



WATER MANAGEMENT PLAN

**LOT 3938 & 7971 CATTERICK ROAD,
CATTERICK**

July 2026

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This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

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1 INTRODUCTION

1.1 Background

Jim Cross (the applicant) is proposing to extract gravel from an area approximately 11.7 hectare (ha) in size and extract hard rock from an area approximately 2 ha in size located within Lot 3938 (HSE 406) and Lot 7971 Catterick Road, Catterick (herein referred to as the subject site) (refer to **Figure 1**). The subject site is located within the municipality of the Shire of Bridgetown- Greenbushes approximately 5.7 km south east of Greenbushes.

The available volume of gravel (*insitu* volume of approximately 350,000 m³) is to be extracted in six cells ranging from 1.9 to 2 ha in size to ensure that no more than 2 ha is disturbed at any time. Works will commence in the north east (cell 1) and then continue in a south-westerly direction (refer to **Figure 2**). The available volume of hard rock (*insitu* volume of approximately 300,000 m³) is to be extracted in one cell approximately 2 ha in size. Excavation of both gravel and hard rock may occur concurrently.

The slope of the final contours of the quarry will be an undulating surface, mirroring the existing ground surface minus the excavated material at between approximately 260 m AHD and 202 m AHD for the gravel resource area and 225 m AHD to 190 m AHD for the hard rock resource area which is consistent with the adjoining land.

Where batters are required, they will be retained at 1:5 vertical to horizontal with the primary objective of ensuring a consistent landform across the property.

1.2 Purpose and Scope

The purpose of this Water Management Plan (WMP) is to review the risks and control measures to appropriately manage minimise the environmental impacts of the extractive industry on both groundwater and surface water in proximity to the subject site. This document has been prepared to support and should be read in conjunction with, the *Extractive Industry Application Management Report* prepared by Accendo Australia (2025) for extraction within the subject site.

The scope of the WMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment water quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to water management.

2 EXISTING ENVIRONMENT

2.1 Location

The subject site is located within Lot 3938 (HSE 406) and Lot 7971 Catterick Road, Catterick. The subject site is located within the municipality of the Shire of Bridgetown- Greenbushes, approximately 5.7 km south east of Greenbushes (refer to **Figure 1**).

2.2 Land Use

The property is zoned 'Rural 2 – General agriculture' pursuant to the Shire of Bridgetown – Greenbushes' *Town Planning Scheme No. 4*. The proposed extractive industry is not permitted by the Scheme unless Planning Consent is granted by the council.

The subject site is located between land zoned Rural 2 – General Agriculture to the north, south and west. Blocks zoned as State Forest are located to the south east and north west of the Lots.

The subject site contains a recently cleared blue gum plantation along with areas of previously farmed land.

2.3 Topography and Soils

The current topography of the property can be described as sloping with the elevation ranging from approximately 280 m Australian Height Datum (AHD) in the south sloping to a gully containing the Hester Brook at approximately 190 m AHD. The topography to the north of the Hester Brook is relatively stable ranging between 190 m AHD to 200 m AHD in the north of the property. The subject site is located at elevations ranging from approximately 280 m AHD to 210 m AHD (refer to **Figures 3 and 4**).

The subject site is located within the Western Darling Range Zone landform consisting of *"moderately dissected lateritic plateau on granite with deeply incised valleys. Soils are formed in laterite, lateritic colluvium and weathered in-situ granite and gneiss"*, and the Lowden Valleys System described as *"Deep gneissic valleys, in the south of the Western Darling Range containing loamy earth, loamy duplex, gravel and stony soils."* (Tille 2006).

Within the Lowden Valleys System, the subject site is located within the following sub-systems:

- Grimwade Subsystem – Moderately deep valleys (30-70) in granite. Soils are loamy earths and loamy gravels.
- Balingup moderate slopes phase (Balingup Subsystem) – moderate slope phase, slopes 15-35% relief 60-120 m.

2.4 Climate

The climate at the Site can be described as a mild climate with warm and dry summers and cold and wet winters. According to data from the closest weather station with the most recent available data, Bridgetown (Station number 9617, accessed at www.bom.gov.au), the annual average rainfall is approximately 724 mm, with the highest monthly rainfall of 127 mm recorded in July and the lowest, 12.9mm, recorded in February. The average monthly maximum temperatures range from 30.0°C in January to 15.8°C in July and the average monthly minimum temperatures range from 13.1°C in January to 4.8°C in July.

During the summer months the dominant wind in the mornings is from the south-east at 10-14 knots, swinging to the south-west at 20-25 knots in the afternoon. During winter, the winds are most commonly

10-14 knots with no dominant prevailing direction. During storms winds from the west and north-west can reach 40 knots (BoM 2022).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 1 in 10 (10%) annual exceedance probability storm event for the subject site as 32.3 mm/hr.

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the Karri Groundwater Area. The Archaen host rocks of the region are generally considered as relatively low yielding groundwater sources. Localised faults and fractures can provide increased yields and isolated aquifers but there is no evidence of large – scale water movement in fractured rocks at Greenbushes (GHD, 2018).

Groundwater resources are limited within the area due to the low permeability of the sub-surface materials and the elevation of the subject site. It is expected that groundwater may be present at depth below the weathered clays. This may be at between 15 to 20 m below ground level (BGL) at the base of the clay layer which is part of the laterite profile (De Silva *et al* 2000).

Information provided in the *Site Details Report* from the *Water Information Reporting* (WIR) website maintained by DWER for an onsite well named 'Catterick – Well 1685' indicates the presence of approximately 0-3 m topsoil and gravel, followed by very hard clay at 3-4 m with water beneath in the soft material. It is likely that this clay level is impermeable and groundwater is unlikely to be present within the gravel soils above. This well is located at an elevation of approximately 202 m AHD, which is at least 2m lower than the lowest elevation within the gravel extraction area, with the majority of the extraction area at much greater elevations. Given that the maximum depth of excavation proposed is 3 m below ground level (BGL), it is considered that adequate separation between groundwater and the maximum depth of excavation can be achieved.

Furthermore, test pitting in the gravel extraction area was undertaken in October 2024 to a depth of approximately 4 m BGL whereby no groundwater was encountered (refer to **Appendix A**). The base of all test pits was observed to be clay materials. As previously discussed, it is likely that the clay layer is the confining layer and groundwater is situated below in softer materials. Therefore, given the maximum depth of excavation is 3 m BGL, no interactions with groundwater area expected at any time of the year.

Test pitting undertaken in the proposed drill and blast area demonstrated loamy topsoils over clay and then gneiss, dolerite or saprolite (refer to **Appendix B**). The extraction area has been located to ensure extraction is concentrated over the dolerite containing areas. The impermeable nature of this formation is likely to restrict the formation of aquifers and therefore no interaction with groundwater in this area is expected.

2.5.2 Surface water

The subject site is located in the Hester Brook subarea of the Middle Blackwood surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

The Hester Brook is located within the property. A buffer of approximately 100 m will be maintained to the extraction area at all times.

3 EXTRACTION ACTIVITIES

The gravel and clay quarry will cover an area of approximately 11.7 ha, with a current maximum elevation ranging from 263 m AHD to 205 m AHD. It will be excavated to a maximum depth of approximately 3 m BGL commencing in the north east and moving initially in a southerly direction in stages less than 2 ha in size (refer to **Figure 2**).

The available volume of gravel (*insitu* volume of approximately 350,000 m³) is to be extracted in six cells ranging from 1.9 to 2 ha in size to ensure that no more than 2 ha is disturbed at any time. Works will commence in the north east (cell 1) and then continue in a south-westerly direction (refer to **Figure 2**). The available volume of hard rock (*insitu* volume of approximately 300,000 m³) is to be extracted in one cell approximately 2 ha in size. Excavation of both gravel and hard rock may occur concurrently.

The planned end use of the quarry is to restore a natural soil profile and return the area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to the perimeter of the proposed pit area.

Typical operating hours for quarries will be adopted for the subject site which involves 0730 am to 1730 pm each Monday to Friday and Saturdays 0730 am to 1300 pm, with no activities to occur on Sundays or public holidays. The site will be worked by 3 - 5 persons, depending on market demand.

3.1.1 Gravel/clay Extraction

The gravel and clay quarry will cover an area of approximately 11.7 ha, with a current maximum elevation ranging from 263 m AHD to 205 m AHD. It will be excavated to a maximum depth of 3.0 m BGL.

It is estimated that the total maximum volume of material to be removed from the six cells will be approximately 350,000 m³ with approximately 35,000 m³ excavated each year, depending on supply and demand.

The material within the subject site can be removed with an excavator or loader without the need for blasting. The material will then be crushed and screened to produce products of the correct size.

A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 metre contour plan developed.
- All topsoil will be removed for spreading directly onto areas to be revegetated and screening or perimeter bunds. If direct spreading is not possible the topsoil will be stored in low dumps, for spreading at a later date.
- Soil and overburden will then be removed and either directly transferred to a rehabilitation area or stored in low dumps for later rehabilitation use.
- An excavator or front-end loader will be used to excavate the gravel material.
- A loader will then transfer the laterite rock into the crusher where it would be reduced to smaller sizes and transferred to an adjoining screener. The screener then sorts the gravel into various sizes for stockpiling. On an as needed basis, gravel product will be loaded on to road trucks of various configurations for transport off-site.

- An excavator or front-end loader will be then be used to excavate the clay material for stockpiling. On an as needed basis, clay product will be loaded on to road trucks of various configurations for transport off-site or combined with the hard rock excavated to produce required products.
- All static and other equipment, such as crushers and screens (where used), will be located on the floor of the quarry to provide visual and acoustic screening.
- Upon completion of each section of the quarry, the section will be reformed and back filled, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

The planned end use of the quarry is to restore a natural soil profile and return the area to pasture, ensuring that there is no net loss of productive agricultural land.

3.1.2 Hard Rock Extraction

The hard rock quarry will cover an area of approximately 2 ha, with a current maximum elevation ranging from 240 m AHD to 205 m AHD. It will be excavated to a maximum depth of 15.0 m BGL.

It is estimated that the total maximum volume of material to be removed from the initial 2 ha cell will be approximately 300,000 m³ with approximately 30,000m³ excavated each year, depending on supply and demand.

The material within the subject site will require blasting prior to removal with an excavator or loader. The material will then be crushed and screened to produce products of the correct size. Where required, the hard rock material will be mixed with clay sourced from within the onsite gravel/clay pit.

A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 metre contour plan developed.
- All topsoil will be removed for spreading directly onto areas to be revegetated and screening or perimeter bunds. If direct spreading is not possible the topsoil will be stored in low dumps, for spreading at a later date.
- Soil and overburden will then be removed and either directly transferred to a rehabilitation area or stored in low dumps for later rehabilitation use.
- A 1m high perimeter bund will be constructed for safety and stormwater management purposes.
- Stormwater detention basins will be constructed on the north and eastern boundaries to contain water and protect onsite watercourses.
- A drill rig will be used to undertaken pattern drilling and then blasting of the face will occur.
- An excavator or front-end loader will be used to excavate the material.
- A loader will then transfer the blasted material into the crusher where it would be reduced to smaller sizes and transferred to an adjoining screener. The screener then sorts the material into various sizes for stockpiling. On an as needed basis, rock product will be loaded on to road trucks of various configurations for transport off-site.
- Depending on the product required, clay product may be combined with the hard rock excavated prior to being loaded on to road trucks of various configurations for transport off-site.
- All static and other equipment, such as crushers and screens (where used), will be located on the floor of the quarry to provide visual and acoustic screening where space permits.
- Upon completion of each section of the quarry, the section will be reformed and back filled, where subgrade material is available, to achieve the proposed final contours.

- At the end of excavation, the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

3.1.3 Final Contours

The slope of the final contours of the quarry will be an undulating surface, mirroring the existing ground surface minus the excavated material at between approximately 260 m AHD and 202 m AHD for the gravel resource area and 225 m AHD to 190 m AHD for the hard rock resource area which is consistent with the adjoining land.

Where batters are required, they will be retained at 1:5 vertical to horizontal with the primary objective of ensuring a consistent landform across the property.

Where benching has occurred within the hard rock extraction area, the benches will be left in place but back filled with overburden with the brow remaining as a rocky outcrop. Blasting will be used to break down the crest and some of the brows to give the appearance of a sloping landform with the rock being used for backfill. Approximately 600 mm of overburden and topsoil will be reinstated over the entire extraction area to ensure adequate soil is present for the successful rehabilitation to pasture.

3.1.4 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 1. Equipment.

Equipment	Description
Site office/crib room and/or containers	May be required for the management and security of small items.
Ablution block	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Caterpillar 982 Front End Loader (or similar)	Loaders will be used for the movement of gravel, feed material and crushed rock; and loading road trucks.
Caterpillar D9 and D8 Dozer (or similar)	Used in specified areas for the movement of materials during site establishment, prestrip etc.
Caterpillar 352/3363/306 Excavator (or similar)	An excavator may be used for the removal of gravel material, loading the crusher, general material handling, rock breaking oversize rock.
Terex Finlay 1-140 or Metso LT1213S Impact Crusher (or similar)	Used for the crushing of gravel, dolerite and gneiss.
Terex Finlay 693 Supertrak/Metso ST 4.10 Triple Deck Screener/Metso S4.11 Reclaimer HD Screen (or similar)	Used for the screening of crushed gravel.

Equipment	Description
Anaconda/ Telestack 424x/Telestack 624R Radial Stockpiler	Used for stockpiling crushed gravel.
Tamrock Drill Rig (or similar)	Used for drilling blast holes for hard rock extraction.
Fuel storage	No fuel will be stored onsite.
Service Truck	Used for service and maintenance of equipment.
Light vehicles	Access to and around the site.
Metso LT120 Jaw Crusher	Crushing of hard rock.
Metso LT350HP with TK Prescreen Cone Crusher	Crushing of hard rock.
Semi Water Cart	Used for dust suppression.
Caterpillar 140M Grader	Used in road maintenance and rehabilitation.

3.1.5 Water Usage

Water is only required for dust suppression within the quarry and the gravel access road. Water will be sourced either from onsite detention basins or purchased from offsite and trucked to site on an as needs basis.

4 POTENTIAL IMPACTS AND MANAGEMENT

The Section provides an overview of the potential impacts to water resources associated with the proposed land use, and the proposed management measures to address the identified impacts.

4.1 Surface Water

The current water cycle within the subject site consists of inputs from rainwater flowing downhill in a westerly direction into the wider drainage system. The development will maintain this process, with all surface water being retained within the excavated areas to enable infiltration through the base of the pit in the gravel/clay extraction area to ensure water quality to the drains is maintained.

A detention basin will be constructed on the northern boundary of the hard rock extraction area to detain any run off from within the extraction area and protect the Hester Brook from silt laden runoff. Diversion bunds will also be located to direct the flow of rainwater around the extraction area (refer to **Figure 5**).

The mobilisation and positioning of equipment is not associated with any impacts to surface water, including stormwater runoff.

4.2 Drainage

Potential impacts associated with sedimentation and erosion from stormwater runoff during the operation of the quarry will be minimised by the construction of diversion drains around the excavation areas to divert clean water away from the pit and contain any potentially sediment laden surface water within the pit.

The DWER recommendation is that surface water runoff produced within the excavation area from the two hour, 1 in 10 (10%) annual exceedance probability event should be contained within the pit (DoW 2019). Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system (BoM 2021), which yields the two hour 1 in 10% (10%) annual exceedance probability event for the site at 32.3 mm. For every 1 ha area open for excavation at any time a holding volume of 323 m³ is required.

For a maximum area of 2 ha, a holding volume of 646 m³ is required. Given an excavation depth of 3 m and width of the cells between 100 – 200 m, this holding volume can easily be provided within each cell within the first few metres of excavation.

The hard rock extraction area will contain bunding around the uphill boundaries and a detention basin on the northern boundary which will be constructed to contain at least the 646 m³.

During excavation activities, the surface will be internally drained, with the gradients in the cells being constructed to ensure that no surface water runoff occurs.

A risk assessment relating to surface water and stormwater runoff in consideration of the proposed management measures is provided below. The residual risk associated with sedimentation and erosion from stormwater runoff during the operation of the extractive industry is considered low.

Table 2. Risk assessment associated with surface water and stormwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Erosion and sedimentation	Uncontrolled and contaminated stormwater runoff	Erosion and sedimentation resulting in poor surface water quality in surrounding waterways.	Construction of diversion drains around the excavation areas to divert clean water away from the pit and contain any potentially sediment laden surface water within the pit. Excavation undertaken with a gradient to ensure that stormwater is contained within the excavation footprint. Construction of detention basin between the hard rock extraction area and the Hester Brook to contain any potentially sediment laden surface water.	1	2	Low

4.3 Groundwater

Groundwater will not be extracted or dewatered during the operation of the quarry and therefore, no impacts to groundwater levels are proposed.

Maximum excavation levels within the gravel/clay extraction area have been determined to ensure at least 1 m separation from the maximum groundwater level will be maintained at all times. The final contours of the quarry will provide an undulating surface mirroring the existing ground surface minus the excavated material at between approximately 260 m AHD and 202 m AHD. This will provide a separation of at least 1.0 m between the final contours and the maximum groundwater elevation.

Excavation will only occur within the hard rock resource, which, as previously discussed is likely to be the confining layer in this area. Therefore, no interaction with groundwater is expected. The extraction and processing of materials within the site is a chemically free operation with the liquids used being lubricants for machinery and fuel. There will be no storage of chemicals or fuel on the subject site. In addition, the subject site is not adjacent to any environmental sensitive areas (i.e. conservation category or Ramsar wetlands). Therefore, a 1 m separation to groundwater is deemed to be suitable in consideration of the low risk nature of the operation.

Table 3. Risk assessment associated with groundwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Contamination of groundwater	Machinery	Contamination of groundwater	Maintenance of at least 1.0 m separation from groundwater at all times.	1	2	Low

4.4 Hydrocarbons and Dangerous Goods Management

Hydrocarbons and small amount of the chemicals associated with the drill and blast operations are the only dangerous goods that will be utilised within the proposed extraction area. Furthermore, no use of chemicals or hydrocarbons and no refuelling operations will occur within the 40 m buffer. However, storage of hydrocarbons on the site will not occur.

Major servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

There is the minor possibility for soil and water contamination as a result of incidental hydrocarbon leakages or spills during the operation of machinery. In such instances the management measures specified below will be implemented.

Table 4. Hydrocarbon and dangerous goods management measures.

Timing	Management Measure
During quarry operations	Mobile refuelling of equipment and vehicles will be undertaken on site by a mobile fuelling truck.
	Spill kits containing appropriate equipment for control, containment and cleanup of hydrocarbon and chemical spills will be available in appropriate locations onsite and maintained.

A risk assessment to determine the residual risk associated with the uncontrolled discharge of contaminants is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with uncontrolled discharges is 'Low'.

Table 5. Risk assessment associated with the uncontrolled discharge of contaminants.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Uncontrolled discharge of contaminants to land	Machinery	Contamination of soils and/or water	Refer to Management Measures provided in Table 4.	1	2	Low

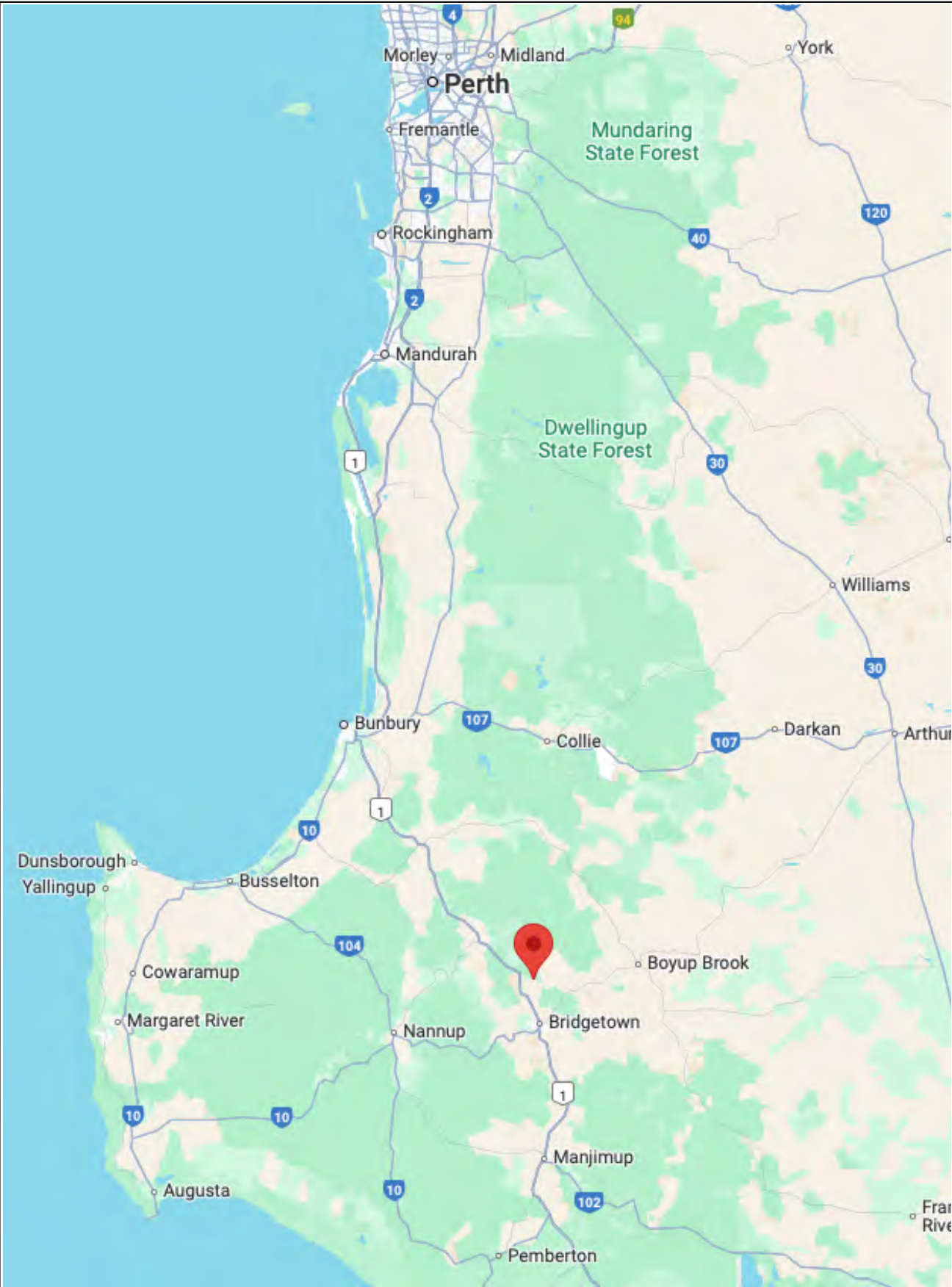
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FIGURES



PROJECT Catterick Road

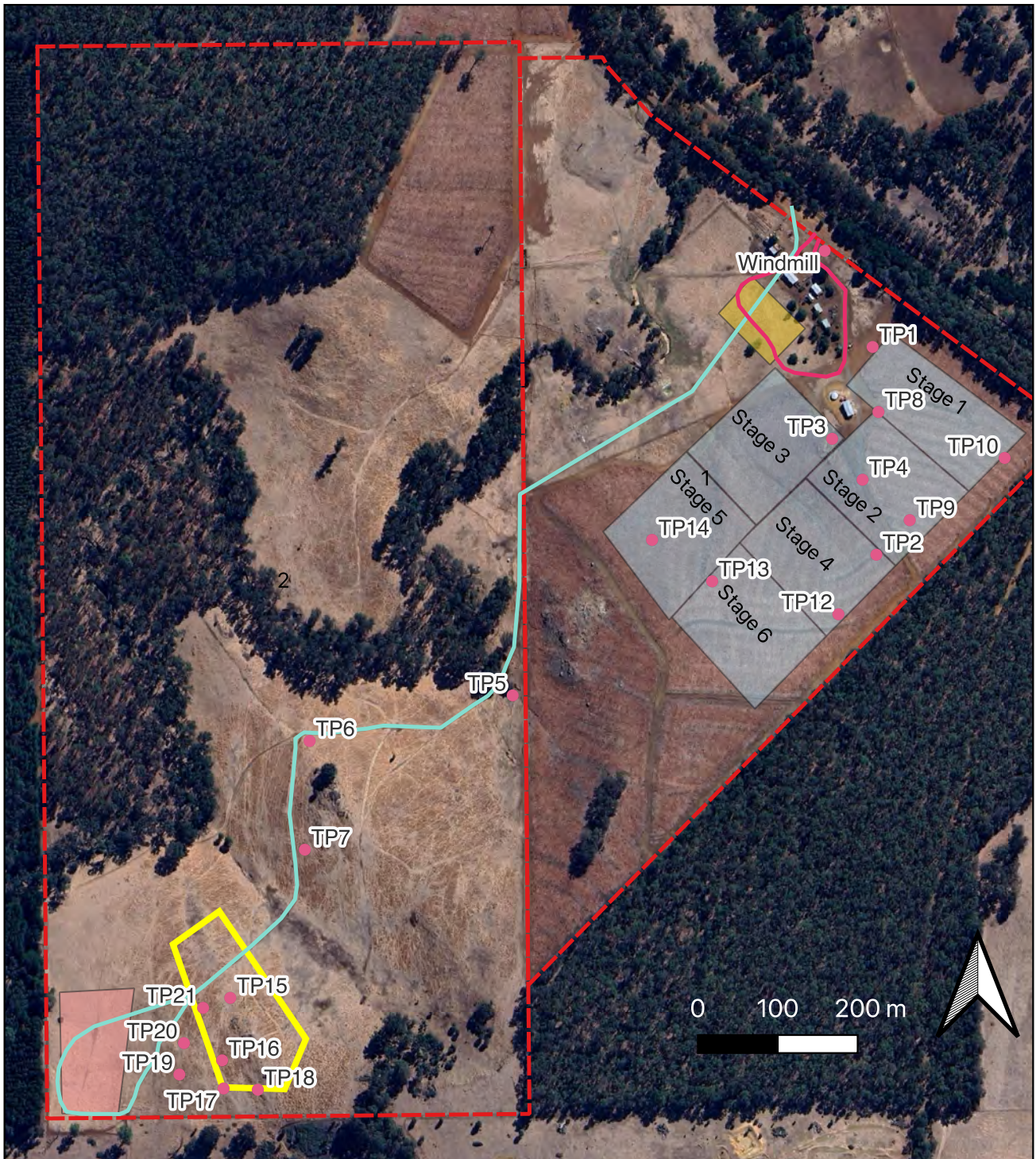
DRAWING TITLE Figure 1 – Site Locality

CLIENT Jim Cross



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Project Number	2409	Drawing Number	Figure 1	Revision	A
Designed	PN	Checked			
Drawn	PN	Approved			
Date	25/11/2024				
Local Authority	Shire of Bridgetown –				
Sheet 1 of 1	Greenbushes				



Legend

 Lot boundary	ROM, Stockpile and Laydown areas
 Gravel/clay extraction	 Gravel/clay ROM, stockpile and laydown areas
 Hard rock haulage route	 Hard Rock ROM, stockpile and laydown areas
 Gravel/clay haulage route	● Test Pits

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DRAWING TITLE Figure 2 – Site Extent

CLIENT Jim Cross



Project Number	Drawing Number	Revision
2409	Figure 2	A
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Drawn PN	Approved	
Date	25/11/2024	
Local Authority	Shire of Bridgetown Greenbushes	
Sheet 1 of 1		



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DRAWING TITLE Figure 3 – Site topography (gravel/clay)

CLIENT Jim Cross



Project Number
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Date
Local Authority
Sheet 1 of 1

Drawing Number
Figure 3

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Approved

25/11/2024
Shire of Bridgetown Greenbushes

Revision
A



PROJECT Catterick Road

DRAWING TITLE Figure 4 – Site topography (hard rock)

CLIENT Jim Cross



PO Box 5178
West Bussellton
Western Australia 6280
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Project Number 2409

Designed PN
Drawn PN

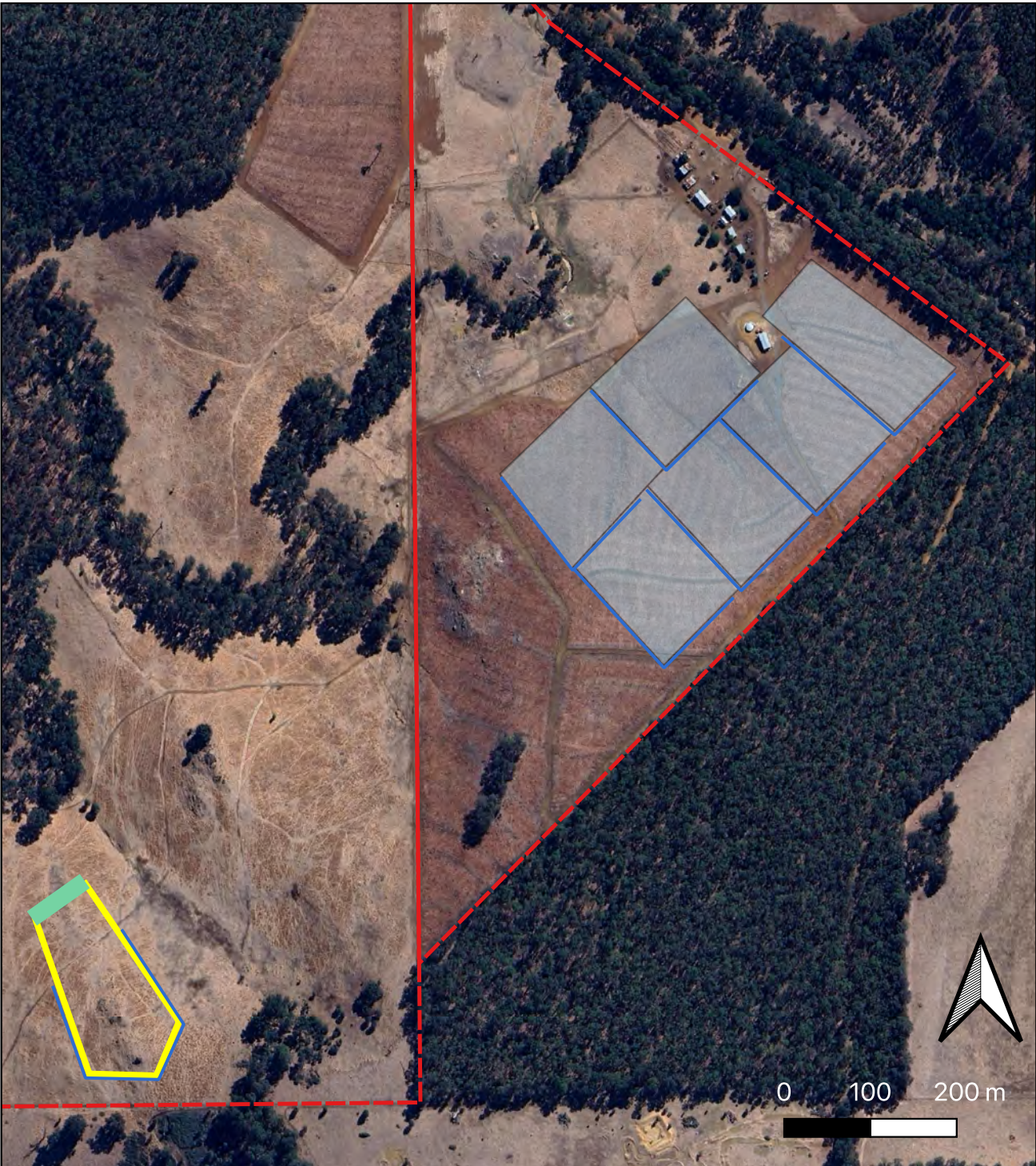
Date 25/11/2024
Local Authority Shire of Bridgetown Greenbushes
Sheet 1 of 1

Drawing Number Figure 4

Checked
Approved

Revision A

25/11/2024
Shire of Bridgetown Greenbushes



Legend

- Lot boundary
- Gravel and clay extraction area
- Hard rock extraction area
- Detention basin
- Diversion Bunds
- Surface Water Management Features

PROJECT	Catterick Road	Project Number	2409	Drawing Number	Figure 5	Revision	A
DRAWING TITLE	Figure 5 – Surface Water Management	Designed	PN	Checked	PN	Approved	
CLIENT	Jim Cross	Drawn	PN	Approved			



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Local Authority Shire of Bridgetown Greenbushes
Sheet 1 of 1

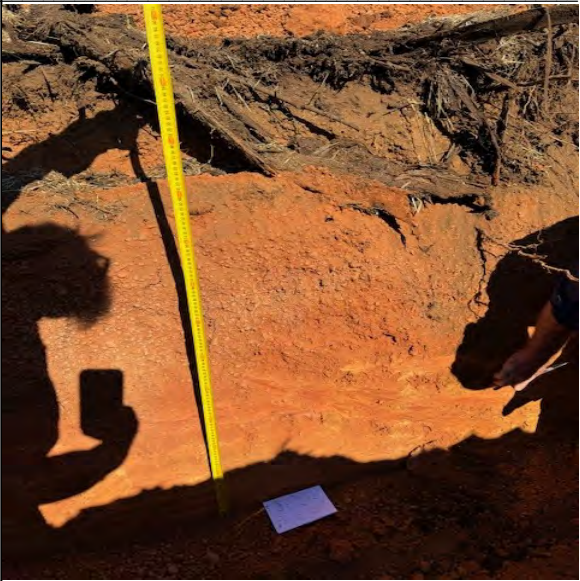
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APPENDIX A – SOIL LOGS (GRAVEL/CLAY)

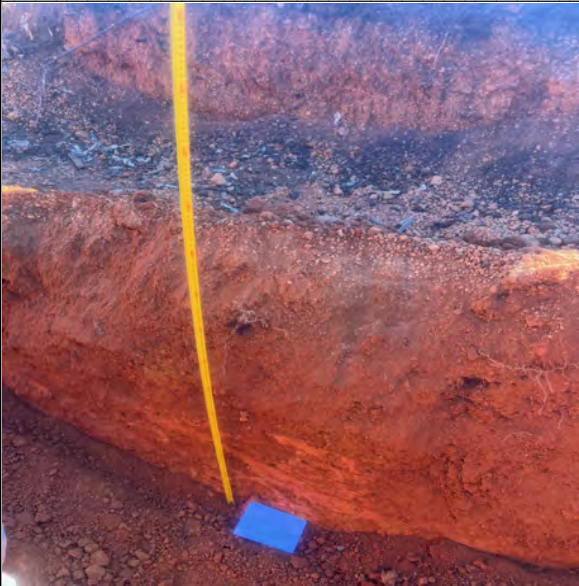
SOIL LOG

PROJECT NUMBER CAT1		BORE NAME CTP1		COORDINATES 418716.3E 6252805.9N		
PROJECT NAME CATTERICK		CONDITIONS Fine Sunny		COORD SYS MGA 94-50		
CLIENT		TOTAL DEPTH 1.5		LOGGED BY J Muir		
DATE 17/05/24		DEPTH TO WATER N/A				
METHOD Excavation						
COMMENTS						
Depth (m)	Samples	Analysed	Graphic Log	Material Description	Moisture	Additional Observations
0.1				Brown Topsoil, well sorted medium grain size, Peozolite Stone composition		
0.2				Brown peozolite gravels uo to 25mm stone		
0.3						
0.4						
0.5						
0.6						
0.7						
0.8				Orrangy red coarse peosolite gravels upto 60mm		
0.9						
1						
1.1						
1.2						
1.3				Peozolitic clay		
1.4						
1.5				No groundwater encountered		
1.6						
1.7						
1.8						
1.9						
2						
2.1						
2.2						
2.3						
2.4						

SOIL LOG

PROJECT NUMBER CAT1		BORE NAME CTP2		COORDINATES 418716.3E 6252805.9N	
PROJECT NAME CATTERICK		CONDITIONS Fine Sunny		COORD SYS MGA 94-50	
CLIENT		TOTAL DEPTH 1.5		LOGGED BY J Muir	
DATE 17/05/24		DEPTH TO WATER N/A			
		METHOD Excavation			
COMMENTS					
Depth (m)	Samples	Analysed	Graphic Log	Material Description	Moisture Additional Observations
				Brown organic topsoil, well sorted medium grain some peozolite stone composition	NA
0.2				Loose res/brown peozolite gravels uo to 25mm stone	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9				Orrangy red coarse sparingly peosolite gravels upto 60mm	
1					
1.1					
1.2					
1.3					
1.4				Peozolitic clay No groundwater encountered	
1.5					
1.6					
1.7					
1.8					
1.9					
2					
2.1					
2.2					
2.3					
2.4					

SOIL LOG

PROJECT NUMBER CAT1		BORE NAME CTP3		COORDINATES 418665.7E 6252691.0N	
PROJECT NAME CATTERICK		CONDITIONS Fine Sunny		COORD SYS MGA 94-50	
CLIENT		TOTAL DEPTH 1.5		LOGGED BY J Muir	
DATE 17/05/24		DEPTH TO WATER N/A			
METHOD Excavation					
COMMENTS					
Depth (m)	Samples	Analysed	Graphic Log	Material Description	Moisture Additional Observations
				Brown organic topsoil, well sorted medium grain some peozolite stone compsiteon	NA
0.2				Loose res/brown peozolite gravels uo to 25mm stone	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8				Orrangy red coarse sparingly peosolite gravels upto 60mm	
0.9					
1					
1.1					
1.2					
1.3				Peozolitic clay	
1.4				No groundwater encountered	
1.5					
1.6					
1.7					
1.8					
1.9					
2					
2.1					
2.2					
2.3					
2.4					

SOIL LOG

PROJECT NUMBER CAT1		BORE NAME CTP4		COORDINATES 418703.7E 6252639.8N	
PROJECT NAME CATTERICK		CONDITIONS Fine Sunny		COORD SYS MGA 94-50	
CLIENT		TOTAL DEPTH 1.5		LOGGED BY J Muir	
DATE 17/05/24		DEPTH TO WATER N/A			
		METHOD Excavation			
COMMENTS					
Depth (m)	Samples	Analysed	Graphic Log	Material Description	Moisture Additional Observations
				Brown organic topsoil, well sorted medium grain some peozolite stone compstion	NA
0.2				Loose res/brown peozolite gravels uo to 25mm stone	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9				Orrangy red coarse sparingly peosolite gravels upto 60mm	
1					
1.1					
1.2					
1.3				Peozolitic clay	
1.4				No groundwater encountered	
1.5					
1.6					
1.7					
1.8					
1.9					
2					
2.1					
2.2					
2.3					
2.4					

CTP8

0-0.1m	topsoil with gravel and organics
0.1-1.3m	gravel
1.3-1.6m	gravelly clay
1.6-4.2m	red orange clay.

CTP9

0-0.1m	topsoil with gravel and organics
0.1-1.5m	gravel
1.5-1.9m	gravelly clay
1.9-4.1m	red orange clay.

CTP10

0-0.2m	topsoil with gravel and organics
0.2-1.6m	gravel
1.6-1.9m	gravelly clay
1.9-4m	red orange clay.

CTP12

0-0.2m	topsoil with gravel and organics
0.2-1.6m	gravel
1.6-1.9m	gravelly clay
1.9-4m	red orange clay.

CTP13

0-0.2m	topsoil with gravel and organics
0.2-1.6m	gravel
1.6-1.9m	gravelly clay

1.9-4m red orange clay.

CTP14

0-0.3m loamy topsoil with gravel and organics

0.3-2.2m red orange clay 1.6-1.9m

2.2-3.2m white clay rich saprolite (weathered Gneiss)

APPENDIX B – SOIL LOGS (HARD ROCK)

Sample ID: CTP5

Co-ordinates

418266 mE

6252370 mN



Sample ID: CTP6

Co-ordinates

418012 mE

6252313 mN



Sample ID: CTP7

Co-ordinates

418006 mE

6252177 mN



CTP15

0.0-0.05	loamy top soil
0.05-0.4m	chocolate loam clay with blocky rubblely dolerite
0.4-0.9m	blocky saprock dolerite
0.9m	EOH – fresh dolerite - refusal



CTP16

0.0-0.05m	loam topsoil
0.05-0.3m	chocolate loam with Dolerite fragments
0.3-1.2m	orange brown clay
1.2-3.8m	tan green clay (Dolerite upper saprolite)
3.8-4.2m	green tan deeply weathered Dolerite



CTP17

0.0-0.05m	loam topsoil
0.05-0.4m	chocolate loam with Dolerite fragments
0.3-1.8m	red orange clay
1.8-2.6m	hard digging lower saprolite, sericite rich Gneiss
2.6m	EOH- couldn't dig deeper- refusal



CTP18

0.0-0.15m	loamy chocolate topsoil
0.15-0.5m	chocolate loam with Dolerite fragments
0.5-1.9m	green tan clay
1.9-2.4m	blocky weathered saprock dolerite
2.4m	EOH- fresh Dolerite.



CTP19

0.0-0.2m	loamy top soil
0.2-0.7m	red orange loamy clay
0.7-3.8m	tan orange clay
3.8-5.0m	gneiss lower saprolite, sericite (mica) rich.
5.0m EOH	



CTP20

0.0-0.4m loamy chocolate topsoil with blocks of fresh Dolerite

0.4-1.6m chocolate clay

1.6-1.9m tan clay - deeply weathered gneiss

1.9-2.8m lower saprolite gneiss



CTP21

0.0-0.4m	chocolate loam topsoil with minor dolerite fragments
0.4-0.8m	dark chocolate clay
0.8-1.9m	greeny tan clay
1.9-2.3m	Dolerite sap rock
2.3m	EOH refusal



APPENDIX G - NOISE MANAGEMENT PLAN