Remedial Action Plan

For UPSS Replacement at Ampol Manly Vale Service Station (Site ID: 22259)

Ampol Australia Petroleum Pty Ltd

Reference: 754-SYDEN346453-R02 - AMPOL_22259_Manly Vale_RAP_Final

23 May 2024

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23 May 2024

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QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
Draft	Draft – for client comment	8 April 2024	Jessie Sixsmith	Anthony Plumb	Anthony Plumb
Final	Updated following comments from Ampol	23 May 2024	Jessie Sixsmith	Anthony Plumb	Anthony Plumb

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Distribution

Report Status	No. of copies	Format	Distributed to	Date
Draft	1	PDF	Liane Tempest-Wilson Ampol Australia Petroleum Pty Ltd	8 April 2024
Final	1	PDF	Liane Tempest-Wilson Ampol Australia Petroleum Pty Ltd	23 May 2024

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
BTEXN	Benzene, toluene, ethylbenzene, xylene and naphthalene
CLM	Contaminated Land Management
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
DQOs	Data quality objectives
DQIs	Data quality indicators
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EPL	Environment Protection Licence
ESA	Environmental Site Assessment
GSW	General solid waste
km	Kilometres
LNAPL	Light non-aqueous phase liquid
LOR	Limit of reporting
LPG	Liquefied petroleum gas
mAHD	Metres in Australian Height Datum
mBGL	Metres below ground level
mBTOC	Metres below top of casing
mg/kg	Milligrams per kilogram
mg/L	Milligrams per litre
mRL	Metres in relative level
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure
NSW	New South Wales
OCPs	Organochlorine pesticides
OPPs	Organophosphorus pesticides
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Poly-chlorinated biphenyls
PID	Photo-ionisation detector
POEO	Protection of the Environment Operations
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RSW	Restricted solid waste
SCC	Specific contaminant concentration

Acronyms/Abbreviations	Definition
SOPs	Standard operating procedures
SWL	Standing water level
TCLP	Toxicity characteristics leaching procedure
TEQ	Toxicity equivalent quotient
TRH	Total recoverable hydrocarbons
UCL	Upper confidence limit
ULP	Unleaded petrol
UPSS	Underground Petroleum Storage System
US	United States
USTs	Underground storage tanks
VENM	Virgin Excavated Natural Material
µg/kg	Micrograms per kilogram

1. INTRODUCTION

Ampol Australia Petroleum Pty Ltd (Ampol) engaged Tetra Tech Coffey Pty Ltd (Tetra Tech Coffey) to prepare a Remediation Action Plan (RAP) for the planned underground petroleum storage system (UPSS) replacement works at the Ampol Manly Vale Service Station (site ID: 22259) (the site). The site is identified as Lot 23 in DP819441, located 236-238 Condamine Street, Manly Vale NSW. The site locality is shown in the Figure 1, Appendix A.

1.1 BACKGROUND

Ampol intend to redevelop the site for ongoing service station and mechanical workshop use, which is proposed to include the replacement of UPSS infrastructure, including all underground storage tanks (USTs), dip and fill points, fuel and vent lines and dispensers. The final concept plans provided by Ampol (Appendix D), indicate the UST tank farm will be located within the south western portion of the site, south of the sales building and canopy and will consist of two, double walled, 70kL spilt tanks. The existing diesel tank in the north western portion of the site, will be removed. The current UPSS infrastructure and proposed locations for the replacement UPSS are shown in Figure 2, Appendix A.

Contamination including petroleum hydrocarbon and asbestos was identified in soils at the site during a Pre-UPSS Replacement Environmental Site Assessment (ESA), undertaken by Tetra Tech Coffey in March 2024, as documented in the following report:

- Tetra Tech Coffey (2024), Pre-UPSS Replacement Environmental Site Assessment, Ampol Manly Vale (Site ID: 22250), 236-238 Condamine Street, Manly Vale NSW, report reference: 754-SYDEN346453-R01 – AMPOL_22259_Manly Vale_ESA, dated 22 May 2024.

This RAP was requested to facilitate planning of the proposed redevelopment with respect to managing contamination during UPSS replacement, and is intended to support a Development Application (DA) submission which Ampol is preparing to submit to Northern Beaches Council (Council) for the UPSS replacement works.

During the removal of the existing fuel infrastructure further assessment of soil contamination and validation of UPSS removal areas shall be carried out in general accordance with the relevant NSW Environment Protection Authority (EPA) endorsed guidelines (outlined in Section 5.4) as outlined in this RAP. Any asbestos and hydrocarbon impacted soil encountered during the works is to be managed in accordance with this RAP.

1.2 OBJECTIVES

The objective of this RAP is to outline the proposed remediation and validation strategy for the planned UPSS replacement works, including minimum environmental management and work practices to be executed by the contractor.

This RAP aims to provide a clear and effective remediation strategy for the management of soil contamination that may be encountered during the UPSS replacement works. The goal of the remediation and validation program is to manage any potential contamination (if identified) such that risks to human health and the environment are considered acceptable in light of the ongoing use of the site as a service station (commercial/industrial non-sensitive land use) with mechanical workshop.

1.3 SCOPE OF WORK

Tetra Tech Coffey prepared this RAP in general accordance with guidelines made or approved by the NSW EPA (refer to Section 5.4). In summary this RAP includes:

- A summary of site identification details, including the site condition and surrounding land uses.
- A summary of the site history and environmental setting, including summarised previous environmental investigation results, as made available to Tetra Tech Coffey.
- Assessment of identified data gaps.
- An outline of the site conceptual site model.
- Identification of remediation goals, remedial options assessment and remediation strategy.
- A proposed validation plan, including adopted remediation criteria.
- An overview of site management plan procedures, including an unexpected finds protocol (UFP).
- An outline of the documentation required to be implemented, to control environmental risks and human health and safety during UPSS replacement works.

2. SITE DETAILS, SETTING & HISTORY

2.1 SITE IDENTIFICATION

Site identification information is provided in Table 2-1. The location and layout of the site are shown in Figure 1 and Figure 2, Appendix A.

Table 2-1: Site Identification Details

Site Address	236-238 Condamine Street, Manly Vale, NSW
Ampol Site ID	22259
Title Identification	Lot 23 DP819441
Local Government Authority	Northern Beaches Council
Current Land Zoning	R3: Medium Density Residential under the Northern Beaches Local Environmental Plan 2011
Site Area	Approximately 1,650m^2
Previous Land Use	Operational service station
Proposed Land Use	Ongoing as operational service station and mechanical workshop
Site Coordinates	-33.784868 lat, 151.267269 long (north-western corner)

2.2 SITE LAYOUT

The site layout, as described within the Tetra Tech Coffey (2024) ESA is summarised below. The site layout plan is presented in Figure 2, Appendix A.

- The approximately square-shaped site is situated on the corner of Condamine Street (western boundary) and Koorala Street (southern boundary), with driveways entering the site from Condamine Street.
- One rectangular-shaped canopy is present on the central-west of the site that extends east, joining with the sales building in the centre of the site.
- Two bowsers are present underneath the canopy, with a diesel dispenser present within the north western corner of the site.

- A mechanical workshop is situated in the central-west portion of the site that extends north from the adjoining sales building. Hardstand surface (predominantly concrete) covers the western portion of the site with exposed gravel surfaces present in the eastern portion of the site.
- The south-west corner of the site is designated for customer vehicle parking and the eastern gravelled portion is predominantly used for vehicle parking associated with the mechanical workshop.
- Two shipping containers used for storage of supplies for the retail business are situated directly to the east of the sales building.
- The site topography is relatively flat with a slight slope to the south, noting that the topography of the surrounding area along Koorala Street slopes down to the east and along Condamine Street down to the South. The site has been filled with imported fill to make the site approximately level with Condamine Street, with a retaining wall present along the southern boundary.

The current fuel storage information is summarised in Table 2-2, which has been collated based on the 2024 Dangerous Good Plan for the site and confirmed with site observations during the site inspection (Tetra Tech Coffey, 2024 ESA).

A copy of the Dangerous Goods Plan (22259-DG, Revision E) is provided in Appendix B.

Table 2-2: Fuel Storage Information

Tank ID	Tank Type (UST/AST)	Capacity (L)	Product
T1	UST	22,800	Petrol (E10)
T2	UST	10,000	Petrol (E10)
T3	UST	10,000	Petrol (98)
T4	UST	22,400	Petrol (95)
T5	UST	5,000	Diesel
Exchange cylinders	AST	9kg, 4x190kg	LPG
Other Related Infrastructure	Bulk Oil Tank[1]	Unknown	Waste Oil
Other Related Infrastructure	Oil Separator[1]	Unknown	Waste Oil

1. it is understood that both the bulk oil tank and oil separators are in-ground sumps. Tetra Tech Coffey understands that the oil separator and the bulk oil tank will remain as they are not included within the UPSS upgrading works.

2.3 SITE ENVIRONMENTAL SETTING SUMMARY

Key site environmental setting information has been summarised below in Table 2-3 which is based on a review of readily available information online, and information presented within the Tetra Tech Coffey (2024) ESA.

Table 2-3: Site Environmental Setting

Topography and site drainage	The topography of the surrounding area slopes down to the east and the site has been filled to make the site approximately level with Condamine Street. Google Earth indicates the Relative Level (RL) of the site is approximately 17 m to 18 meters Australian Height Datum (mAHD), with the surrounding land to the south east approximately 14 mAHD. The site surface is generally flat with a slight slope to the south, having an elevation of approximately 17 mAHD (GHD, 2016). The topography of the surrounding area along Koorala Street slopes down to the east. The surface is mostly covered by concrete, with a gravelled car park located within the eastern portion of the site. A strip of trees and shrubs is present along the eastern site boundary. A brick retaining wall is present along the southern boundary, with a grassed area along the top of the retaining wall in the south eastern corner of the site.

	It is anticipated that surface water runoff will drain into the grated channel drains located along the Condamine Street.
Hydrology	The nearest down-gradient surface water bodies to the site are Burnt Bridge Creek located approximately 280 m south-east and Manly Creek, located approximately 730m east. Both Manly Creek and Burnt Bridge Creek are freshwater ecosystems which discharge into the Manly Lagoon, which is a highly modified, marine environment.
Geology	The NSW MinView geospatial data resource indicates that the Site is underlain by Hawkesbury Sandstone of the Wianamatta Group generally described as a medium to coarse grained sandstone, with very minor shale and laminate lenses. The site has been filled with up to 4.5m of imported fill material. The lithology encountered during the Tetra Tech Coffey (2024) ESA included: • Concrete (0 – 0.20 mBGL), underlain by • Fill material (0.15 – 4.2 mBGL), described as a mixture of gravelly sand, silty clay, sand, clay and silty sand, medium to coarse grained, low - high plasticity clay, orange-brown, dark grey, red, grey, with sandstone gravel, charcoal fragment observed in BH3 (1.6 mBGL) and BH4 (0.8 m and 1.6 mBGL), underlain by • Residual clays (2.7 – 6.0 mBGL), Clayey sand, clay, pale brown, mottled orange fine to medium grained, medium-high plasticity, some ironstone bands between 5.6-5.7m (BH3). Hydrocarbon odours were noted in two boreholes (BH3 and BH4), positioned north of the tank farm, with grey staining noted between 4.4m and 6.0m in BH4. Groundwater was not observed during drilling. An asbestos fibre cement sheet fragment confirmed by laboratory analysis to contain asbestos was in borehole BH3(0.5-0.6).
Soil landscapes	The NSW Department of Planning, Industry and Environment eSPADE resource indicates that the Site is located within the Warriewood swamp landscape, characterised by deep (>150cm), well sorted, sandy Humus Podzols and dark, mottled Siliceous Sands, overlying buried acid peats in depressions, deep (>200cm podsols and pale Siliceous Sands on Sandy Rises.
Acid sulphate soils	The eSPADE resource indicates that acid sulphate soils are not known to occur at the site or within 1km of the site. As such, acid sulphate soils are unlikely to be present at the site.
Salinity	The NSW Government SEED resource indicates that the site is located in an area of low salinity risk.
Hydrogeology	Based on a review of available records, the existing groundwater well network at the site includes seven groundwater monitoring wells, MW01, MW02, MW03B, MW04, MW05, MW06 and MWX. It is understood that MW03B was installed as a replacement well for MW03 which could not be located during the 2022 monitoring events. MWX is an unknown groundwater well installed in 2019, and slightly north of MW03B. Groundwater inflow was recorded between 10m and 12mBGL within the weathered sandstone bedrock beneath the site (AECOM, 2011). Groundwater flow direction was inferred to be towards the south east (GHD, 2016). Groundwater was not observed during the Tetra Tech Coffey (2024) ESA. The WaterNSW database of registered groundwater bores accessed during the Tetra Tech Coffey (2024) ESA, through the MinView resources which identified 10 registered groundwater monitoring wells within a 500m radius of the site. Eight of these wells are located between 70m and 115m south west at 277 Condamine Street, and were installed for monitoring purposes. Additional information regarding groundwater conditions at the site is presented in Section 3.1.

2.4 SURROUNDING LAND USES

The site is located in a mixed, commercial and residential area, with medium density residential houses directly bordering the northern boundary, an at grade carpark and supermarket complex is present immediately east, followed by medium density residential. The southern site boundary is bound by Koorala Street and eastern boundary by Condamine Street, with mixed commercial and medium density residential land uses present.

3. SITE HISTORY SUMMARY

Review of historical aerials and land title records were undertaken during previous investigations for the site, as described within the Tetra Tech Coffey (2024) ESA. In Summary, the was site undeveloped, partially cleared land from at least 1945, and was fully cleared of all vegetation by 1955. The service station has been present at the site since the early 1960s, with the existing site layout remaining relatively unchanged since 1965.

3.1 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Environmental site investigations have been undertaken at the site since 2011. A summary of the key findings is provided in Table 3.1 below, which includes the following reports:

- AECOM (2011), Groundwater Monitoring Well Report, Caltex Manly Vale (22259), 236-238 Condamine Street, Manly Vale, NSW 2093, report reference: S4138301_RPTFinal_2Feb22, dated 2 February 2011.
- PB (2014), Environmental Site Assessment, Caltex Manly Vale Service Station, 236-238 Condamine Street, Manly Vale, NSW (Caltex Site ID 22259), report reference: 2201556A-CLM-RPT-0782-RevB, dated September 2014.
- GHD (2016), Environmental Site Assessment, 22259 - Caltex Manly Vale Service Station, 236-238 Condamine Street, Manly Vale, NSW, report reference: 40/10135, dated September 2016.
- GHD (2020), 22259 Caltex Manly Vale, 236-238 Condamine Street, Manly Vale, Well Installation Report, report reference: 4010208-45048, dated 30 November 2020.
- SGS (2022), Analytical Report – Premium Fingerprint for one LNAPL sample (22259_MWX_20220420).
- AMPOL Manly Vale 22259 - Groundwater Gauging Data August 2011 – April 2023.
- Tetra Tech Coffey (2024), Pre-UPSS Replacement Environmental Site Assessment, Ampol Manly Vale (Site ID: 22250), 236-238 Condamine Street, Manly Vale NSW, report reference: 754-SYDEN346453-R01 – AMPOL_22259_Manly Vale_ESA, dated 4 April 2024.

A copy of the Tetra Tech Coffey (2024) ESA results tables are provided in Appendix C. Borehole Locations are shown on Figure 2, Appendix A.

Table 3-1 Summary of Previous Environmental Assessments

Report Reference	Scope and Outcome
AECOM (2011) Groundwater Monitoring Well Report	In 2011, AECOM installed three groundwater monitoring wells (MW01 to MW03) to address groundwater monitoring requirements made under the UPSS Regulation. The wells were required to assess groundwater conditions at the site with respect to potential impacts from the UPSS. The lithology observed during drilling consisted of fill materials up to 4.2 m thick, comprising sand, clayey sand, sandy clay and gravelly sand material, underlain by sand, sandy clay, clayey sand weathered sandstone bedrock to the maximum depth of investigation (13 mBGL). Groundwater was encountered in the sandstone bedrock at depths between 10 m and 12 mBGL. Standing Water Level (SWL) was measured between 6.592 metres below top of casing (mBTOC) (MW03) and 7.066 mBTOC (MW01), with groundwater noted to be under a pressure head and groundwater level above the screen. Hydrocarbon odours were noted in two monitoring wells (MW02 and MW03), with no sheen or phase separated hydrocarbons (PSH) observed. Groundwater flow direction was calculated to be towards the south east. Soil contamination above the adopted site criteria was reported at borehole location BH02 (MW02), including TPH C_{10}-C_{36} (2.4-2.6 m), and Total Xylene (6.2-6.6 m). Groundwater contamination was reported in MW02 and MW03, which exceeded the site criteria for some Total Recoverable Hydrocarbons (TRH) and Benzene, Toluene, Ethylbenzene and Xylene (BTEX) compounds.

PB (2014) **Environmental Site Assessment**	In 2014, Caltex commissioned Parsons Brinckerhoff Australia Pty Ltd (PB) to undertake an ESA for the site for potential divestment purposes. The ESA involved undertaking a limited desktop review, drilling of 10 boreholes to depths between 1.2 m and 12 mBGL, conversion of three boreholes into groundwater monitoring wells, and a Hazardous Building Materials Survey (HAZMAT). Soil contamination was identified which exceeded the ecological and health criteria for low density residential (TRH, benzene, naphthalene, benzo(a)pyrene Toxicity Equivalent Quotient (TEQ), total Polycyclic Aromatic Hydrocarbons (PAHs), lead and asbestos) and ecological and health-based criteria for commercial / industrial (benzo(a)pyrene, benzo(a)pyrene TEQ and asbestos. Asbestos and PAHs were identified to be within fill material, with petroleum hydrocarbon contamination attributed to the long-term use of the site as a service station. Groundwater was encountered between 7-9 mBGL with the highest concentrations of petroleum hydrocarbon contamination reported within the south-eastern corner of the site (MW03), and eastern and north-eastern to eastern portions of the site (MW04 and MW05). Impacts were also reported in wells south and north of the tank farm (MW06 and MW02). Groundwater was considered to flow east or south-east towards Burnt Bridge Creek. The HAZMAT identified asbestos-containing materials, lead based paint and light fittings potentially containing Poly-chlorinated biphenyls (PCBs) within existing site structures.
GHD (2016) **Environmental Site Assessment**	GHD were engaged by Caltex to undertake an ESA to obtain further information to enable Caltex to facilitate close out of the Section 60, under the Contaminated Land Management Act, 1997. The ESA involved a desktop review, an intrusive investigation including installation of a paired soil vapour bore near MW04 (6 m and 4.5 m deep), soil sampling, a soil vapour monitoring event and one round of groundwater sampling across the network of six monitoring wells to assess for natural attenuation. The investigation identified the following: ▪ Ground conditions were consistent with previous investigation, with fill material encountered up to 4.3 m thick, underlain by weathered sandstone. ▪ PID results ranged from 0.9 ppm to 11.3 ppm from soil samples collected during this investigation. ▪ Exceedances above the adopted criteria were not reported for soil samples ▪ Groundwater flow was determined to be towards the south east, which is consistent with inferred regional groundwater flow direction. ▪ No Light Non-Aqueous Phase Liquids (LNAPL) was reported at the site. ▪ Groundwater monitoring well MW03 could not be located was assumed to be lost/destroyed. ▪ Dissolved phase hydrocarbons concentrations at the southern (MW06) and eastern (MW05) boundary were an order of magnitude lower than MW02 (located in close vicinity of the tank farm), it was stated that groundwater contamination is attenuating towards the site boundary. ▪ Exceedances for both ecological and drinking water were reported, however the risk considered low given the distance to these potential receptors. ▪ Exceedances above the HSL for residential land use were reported in MW02 (near the tank farm), the offsite vapour intrusion risk was considered to be low based on no exceedances within the newly installed soil vapour bores adjacent to MW04 and the no exceedances reported within the nearest down-gradient groundwater well MW06, and closest point to the off-site residential receptors (south-east). It was concluded that complete or potentially complete exposure pathways between contaminated groundwater and the identified receptors are unlikely to be present.
GHD (2020) **Well Installation Report**	GHD were engaged by Caltex in 2020 to replace the previously destroyed monitoring well MW03. MW03B was installed to a depth of 13 mBGL and screened between 10 m and 13 mBGL. Soil samples were collected during drilling and analysed for TRH and BTEX. PID readings of soil samples ranged from 0.3 ppm to 650 ppm. Two samples were selected for analysis for TRH and BTEX, including Sample MW03B_9.0 with the highest PID reading (650 ppm) and sample MW03B_3.2 which was considered representative of fill material. Detections of xylene, naphthalene and TRH C_6-C_{10} and C_{10}-C_{14} were reported in

	MW03B_9.0, with concentrations below the adopted site criteria, indicating unacceptable vapour intrusion risks are unlikely. Groundwater sampling was not included as part of this scope of works.
SGS (2022), Analytical Report – Premium Fingerprint for one LNAPL sample	An analytical report was provided for one LNAPL sample (22259_MWX_20220420), collected from groundwater well MWX on 20 April 2022. Records show that MWX is an unknown groundwater well installed in 2019, and slightly north of MW03B. SGS undertook fingerprinting analysis, which showed that the hydrocarbon material was dominantly a product of weathered unleaded petrol with a trace amount of leaded petrol. The estimated release time for unleaded petrol found within the sample was less than 2 years. The estimated release time of for the leaded petrol found within the sample was greater than 22 years.
Groundwater Gauging Data August 2011 – April 2023	Tetra Tech was provided with a excel spreadsheet which contained groundwater gauging data from 23 August 2011 to 21 April 2023 for the site. The groundwater wells had been gauged at a bi-annual frequency. These records show that LNAPL has been reported in monitoring well MW03B since reinstallation (20/04/2021), and previously in MW3 during the March 2020 GME. LNAPL was also reported in monitoring well MWX since 25 October 2021. The most recent gauging event was undertaken on 21 April 2023, which reported LNAPL at an apparent thickness of 1.284 m in MWX and 1.354 m in MW03B.
Tetra Tech Coffey (2024) Pre-UPSS ESA	The Pre-UPSS ESA undertaken in March 2024 involved drilling four boreholes to a maximum depth of 6 mBGL and one hand auger up to 1.5 mBGL (noting refusal was encountered at boreholes BH1 (0.5 mBGL) and BH2 (0.8 mBGL), geotechnical testing at two of those boreholes, sampling of soil, assessment of analytical results against the adopted site criteria and a preliminary waste classification. The ESA was carried out to inform management of contamination and stability of excavations during the proposed UPSS replacement works. The site lithology encountered generally comprised fill immediately beneath the concrete hardstand, comprised of gravelly sand, silty clay, sand, clay and silty sand to 4.2 mBGL, followed by residual clay sand, pale brown, mottled orange fine to medium grained, medium-high plasticity, to the depth of investigation (6 m BGL). Soils immediately surrounding the UPSS were not encountered due to safety and limitations of drilling directly adjacent to the USTs. Evidence of petroleum hydrocarbon contamination in the soils surrounding the tank pit was identified, with hydrocarbon odours, grey staining and elevated PID readings recorded during field works. The field observations correlated with analytical laboratory data, where TRH (C6-C10) reported above the laboratory LOR and exceeding the Management Limit (commercial / industrial) within natural soils at BH3 (5.5 - 5.95 mBGL). BTEX was also reported above the laboratory LOR in multiple samples from BH3 and BH4 (although below the site criteria), with the highest concentrations reported from the deepest sample (BH3(5.5 - 5.95m)). Asbestos in the form of fibre cement sheet fragments and loose fibre bundles were detected in two samples collected from fill material (BH3 0.5-0.6m); this is consistent with previous investigations at the site which reported asbestos within the fill material (PB, 2014). Given the site is covered by concrete or thick gravel surface layer, the risk to current site users was considered to be low and acceptable, however management measures were recommended for subsurface works, including the UPSS upgrading works. A copy of the result summary table has been provide in Appendix C and the borehole locations are shown on Figure 2, Appendix A of this RAP. For the stability of the excavations, it was recommended that consideration should be given to battering or benching, if space permits, where excavations extend through fill. A temporary batter of 2H:1V, possibly steeper, may be appropriate for fill material, subject to geotechnical inspection. A temporary batter of 1.5H:1V, may be appropriate for residual soils. Alternatively, traditional box-shield support should be utilised for trenches. For excavations deeper than 3 m, as will likely be the case for the UPSS replacement works, more detailed assessment was recommended once excavation dimensions are known. It was concluded that petroleum hydrocarbon and asbestos soil contamination was identified at the site, which requires remediation management during the UPSS upgrading works. Further investigation was recommended to be carried out during removal of the UPSS to

	assess whether excavated soils are suitable to be reused onsite and validate excavations for residual contamination prior to backfilling. As asbestos was considered likely to be widespread and randomly distributed within fill material, it was recommended that future intrusive construction and maintenance works onsite should be managed under an asbestos management plan / environmental management plan.

3.2 PRODUCT LOSS AND SPILL HISTORY

No information on historical product losses or spills has been provided by Ampol. No tank and line integrity testing has been provided by Ampol. Gauging data records provided shows LNAPL being recorded in two groundwater monitoring wells (MWX and MW03B) to the east of the UPSS since late 2021.

4. CONCEPTUAL SITE MODEL

A risk based, source-pathway-receptor (SPR) model has been included as presented in Table 4-1, to assess potential risks from a contamination perspective in light of the findings of the Tetra Tech Coffey (2024) ESA and specific to the UPSS replacement.

Table 4-1: Source Contamination, Transport Mechanisms and Receptors (UPSS Replacement)

Potential Source / Impacted Medium	Contaminants of Concern	Potential Transport Mechanisms	Potential Receptors	Potential Exposure Pathways	Likelihood of Complete SRP and Presence of Contamination
Fuel stored in UPSS leaking into surrounding soils and perched groundwater (if present)	Petroleum hydrocarbons including TRH and BTEX, free-phase LNAPL	• Potential generation of dust during disturbance and stockpiling of soils during UPSS replacement works. • Potential accumulation of surface water during UPSS replacement works. • Leaching of contaminants from soil into groundwater • Volatilisation and migration. • Potential for redistribution of soils during UPSS replacement works.	Onsite commercial workers/attendants and customers	Vapour intrusion and inhalation.	<u>Potentially Complete (Low- Moderate Likelihood)</u> Results indicate that petroleum hydrocarbon impact is present within soils in the vicinity of the tank pit of T1 to T4, with no exceedances above the HSL reported for boreholes drilled adjacent to the sales building (BH3 and BH4), which indicates a low potential risk to the current site users based on the current site condition. It is noted however that groundwater assessment was not part of this investigation and that LNAPL has been identified within groundwater wells at the site since a soil vapour assessment was carried out previously by GHD.
			Intrusive construction and maintenance workers, including site workers involved in UPSS replacement works	• Direct contact - dermal contact and incidental ingestion of soil/dust, surface water runoff or perched groundwater (if present). • Vapour intrusion and inhalation within a shallow trench/excavation.	<u>Potentially Complete (Moderate - High Likelihood)</u> During the Tetra Tech Coffey, 2024 ESA, concentrations of CoPCs in soil were below the adopted assessment criteria for intrusive maintenance workers. There is a moderate – high potential risk that construction workers may come into contact with petroleum impacted soils during the UPSS replacement works. Management of petroleum hydrocarbon contamination in soil will therefore be required. Should perched groundwater be encountered during the redevelopment works, further assessment and management will be required. Further investigation should be carried out during removal of the UPSS to assess whether excavated soils are suitable to reused onsite and validate excavations prior to backfilling.
Uncontrolled fill used for site development and backfilling tank pits/UPSS	Non friable (bonded) asbestos and Friable asbestos in the form of loose fibre bundles	• Disturbance during redevelopment / future excavation	• Intrusive construction and maintenance workers,	Inhalation of asbestos fibres	<u>Partially Complete (High Likelihood)</u> Asbestos was confirmed to be present within fill material at the site during the ESA (Tetra Tech Coffey 2024), this is consistent with previous investigations.

infrastructure trenches			• onsite commercial workers/attendants and customers • Users of surrounding land		Given the majority of the site is sealed with concrete, the current risk to site users, including commercial workers/attendant and customers is considered to be low. However, there is a high likelihood that intrusive construction and maintenance workers will come into contact with asbestos during subsurface works. Appropriate asbestos controls are required during subsurface works to mitigate any potential risk to on-site and off-site receptors during the UPSS upgrading works. Future intrusive construction and maintenance works onsite should be managed under an asbestos management plan / environmental management plan.

4.1 POTENTIAL DATA GAPS

Due to limitations of the Pre-UPSS investigation, including refusal in fill materials and drilling of locations within a safe distance from the infrastructure, soil immediately surrounding the bowsers or USTs was not observed. The following potential data gaps exist with respect to contamination and the UPSS replacement works:

- The condition of soil directly surrounding the UPSS infrastructure (i.e., the tank pit sands and surrounding the bowers) is unknown, noting that petroleum hydrocarbon and asbestos contamination may be present based on the findings of the ESA (Tetra Tech Coffey, 2024).
- Soil surrounding the diesel UST and bowser at the northern end of the site is unknown.
- It is unknown whether perched groundwater is present within the tank pits.
- The suitability of soils once excavated during UPSS replacement works for potential reuse on site is unknown.

5. REMEDIATION PLANNING

5.1 REMEDIATION OBJECTIVES

The objective of the works is to support the replacement of the UPSS in a way that facilitates Ampol to fulfill their legal obligations with regards to managing soil contamination and facilitates the continued use of the site as a service station and mechanical workshop. This shall be achieved by providing and implementing control measures to mitigate potential risks to identified receptors with regards to petroleum hydrocarbons and asbestos, and assessing the suitability of soils which are proposed to remain in-situ (i.e., at the extent of the UPSS excavations) and potentially be reused onsite for continued land use as a service station (commercial/ industrial) and mechanical workshop.

5.2 PROPOSED REMEDIATION AREAS

Remediation activities are limited to the soils in the vicinity of the UPSS, including the existing tank farm areas (T1 to T4, and T5) and associated fuel lines and bowser infrastructure. Once the existing UPSS is removed from the site, excavation and backfilling will occur as required.

The inferred UPSS replacement area is shown on Figure 2, Appendix A, which is based on the location of the existing UPSS infrastructure. It is understood that this area may be revised once UPSS replacement plans have been developed, if so an Addendum to the RAP may be required.

5.3 REMEDIATION OPTIONS ASSESSMENT

The *Key Principles for Remediation and Management of Contaminated Sites* from the ASC NEPM Toolbox, referenced by the Contaminated Land Guidelines, gives a preferred hierarchy of site remediation options. The two preferred options are given as:

- onsite treatment of contaminated soil
- offsite treatment of contaminated soil, after which it is returned to the site.

If it is not possible for either of those options to be implemented, other options for consideration should include:

- removal of contaminated soil to an approved facility, followed by replacement with clean fill, where necessary,
- isolation of contamination in a containment facility,

- adopted a less sensitive land use to minimise the need for remedial work,
- leaving contaminated material in-situ, providing there is no immediate danger to the environment or community and the site has appropriate management controls in place.

The UPSS replacement project objectives, including budget and timeline, do not allow for onsite treatment of contaminated soils or off-site treatment of contaminated soil to be returned to the site. Based on the objectives of the remediation, unless unexpected gross contamination is identified during works that poses an unacceptable risk to human health, or the environment (e.g. significant hydrocarbon contamination), the remediation options considered applicable to these works are:

- where soil is deemed **suitable** for the land use, in accordance with the validation criteria presented in Section 7; onsite retention and reuse of excavated soil.
- where soil is deemed **unsuitable** for reuse onsite, in accordance with the validation criteria presented in Section 7; waste characterisation and offsite disposal to an appropriately licenced facility.

It is anticipated that the planned replacement of the existing UPSS will remove petroleum hydrocarbon and asbestos impacted soils (where present) within the area of the UPSS, only. Asbestos contaminated fill material in other areas of the site, and the known petroleum hydrocarbon groundwater contamination (including LNAPL) within the deeper sandstone aquifer (which is unlikely to be intercepted during these upgrading works), do not form part of this RAP.

5.4 REGULATION

Prior to earthworks commencing, all relevant licences and approvals shall be obtained from the relevant authorities.

5.4.1 Technical and Regulatory Framework

This RAP was prepared with reference to the following legislation, industry standards, codes of practice, and guidance documents, where relevant:

- NSW Protection of the Environment Operations Act 1997 (POEO Act).
- NSW Contaminated Land Management Act 1997 (CLM Act).
- NSW Work Health and Safety Act 2011 (WHS Act).
- NSW Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (UPSS Regulation).
- NSW Work Health and Safety Regulation 2017 (WHS Regulation).
- NSW State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP).
- Safe Work NSW How to Manage and Control Asbestos in the Workplace Code of Practice 2022.
- Safe Work NSW How to Safely Remove Asbestos Code of Practice 2022.
- SafeWork NSW (2019) Code of Practice: Demolition Work.
- SafeWork NSW (2020) Code of Practice: Excavation Work.
- NSW Environment Protection Authority (EPA) (2020) Guidelines for Consultants Reporting on Contaminated Land (Contaminated Land Guidelines).
- NSW EPA (2020) Underground Petroleum Storage Systems – Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019.
- NSW EPA (2022) Sampling design part 1 – application: Contaminated Land Guidelines (Sampling Design Guidelines).
- NSW EPA (2022) Sampling design part 2– interpretation: Contaminated Land Guidelines (Sampling Design Guidelines).
- NSW EPA (2023) Contamination Assessment of Service Station Sites, Minimum sampling requirements.
- NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd edition).
- NSW EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste.
- Australian Standard AS 1726-2017 Geotechnical Site Investigations.
- Australian Standard AS 4976-2008 The removal and disposal of underground petroleum storage tanks.
- Australian Standard AS 1940-2004 The storage and handling of flammable and combustible liquids.
- National Environment Protection Council (NEPC) (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (NEPM, 2013).
- Friebel E and Nadebaum P (2011) Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, Part 1: Technical Development Document. The Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report 10.

5.4.2 Northern Beaches Council Local Environmental Plan 2011

Review of the *Northern Beaches Council Local Environmental Plan 2011* (LEP) (specifically Section 6.2 Earthworks) indicates that development consent with regard to proposed earthworks (to facilitate the removal of UPSS infrastructure as outlined herein) is not required on the basis that the works are ancillary to other

development for which development consent is required, presuming that that development consent is granted. In any case, a development application is being prepared to facilitate the redevelopment of the service station.

5.4.3 State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 4 of the NSW *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP) refers to the remediation of land and contains planning provisions which provides a state-wide planning framework and planning controls for the remediation of contaminated land and to minimise the risk of harm.

Under the requirements of this SEPP presented in Section 4.8 and Section 4.11, remediation work is classified as either as:

- Category 1: remediation work for which development consent is required.
- Category 2: remediation work not requiring development consent.

In accordance with the definitions provided in this SEPP, the proposed remediation works for the UPSS replacement are considered to be classified as 'Category 2: remediation work not requiring development consent'. It is noted, however, that a development application will be submitted by Ampol regardless of Category 1 or Category 2 remediation works classification.

5.4.4 Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) includes requirements to prevent pollution of waters, to prevent or minimise air pollution, to maintain and operate plant in a proper and efficient condition/ manner and to deal with materials in a proper and efficient manner to minimise noise impacts, and to minimise and manage wastes. The Act also requires notification to the EPA when a pollution incident occurs that causes or threatens material harm to the environment. The provisions of the POEO Act relating to the pollution of waters and waste disposal are particularly relevant to the proposal and would need to be considered during the remediation work.

A license under Schedule 1 of the POEO Act is not required unless more than 30,000m^3 of contaminated soil is treated onsite or if an area of contaminated soil greater than 3 hectares is disturbed. For this project, none of these conditions apply.

5.4.4.1 Protection of the Environment Operations (Waste) Regulation 2014

The *Protection of the Environment Operations (Waste) Regulation 2014* (Waste Regulation), made under the POEO Act, governs disposal of waste including waste classification and tracking requirements for materials requiring off-site disposal and discharges to the environment.

5.4.4.2 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019

The *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019* (UPSS Regulation), made under the POEO Act, aims to minimise the risk to human health and the environment by requiring best practice design, installation, maintenance, and monitoring of UPSS in NSW.

Under Part 5 of the UPSS Regulation, if a storage system is to be decommissioned, the person responsible for the storage system must notify the relevant local authority of the decommissioning no later than 30 days before the system is decommissioned or removed. Where a system has been decommissioned, a validation report must be provided to the council or other relevant authority within 60 days of completion of the decommissioning or remediation works. The validation report must provide independent verification that goals

associated with site works have been met and the site is suitable for its ongoing or future uses. Reports should be prepared by a suitably qualified and experienced person, such as a contaminated land consultant.

The *Guidelines for implementing the Protection of the Environment (Underground Petroleum Storage Systems) Regulation 2019* (EPA, 2020), provides further guidance on meeting the requirements of the UPSS Regulation.

5.4.5 Asbestos Related Licences

Based on the type of asbestos identified (bonded ACM and asbestos fines) at the site, a SafeWork NSW Class A Licensed Asbestos Removal Contractor (LARC) will be required to conduct and/or oversee asbestos related works. The Class A LARC supervisor will be required to be present during asbestos related works.

A SafeWork NSW Licenced Asbestos Assessor (LAA), independent to the remedial/civil contractor, will be required to provide asbestos fibre air monitoring. An LAA will be required to perform visual clearances as required.

5.4.5.1 Regulator Notification

The Class A LARC will be required to lodge and obtain the necessary SafeWork NSW asbestos removal permit prior to commencement of asbestos related works (5 days notification required). An Asbestos Removal Control Plan (ARCP) will be required to be prepared by the LARC and submitted with the notification. The ARCP must be aligned with this RAP and include:

- Details of the asbestos which will and may be encountered, including the location, type and condition of the asbestos.
- Details of how excavation works will be carried out and how asbestos impacted soil will be handled, including the method to be used and the tools, equipment and personal protective equipment to be used.

5.4.6 Work Health and Safety Act 2011

Guidance on the safe removal and decommissioning of USTs made under the NSW *Work Health and Safety Act 2011* (WHS Act) includes:

- Work Health and Safety Regulation 2017.
- SafeWork NSW (2019) Code of Practice: Demolition Work.
- SafeWork NSW (2020) Code of Practice: Excavation Work.
- Australian Standard AS 4976-2008 The removal and disposal of underground petroleum storage tanks.
- Australian Standard AS 1940-2004 The storage and handling of flammable and combustible liquids.
- Australian Standard AS/NZS 60079.10.1: Explosive atmospheres – Classification of areas – Explosive gas atmospheres.
- Australian Standard AS/NZS 60079.29.1: Explosive atmospheres – Gas detectors – Performance requirements of detectors for flammable gases.

It is noted that demolition of the existing UPSS must be undertaken by a demolition contractor who holds an unrestricted demolition licence for chemical installations.

A site-specific Health and Safety Plan shall be prepared by the engaged remediation and/or UPSS removal contractor in accordance with the regulatory requirements and Safe Work Method Statements (SWMS) will be required by all subcontractors for the tasks to be undertaken.

5.4.7 Other Legislation & Guidelines

The framework upon which the contamination status of soils will be assessed shall be constructed on guidelines, “made or approved” by the NSW EPA under Section 105 of the Contaminated Land Management Act 1997. These include, but are not limited to the following:

- NSW EPA (2020) *Contaminated Land Guidelines: Consultants reporting on contaminated land*
- NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* (Waste Classification Guidelines)
- NSW EPA (2017) *Contaminated Sites: Guidelines for NSW Site Auditor Scheme*, 3rd edition
- National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013* (NEPM, 2013)
- NSW EPA (2022) *Sampling design part 1 – application: Contaminated Land Guidelines* (Sampling Design Guidelines)
- NSW EPA (2022) *Sampling design part 2– interpretation: Contaminated Land Guidelines* (Sampling Design Guidelines)

6. REMEDIATION APPROACH

The proposed remediation works for the site is anticipated to involve:

- Concrete break out and UPSS removal,
- Excavation of soils surrounding the existing UPSS infrastructure and to accommodate the new UPSS,
- Stockpile sampling and classification of excavated spoil (for reuse onsite or offsite disposal),
- Soil disposal, as required,
- Importation of soil for backfilling, as required, and
- Reinstatement/backfilling of excavations.

Final installation and commissioning of the new UPSS is outside the scope of remediation and validation.

Management of asbestos impacted fill material is detailed in Section 6.2.1 and Section 8.5.

As a minimum, the Codes of Practice and Australian Standards referred to in Section 5.4.6 are applicable to the work and a copy of each should be obtained by the contractor. Standards should be the most recent version available unless otherwise specified. If the legislation, regulations or guidelines contradict the information presented here the legislation, regulations or guidelines prevail.

6.1 UPSS DECOMMISSIONING

All excavation works should be undertaken by licensed contractors, experienced in the decommissioning and removal of fuel infrastructure and the remediation of contaminated soils. An experienced environmental consultant should be present during the excavation works, particularly to assess the contamination status of the soil excavated from around the UPSS, and to assess whether further excavation of tank pit walls and floors is required to remove potentially contaminated soil.

The UPSS removal is based on the removal of the five USTs described in Section 2.2, and associated bowsers and fuel lines, identified in Figure 2, Appendix A. Tetra Tech Coffey understands that the oil separator adjacent to UST T5 will also be removed during the UPSS replacement. Concrete will be required to be removed from the proposed UPSS removal area and from above fuel delivery and vent lines.

Tanks shall be removed and disposed of in accordance with AS 4976 - 2008 The Removal and Disposal of Underground Storage Tanks. Following product removal from the UPSS, residual amounts of fuel should be further washed out/removed and disposed offsite appropriately. Following oily water and product washout, the USTs will require venting/degassing (or other suitable method) by the remedial contractor to remove any harmful vapour and eliminate any explosive risks prior to removal. Atmospheric gas testing within the USTs shall be carried out by the contractor prior to removal to confirm the tanks do not pose an unacceptable risk of explosion.

Where tank lifting lugs are in good working order, they shall be utilised to remove the tanks. In the event that the tank lugs are not able to be utilised, the UPSS removal contractor shall identify suitable alternative options for UST removal, destruction and disposal. Following removal, tanks are proposed to either be cut up onsite for offsite disposal or transported offsite whole for later destruction. Associated fuel lines and bowser bases are proposed to be removed as part of the overall UPSS removal. Tank destruction certificates shall be retained by the contractor and provided to the environmental consultant for inclusion in the Validation Report.

6.2 EXCAVATION OF SOILS

Following tank removal, tank pit sands and other associated soils will be excavated and characterised for onsite reuse or offsite disposal (if unsuitable to remain onsite). The excavations shall be left open while waiting for laboratory results for the validation samples to facilitate further excavation if required. If UST excavations are required to be temporarily backfilled (such as to address unforeseen safety issues or to control stormwater infiltration) then the excavations shall be lined with geotextile fabric marker layer prior to temporary backfilling.

The extent and depth of the tank pits and UPSS excavations shall be surveyed at the time of validation sampling (refer to Section 7.3), by a registered surveyor.

Based on the inferred locations of the existing UPSS area requiring excavation to remove the existing UPSS and install the new tank farm (Figure 2, Appendix A), is estimated to cover an area of approximately 650 m^3. The total volume of the existing fuel tanks is estimated to be 70 m^3. If excavated to an assumed depth of approximately 4 m, the volume of soil excavated during removal of the existing UPSS and excavation of new tank pit is estimated to be in the order of 600 m^3 to 650 m^3. This does not include excavation of fuel and vent lines, any required benching of excavations, additional excavation to chase out contamination (if identified), or additional excavation of a new tank pit. Once excavated, the size of uncompacted stockpiles will be greater and an appropriate bulking factor will need to be applied. A bulking factor of 10-15% for sands and gravels and 20-40% for clays (source: Look, B, 2007) is provided as a general guide however the contractor will need to make their own assessment of specific volumes upon excavation.

Fill soils should be excavated separately and segregated from underlying natural soils, where possible, to assist with assessment for reuse or disposal.

Any soil that is observed to be odorous, stained or otherwise contaminated during excavation should be segregated prior to assessment for reuse or disposal.

6.2.1 Asbestos Impacted Fill Materials

Excavation of asbestos impacted fill materials is to be undertaken by a SafeWork NSW Class A LARC, who shall ensure all excavation work is undertaken in accordance with the required minimum control measures, as detailed in Section 8.5 and the ARCP. The validation requirements for asbestos is provided in Section 7.3.1.

6.2.2 Excavation Support

The ability of excavations to stand unsupported will depend on the overall depth, size and shape of the excavation.

Where excavations extend through fill, consideration could be given to battering or benching the excavation, if space permits. A temporary batter of 2H:1V, possibly steeper, may be appropriate. A temporary batter of 1.5H:1V, may be appropriate for residual soils, subject to geotechnical inspection. Alternatively, traditional box-shield support should be utilised for trenches. Further guidance is provided in the ESA (Tetra Tech Coffey, 2024).

Temporary excavations above the water table up to 2m high into natural clay and extremely weathered rock can be expected to stand for short periods with vertical cuts, however workers should not approach any vertical cut higher than 1.4m. For excavations deeper than 3 m, more detailed assessment is recommended once excavation dimensions are known.

Notwithstanding the above comments on trench stability, the contractor should comply with all statutory requirements for excavation support.

6.2.3 Groundwater

Groundwater was not observed during the drilling works however it is important to note that groundwater levels are affected by soil/rock permeability and the prevailing weather conditions and will fluctuate over time. Groundwater could be higher or lower depending on the subsurface conditions and rainfall during construction. Stormwater run-off and accumulation is addressed in Section 8.9.

The standing groundwater level at the site is likely to be below the proposed bulk excavation level, however if groundwater seepage is observed above the proposed excavation level, then works shall cease until further advice is sought from Tetra Tech Coffey as consideration of the inflow and associated impacts as well as a Dewatering Management Plan may be required.

6.3 ONSITE REUSE OF SOIL

The preliminary soil results collected during the Pre-UPSS ESA (Tetra Tech Coffey, 2024), indicate that soils excavated may not be suitable for re-use on site without consideration of placement and future use / management, given the asbestos and petroleum hydrocarbon contamination previously identified.

Following the excavation and removal of UPSS infrastructure, any spoil generated during these works shall be stockpiled at the site, and subsequently assessed by a qualified environmental consultant to evaluate suitability for onsite reuse. This shall include the inspection, sampling and analysis of the subject materials prior to re-use. In the event the materials are deemed unsuitable for onsite reuse, the materials should be characterised in accordance with NSW EPA (2014) Waste Classification Guidelines to support offsite disposal to landfill, as in Section 6.4. Refer to Section 7 for details on sampling and analysis requirements.

6.4 EXPORTATION / DISPOSAL OF SOIL (WASTE)

In the event the materials are deemed unsuitable for onsite reuse, the materials should be characterised in accordance with NSW EPA (2014) Waste Classification Guidelines to support offsite disposal to landfill or appropriately licenced facility. Where sampling is required to confirm the waste classification of surplus soil, this shall be undertaken in accordance with the NEPM (2013) and the NSW EPA Sampling Design Guidelines (2020). The analytical suite for waste classification (if unsuitable for reuse onsite) should include TRH/BTEXN, PAHs, phenols, heavy metals and asbestos (or as otherwise advised).

All waste should be tracked, and copies of all disposal receipts should be provided to the validating environmental consultant.

Concentrations of contaminants in all soil samples analysed during the ESA were less than the General Solid Waste Contaminant Threshold 1 (GSW CT1). It was noted, however, that soil directly surrounding the UPSS infrastructure could not be accessed, and tank pit fill soils were not encountered, which may have a significantly different propensity for contamination, especially by fuel products.

Any soil that is observed to be odorous, stained or otherwise contaminated during excavation should be segregated prior to assessment for reuse or disposal, as different waste classifications may be applicable to different waste streams.

6.5 IMPORTATION OF SOIL

The potential quantity of imported soils required for backfilling will depend on the final size of the excavation(s) and the amount of site-won material that is able to be retained and used as backfill.

Imported fill (as required) shall be certified as Virgin Excavated Natural Material (VENM) or classified as Excavated Natural Material (ENM) or under another applicable resource recover order and resource recovery exemption. The definition of Virgin Excavated Natural Material (VENM) is specified in Schedule 1 of the

POEO Act. Where ENM is to be imported to the site for use as backfill, the material should be assessed in accordance with the Excavated Natural Material Order (NSW EPA, 2014).

Prior to import, any material proposed to be imported onto the site will need to be approved as suitable for import by the validating environmental consultant. This procedure will involve reviewing the history of the source of the material and reviewing any VENM certificates or ENM reports.

Upon arrival at the site, any imported material should be inspected for foreign material, unusual staining and any odours. It should be verified that the imported material is consistent with the material described in the certifying documentation provided by the supplier.

VENM supplied by a NEW EPA licenced quarry will be exempt from sampling provided that visual observations are consistent with the quarried product and appropriate documentation can be provided confirming the source and VENM status of the material.

Products which are processed/recycled including but not limited to recycled DGB, recovered aggregate/fines, or VENM / ENM from another construction site or landscape supplier will be subject to sampling and analysis during import (and potentially at the source for due diligence at the discretion of Ampol) to assess the suitability of the material for use at the site.

Requirements for QA/QC evaluation of any sampling and analysis for material brought to site are detailed in Section 7.3.

6.6 REINSTATEMENT OF EXCAVATIONS

Following the completion of excavation and validation works, remaining excavations will be backfilled with material that will comprise validated site-won soils that are deemed suitable for reuse onsite or imported VENM/ENM or similar validated material. Where excavations are backfilled, the material shall be compacted to a standard suitable for the continued use as a service station.

7. VALIDATION PROGRAM

Validation of the UPSS removal works will be undertaken to assess that the UPSS removal has undergone appropriate and effective remediation works, and to facilitate ongoing use of the site as a service station and mechanical workshop. This section summarises the scope of works for the validation program, including:

- Data Quality Objectives (DQOs) for the validation, including validation criteria and data quality indicators (DQIs).
- Validation requirements for excavations subsequent to the removal of the UPSS (tanks, lines and bowsers), validation.
- Validation requirements for soils to be reused on site.
- Validation requirements for of any soils imported to the site.
- Validation that any waste has been legally disposed of.

7.1 DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQO) establish a framework for systematically planning an environmental assessment. The approach involves an iterative seven-step process for developing a set of performance and acceptance criteria. The DQO process is used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of the site following the proposed remediation works. The DQOs for the validation are based on guidance presented in the NEPM (2013), *The Contaminated Land Guidelines: Consultants Reporting on Contaminated Land* (NSW EPA, 2020) and *Contaminated Land*

Guidelines: Sampling Design (NSW EPA, 2022). The seven steps as applied to the validation of the UPSS replacement remediation area are outlined below in Table 7-1.

Table 7-1: Data Quality Objectives

DQO	Outcome
Step 1: State the problem	The site is an operational service station that requires UPSS replacement. Petroleum hydrocarbon and asbestos contaminated soils are present at the site, which require management during the replacement works. It is unlikely that excavated soils will be considered suitable for re-use without consideration of placement and future use / management, however further assessment will be required to confirm.
Step 2: Identify the decisions	The decisions to be made based on the results of the validation assessment will be as follows: • Has petroleum hydrocarbon contaminated soil, if encountered, been removed during the UPSS replacement works to the extent practical? • Is excavated soil suitable for reuse as in backfilling remedial excavations at the site? • Has surplus spoil, if any, removed during remediation been sent to an appropriately licenced waste disposal/transfer facility? • Has imported material been validated as suitable for the ongoing use of the site as a service station and mechanical workshop? • Have remedial works been carried out in a way that minimises risk to human health and the environment?
Step 3: Identify the inputs	The following inputs are required to make a decision: • Understanding of existing site conditions (preliminary conceptual site model and historical reports). • Documentation of the tank removal process, to be provided by the remedial / UPSS removal contractor including but not limited to waste disposal records, tank degassing records, tank destruction certificates, licences, approvals, plans, air monitoring results, clearances. • Survey data showing the extent of the remedial excavations. • Visual observations and field measurements during remedial works. • Review of any imported material. • Analytical laboratory data collected during remedial and validation works. • Guidelines set out within the ASC NEPM and other guidelines published/endorsed by the NSW EPA. • Unexpected finds records. • Clarifications from the remedial contractor or Ampol, if required.
Step 4: Define the study boundaries	The study boundary is the estimated UPSS remediation areas presented in Figure 2, Appendix A, within the site identified in Figure 1, Appendix A. Soil to be validated is anticipated to extend to a depth of approximately 4 mBGL. Temporal boundaries are considered to be the status of the sampling points at the time of the investigation.
Step 5: Develop the analytical approach (or decision rule)	The purpose of this step was to define the parameter of interest, specify the action level and combine the outputs of the previous DQO steps into an 'if/then' decision rule that defines the conditions that would cause the decision maker to choose alternative actions. Soil samples shall be collected according to the validation sampling plan described in Section 7.3, analysed for the COPCs and assessed against the validation criteria defined in Section 7.2. Tier 1 validation criteria have been derived from the NEPM, 2013, for a commercial/industrial land use, as detailed in Section 7.2. In accordance with the process for comparison with investigation and screening levels recommended by the NEPM (2013) the following decision rules have been adopted: • Decision Rule 1: If the concentrations of COPC detected are below the adopted soil validation criteria, the risk to human health, the environment and proposed underground services at that location (for excavation validation samples) or per stockpile (for soil proposed to be reused on site or material imported to site) could be considered to be low and acceptable. • Decision Rule 2: If concentrations of COPC are greater than the adopted validation criteria, consideration for statistical analysis of the dataset should be undertaken to support the need or

DQO	Outcome
	otherwise for further assessment or remediation. These decision rules include consideration of the following for similar soil types. Statistical appraisal does not apply to asbestos. – The 95% upper confidence limit (UCL) of the arithmetic mean contaminant concentration not exceeding the investigation/screening level, – The standard deviation of the results being less than 50% of the investigation/screening level, and – No single value exceeding 250% of the investigation/screening level. • Decision Rule 3: If asbestos is observed in the field, or detected in samples analysed above the adopted criteria in stockpiled soil, consideration of the nature, type, location and condition of the asbestos shall be evaluated to assess the potential risk to human health and whether ongoing management is required in lieu of off-site disposal. Given that asbestos is considered to be present in fill across the site, soil containing asbestos at concentrations above the HSLs may not preclude the reuse of spoil in stockpiles subject to ongoing management. Ampol may however take the decision to dispose asbestos impacted stockpiles off-site where identified. • Decision Rule 4: If incomplete or inaccurate waste disposal documentation is provided, then this shall be documented in the Validation Report. • Decision Rule 5: If asbestos is identified in imported material, then Ampol shall be notified as use of this material for backfilling may form a breach of the POEO Act, regardless of the concentration. • Decision Rule 6: If quality control (QC) results meet the acceptable limits defined in the adopted DQIs, then the analytical data can be considered to be suitable and reliable for the purpose of the investigation.
Step 6: Specify limits on decision errors	The null hypothesis (H_0) is that the soil on the extent of UPSS excavations and in stockpiles is contaminated, and parameters exceed the adopted criteria. The alternative hypothesis is that the material is not contaminated above the adopted criteria. Potential outcomes include Type I errors – wrongly determining the material is acceptable for the continued land use when it is not (wrongly rejects true H_0), consequently risking human health or environmental impacts. Another possible outcome is a Type II error – determining the material is unacceptable for the continued land use when it is acceptable (wrongly accepts false H_0), consequently placing unnecessary financial and/or resource burdens on the project. The acceptable limits on the likelihood of making decision errors are nominated as α risk = 0.05 (Type I error) and β risk = 0.2 (Type II error). Assessment of decision errors will be based on the data quality indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness. Data quality assessment will be applied in accordance with the NEPM (2013), Sampling Design Guidelines (EPA, 2022).
Step 7: Optimise the plan for obtaining data	The validation strategy for the remediation area will consist of targeted sampling for UPSS removal (validation sampling), and systematic sampling for soil reuse in stockpiles. The sampling, analysis and quality plan for obtaining data generally meets or exceeds requirements of the NEPM (2013). Refer to Section 7.2 and 7.3 for further detail.

7.2 VALIDATION CRITERIA

To assess the significance of contaminant concentrations detected in soil samples, analytical results shall be compared to tier 1 soil assessment criteria adopted from ASC NEPM 2013 and CRC CARE, 2011 as outlined below.

To be considered suitable for use, chemical results for recycled or processed products (where presented in supplied documentation) shall meet the criteria specified in the appropriate resource recovery order and be less than the validation criteria presented in this RAP. Where no validation criteria is presented in the RAP for analytes presented in imported material documentation, reference shall be made to appropriate tier 1 criteria presented in NSW EPA approved or endorsed guidelines.

7.2.1 Soil Validation Criteria

Health Investigation Levels (HILs) are applicable for assessing human health risk via relevant exposure pathways. HILs were developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of 3 m below the soil surface.

Health screening levels (HSLs) have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation after vapour intrusion into indoor air and direct contact with soil and groundwater. HSLs depend on general soil type (sand, silt and clay), building configurations and land use scenarios.

As the site is proposed to be used for continued non-sensitive commercial/ industrial land use and the underlying lithology consists of sandy soils, analytical results will be compared against HIL/HSL-D (commercial/industrial) criteria, for sand soils.

The adopted HILs and HSLs for the COPCs are summarised below in Table 7-2, Table 7-3 and Table 7-4.

Table 7-2: Soil Health-based Investigation Levels

Contaminant	HIL D – Commercial/ Industrial (mg/kg)[1]
Arsenic	3,000
Cadmium	900
Chromium (VI)	3,600
Copper	240,000
Lead	1,500
Mercury (inorganic)	730
Nickel	6,000
Zinc	400,000
Carcinogenic PAHs, as Benzo(a)pyrene TEQ	40
Cresol Total	25,000
Pentachlorophenol	660
Phenol	240,000
Total PAHs	4,000

1. *Table 1A(1) – Health investigation levels for soil contaminants (ASC NEPM 2013).*

Table 7-3: Soil Health-based Screening Levels

Contaminant	HSL D – Commercial/ Industrial (Sand) (mg/kg)[1]				HSL-D Direct Contact[2] (mg/kg)	Direct Contact – Intrusive Maintenance Worker[2] (mg/kg)	HSL – Intrusive Maintenance Worker (Shallow Trench) (Sand)[3] (mg/kg)	
	0m to <1m	>=1m, <2m	>=2m, <4m	>=4m			0m to <2m	2m to <4m
Benzene	3	3	3	3	430	1,100	77	160
Toluene	NL	NL	NL	NL	99,000	120,000	NL	NL
Ethylbenzene	NL	NL	NL	NL	27,000	85,000	NL	NL
Xylenes	230	NL	NL	NL	81,000	130,000	NL	NL
Naphthalene	NL	NL	NL	NL	11,000	29,000	NL	NL
TRH F1 (C_6-C_{10} less BTEX)	260	370	630	NL	-	-	NL	NL
TRH F1 C_6-C_{10}	-	-	-	-	26,000	82,000	-	-
TRH F2 (>C_{10}-C_{16} less Naphthalene)	NL	NL	NL	NL	-	-	NL	NL
TRH F2 (>C_{10}-C_{16})	-	-	-	-	20,000	62,000	-	-

TRH F3 ($>C_{16}$-C_{34})	-	-	-	-	27,000	85,000	-	-
TRH F4 ($>C_{34}$-C_{40})	-	-	-	-	38,000	120,000	-	-

NL: not limiting (i.e. HSL exceeds the solubility limit, HSL is not limiting as soil vapour is limited by the solubility limit. Possible concentrations of vapour are not considered to pose a risk to human health through vapour inhalation).

1. *Table 1A(3) – Soil Health Screening Levels for Vapour Intrusion (ASC NEPM 2013).*
2. *Table A4 - Soil Health Screening levels for Direct Contact for commercial/ industrial (CRC CARE, 2011).*
3. *Table A3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC CARE, 2011).*

In accordance with Section 2.9 of Schedule B1 of the NEPM (2013), consideration of Management Limits for petroleum hydrocarbons has been included to assess the potential for accumulation of explosive vapours, the potential risk to buried infrastructure, or the formation of light non-aqueous phase liquid (LNAPL). A summary of the adopted management limits for this site is provided below in Table 7-4.

Table 7-4: Management Limits for Commercial/ Industrial Land Use

Contaminant	Soil Type	Commercial/ Industrial (mg/kg) [1]
TRH F1 (C_6-C_{10})	Fine	800
TRH F2 (>C_{10}-C_{16})	Fine	1,000
TRH F3 (>C_{16}-C_{34})	Fine	5,000
TRH F4 (>C_{34}-C_{40})	Fine	10,000

1. Table 1 B(7) Management Limits for TPH fractions F1-F4 in soil (NEPM (2013)).

The ASC NEPM Schedule B1 also provides health screening levels (HSLs) for asbestos in soil. These HSLs cover a range of land use settings including commercial / industrial land uses (HSL-D), which has been adopted as representative of this site. Adopted values for asbestos health-based criteria are summarised in Table 7.5. Given that fill at the site is impacted with asbestos outside the areas of the estimated UPSS excavation areas, these HSLs would be applicable to spoil proposed to be reused or imported to the site only.

Table 7-5: Summary of Health Screening Levels for Asbestos in Soil

Forms of Asbestos	Commercial/ Industrial (w/w)
Bonded ACM	0.05%
FA and AF	0.001%*
All forms of asbestos	No visible asbestos in surface soils No respirable fibres of asbestos No asbestos fibres detected by trace analysis.

Notes:
**. As per Section 4.8 of Schedule B1 of the ASC NEPM (2013), the screening level of 0.001%w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) does not apply to free fibres.*
FA = Fibrous Asbestos
AF = Asbestos fines

7.2.2 Waste Classification Assessment Criteria

To classify soils for offsite disposal of soil, analytical results will be assessed according to the methods and values specified in the NSW EPA *Waste Classification Guidelines Part 1: Classifying waste* (2014), the ASC NEPM (2013) and NSW EPA (2020) Sampling Design Guidelines.

Asbestos is pre-classified as Special (Asbestos) Waste under the POEO Act 1997.

7.2.3 Liquid Waste Criteria

If surface water accumulates in the excavation, then it shall be classified and disposed off-site in accordance with NSW EPA *Waste Classification Guidelines Part 1: Classifying waste* (2014). Liquid waste shall be transported by a licenced waste contractor under consignment and waste tracking documentation to facilitate disposal at a facility licenced to receive the waste.

7.2.4 Imported Material Criteria

Imported material for backfilling must comply with the definition of VENM or ENM or another applicable NSW EPA resource recovery order and resource recovery exemption. The suitability of imported soils and aggregates shall also be assessed against the HILs, HSLs and Petroleum Hydrocarbon Management Limits

presented in the NEPM (2013) and CRCCARE (2011) , or other NSW EPA approved/endorsed guidelines applicable to a commercial/ industrial land use, as detailed in Section 7.2.1. Aesthetics shall also be considered; unacceptable impacts would include highly odorous or discoloured/ stained soils, or the presence of large quantities of inert or putrescible wastes.

For any required QA/QC analysis of imported soil, as described in Section 6.5, contaminant concentrations must confirm that the imported soil complies with the definition of VENM or ENM or another applicable NSW EPA resource recovery order and resource recovery exemption, and also with the adopted validation criteria detailed in Section 7.2.1.

7.3 PROPOSED VALIDATION SAMPLING & ANALYSIS PLAN

Validation is required to ensure that remediation works have been conducted in accordance with the methodology provided in the RAP and to fulfil legal reporting requirements.

7.3.1 UPSS Excavations

Following removal of petroleum infrastructure, inspection of excavations will be required to confirm the absence of potential residual impact which may exceed the adopted validation criteria outlined in Section 7.2. Where residual impacts which may exceed the adopted land use criteria (via visual inspection, olfactory detection and/or using a PID - 100ppm adopted as a screening value), further assessment will be required, and associated materials may require further removal prior to the validation of the remediation excavation area.

Validation sampling shall be undertaken with reference to the NSW EPA Contamination assessment of service station sites – minimum sampling requirements (2023), NSW EPA Sampling Design Guidelines (2022) and Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (2020). Tank pit excavation and other primary source area excavation samples will be collected as per Table 7-6 below, which is summarised from Table 2 of the NSW EPA (2023) Contamination assessment of service station sites – minimum sampling requirements guidelines. It is noted that additional samples may be required should contamination be identified and/ or changes in lithology are observed.

Table 7-6: Summary of UPSS Excavation Validation Requirements (NSW EPA, 2023)

Validation Area	Minimum no. of samples, locations and action
Underground storage tank (sampling requirements per tank)	• Tank length < 4 m: one sample from beneath the centre of each tank, and one sample from each of the four walls. • Tank length 4–10 m: one sample from beneath each end of each tank, and two samples from each of the four walls. • Tank length > 10 m: one sample from beneath each end of each tank, and three samples from each of the four walls.
Fuel dispensers	One sample per dispenser. Sample to be collected from area adjacent to line and dispenser junction.
Fuel feed lines to dispensers	One sample every 5 m of line.
Remote fill points	One sample per fill point.
Below-ground waste oil/wastewater tank	Two samples per tank.

A large pit may occur when there are multiple tanks are within a tank pit excavation. In this case, the number of samples may be adjusted to reflect the larger area of excavation and the common walls of USTs. Additional samples may be required, based on observations made during remedial works. Samples shall be field screened initially using a PID and logged, noting visual observations, structure and PID screening results.

Soil validation samples shall be analysed for the following COPC (based on the identified impacts and data gaps):

- TRH, BTEXN, and PAH
- Metals
- Phenols

It is noted that samples from the remedial excavations are not proposed to be analysed for asbestos as fill across the site is considered to be impacted with asbestos which will require ongoing management following the UPSS replacement works.

7.3.2 Soil for Reuse

A representative number of samples shall be collected from each stockpile. Stockpiles should be sampled at a rate consistent with Table 3 and Table 4 in the NSW EPA Sampling Design Guidelines (2022), which recommends a minimum of:

- 3 samples per stockpile, and 1 sample per 25m^3 for stockpiles up to 200 m^3; and
- 10 samples to assess stockpiles between 200m^3 and 2,500m^3 in volume with consideration of the 95% UCL_{mean}.

The size of stockpiles will be dependent upon site screening and segregation of stockpiles from certain excavations. Samples shall be field screened using a PID and logged, noting visual observations, structure and PID screening results.

All excavated soils will need to be sampled to confirm suitability for reuse, including soils from any tank pit(s), soil excavated to remove any fuel infrastructure and any soil excavated to accommodate the new UPSS.

Soil samples shall be collected from at least 0.5m beneath the surface of stockpile using hand tools or an excavator depending on the dimensions of the stockpile.

Field screening shall be carried out for suspected ACM including the following:

- Collection of a 10-litre bulk sample using a bucket.
- Sifting of the 10-litre bulk sample though a 7 mm sieve.
- Visual inspection of the material retained on the 7 mm sieve for suspected ACM.
- Collection of one 500 ml soil sample (approximate volume), for subsequent asbestos analysis.

Soil validation samples from stockpiles shall be analysed for the following COPC (based on the identified impacts and data gaps):

- TRH, BTEXN, PAH
- Metals
- Phenols
- Asbestos.

7.3.3 Waste Soil

Where soils are considered unsuitable to remain or be reused onsite, a waste classification shall be provided for the excavated soils in accordance with the NSW EPA Waste Classification Guidelines (2014) and the NSW EPA (2020) Sampling Design Guidelines. The sampling suite for waste classification (if unsuitable for reuse onsite) should include TRH, BTEXN, PAHs, phenols, heavy metals and asbestos (or as otherwise advised).

7.3.4 Data Quality Indicators (QA/QC Plan)

Fieldwork shall be carried out by a suitably qualified and experienced environmental consultant using Standard Operating Procedures (SOPs) consistent with NSW EPA guidance, including the NEPM (2013), which ensure all samples are collected by a set of uniform and systematic methods. Sample collection, sample storage and chain-of-custody procedures will align with standard industry practice methods as outlined in NEPM (2013). Key requirements of these procedures are listed below:

- Decontamination procedures: including washing and rinsing of re-useable equipment, the use of new disposable gloves between each sampling location and the use of sampling containers provided by the laboratory.
- Sample identification procedures: All sample containers shall be clearly labelled with a sample number, job number and sample date.
- Sample storage and handling procedures: All samples shall be immediately transferred to sample containers of appropriate composition and preservation for the required laboratory analysis. The sample containers shall be transferred to a chilled insulated container for sample preservation prior to and during shipment to the analytical laboratory.
- Chain of custody information requirements: a chain of custody form shall be completed and forwarded to the testing laboratory with the samples.
- Holding times: Samples should be analysed within recommended holding times.
- Limits of reporting: Results less than the adopted assessment criteria; justify/quantify if different.
- Laboratory selection: Laboratories accredited by the National Association of Testing Authorities (NATA) for the analyses undertaken shall be used.
- Laboratory quality control results: the laboratory internal QA/QC sample results will be reviewed for comparison with the laboratory's NATA guidelines and Schedule B3 of the ASC NEPM 2013.
- Field quality control samples:
  - Field duplicate and triplicate samples shall be collected at a rate of 1:20.
  - Soil trip spike and trip blank samples shall be analysed at a rate of one per batch.
  - Equipment rinsate blanks shall be collected at a rate of one per day of sampling using reusable sampling equipment.
  - Acceptable limits to be adopted shall be as follows. Exceedances if reported shall be discussed in the context of the field methodologies and assessment outcomes.
    - Blanks: less than the laboratory limit of reporting (LOR)
    - Spikes: results within 60-120% recovery.
    - Duplicate RPD results: No Limit (where the average concentration is 0-10 x laboratory LOR; 50% (where the average concentration is 10-20 x laboratory LOR); and 30% (where the average concentration is > 20 x laboratory LOR). RPDs shall be considered where concentrations are greater than the laboratory LOR.

7.4 VALIDATION REPORT

A validation report will be prepared in accordance with relevant guidelines, including:

- NSW EPA (2020) Contaminated Land Guidelines: Consultants reporting on contaminated land.
- NSW EPA (2020) Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019
- NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013. (April 2013)

The report will be provided to Ampol then, following Ampol review, to Council for their records. The report should be provided to Council within 60 days of completion of the decommissioning or remediation works.

8. SITE MANAGEMENT

8.1 WORK HEALTH AND SAFETY

Prior to commencing works, the appointed Principal Contractor and subcontractors (including the environmental consultant) shall prepare an OH&S plan addressing the works to be undertaken to fulfill their scope.

The plans should cover the following aspects:

- Induction of personnel.
- Hazard locations and identification.
- Description of exposure pathways and personnel protection requirements.
- Location of all underground/aboveground services.
- Work practice procedures, within the designated contaminated zones.
- Monitoring protocols to identify a potentially hazardous practice.
- Emergency response information and procedures.
- Incident reporting.

8.2 STAKEHOLDER ENGAGEMENT

A consultation program shall be implemented which will keep affected stakeholders informed of activities and provide them with an opportunity for input.

The purpose of the consultation and involvement plan is to provide coordination and ensure consistent messages are used in a range of communication and consultation activities.

The plan should include:

- Key messages
- Stakeholder details
- Communication tools
- Enquiry and complaints management process
- Example answers for example questions

8.3 SITE ACCESS AND SECURITY

Access to the site shall be restricted to authorised staff and contractors who have been inducted and appropriately trained for the works being undertaken. If required, traffic management shall be employed for access to the site.

Fencing and/or hoarding shall be maintained around the perimeter of the site during the works.

Signage, including contractor details and contact numbers, shall be erected near the gate at the site. The signage shall remain displayed on the site entrance throughout the duration of the remediation works.

The contractor is responsible for keeping public roads on the routes of site vehicle traffic clean of any material sourced from the site. All equipment and plant are to be decontaminated, if required, prior to leaving the site to prevent the inadvertent transport of contaminated material offsite.

8.4 HOURS OF OPERATION

All operations will be conducted within the working hours permitted by local council requirements. The only works permitted outside these hours shall be emergency response procedures and subject to approval by council.

Work is proposed to be conducted between the following nominal hours or as outlined in the Development Approval:

- Monday – Friday: 0700 hrs – 1800 hrs
- Saturday: 0800 hrs – 1700 hrs
- Sunday & Public Holidays: No work is permitted.

8.5 ASBESTOS MANAGEMENT

8.5.1 Asbestos Awareness Training and Toolbox Talks

Prior to disturbing soil, all relevant site personnel must have completed asbestos awareness training such that they are trained to recognise potential health risks and control measures associated with asbestos. The Class A LARC Supervisor or the LAA may provide the asbestos awareness training on site prior to earthworks commencing.

Prior to commencing excavation and handling of asbestos impacted soil or following change in site conditions, all relevant site personnel should participate in a toolbox talk. The toolbox talk must incorporate details and instructions on how to manage asbestos-impacted soil in accordance with this RAP. The toolbox talk can be combined with the Induction if practicable. Asbestos toolbox talks shall be carried out by the Class A LARC or the environmental scientist/LAA. Toolbox talks shall be used to notify other workers on site of soil disturbance works being carried out.

8.5.2 Health Monitoring

Workers should be informed of any health monitoring requirements before they undertake work that may expose them to asbestos.

Employers are required by law to provide health monitoring to workers who are at risk of being exposed to asbestos while on the job, prior to commencing asbestos removal work or ongoing asbestos related work. This includes licensed asbestos removalists and assessors who are wearing full personal protective equipment.

All relevant site personnel involved in soil disturbance activities should undergo health monitoring prior to them commencing remedial works / soil disturbance works and at regular intervals (at least once every two

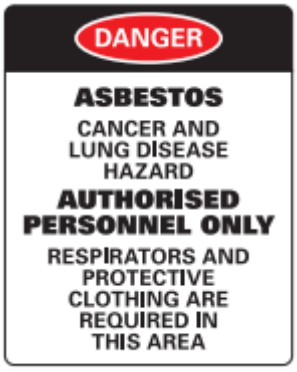
years) after the worker commences asbestos-related work where there is a risk of exposure to asbestos. Health monitoring must be conducted by a registered medical practitioner.

8.5.3 Barricades and Signs

Signs and barricades must be placed to clearly demarcate where excavation and handling of asbestos impacted soil are being performed and restrict access to personnel not involved in the works.

Barricades may comprise temporary fencing with wind rated mesh/geofabric. It is recommended that the general public cannot see into the work site due of the perceived risk of exposure, which could be exacerbated when observing workers wearing asbestos related PPE/RPE.

Signs should be in accordance with AS 1319-1994 Safety Signs for the Occupational Environment for size, illumination, location and maintenance. The following graphic is an example of warning sign provided in SafeWork NSW How to Manage and Control Asbestos in the Workplace Code of Practice 2019.



8.5.4 Designated Wash Down Area

To minimise tracking of contaminated soil on vehicles leaving the site, a wheel wash bay shall be installed at the site entrance/exit. This may comprise a cattlegrid underlaid by geo-textile fabric with aggregate on either side.

All vehicles are to be washed in the wheel wash bay prior to leaving the site.

Where vehicles have been used on exposed soil, tyres and wheels and are to be cleaned using a low-pressure hose and/or hand tools where necessary.

8.5.5 Dust Suppression

Dust suppression techniques will be required to control generation of visible dust during the course of the works. Dust suppression techniques may include one or a combination of the following:

- Fine water spraying/misting directly onto the soil and on the boundaries of the asbestos work areas and/or where asbestos impacted soil is being excavated.
- Use of PVA to stabilise the soil, if required.
- Covering soil within trucks using tarpaulin or fabric cover.
- Covering dump truck/skip bins/stockpiles with high-density polythene (HDPE) sheeting or geotextile fabric.
- Restricting trucks to low speeds when transporting ACM impacted soils.
- Ceasing works if visible dust is being generated.

8.5.6 Personal Protective and Respiratory Protective Equipment

Personnel onsite will be required to wear appropriate personal protective equipment in line with WHS requirements specific to the task. For personnel within asbestos work areas / exclusion zones whilst soil disturbance activities are occurring, the following PPE/RPE is also mandatory:

- Half face respirator (i.e. Sundstrom SR900 Half Mask) with P3 particle filter.
- Footwear that can be easily decontaminated (i.e. steel – capped gumboots) or disposable booties.
- Disposable asbestos coveralls rated type 5, category 3 (Tyvek suits).
- Disposable nitrile gloves.

For visitors/workers within asbestos work areas / exclusion zones whilst no soil disturbance activities are occurring, the following PPE/RPE may be used as the discretion of the LAA or Class A LARC supervisor:

- Minimum P2 half face disposable respirator.
- Footwear that can be easily decontaminated (i.e. steel – capped gumboots) or disposable booties.

Workers wearing RPE must be tested to ensure the mask fits correctly with proper seals. When wearing respiratory protection, the worker must be clean shaven to ensure a proper seal between the face and mask otherwise a positive pressure respirator shall be used.

Excavator operators or truck drivers may be exempt from asbestos RPE requirements whilst operating the excavator if the excavator/truck cabs can be sealed during works and reverse cycle air conditioning can be engaged.

Respirators must comply with AS/NZS1715–2009 Selection, use and maintenance of respiratory equipment. Occupational protective gloves shall comply with EN 420:1994(AS/NZS 2161.2:1998)–Occupational Protective Gloves, Part 2 General Requirements.

8.5.7 Asbestos Decontamination

Decontamination facilities will be required for equipment and workers carrying out soil disturbance activities. This may include a modular decontamination unit or decontamination area depending on the planned excavation works at the discretion of the licenced asbestos removal contractor. Based on the nature of the proposed excavation works and in consideration of site conditions, decontamination procedures shall include, but not be limited to:

- Establishment changing area for personal decontamination.
- When entering the asbestos work area:
    1. Workers must enter the ‘Personal Clean Area’ of the decontamination unit and change into clean asbestos specific protective clothing.
    2. Any removed personal clothing must be stored in a dust-proof container.
    3. Move into the asbestos work area.
- When leaving the asbestos work area:
    1. Workers must enter the designated ‘Personal Decontamination Area’ and:
        - Remove any loose visible asbestos dust/residue from protective clothing by wiping down with damp cloths/wet wipes or using a HEPA fitted Vacuum cleaners.
        - Place cloths/wet wipes into heavy duty polythene asbestos waste bags (1200mm long, 900mm wide, and 200 µm thick) marked with the label ‘Caution Asbestos – Do not open or damage bag. Do not inhale dust’.
        - Carefully remove disposable protective clothing and place into asbestos waste bags (RPE must still be worn).

- Use a footbath and/or damp cloths/wet wipes to wipe down footwear and place cloths/wet wipes into asbestos waste bags.
- Seal all asbestos waste bags with duct tape and place each into a second plastic bag.
- Seal this second plastic bag and label/mark as 'Asbestos Waste' for subsequent off-site disposal. The bags must be twisted tightly and have the neck folded over and secured with adhesive tape (referred to as goose-necking).

2. Then move into the 'Personal Clean Area' and put on personal clothes.

- To reduce the risk of an asbestos waste bag tearing or splitting and to assist in manual handling, asbestos waste bags should not be filled more than half full (depending on the weight of the items) and excess air should be gently evacuated from the waste bag in a way that does not cause the release of dust.

Reusable equipment shall be decontaminated in a designated Decontamination Area using water and wet rags.

8.5.8 Handling of Asbestos Impacted Soil

Asbestos impacted soil shall be handled in manner to minimise the potential for cross contamination of other areas of the site by:

- Placing the soil directly into awaiting trucks where possible during excavation.
- Not overloading trucks.
- Keeping movements of vehicles, plant and equipment to a practical minimum and maintaining low speeds during transportation.
- Using designated transportation routes/corridors.
- Stockpiling spoil on a reasonably robust barrier (i.e. asphalt, concrete or geofabric).

8.5.9 Asbestos Fibre Air Monitoring

The environmental scientist, occupational hygienist, or LAA shall carry out air monitoring of the work area during excavation and handling of asbestos impacted soil. The person carrying out air monitoring shall undertake control monitoring using static or positional samples during excavation and handling of asbestos impacted soil. Asbestos fibre air monitoring results shall be discussed at the following shift toolbox talk and presented on a site noticeboard to inform site workers of the results.

Air monitoring shall be conducted by a NATA accredited laboratory in accordance the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003 (2005)] and Australian Standard AS ISO/IEC 17025 – 2005, General requirements for the competence of testing and calibration laboratories. Air Monitoring Reports are required to be issued in accordance with NATA's accreditation requirements.

Works must be suspended if the air monitoring results are found to be above the detection limit of 0.01 fibres per millilitre of air (f/mL). The control limits/action levels are set out in Table 8-1

Table 8-1: Air Monitoring Control limits

Action level (fibres/ml)	Control	Action
< 0.01	No new control measures are necessary	Continue with control measures.
0.01 to ≤ 0.02	1 - Review	Review control measures.
	2 - Investigate	Investigate the cause.

	3 - Implement	Implement controls to eliminate or minimise exposure and prevent further release.
> 0.02	1 - Stop removal work	Stop earthworks.
	2 - Notify regulator	Notify the regulator (SafeWork NSW) by phone followed by written statement that work has ceased & the results of the air monitoring.
	3 - Investigate the cause	Conduct a thorough visual inspection of in consultation with all workers involved. Check for anomalies by carrying out Scanning Electron Microscopy (SEM) on the elevated filter.
	4 - Implement controls to eliminate or minimise exposure and prevent further release	Review the controls to eliminate or minimise exposure and prevent further release
	5 - Do not recommence removal work until further air monitoring is conducted	Do not recommence until fibre levels are ≤ 0.01 fibres/mL

8.5.10 Asbestos Visual Clearance Inspections

The LAA will be required to carry out visual clearance inspections to verify that areas of the UPSS replacement area can be reoccupied without asbestos controls including, but not limited to:

- Where asbestos impacted soil has been removed and no fill is present on the walls of the excavation (e.g., if covered with geofabric or other appropriate barrier).
- At the completion of remedial works.

Asbestos clearance inspections shall also be carried out for decontaminated machinery.

The LAA who carried out the clearance inspection must issue a clearance certificate before the area requiring clearance is re-occupied. A clearance certificate must not be issued unless the LAA is satisfied that:

- The inspection area, and the area immediately surrounding it, are free from visible asbestos; and
- Air monitoring results, if undertaken as part of the clearance inspection, shows asbestos below 0.01 fibres/ml.

8.6 NOISE CONTROL

Noise producing machinery and equipment will only be operated during approved working hours. Australian *Standard AS 2436-1981 Guide to noise control on construction, maintenance and demolition sites outlines guidelines for the minimisation of noise on construction and demolition sites*. These guidelines will be followed at all times.

Best practical means to minimise noise levels will be used to minimise noise levels throughout remediation works. Mechanical plant and equipment used during remediation works will use all practical and reasonable noise attenuating devices and measures to minimise noise being transmitted from the Site. All equipment and machinery must be properly maintained and operated in an efficient manner to minimise the emission of noise.

8.7 DUST CONTROL

Generation of dust during remediation works may occur. Site activities will be managed to minimise the generation of dust and the movement of dust off the site.

The following dust control measures should be considered:

- Wetting down of dry soils during excavation and loading.
- Covering loads during transportation.
- Application of shade cloth or similar to perimeter fencing.
- Limiting excavation and loading activities during high winds.
- Wetting down stockpiles and/or covering with plastic/geofabric.
- Maintaining stockpile heights below the heights of perimeter fencing.

8.8 ODOUR CONTROL

Given the anticipated levels and type of contamination expected at the site, generation of odours to a level that requires action is not considered likely, however, odour controls should be adopted as appropriate to ensure that no offensive odours occur at or beyond the site boundary.

The following odour management procedures may be used:

- Undertaking the excavation works in a staged manner to limit the surface area and amount of potentially odorous materials being exposed.
- Application of odour suppressants (e.g. Biosolve® or Killsmell®).
- Covering of stockpiled material until disposal.
- Covering of transported soil, to suppress the release of the odours.

Should volatile hydrocarbon compounds (such as light fuel) be identified during remediation works, air monitoring shall be carried out during the excavation works using a calibrated PID, to assess the potential for ionisable volatile organic compounds (VOC) to be present. Air quality within workers' breathing zones shall also be monitored during the remediation works using a PID. Workers will stop work and withdraw from the work area if PID readings are continuously greater than 10 ppm in the workers' breathing zone. Use of respirators, watering or covering of stockpiles and suspension of site works shall be implemented as appropriate.

8.9 STORMWATER RUN-OFF

No visibly dirty water shall migrate as surface water flow from the site. The following measures will be employed to minimise the risk imposed by stormwater run-off from impacted areas:

- Straw bale/silt fences will be established across all areas where surface water could flow from the proposed excavation/stockpile areas.
- Covering of any stockpiles of contaminated soil with plastic, for example, in order to prevent leaching of chemicals and subsequent transport into site drainage.

8.10 SOIL & WATER MANAGEMENT

The following measures outline generalised methods that should be implemented to manage soil and water (if any) related impacts. However, activity specific factors need to be considered and appropriate control measures assessed for the specific activity.

Management measures should include (but are not necessarily limited to):

- Installation and maintenance of secure fencing (with shade cloth if required) around the site boundaries to prevent public access.
- Implementation of sediment and erosion controls to divert surface water away from open excavations, such as sandbags and hay bales.

- Implementation of control measures to prevent surface run-off impacting local drainage networks.
- Covering of temporary stockpiles (if required) with high density polyethylene (HDPE) sheeting. Stockpiles should not be placed near the site boundary, drainage lines, easements, footpaths, roadways, gutters or stormwater pits.
- Where possible, accumulation of water in excavations will be minimised by back filling open excavations as soon as practicable.
- The standing groundwater level at the site is likely to be below the proposed bulk excavation level however if groundwater is observed above the proposed excavation level, consideration of the inflow and associated impacts, if deemed necessary, further advice should be sort from Tetra Tech Coffey and may need to be addressed in a dewatering management plan.
- Stormwater runoff accumulating in excavations, if encountered, will be pumped into a mobile tanker, transported and disposed at an appropriately licence facility. In the event that excessive volumes of water are encountered, further excavations will be terminated, and any open excavations backfilled until an appropriate way forward is established.

8.11 HAZARDOUS MATERIALS MANAGEMENT

Identified hazardous materials should be managed in accordance with the appropriate legislation and guidance. Works should be conducted by suitably qualified personnel (included holding the appropriate licenses) and, where required, monitored or assessed by an Occupational Hygienist.

If unexpected hazardous materials are encountered, works should be undertaken in accordance with the unexpected finds protocol detailed in Section 8.13.

8.12 EMERGENCY PREPAREDENESS & RESPONSE

The appointed contractor will ensure that plans to respond to incidents and emergencies (e.g. fires, spills or other uncontrolled releases) have been prepared. The appointed contractor will ensure that all employees, subcontractors and visitors to the site are made aware of the emergency protocols in place. A Contingency and Emergency Response Plan should be prepared by the contractor. The purpose of the contingency plan is to identify unexpected situations that could occur during the project, and to specify procedures that can be implemented to manage such situations and prevent adverse impacts to the environment and human health.

The information that will be contained in the Contingency and Emergency Response Plan will include, but is not necessarily limited to:

- Assignment of responsibilities to nominated key personnel
- Hazard assessment of potential offsite impacts
- Contingency responses
- Reporting to regulatory authorities
- Unexpected situations

8.13 UNEXPECTED FINDS PROTOCOL

Should unexpected contamination be found onsite, works shall stop immediately in the affected part of the site. This area shall be isolated to minimise potential disturbance of affected soils.

Unexpected contamination could include:

- Unexpected staining, presence of LNAPL or odours in soil.
- Additional subsurface infrastructure such as underground tanks and pipes that were not identified previously.
- Encountering contaminated shallow (perched) water.
- Buried wastes.
- Encountering unexpected contaminants or hazardous materials, for example, asbestos.

The general approach for managing unexpected finds comprises:

- Immediate notification of the unexpected find to sub-contractors onsite, the environmental consultant and client.
- An appropriately experienced environmental consultant or occupational hygienist (as required) will assess the nature and extent of the find, which may include sampling, laboratory analysis and reporting.
- Additional remediation work (including an amendment to this RAP, if required), and validation if required.

9. CONCLUSIONS AND RECOMMENDATIONS

Ampol are planning on redeveloping the site for ongoing service station and mechanical workshop use. In doing so Ampol requested a RAP to manage contamination which may be encountered during UPSS replacement works. Tetra Tech Coffey previously carried out an ESA (Tetra Tech Coffey, 2024) to inform the UPSS replacement works which identified soil at the site to be impacted with petroleum hydrocarbons and asbestos, and groundwater to be impacted with petroleum hydrocarbons (both dissolved phase and LNAPL).

Based upon the contamination identified, extent of the proposed UPSS replacement works, review of appropriate remedial technologies, and discussions with Ampol, the preferred remedial strategy is onsite reuse of excavated spoil where additional assessment confirms the risk to human health and the environment are acceptable, or off-site disposal to an appropriately licenced landfill facility. Excavations shall be backfilled with site won soil (subject to further assessment) and/or imported validated materials. Control measures will be required to be implemented by the remedial contractor during the UPSS replacement works to mitigate potential risks to human health, the environment and infrastructure as outlined in this RAP.

Following implementation of the measures outlined in this RAP, it is considered that petroleum hydrocarbon and asbestos contamination previously identified at the site can be appropriately managed during the UPSS replacement works.

Tetra Tech Coffey is not aware of any existing long-term environmental management plan (LTEMP) for contamination which exists at the site and is likely to remain following replacement of the UPSS. The remediation/management of asbestos and petroleum hydrocarbon impacts previously identified in soil and groundwater in other areas of the site does not form part of this RAP, however, could be managed by Ampol under an asbestos management plan and/or long-term environmental management plan; further assessment may be undertaken to inform ongoing management of contamination which remains at the site following the UPSS replacement works.

A Validation Report shall be prepared at the completion of the UPSS replacement works documenting the works carried out which will be required to be provided to Council within 60 days of completion of the remediation works.

Furthermore, Ampol should check the status of the groundwater monitoring well network following the UPSS replacement works to check it is sufficient in meeting their obligations for leak detection and/or the fuel system operation plan or the site required under the POEO UPSS Regulation 2019.

10. REFERENCES

- AECOM (2011), Groundwater Monitoring Well Report, Caltex Manly Vale (22259), 236-238 Condamine Street, Manly Vale, NSW 2093, *report reference: S4138301_RPTFinal_2Feb22, dated 2 February 2011.*
- AMPOL Manly Vale 22259 - Groundwater Gauging Data August 2011 – April 2023
- GHD (2016), Environmental Site Assessment, 22259 - Caltex Manly Vale Service Station, 236-238 Condamine Street, Manly Vale, NSW, *report reference: 40/10135, dated September 2016.*
- GHD (2020), 22259 Caltex Manly Vale, 236-238 Condamine Street, Manly Vale, Well Installation Report, report reference: 4010208-45048, dated 30 November 2020.
- PB (2014), Environmental Site Assessment, Caltex Manly Vale Service Station, 236-238 Condamine Street, Manly Vale, NSW (Caltex Site ID 22259), *report reference: 2201556A-CLM-RPT-0782-RevB, dated September 2014.*
- SGS (2022), Analytical Report – Premium Fingerprint for one LNAPL sample.
- NSW Department of Planning, Industry and Environment. eSPADE. Available at https://www.environment.nsw.gov.au/eSpade2Webapp/
- NSW Department of Planning, Industry and Environment. ePlanning Spatial Viewer. Available at https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address
- NSW Department of Regional NSW, Mining, Exploration and Geoscience. MinView. Available at: https://minview.geoscience.nsw.gov.au/
- NSW *Protection of the Environment Operations Act 1997* (POEO Act).
- NSW *Contaminated Land Management Act 1997* (CLM Act).
- NSW *Work Health and Safety Act 2011* (WHS Act).
- NSW *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019* (UPSS Regulation).
- NSW *Work Health and Safety Regulation 2017* (WHS Regulation).
- NSW *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP).
- SafeWork NSW (2019) *Code of Practice: Demolition Work*.
- SafeWork NSW (2020) *Code of Practice: Excavation Work*.
- NSW Environment Protection Authority (EPA) (2020) *Guidelines for Consultants Reporting on Contaminated Land* (Contaminated Land Guidelines).
- NSW EPA (2020) *Underground Petroleum Storage Systems – Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019*.
- NSW EPA (2022) *Sampling design part 1 – application: Contaminated Land Guidelines* (Sampling Design Guidelines).
- NSW EPA (2022) *Sampling design part 2– interpretation: Contaminated Land Guidelines* (Sampling Design Guidelines).
- NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd edition)*.
- NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste*.
- Australian Standard AS 1726-2017 *Geotechnical Site Investigations*.
- Australian Standard AS 4976-2008 *The removal and disposal of underground petroleum storage tanks*.
- Australian Standard AS 1940-2004 *The storage and handling of flammable and combustible liquids*.
- National Environment Protection Council (NEPC) (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013 (NEPM, 2013).

- Friebel E and Nadebaum P (2011) *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, Part 1: Technical Development Document*. The Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report 10.
- Look, B (2007) *Handbook of Geotechnical Investigation and Design Tables.* 10.1201/9780203946602. Taylor & Francis Group, London, UK.

11. LIMITATIONS

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

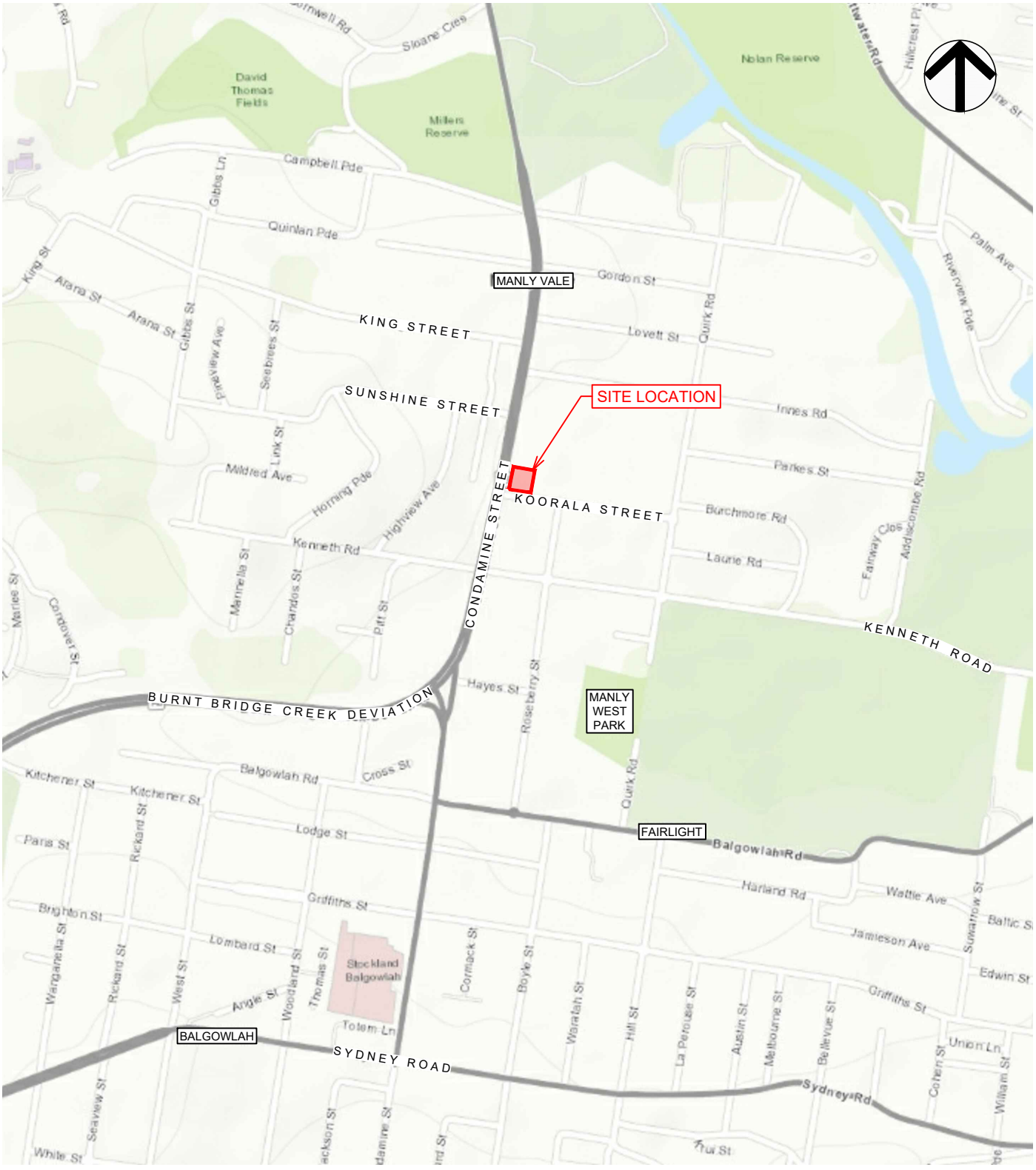
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

APPENDIX A: FIGURES



MAP PROJECTION: GDA2020 MGA ZONE 56

100 0 100 300 500

Scale (metres) 1:10000

IMAGERY SOURCE: WORLD TOPOGRAPHIC MAP
SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

drawn	JS / DR
approved	-
date	23-05-2024
scale	AS SHOWN
original size	A4

TETRA TECH COFFEY

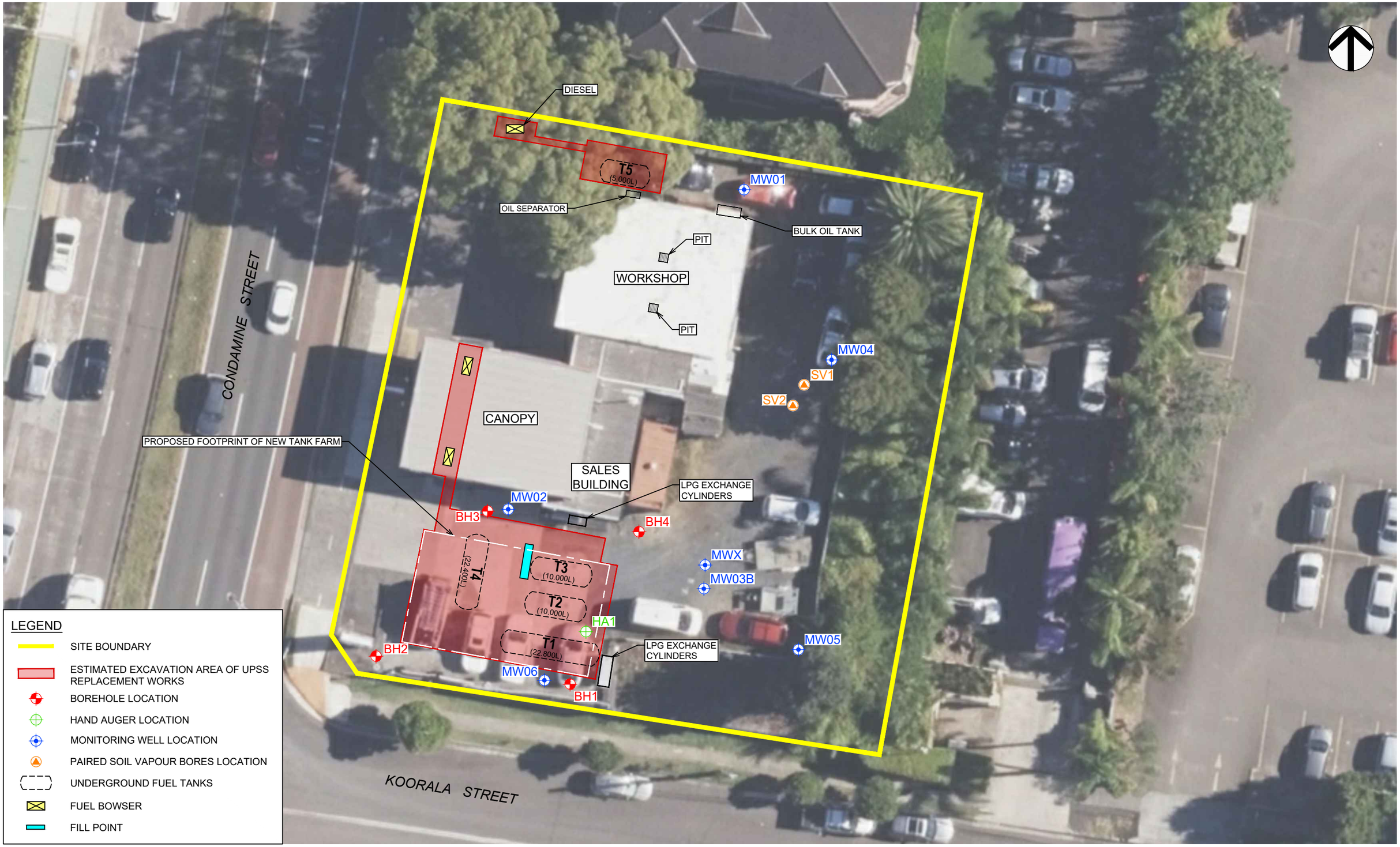
client: AMPOL AUSTRALIA PETROLEUM PTY LTD

project: REMEDIAL ACTION PLAN
236-238 CONDAMINE STREET, MANLY VALE, NSW

title: SITE LOCATION PLAN

project no: 754-SYDEN346453-R02 | figure no: FIGURE 1 | rev: A

PLOT DATE: 23/5/2024 11:59:13 AM DWG FILE: F:\1. PROJECTS\1. SYDENENV\2024\SYDEN346453 AMPOL MANLY VALE\9.CAD\754-SYDEN346453-R02.DWG



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

2.5 0 5 10

Scale (metres) 1:250

drawn	JS / DR
approved	-
date	23-05-2024
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: AMPOL AUSTRALIA PETROLEUM PTY LTD

project: REMEDIAL ACTION PLAN
236-238 CONDAMINE STREET, MANLY VALE, NSW

title: SITE LAYOUT AND ESTIMATED UPSS EXCAVATION AREA

project no: 754-SYDEN346453-R02 | figure no: FIGURE 2 | rev: A

PLOT DATE: 23/5/2024 12:20:21 PM DWG FILE: F:\1. PROJECTS\1. SYDENENV\2024\SYDEN346453 AMPOL MANLY VALE\9.CAD\754-SYDEN346453-R02.DWG

APPENDIX B: DANGEROUS GOODS PLAN

N

NOTE:
BOUNDARY SHOWN IS FROM SITE DERIVED MEASUREMENTS, AND IS APPROXIMATE ONLY. THE SITE BOUNDARY AND SETBACKS MUST BE CONFIRMED BY SURVEY.

SITE INFORMATION		
1	BUSINESS NAME / OPERATOR	AMPOL RETAIL PTY LTD
2	EMERGENCY RESPONSE : ERS	1800 225 839
3	RPD	-
4	PARISH	MANLY VALE 2093
5	LOCALITY	236-238 CONDAMINE ST
6	AREA	1724m²
7	LGA	NORTHERN BEACHES COUNCIL
8	LATITUDE	-33.785069
9	LONGITUDE	151.267353
10	NSW NDG#	NDG003905

LEGEND:			
MW01	GROUNDWATER MONITORING WELLS		EMERGENCY STOP BUTTON
	SWITCHBOARD		CO^2 FIRE EXTINGUISHER
	FIRE HOSE REEL		DRY CHEMICAL FIRE EXTINGUISHER
M	MANIFEST BOX - CONTAINING ERP DOCUMENT		1 OR 2 HOSE DISPENSER

RESIDENTIAL

BULK OIL TANK

MW01

PIT

PIT

WORKSHOP

SALES BUILDING

MW03

T3

T2

T1

FILL POINTS

MW02

T4

T5

OIL SEPARATOR

DEPOT : T5
TYPE : UNDERGROUND TANK
PRODUCT : P-DSLA
CLASS : C1
CAPACITY : 5 000 LITRES

DEPOT : PS1
TYPE : EXCHANGE CYLINDERS
PRODUCT : LPG
CLASS : 2.1
CAPACITY : 428 x 8.5kg+6 x 3.7kg

DEPOT : T3
TYPE : UNDERGROUND TANK
PRODUCT : P-98A
CLASS : 3
CAPACITY : 10 000 LITRES

DEPOT : T1
TYPE : UNDERGROUND TANK
PRODUCT : E10
CLASS : 3
CAPACITY : 22 800 LITRES

DEPOT : T2
TYPE : UNDERGROUND TANK
PRODUCT : E10
CLASS : 3
CAPACITY : 10 000 LITRES

DEPOT : T4
TYPE : UNDERGROUND TANK
PRODUCT : P-95A
CLASS : 3
CAPACITY : 22 400 LITRES

KOORALA STREET

UNIT BLOCKS

DIESEL

M

DRAIN

VEHICLE ENTRY

VEHICLE EXIT

CONDAMINE STREET

0 2m 4 6 8 10

project consultants
DESIGN | DOCUMENT | DELIVER
ACN 602 924 336 ABN 40 415 457 574
CONTACT No 0430 466 223

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
C	JS	24.06.22	GENERAL REVISIONS
D	JS	10.02.23	GENERAL REVISIONS
E	JS	02.02.24	GENERAL REVISIONS

REVISION

PROJECT
MANLY VALE 22259
236-238 CONDAMINE ST
MANLY VALE NSW 2093

TITLE
SITE FUEL SERVICES
DANGEROUS GOODS PLAN

SCALE 1:200

SIZE A3

INFORMATION

APPROVED

DATE

DRAWING No. 22259-DG

REV. E

APPENDIX C: PRE-UPSS ESA RESULTS (TETRA TECH COFFEY, 2024)

					Field ID	BH1(0.3_0.5)	BH2(0.4_0.5)	BH3(0.5_0.6)	BH3(1.5_1.95)	BH3(2.5_2.95)	BH3(4.5_4.95)	BH3(5.5_5.95)	BH4(0_0.3)
					Depth (m)	0.3-0.5	0.4-0.5	0.5-0.6	1.5-1.95	2.5-2.95	4.5-4.95	5.5-5.95	0-0.3
					Date	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024
	Unit	**EQL**	HIL D	HSL D, sand[1, 4]	ML com/ind, coarse [3]								
TRH													
F1 (C6 - C10) less BTEX	mg/kg	**20**	-	260 | 370 | 630 | NL [1]	-	< 20	< 20	< 20	< 20	< 20	< 20	**610***	< 20
F1 (C6 - C10)			-	-	700	< 20	< 20	< 20	< 20	< 20	< 20	**860**	< 20
F2 (C10 - C16) less Naph	mg/kg	**50**	-	NL [1]	-	< 50	< 50	< 50	< 50	< 50	< 50	**382**	< 50
F2 C10 - C16			-	-	1,000	< 50	< 50	< 50	< 50	< 50	< 50	**400**	< 50
F3 (C16 - C34)	mg/kg	**100**	-	-	3,500	< 100	< 100	100	< 100	< 100	< 100	< 100	< 100
F4 (C34 - C40)	mg/kg	**100**	-	-	10,000	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEX													
Benzene	mg/kg	**0.1**	-	3 | 3 | 3 | 3	-	< 0.1	< 0.1	**0.3**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**0.1**	-	NL [1]	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	**17**	< 0.1
Ethylbenzene	mg/kg	**0.1**	-	NL [1]	-	< 0.1	< 0.1	< 0.1	**0.1**	< 0.1	**0.2**	**36**	< 0.1
Xylene Total	mg/kg	**0.3**	-	230 | NL [1]	-	< 0.3	< 0.3	**0.5**	**0.8**	< 0.3	< 0.3	**200**	< 0.3
Xylene (o)	mg/kg	**0.1**	-	-	-	< 0.1	< 0.1	< 0.1	**0.1**	< 0.1	< 0.1	**47**	< 0.1
Xylene (m & p)	mg/kg	**0.2**	-	-	-	< 0.2	< 0.2	**0.5**	**0.6**	< 0.2	< 0.2	**150**	< 0.2
PAH													
Benzo(a)pyrene TEQ [2]	mg/kg	**0.5**	40	-	-	**0.6**	**0.6**	-	-	-	-	**0.6**	-
Benzo(a) pyrene	mg/kg	**0.5**	-	-	-	< 0.5	< 0.5	-	-	-	-	< 0.5	-
Naphthalene	mg/kg	**0.5**	-	NL [1]	-	< 0.5	< 0.5	-	-	-	-	**13**	-
PAHs (Sum of total)	mg/kg	**0.5**	4,000	-	-	< 0.5	< 0.5	-	-	-	-	**13**	-
Phenols													
Cresol Total	mg/kg	**0.5**	25,000	-	-	< 0.5	< 1	-	-	-	-	< 0.5	-
Pentachlorophenol	mg/kg	**1**	660	-	-	<1	<1	-	-	-	-	<1	-
Phenol	mg/kg	**0.5**	240,000	-	-	< 0.5	< 2	-	-	-	-	< 0.5	-
PCBs & OCP/OPPs													
PCBs (Sum of total)	mg/kg	**0.1**	7	-	-	<0.1	<0.1	-	-	-	-	<0.1	-
OCP/OPP	mg/kg	**2.0**	45			<LOR	<LOR	-	-	-	-	<LOR	-

Notes:

1. NL = not limiting, i.e. HSL exceeds the solubility limit, HSL is not limiting as soil vapour is limited by the solubility limit. Possible concentrations of vapour are not considered to pose a risk to human health through vapour inhalation.
2. Benzo(a)pyrene TEQ calculated using half the LOR.
3. ML = Management Limits
4. HSLs applicable for the following depths - 0 m to <1 m | 1 m to <2 m |2 m to <4 m | 4 m +

* concentration does not exceed HSLs based on depth of sample collected.

					Field ID	BH4(1.0_1.1)	BH4(2.5_2.95)	BH4(3.5_3.95)	BH4(4.5_4.95)	HA1(0_0.3)	DUP1	HA1(1.0)
					Depth (m)	1.0-1.1	2.5-2.95	3.5-3.95	4.5-4.95	0-0.3	HA1(0_0.3)	1.0
					Date	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024
	Unit	**EQL**	HIL D	HSL D, sand[1, 4]	ML com/ind, coarse [3]							
TRH												
F1 (C6 - C10) less BTEX	mg/kg	**20**	-	260 | 370 | 630 | NL [1]	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F1 (C6 - C10)			-	-	700	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2 (C10 - C16) less Naph	mg/kg	**50**	-	NL [1]	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50
F2 C10 - C16			-	-	1,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50
F3 (C16 - C34)	mg/kg	**100**	-	-	3,500	< 100	< 100	< 100	< 100	< 100	< 100	< 100
F4 (C34 - C40)	mg/kg	**100**	-	-	10,000	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEX												
Benzene	mg/kg	**0.1**	-	3 | 3 | 3 | 3	-	< 0.1	**0.1**	< 0.1	**0.2**	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**0.1**	-	NL [1]	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	**0.1**	-	NL [1]	-	< 0.1	**0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene Total	mg/kg	**0.3**	-	230 | NL [1]	-	< 0.3	**0.4**	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Xylene (o)	mg/kg	**0.1**	-	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene (m & p)	mg/kg	**0.2**	-	-	-	< 0.2	**0.4**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PAH												
Benzo(a)pyrene TEQ [2]	mg/kg	**0.5**	40	-	-	-	-	-	**0.6**	-	-	-
Benzo(a) pyrene	mg/kg	**0.5**	-	-	-	-	-	-	< 0.5	-	-	-
Naphthalene	mg/kg	**0.5**	-	NL [1]	-	-	-	-	< 0.5	-	-	-
PAHs (Sum of total)	mg/kg	**0.5**	4,000	-	-	-	-	-	< 0.5	-	-	-
Phenols												
Cresol Total	mg/kg	**0.5**	25,000	-	-	-	-	-	< 0.5	-	-	-
Pentachlorophenol	mg/kg	**1**	660	-	-	-	-	-	<1	-	-	-
Phenol	mg/kg	**0.5**	240,000	-	-	-	-	-	< 0.5	-	-	-
PCBs & OCP/OPPs												
PCBs (Sum of total)	mg/kg	**0.1**	7	-	-	-	-	-	<0.1	-	-	-
OCP/OPP	mg/kg	**2.0**	45			-	-	-	<LOR	-	-	-

Notes:

1. NL = not limiting, i.e. HSL exceeds the solubility limit, HSL is not limiting as soil vapour is limited by the solubi
2. Benzo(a)pyrene TEQ calculated using half the LOR.
3. ML = Management Limits
4. HSLs applicable for the following depths - 0 m to <1 m | 1 m to <2 m |2 m to <4 m | 4 m +
   * concentration does not exceed HSLs based on depth of sample collected.

Table 2 - Inorganic Contaminants in Soil Analytical Results
Ampol Manly Vale (22259) Pre-UPSS Replacement ESA

			Sample ID	BH1(0.3_0.5)	BH2(0.4_0.5)	BH3(0.5_0.6)	BH3(FC)	BH3(1.0_1.1)	BH3(5.5_5.95)	BH4(4.5_4.95)
			Depth (m)	0.3-0.5	0.4-0.5	0.5-0.6		1.0-1.1	5.5-5.95	4.5-4.95
			Sample Date	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024
	Unit	**EQL**	HIL D							
Arsenic	mg/kg	**2**	3,000	2.6	2.6	-		-	4.9	5.2
Cadmium	mg/kg	**0.4**	900	< 0.4	< 0.4	-	-	-	< 0.4	< 0.4
Chromium (III+VI)[1]	mg/kg	**5**	-	21	15	-	-	-	42	30
Copper	mg/kg	**5**	240,000	< 5	11	-	-	-	< 5	< 5
Lead	mg/kg	**5**	1,500	5.7	27	-	-	-	7.5	< 5
Mercury	mg/kg	**0.1**	730	< 0.1	< 0.1	-	-	-	< 0.1	< 0.1
Nickel	mg/kg	**5**	6,000	< 5	6.9	-	-	-	< 5	< 5
Zinc	mg/kg	**5**	400,000	< 5	38	-	-	-	< 5	< 5
Asbestos[2]	% w/w	**0.01**	-	<0.01	<0.01	**Detected (0.041)**	Detected	<0.01	<0.01	<0.01

Notes:

1. Chromium HIL refers to Cr(III), results not speciated.
2. Asbestos HSLs not relevant to analytical methods used.

Table 3 - Soil Preliminary Waste Classification
Ampol Manly Vale (22259) Pre-UPSS Replacement Waste Classification

			Sample ID	BH1(0.3_0.5)	BH2(0.4_0.5)	BH3(0.5_0.6)	BH3(1.0_1.1)	BH3(1.5_1.95)	BH3(2.5_2.95)	BH3(4.5_4.95)	BH3(5.5_5.95)
			Depth (m)	0.3-0.5	0.4-0.5	0.5-0.6	1.0-1.1	1.5-1.95	2.5-2.95	4.5-4.95	5.5-5.95
			Sample Date	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024
	Unit	EQL	GSW CT1 (No TCLP)								
Metals											
Arsenic	mg/kg	**2**	100	2.6	2.6	-	-	-	-	-	4.9
Cadmium	mg/kg	**0.4**	20	< 0.4	< 0.4	-	-	-	-	-	< 0.4
Chromium[2]	mg/kg	**5**	-	21	15	-	-	-	-	-	42
Copper	mg/kg	**5**	-	< 5	11	-	-	-	-	-	< 5
Lead	mg/kg	**5**	100	5.7	27	-	-	-	-	-	7.5
Mercury	mg/kg	**0.1**	4	< 0.1	< 0.1	-	-	-	-	-	< 0.1
Nickel	mg/kg	**5**	40	< 5	6.9	-	-	-	-	-	< 5
Zinc	mg/kg	**5**	-	< 5	38	-	-	-	-	-	< 5
TPH[1]											
C6 - C9	mg/kg	**20**	650	< 20	< 20	< 20	-	< 20	< 20	< 20	480
C10 - C36 (Sum of total)	mg/kg	**50**	10,000	< 50	60	66	-	< 50	< 50	< 50	605
BTEX											
Benzene	mg/kg	**0.1**	10	< 0.1	< 0.1	0.3	-	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**0.1**	288	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	**0.1**	600	< 0.1	< 0.1	< 0.1	-	0.1	< 0.1	0.2	36
Xylene Total	mg/kg	**0.3**	1,000	< 0.3	< 0.3	0.5	-	0.8	< 0.3	< 0.3	200
PAH											
Benzo(a) pyrene	mg/kg	**0.5**	0.8	< 0.5	< 0.5	-	-	-	-	-	< 0.5
PAHs (Sum of total)	mg/kg	**0.5**	200	< 0.5	< 0.5	-	-	-	-	-	13
Phenols											
2,4,5-Trichlorophenol	mg/kg	**1**	8,000	< 1	< 1	-	-	-	-	-	< 1
2,4,6-Trichlorophenol	mg/kg	**1**	40	< 1	< 1	-	-	-	-	-	< 1
2-Methylphenol	mg/kg	**0.2**	4,000	< 0.2	< 0.5	-	-	-	-	-	< 0.2
Cresol Total	mg/kg	**0.5**	4,000	< 0.5	< 1	-	-	-	-	-	< 0.5
Phenol	mg/kg	**0.5**	-	< 0.5	< 2	-	-	-	-	-	< 0.5
PCBs (Sum of total)[3]	mg/kg	**0.1**	50	< 0.1	< 1	-	-	-	-	-	< 0.1
OCP/OPP[4]	mg/kg	**2**	2	ND	ND	-	-	-	-	-	ND
Asbestos	% w/w	**0.01**	LOR	ND	ND	0.041	ND	-	-	-	ND

Notes:
1. Value is for total petroluem hydrocarbons, while reported concentrations are total recoverable hydrocarbons which have not been subjected to further speciation.
2. ENM Chromium value is for Cr(III+VI). Waste value is for Cr(III) only. Results have not been speciated.
3. OCP/OPP EQL highest in group used (2mg/kg). Criteria derived from the Scheduled Chemical Wastes Chemical Control Order 2004.
4. Polychlorinated Biphenyl (PCB) Chemical Control Order 1997
5. Red = Higher concentration in duplicate presented.
6. ND = Not Detected above laboratory limit of reporting (LOR).

			Sample ID	BH4(0_0.3)	BH4(1.0_1.1)	BH4(2.5_2.95)	BH4(3.5_3.95)	BH4(4.5_4.95)	HA1(0_0.3)	HA1(1.0)	DUP1	BH3(FC)
			Depth (m)	0-0.3	1.0-1.1	2.5-2.95	3.5-3.95	4.5-4.95	0-0.3	1	HA1(0_0.3)	1
			Sample Date	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024	01 Mar 2024
	Unit	EQL	GSW CT1 (No TCLP)									
Metals												
Arsenic	mg/kg	**2**	100	-	-	-	-	5.2	-	-	-	-
Cadmium	mg/kg	**0.4**	20	-	-	-	-	< 0.4	-	-	-	-
Chromium[2]	mg/kg	**5**	-	-	-	-	-	30	-	-	-	-
Copper	mg/kg	**5**	-	-	-	-	-	< 5	-	-	-	-
Lead	mg/kg	**5**	100	-	-	-	-	< 5	-	-	-	-
Mercury	mg/kg	**0.1**	4	-	-	-	-	< 0.1	-	-	-	-
Nickel	mg/kg	**5**	40	-	-	-	-	< 5	-	-	-	-
Zinc	mg/kg	**5**	-	-	-	-	-	< 5	-	-	-	-
TPH[1]												
C6 - C9	mg/kg	**20**	650	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	-
C10 - C36 (Sum of total)	mg/kg	**50**	10,000	< 50	51	< 50	< 50	< 50	58	< 50	50	-
BTEX												
Benzene	mg/kg	**0.1**	10	< 0.1	< 0.1	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	-
Toluene	mg/kg	**0.1**	288	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Ethylbenzene	mg/kg	**0.1**	600	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-
Xylene Total	mg/kg	**0.3**	1,000	< 0.3	< 0.3	0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	-
PAH												
Benzo(a) pyrene	mg/kg	**0.5**	0.8	-	-	-	-	< 0.5	-	-	-	-
PAHs (Sum of total)	mg/kg	**0.5**	200	-	-	-	-	< 0.5	-	-	-	-
Phenols												
2,4,5-Trichlorophenol	mg/kg	**1**	8,000	-	-	-	-	< 1	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	**1**	40	-	-	-	-	< 1	-	-	-	-
2-Methylphenol	mg/kg	**0.2**	4,000	-	-	-	-	< 0.2	-	-	-	-
Cresol Total	mg/kg	**0.5**	4,000	-	-	-	-	< 0.5	-	-	-	-
Phenol	mg/kg	**0.5**	-	-	-	-	-	< 0.5	-	-	-	-
PCBs (Sum of total)[3]	mg/kg	**0.1**	50	-	-	-	-	< 0.1	-	-	-	-
OCP/OPP[4]	mg/kg	**2**	2	-	-	-	-	ND	-	-	-	-
Asbestos	% w/w	**0.01**	LOR	-	-	-	-	ND	-	-	-	DETECTED

Notes:
1. Value is for total petroluem hydrocarbons, while reported concentra
2. ENM Chromium value is for Cr(III+VI). Waste value is for Cr(III) onl
3. OCP/OPP EQL highest in group used (2mg/kg). Criteria derived fro
4. Polychlorinated Biphenyl (PCB) Chemical Control Order 1997
5. Red = Higher concentration in duplicate presented.
6. ND = Not Detected above laboratory limit of reporting (LOR).

Table 4 - QC Duplicate RPD Results
Ampol Manly Vale (22259) Pre-UPSS Replacement ESA

			Sample ID	HA1(0_0.3)	DUP1	
			Date	01 Mar 2024	01 Mar 2024	
			Lab Report Number	1074481	1074481	
			QC Type	Primary	Intra-lab	
			Matrix Type	Soil	Soil	RPD
	Unit	EQL				
BTEX						
Benzene	mg/kg	0.1		<0.1	<0.1	0
Toluene	mg/kg	0.1		<0.1	<0.1	0
Ethylbenzene	mg/kg	0.1		<0.3	<0.3	0
Xylene (o)	mg/kg	0.1		<0.1	<0.1	0
Xylene (m & p)	mg/kg	0.2		<0.2	<0.2	0
Naphthalene (VOC)	mg/kg	0.5		<0.5	<0.5	0
Total Petroleum Hydrocarbons						
C6 - C9	mg/kg	20		<20	<20	0
C10 - C14	mg/kg	50		<20	<20	0
C15 - C28	mg/kg	100		<50	<50	0
C29 - C36	mg/kg	100		<50	<50	0
Total Recoverable Hydrocarbons						
F1 (C6 - C10) less BTEX	mg/kg	20		<20	<20	0
F2 C10 - C16 (minus Naphthalene)	mg/kg	50		<50	<50	0
F3 (C16 - C34)	mg/kg	100		<100	<100	0
F4 (C34 - C40)	mg/kg	100		<100	<100	0

Notes:
1. Duplicate analysis only presented where contaminants analysed at both primary and secondary laboratory.
2. Where result <LOR, half the LOR used to calculate RPD.

Table 5 - QC Spike Blank Results
Ampol Manly Vale (22259) Pre-UPSS Replacement ESA

Sample ID	Trip blank	Trip spike	RINSATE
Date	01 Mar 2024	01 Mar 2024	01 Mar 2024
Lab Report Number	1074481	1074481	1074481
QC Type	Trip blank	Trip spike	Rinsate blank
Matrix Type	Soil	Soil	Water
Unit	mg/kg	Recovery %	mg/L
BTEXN			
Benzene	<0.1	87	<0.001
Toluene	<0.1	84	<0.001
Ethylbenzene	<0.1	86	<0.001
Xylene Total	<0.3	87	<0.003
Xylene (o)	<0.1	87	<0.001
Xylene (m & p)	<0.2	86	<0.002
Naphthalene (VOC)	<0.5	110	<0.01
Total Petroleum Hydrocarbons			
C6 - C9	<20	89	<0.02
C10 - C14	-	-	<0.05
C15 - C28	-	-	<0.1
C29 - C36	-	-	<0.1
Total Recoverable Hydrocarbons			
F1 (C6 - C10)	<20	89	<0.02
F1 (C6 - C10) less BTEX	<20	-	<0.02
F2 (C10 - C16)	-	-	<0.05
F2 C10 - C16 (minus Naphthalene)	-	-	<0.05
F3 (C16 - C34)	-	-	<0.1
F4 (C34 - C40)	-	-	<0.1
C10 - C40 (Sum of total)	-	-	<0.1

APPENDIX D: CONCEPT DESIGN PLAN

AMPOL

DEVELOPMENT APPLICATION

'UPSS REPLACEMENT WORKS'

MANLY VALE - NSW

CNR 236-238 CONDAMINE ST & KOORALA ST

DRAWING LIST	
DRAWING	DESCRIPTION
D00	COVER SHEET
D01	EXISTING SITE SURVEY
D02	EXISTING SITE PLAN
D03	PROPOSED DEMOLITION PLAN
D04	PROPOSED SITE PLAN & TANKER PATH
D05	CONCEPTUAL STORMWATER MANAGEMENT PLAN
D06	PROPOSED EROSION & SEDIMENT CONTROL PLAN
D07	PROPOSED TANK EXCAVATION CROSS-SECTION

REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALE
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 2093
	LOT 23 ON DP819441
	1570.0m²
LGA:	NORTHERN BEACHES COUNCIL

NOTE:
BOUNDARY AND SITE FEATURES SHOWN AS PER SURVEY PLAN BY SUMMIT GEOMATIC PTY LTD JOB REF: 7080, REV 'A', SURVEY DATE: 03.04.2024

LEGEND:

TR/3/0.3/12 = TREE 3m Radius Spread / 0.3m Dia Trunk / 12m High
DT= DOOR TOP
WT= WINDOW TOP
WS= WINDOW SILL
RL= REDUCED LEVEL
VC= VEHICULAR CROSSING
FLR= FLOOR LEVEL
AWN= AWNING
LP= LIGHT POLE
PP= POWER POLE
SV= STOP VALVE
WM= WATER METER
GAS= GAS VALVE
GUT= TOP OF GUTTER
HYD= HYDRANT
SLH= SEWER LAMP HOLE
SMH= SEWER MANHOLE
GPIT= GRATED PIT
EBOX= ELECTRICITY BOX
ELEC-PIT= ELECTRICITY PIT
TPIT= TELECOMMUNICATION PIT
SVENT= SERVICE VENT
BRW= BOTTOM OF RETAINING WALL
TRW= TOP OF RETAINING WALL

EXTENT OF SUBJECT LAND
ADJOINING BOUNDARY (APPROXIMATE POSITION)
DENOTES OVER HEAD WIRE

DEVELOPMENT APPLICATION

0 2.5 5 7.5 10 12.5

TFA Project Group

PROJ. No.: 24209 | Appr.

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	10.05.24	D.A. ISSUE

REVISION

PROJECT
MANLY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

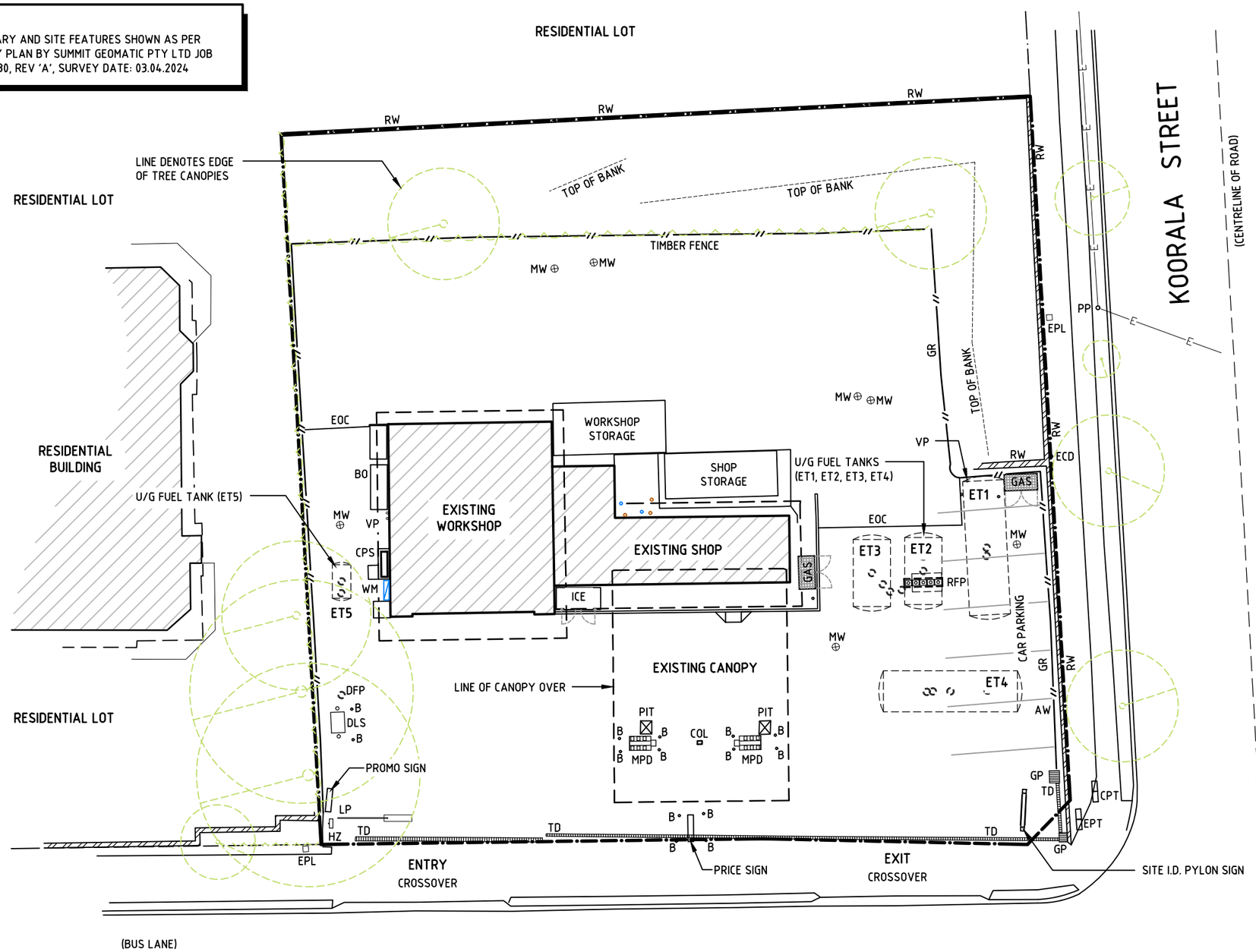
TITLE
EXISTING SITE SURVEY

DRAWN	DATE	APPROVED	DATE
MAF	09.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:250	A3	22259-D01	A

NOTE:
BOUNDARY AND SITE FEATURES SHOWN AS PER SURVEY PLAN BY SUMMIT GEOMATIC PTY LTD JOB REF: 7080, REV 'A', SURVEY DATE: 03.04.2024

REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALE
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 22093
	LOT 23 ON DP819441
	1570.0m²
LGA:	NORTHERN BEACHES COUNCIL



LEGEND

AW	AIR & WATER POINT
B	BOLLARD
BO	BULK OIL STORAGE
CPS	CAOLESCING PLATE SEPARATOR
CPT	COMMUNICATIONS PIT
COL	CANOPY COLUMN
DFP	DIRECT FUEL FILL POINT
DLS	DIESEL DISPENSER
ECD	ELECTRICAL CONDUIT
EPL	ELECTRICAL PILLAR
EPT	ELECTRICAL PIT
EOC	EDGE OF CONCRETE
GAS	LPG GAS BOTTLE CAGE
GP	GULLY PIT
GR	GUARD RAIL
HZ	HAZMAT BOX
ICE	ICE BOX
LP	LIGHT POLE
MPD	MULTI-PRODUCT DISPENSER
MW	MONITORING WELL
PIT	UNKNOWN PIT
PP	POWER POLE
RFP	REMOTE FUEL FILL POINT
RW	BLOCK WORK RETAINING WALL
TD	TRENCH DRAIN
WM	WATER METER
E	A/G POWER LINE

NOTES

1. FOR DEVELOPMENT APPLICATION ONLY - NOT FOR TENDER OR CONSTRUCTION
2. CONTRACTOR TO CONFIRM EXISTING SERVICES PRIOR TO DEMOLITION & CONSTRUCTION WORKS.

TFA Project Group

PROJ. No.: 24209 | Appr.

DEVELOPMENT APPLICATION

0 2.5 5 7.5 10 12.5

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	10.05.24	D.A. ISSUE

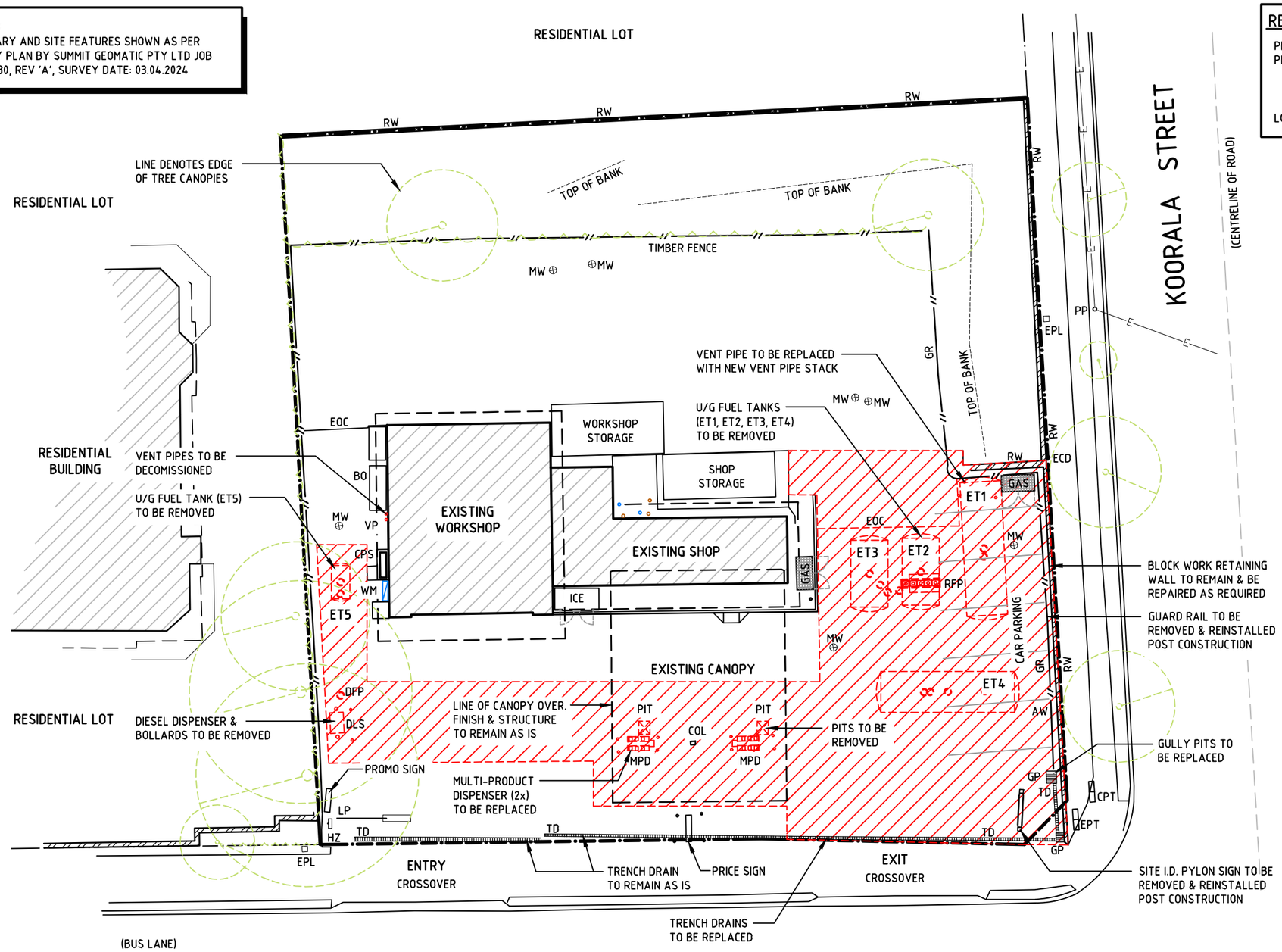
REVISION

PROJECT
MANLEY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

TITLE
EXISTING SITE PLAN

DRAWN	DATE	APPROVED	DATE
MAF	09.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:250	A3	22259-D02	A

NOTE:
BOUNDARY AND SITE FEATURES SHOWN AS PER SURVEY PLAN BY SUMMIT GEOMATIC PTY LTD JOB REF: 7080, REV 'A', SURVEY DATE: 03.04.2024



REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALE
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 22093
	LOT 23 ON DP819441
	1570.0m²
LGA:	NORTHERN BEACHES COUNCIL

LEGEND

AW	AIR & WATER POINT
BO	BULK OIL STORAGE
CPS	CAOLESCING PLATE SEPARATOR
CPT	COMMUNICATIONS PIT
COL	CANOPY COLUMN
DFP	DIRECT FUEL FILL POINT
DLS	DIESEL DISPENSER
ECD	ELECTRICAL CONDUIT
EPL	ELECTRICAL PILLAR
EPT	ELECTRICAL PIT
EOC	EDGE OF CONCRETE
GAS	LPG GAS BOTTLE CAGE
GP	GULLY PIT
GR	GUARD RAIL
HZ	HAZMAT BOX
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MW	MONITORING WELL
PIT	UNKNOWN PIT
PP	POWER POLE
RFP	REMOTE FUEL FILL POINT
RW	BLOCK WORK RETAINING WALL
TD	TRENCH DRAIN
WM	WATER METER
E	A/G POWER LINE

EXTENT OF CONCRETE/PAVEMENT TO BE DEMOLISHED

NOTES

1. FOR DEVELOPMENT APPLICATION ONLY - NOT FOR TENDER OR CONSTRUCTION
2. CONTRACTOR TO CONFIRM EXISTING SERVICES PRIOR TO DEMOLITION & CONSTRUCTION WORKS.

DEMOLITION NOTES

1. ALL BUILDINGS & STRUCTURES TO BE DEMOLISHED AND REMOVED FROM SITE, INCLUDING DISUSED MATERIALS, BOLLARDS, GUARD RAILS.
2. ANY EXISTING UNDERGROUND FUEL LINES OR TANKS TO BE REMOVED IN STRICT ACCORDANCE WITH THE WORK HEALTH & SAFETY ACT 2011 REGULATIONS 366 & 367. ANY EXISTING UNDERGROUND FUEL TANKS TO BE PREPARED AS PER AS4976 FOR REMOVAL & DESTRUCTION. CERTIFICATE OF DESTRUCTION TO BE ISSUED UPON COMPLETION.
3. EXISTING OVERHEAD POWER LINE TO STREET LIGHT ON BOURKE STREET. CONTRACTOR TO CO-ORDINATE WITH COUNCIL / ESSENTIAL ENERGY TO REMOVE AND REINSTATE OR RELOCATE TO ALLOW EXCAVATION AND LIFTING WORKS.

CONDAMINE STREET
(TRAFFIC ISLAND)

DEVELOPMENT APPLICATION

0 2.5 5 7.5 10 12.5

TFA Project Group
PROJ. No.: 24209 | Appr.

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	10.05.24	D.A. ISSUE

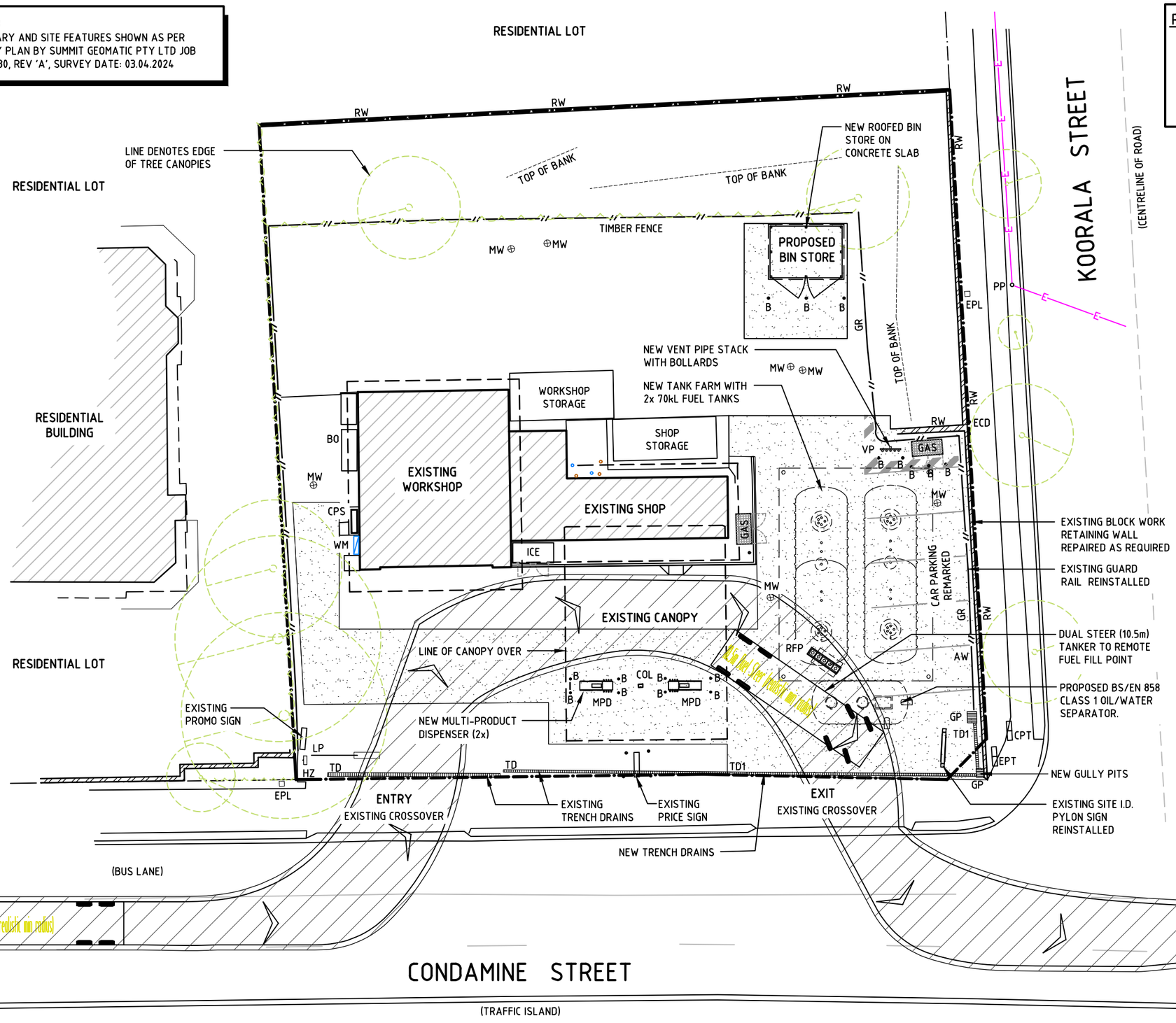
REVISION

PROJECT
MANLY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

TITLE
PROPOSED DEMOLITION PLAN

DRAWN	DATE	APPROVED	DATE
MAF	09.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:250	A3	22259-D03	A

NOTE:
BOUNDARY AND SITE FEATURES SHOWN AS PER SURVEY PLAN BY SUMMIT GEOMATIC PTY LTD JOB REF: 7080, REV 'A', SURVEY DATE: 03.04.2024



REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALE
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 22093
	LOT 23 ON DP819441
	1570.0m²
LGA:	NORTHERN BEACHES COUNCIL

LEGEND - EXISTING

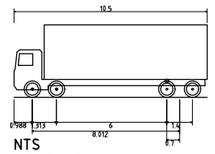
AW	AIR & WATER POINT
BO	BULK OIL STORAGE
CPS	CAOLESCING PLATE SEPARATOR
CPT	COMMUNICATIONS PIT
COL	CANOPY COLUMN
ECD	ELECTRICAL CONDUIT
EPL	ELECTRICAL PILLAR
EPT	ELECTRICAL PIT
GAS	LPG GAS BOTTLE CAGE
GP	GULLY PIT
GR	GUARD RAIL
HZ	HAZMAT BOX
ICE	ICE BOX
LP	LIGHT POLE
MW	MONITORING WELL
PP	POWER POLE
RW	BLOCK WORK RETAINING WALL
TD	TRENCH DRAIN - OILY WATER
WM	WATER METER
—E—	A/G POWER LINE

LEGEND - NEW

B	100Φ METAL BOLLARD
GP	GULLY PIT - OILY WATER
MPD	MULTI-PRODUCT DISPENSER (8 HOSE)
RFP	REMOTE FUEL FILL POINT
TD1	TRENCH DRAIN - OILY WATER
VP	FUEL VENT PIPE STACK
	EXTENT OF NEW CONCRETE

NOTES

1. FOR DEVELOPMENT APPLICATION ONLY - NOT FOR TENDER OR CONSTRUCTION
2. CONTRACTOR TO CONFIRM EXISTING SERVICES PRIOR TO DEMOLITION & CONSTRUCTION WORKS.



NTS

10.5m Duel Steer (realistic min radius)

Overall Length	10.500m
Overall Width	2.500m
Overall Body Height	3.933m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	36.00°

DEVELOPMENT APPLICATION

0 2.5 5 7.5 10 12.5

TFA Project Group

PROJ. No.: 24209 | Appr.

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	10.05.24	D.A. ISSUE

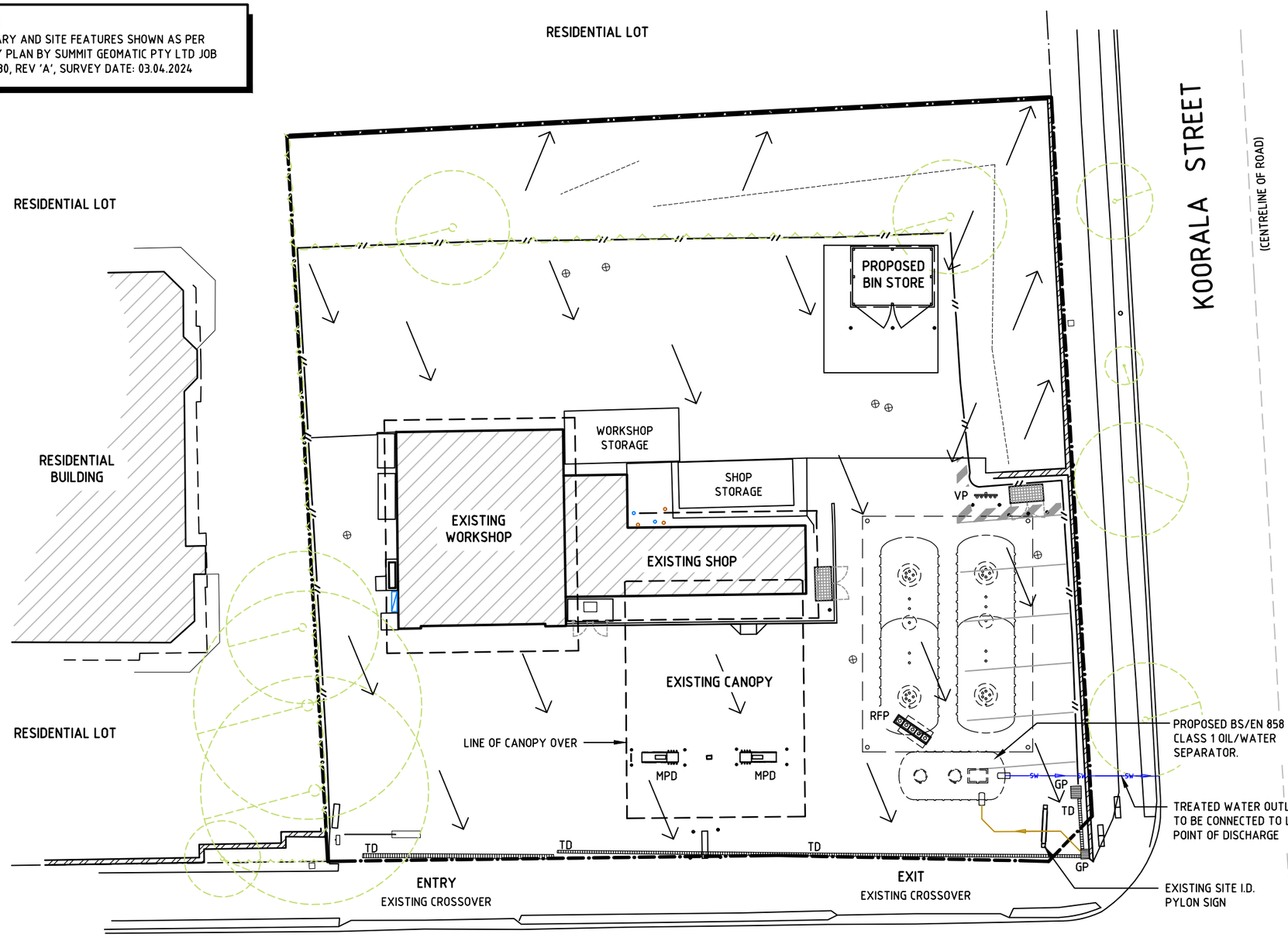
REVISION

PROJECT
MANLY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

TITLE
PROPOSED SITE PLAN & TANKER PATH

DRAWN	DATE	APPROVED	DATE
MAF	09.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:250	A3	22259-D04	A

NOTE:
BOUNDARY AND SITE FEATURES SHOWN AS PER SURVEY PLAN BY SUMMIT GEOMATIC PTY LTD JOB REF: 7080, REV 'A', SURVEY DATE: 03.04.2024



REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALE
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 22093
	LOT 23 ON DP819441
	1570.0m^2
LGA:	NORTHERN BEACHES COUNCIL

LEGEND

GP	GULLY PIT
MPD	MULTI-PRODUCT DISPENSER
RFP	REMOTE FUEL FILL POINT
TD	TRENCH DRAIN
VP	FUEL VENT PIPES
	PROPOSED OILY WATER LINE WITH DRAIN DIRECTION
	DIRECTION OF SURFACE FALL
SW	PROPOSED TREATED WATER LINE WITH DRAIN DIRECTION

NOTES

1. LEVELS TO BE DETERMINED AT DETAILED DESIGN STAGE FOLLOWING COUNCIL DEVELOPMENT CONSENT.
2. THE PAVEMENT WORKS REQUIRED FOR REPLACEMENT OF EXISTING UNDERGROUND FUEL SYSTEM WILL BE LIMITED TO THE MINIMUM AREAS AS DEPICTED ON THE DRAWINGS.
3. FUEL DISPENSING AREAS WILL BE UPGRADED TO INCORPORATE SMOOTH BUNDED CATCHMENT AREAS THAT DRAIN TO THE NOMINATED OILY WATER COLLECTION & TREATMENT SYSTEM.
4. ALL EDGES OF NEW REPLACEMENT PAVEMENT WORKS WILL TIE INTO EXISTING PAVEMENTS & EXISTING LEVEL & GRADES WILL HAVE A SMOOTH TRANSITION.
5. FINAL LOCATION OF U/G OILY WATER SEPARATOR TO BE DETERMINED AT DETAIL DESIGN STAGE.
6. FOR DEVELOPMENT APPLICATION ONLY - NOT FOR TENDER OR CONSTRUCTION
7. CONTRACTOR TO CONFIRM EXISTING SERVICES PRIOR TO DEMOLITION & CONSTRUCTION WORKS.

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DEVELOPMENT APPLICATION

0 2.5 5 7.5 10 12.5

AMPOL

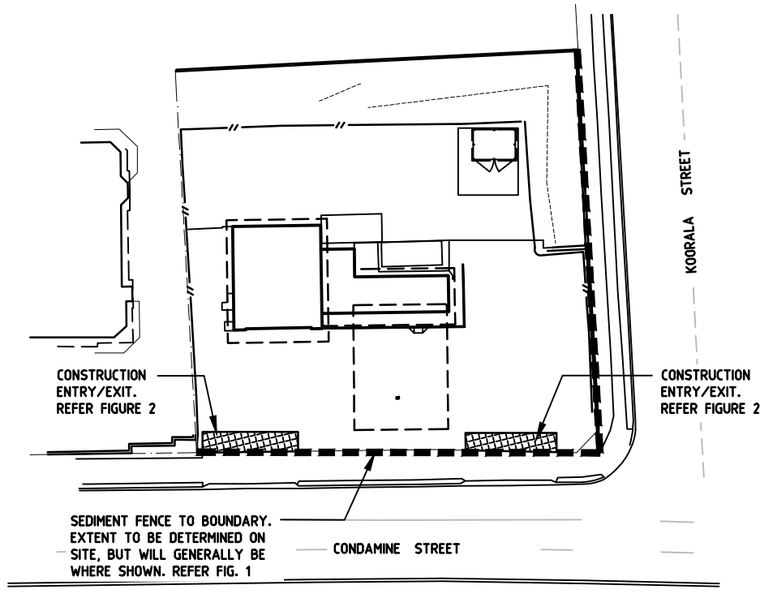
REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	09.05.24	D.A. ISSUE

REVISION

PROJECT
MANLY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

TITLE
CONCEPTUAL STORMWATER MANAGEMENT PLAN

DRAWN	DATE	APPROVED	DATE
MAF	07.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:250	A3	22259-D05	A



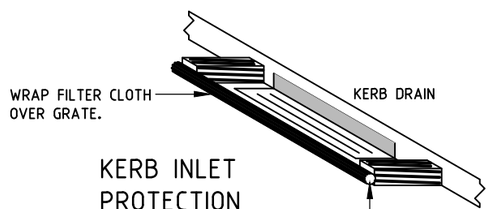
A – SITE PLAN
NTS

LEGEND

AREA DEFINING EXTENT OF WORKS TO HAVE SEDIMENT AND EROSION CONTROLS INSTALLED

NOTES:

1. BUNDING TO BE POSITIONED AS REQUIRED TO SUIT WORKING & COUNCIL REQUIREMENTS SO AS NOT TO CAUSE NUISANCE & POLLUTION TO COUNCIL FOOTWAYS & ASSOCIATED AREAS.
2. SECURE & CLEAN ALL WORK AREAS AT COMPLETION OF EACH DAY.
3. SITE ACCESS POINTS ARE TO BE CONTROLLED BY THE BUILDER WHO IS TO ENSURE TEMPORARY REMOVAL & REPLACEMENT OF SILTATION CONTROL METHODS AREA SUFFICIENT TO ENSURE COMPLIANCE WITH THESE CONTROLS.
4. SILT FENCE SHALL NOT BE REMOVED UNTIL SITE HAS BEEN PAVED & SURFACED. BUNDWALLS SHALL BE LOCATED AROUND ALL PITS & MAINTAINED UNTIL THE CATCHMENT AREA HAS BEEN PAVED.
5. KERB DRAIN EXCLUDER SHALL INCORPORATE TRAFFIC CONTROL BARRICADES IN ACCORDANCE WITH AS1742.3, & SHALL NOT BE PLACED UNTIL WORKS ARE BEING CARRIED OUT ON THE FOOTPATH AREA, OR AS OTHERWISE DIRECTED BY COUNCIL.
6. ALL SEDIMENT TRAPS, EXCLUDERS, BUNDWALLS SHALL BE INSPECTED & CLEANED AFTER EACH STORM EVENT. DAMAGED OR CLOGGED BUNDING ARE TO BE REMOVED AND REPLACED.
7. THE BUILDER SHALL CARRY OUT ANY ADDITIONAL WORKS DEEMED NECESSARY AND DIRECTED BY COUNCIL TO BE CARRIED OUT.
8. THE SEDIMENT CONTROL PLAN SHALL BE IMPLEMENTED PRIOR TO ANY WORKS BEING CARRIED OUT ON SITE.



KERB INLET PROTECTION

SEDIMENT AND EROSION CONTROL NOTES:

GENERAL
1. ALL SEDIMENT & EROSION CONTROL MEASURES TO BE IN ACCORDANCE WITH LOCAL COUNCIL'S GUIDE LINES.

PRIOR TO THE COMMENCEMENT OF CONSTRUCTION
1. AVOID STRIPPING & EXCAVATING UNTIL READY TO BUILD.
2. INSTALL SEDIMENT FENCES.

BULK EARTHWORKS
1. AVOID STRIPPING & EXCAVATING UNTIL READY TO BUILD.
2. CONSTRUCTION OF AN ENTRY/EXIT POINT TO THE SITE SHALL BE MANAGED SO THAT SEDIMENT IS NOT TRACKED OFF THE SITE.
3. TOPSOIL SHALL BE STOCKPILED ON SITE FOR LATER USE.
4. WHERE PRACTICABLE MAINTAIN KERB VEGETATION IN A HEALTHY STATE DURING THE CONSTRUCTION PROCESS.
5. WHEN UP SLOPE WATER IS DIVERTED AROUND A WORK SITE IT SHALL BE DISCHARGED AS SHEET FLOW THROUGH AN UNDISTURBED AREA BESIDE THE WORKS.

SERVICES TRENCHES
1. TO AVOID UNNECESSARY SOIL EROSION, SERVICE TRENCHES SHOULD BE BACK FILLED, CAPPED AND COMPACTED TO A LEVEL AT LEAST 75-100mm ABOVE THE ADJOINING GROUND LEVEL.

BUILDING OPERATIONS
1. ERODABLE MATERIAL MISTAKENLY PLACED WITHIN THE ROAD RESERVE (INCLUDING ACCIDENTAL SPILLAGE AND TRACKING OF SUCH MATERIALS ONTO THE ROAD) THAT CANNOT BE PREVENTED THROUGH REASONABLE MEANS, MUST BE:
   (a) REMOVED IMMEDIATELY IF RAINFALL IS IMMINENT OR OCCURRING.
   (b) REMOVED PRIOR TO THE END OF THE DAY'S WORK IF RAINFALL IS NOT EXPECTED.
2. MATERIALS SHOULD BE SWEPT FROM THE ROAD, NOT WASHED DOWN THE GUTTER.
3. ALL SOLID WASTE SHALL BE STORED ON SITE IN SUCH A MANNER THAT IT IS PREVENTED FROM LEAVING THE SITE EITHER BY THE ACTION OF WIND OR WATER.
4. SMALLER MATERIALS, SUCH AS LITTER, SHOULD BE CONTAINED IN COVERED BINS OR LITTER TRAPS FORMED ON THREE SIDES BY A GEOTEXTILE WIND BREAK.
5. CONCRETE WASTE WASHED FROM TRUCKS AND MIXERS UNITS SHALL BE CONTAINED ON SITE AND SHALL NOT BE PLACED IN A POSITION WHERE IT COULD REASONABLY BE EXPECTED TO WASH FROM THE SITE AND HARM THE ENVIRONMENT.

SITE REHABILITATION
1. ALL GROUND DISTURBED BY THE CONSTRUCTION ACTIVITY SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED SO IT CAN NO LONGER ACT AS A SOURCE OF SEDIMENT.

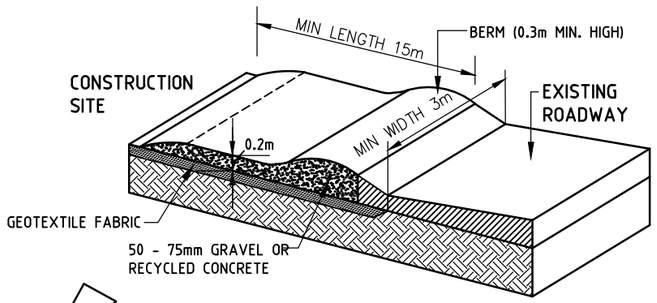


FIG. 2. - CONSTRUCTION EXIT/ENTRY

MAINTENANCE:
1. THE ENTRANCE SHOULD BE MAINTAINED SO THAT IT PREVENTS TYRES FROM TRACKING.
2. DRESSING WITH ADDITIONAL AGGREGATE IF REQUIRED.
3. REGULARLY REMOVE SEDIMENT FROM ROADWAY.

STOCKPILES
1. STOCKPILES ARE NOT TO BE STORED ON THE FOOTPATH OR THE ROAD RESERVE, UNLESS APPROVED BY COUNCIL.
2. WHERE NECESSARY STOCKPILE LOSSES CAN BE MINIMISED WITH THE USE OF COVERS.
3. ALL STOCKPILES AND BUILDING MATERIAL SHOULD BE LOCATED WITHIN THE SEDIMENT CONTROL ZONE.
4. TO MINIMISE EROSION AND THE LOSS OF SAND AND SOIL, STOCKPILES SHALL NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH. IF IT IS IMPRACTICAL TO AVOID STORMWATER RUNOFF BEING DIRECTED TO A STOCKPILE, THEN A PERIMETER BANK SHALL BE CONSTRUCTED UP SLOPE OF THE STOCKPILE TO DIRECT RUNOFF IN A CONTROLLED MANNER AROUND THE STOCKPILE.

SEDIMENT BARRIERS

SEDIMENT FENCE
- INSTALL SEDIMENT FENCE(S) ALONG THE LOW SIDE OF THE SITE, AND IDEALLY ALONG A LINE OF CONSTANT LAND LEVEL TO PREVENT THE CONCENTRATION OF STORMWATER RUNOFF.
  IN AREAS WHERE IT IS EITHER UNDESIRABLE OR IMPRACTICAL TO BURY THE LOWER EDGE OF THE SEDIMENT FENCE, THE LOWER 200mm (MIN) PORTION OF THE FABRIC SHOULD BE PLACED ON THE GROUND UP SLOPE OF THE FENCE AND BURIED UNDER A 100mm (MIN) LAYER OF AGGREGATE.
  SEDIMENT FENCES ON BUILDING SITES CAN BE STAPLED TO APPROXIMATELY 40mm SQUARE HARDWOOD POSTS OR WIRE TIED TO STEEL POSTS.

FIELD INLET GULLIES
- SEDIMENT CONTROLS FOR STORMWATER INLETS LOCATED WITHIN THE PROPERTY BOUNDARIES MAY CONSIST OF GEOTEXTILE FABRIC PLACED EITHER DIRECTLY OVER THE GRATED INLET OR AROUND THE INLET SUPPORTED BY A TIMBER FRAME. FIELD INLET PROTECTION IS NECESSARY WHERE INLETS DRAIN AREAS OF BARE AND UNPROTECTED SOIL. DURING STORMS, PONDING SHALL BE ALLOWED TO OCCUR AROUND THE STORMWATER INLET TO ASSIST IN THE SETTLING OUT OF SEDIMENTS.

PAVEMENT INLET GULLY
- A ROADSIDE INLET BARRIER IS TO BE INSTALLED, SO THAT IT SHALL NOT BE ALLOWED TO FULLY BLOCK THE INLET STRUCTURE.
  ON A HILLSIDE, SEDIMENT BARRIERS MAY CONSIST OF A TEMPORARY DAM CONSTRUCTED FROM SAND AND GRAVEL BAGS AT LEAST 4 METRES UP SLOPE FROM THE GULLY INLET.

MAINTENANCE
1. SEDIMENT FENCES SHOULD BE REPLACED IF THE FABRIC IS RIPPED OR OTHERWISE DAMAGED. THE MAINTENANCE OF THE SEDIMENT FENCES INCLUDES THE REMOVAL OF SEDIMENT DEPOSITED UP SLOPE OF THE FENCE AND RETRENCHING THE FABRIC WHEN THE FENCE IS 25% FULL.
2. FOLLOWING STORM EVENTS, THE ROAD RESERVE AND ALL SEDIMENT BARRIERS SHALL BE INSPECTED AND ANY EXCESSIVE SEDIMENT RESIDUE SHALL BE APPROPRIATELY REMOVED.

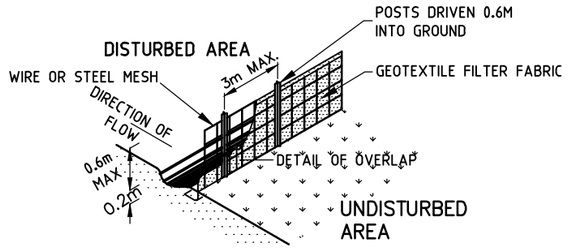


FIG. 1. – SEDIMENT FENCE

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PROJ. No.: 24209 | Appr.

DEVELOPEMENT APPLICATION

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	10.05.24	D.A. ISSUE

REVISION

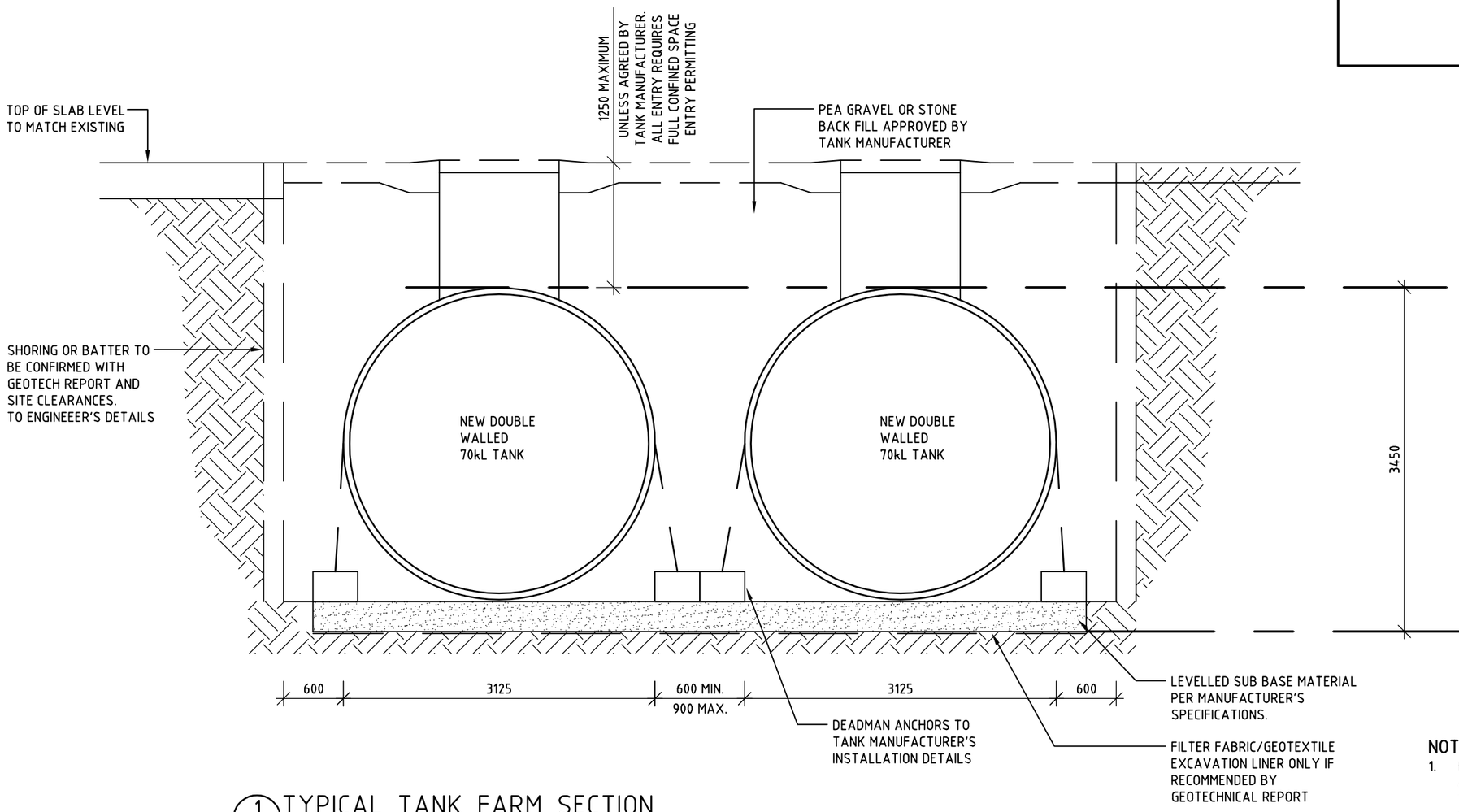
PROJECT
MANLEY VALE - 22259
236-238 CONDAMINE STREET
MANLY VALE NSW 2093

TITLE
PROPOSED EROSION & SEDIMENT CONTROL PLAN

DRAWN	DATE	APPROVED	DATE
MAF	09.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
NTS	A3	22259-D06	A

REAL PROPERTY DESCRIPTION:

PROPERTY NAME:	AMPOL - MANLY VALY
PROPERTY ADDRESS:	236-238 CONDAMINE STREET, MANLY VALE, NSW, 2093 LOT 23 ON DP819441 1570.0m²
LGA:	NORTHERN BEACHES COUNCIL



1 / - TYPICAL TANK FARM SECTION
1 : 50

NOTE:
1. FOR THE INSTALLATION OF THE TANKS AND DEADMAN ANCHORS REFER TO THE VIVA AUSTRALIA GUIDE FOR THE INSTALLATION AND REMOVAL OF UNDERGROUND PETROLEUM STORAGE SYSTEMS (UPSS) AND THE TANK MANUFACTURER'S RECOMMENDATIONS
2. ALL TANKS INSTALLED AT SAME LEVEL, TANK TOPS AND TURRETS TO BE ALIGNED.
3. TANKS TO BE PLACED AT MINIMAL PRACTICAL DEPTH.

TFA Project Group

PROJ. No.: 24209 | Appr.

DEVELOPMENT APPLICATION

0 500 1000 1500 2000 2500

AMPOL

REV.	BY	DATE	DESCRIPTION OF CHANGE
A	MAF	08.05.24	D.A. ISSUE

REVISION

PROJECT
TALMAC DUBBO -22728
119 BOURKE ROAD
DUBBO NSW 2830

TITLE
PROPOSED TANK EXCAVATION
TYPICAL CROSS-SECTION

DRAWN	DATE	APPROVED	DATE
MAF	08.05.24		
SCALE	**SIZE**	**DRAWING No.**	**REV.**
1:50	A3	22259-D07	A