundwater well

Groundwater contours (mAHD)

- 1m contour
- 0.1m contour
- Inferred groundwater flow

Geology (derived from ©State of New South Wales through Regional NSW 2021)

- Bumballa Formation (Sandstone)
- Captains Flat Formation (Shale)
- Kohinoor Volcanics (Dacite)
- Narongo Fault

Exceedance Criteria

Analyte (filtered) (mg/L)	95% Fresh Water Protection for Aquatic Ecosystems	Drinking Water Guidelines	Human Health - Recreational
Arsenic	0.013	0.01	0.1
Barium		2	20
Cadmium	0.0002	0.002	0.02
Chromium	0.001	0.05	0.5
Cobalt	0.0014		
Copper	0.0014	2	20
Iron		0.3	3
Lead	0.0034	0.01	0.1
Manganese	1.9	0.1	1
Mercury	0.0006	0.001	0.01
Molybdenum	0.034	0.05	0.5
Nickel	0.011	0.02	0.2
Selenium	0.011	0.01	0.1
Zinc	0.008	3	30

A4
1:400

Figure 3 | Groundwater Sampling Locations and Exceedances
Detailed Site Investigation : 2 Copper Creek Road, Captains Flat

APPENDIX 2
SAFEWORK NSW LEAD NOTIFICATION REQUIREMENTS

SafeWork NSW Lead Risk Definition

Lead risk work involves work that may cause lead levels in a worker's blood to exceed health limits.
'Lead risk work' means:

- 5 µg/dL (0.24 µmol/L) for a female of reproductive capacity
- 20 µg/dL (0.97 µmol/L) in other cases.

SafeWork NSW Notifications

Notification must be provided if the work is likely to cause lead levels in a worker's blood to exceed healthy levels. Notification is also needed if a worker needs to be removed from working with lead.

Notification for lead risk work

SafeWork NSW states the following:
You must assess each process that involves lead to determine whether lead risk work is being carried out.
If you cannot determine whether lead risk work is being carried out, then assume it is and notify us.
Submit the Notification of lead risk work form at least seven days before lead work begins. Each form is valid for the duration of the lead risk work.
You need to notify us if a worker needs to be removed from working with lead.
More information on this can be found in the legislation as well as in our Guide on lead notifications. https://www.safework.nsw.gov.au/resource-library/licence-and-registrations/guide-for-applicants-for-lead-notifications
All lead notifications are free.

Health Monitoring

SafeWork NSW states that:
Health monitoring must be provided to workers before lead risk work starts and one month after starting.
For workers who perform ongoing lead work, biological monitoring must be arranged in accordance with the frequencies published in the WHS Regulation.
Additional guidance can be found at https://www.safework.nsw.gov.au/notify-safework/lead-notifications

APPENDIX 3
MONITORING CHECKLIST

Inspection Checklist for the Interim EMP for 2 Copper Creek Road Captains Flat NSW

Date:	UGL Representative completing inspection:
Start time:	
Finish time:	
Weather:	
	BoM

Date and volume of maximum rainfall in a 24hr period since last inspection?

Date:

Max volume (mm) in 24hr period:

Plan Ref	Control	Inspection		Corrective Action	Implemented?
		Yes	No		
General Observations					
NA	Is airborne dust from site evident?				
	Is sediment run-off evident?				
	Is surface water discharging from site?				
	Is there evidence of excavation or other works non-compliant with the EMP?				
Table 3-1					
3.3	Is signage in place at the front of the site?				
	Is fencing in place to prevent inadvertent access?				
	Exclusion Zone fencing and signage undamaged?				
	Is > 80% of the site covered with hardstand pavement, building footprints and / or vegetation				
	Is evidence of unauthorised site access visible?				
	Is excavation occuring onsite?				

Plan Ref	Control	Inspection		Corrective Action	Implemented?
		Yes	No		
3.3	Is the UGL Environment Manager or delegated representative supervising the excavation?				
	Are excavators operating with closed cabs?				
	Are excavation exclusion zones in place?				
	Are staff wearing appropriate PPE per **Table 3-1**?				
	Is dust suppression occurring?				
	Is airborne dust visible?				

Other Observations
