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Mirvac Projects Pty Ltd
Prepared by
Ramboll Australia Pty Ltd
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SITE AUDIT REPORT
REMEDIAL ACTION PLAN, ASPECT INDUSTRIAL ESTATE, MAMRE ROAD, KEMPS CREEK, NSW

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16 October 2020

Mirvac Projects Pty Ltd
Level 28, 200 George Street
Sydney NSW 2000
Attention: Russell Hogan

By email: russell.hogan@mirvac.com

Dear Russel

SITE AUDIT REPORT - REMEDIAL ACTION PLAN, ASPECT INDUSTRIAL ESTATE, MAMRE ROAD, KEMPS CREEK, NSW

I have pleasure in submitting the Site Audit Report for the subject site. The Site Audit Statement, produced in accordance with the NSW *Contaminated Land Management Act 1997* is included as Appendix B. The Audit was commissioned by Mirvac Projects Pty Ltd to assess the adequacy of a remedial action plan.

The Audit is currently a Non-Statutory Audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 9954 8100 if you have any questions.

Yours sincerely,
Ramboll Australia Pty Ltd

Tom Onus
EPA Accredited Site Auditor 1505

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Measures

%	per cent
µg/L	Micrograms per Litre
ha	Hectare
km	Kilometres
m	Metre
mAHD	Metres Australian Height Datum
mbgl	Metres below ground level
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
mm	Millimetre
ppm	Parts Per Million

General

ABC	Ambient Background Concentration
ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
ADWG	Australian Drinking Water Guidelines
AF	Asbestos Fines
AHD	Australian Height Datum
Airsafe	Airsafe OHC Pty Ltd
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian & New Zealand Guidelines
Arcadis	Arcadis Australia Pacific Pty Ltd
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes & Naphthalene
CCME	Canadian Council of Ministers of the Environment
CLM Act	NSW Contaminated Land Management Act 1997
COC	Chain of Custody
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development Application
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
Envirolab	Envirolab Services Pty Ltd
EPA	Environment Protection Authority (NSW)
ESL	Ecological Screening Level
FA	Fibrous Asbestos
GSW	General Solid Waste
HIL	Health Investigation Level
HSL	Health Screening Level
LEP	Local Environment Plan
LOR	Limit of Reporting
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
Mirvac	Mirvac Projects Pty Ltd
ML	Management Limits
NATA	National Association of Testing Authorities
NEHF	National Environmental Health Forum
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NL	Non-Limiting
n	Number of Samples
OCPs	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OPPs	Organophosphorus Pesticides

PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd – previously Ramboll Environ Australia Pty Ltd and ENVIRON Australia Pty Ltd
RAP	Remediation Action Plan
RL	Relative Level
RPD	Relative Percent Difference
RSW	Restricted Solid Waste
SAQP	Sampling Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxicity Equivalence Quotient
TPHs	Total Petroleum Hydrocarbons
TRHs	Total Recoverable Hydrocarbons
TV	Trigger Value
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1 Audit Details

A site contamination audit (Audit) has been conducted in relation to the Aspect Industrial Estate at 788-882 Mamre Road, Kemps Creek, NSW (the site).

The Audit was conducted to provide an independent review by an EPA Accredited Auditor of the suitability and appropriateness of a remedial action plan (RAP) i.e. a "Site Audit" as defined in Section 4 (1) (b) (v) of the NSW *Contaminated Land Management Act 1997* (the CLM Act).

The Audit is currently non-statutory.

Details of the Audit are:

Requested by:	Russell Hogan on behalf of Mirvac Projects Pty Ltd (Mirvac)
Request/Commencement Date:	25 September 2019
Auditor:	Tom Onus
Accreditation No.:	1505

1.2 Background

The site comprises rural residential land that is proposed to be redeveloped by Mirvac as the Aspect Industrial Estate, comprising warehouses and distribution centres.

Site investigations identified contamination associated with localised point sources (e.g. drums of hydrocarbons and electrical transformer), hazardous building materials and fill material. A remedial action plan (RAP) has been prepared to document the proposed remediation.

The RAP is a requirement of the Secretary's Environmental Assessment Requirements (SEARs). This Site Audit Report (SAR) and accompanying Section B Site Audit Statement (SAS, Appendix B) have been prepared to review the RAP.

1.3 Scope of the Audit

The scope of the Audit included:

- Review of the following reports:
  - 'Preliminary Site Investigation, Mamre Road, Kemps Creek, NSW', JBS&G Australia Pty Ltd (JBS&G), 30 January 2019 (**the PSI**)
  - 'Dam Decommissioning Study, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis Australia Pacific Pty Ltd (Arcadis), 1 November 2019 (**the DDS**)
  - 'Unexpected Finds Protocol, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis, 22 November 2019 (**the UFP**)
  - 'Imported Fill Protocol, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis, 22 November 2019 (**the IFP**)
  - 'Hazardous Materials Survey, Lot 54-58 Mamre Road, Kemps Creek', Airsafe OHC Pty Ltd (Airsafe), 10 December 2019
  - 'Detailed Site Investigation - Aspect Industrial Estate, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 2 Final', Arcadis, 5 May 2020 and earlier draft 1 November 2019 (**the DSI**)

  - 'Remedial Action Plan, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 3 Final', Arcadis, 15 October 2020 and earlier version dated 4 August 2020, 10 June 2020 and 25 May 2020 (**the RAP**).
- A site visit by the Auditor on 11 November 2019.
- Discussions with Mirvac, and with Arcadis who undertook the DSI and prepared the RAP.

1.4 Conflict of Interest

The Auditor has considered the potential for a conflict of interest in accordance with the requirements of section 3.2.3 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme*.

The Auditor considers that there are no conflicts of interest, given that:

1. The Auditor is not related to a person by whom any part of the land is owned or occupied.
2. The Auditor does not have a pecuniary interest in any part of the land or any activity carried out on any part of the land.
3. The Auditor has not reviewed any aspect of work carried out by, or a report written by, the site auditor or a person to whom the site auditor is related.

2. SITE DETAILS

2.1 Location

The site details are as follows:

Street address:	788-882 Mamre Road, Kemps Creek, NSW, 2178
Identifier:	Lots 54 to 58 DP 259135 (Attachment 2, Appendix A)
Local Government:	Penrith City Council
Owner:	Mirvac
Site Area:	Approximately 563,000 m^2 (56.3 hectares)

The boundaries of the site are not well defined on the ground. The site locality is shown on Attachment 1, Appendix A and the site layout and lot boundaries are shown on Attachment 2, Appendix A.

2.2 Zoning

Based on a search of the ePlanning Spatial Viewer by the Auditor on 13 August 2020, the site is understood to be largely zoned IN1 General Industrial, with a strip along the western boundary zoned SP2 Infrastructure and a creek alignment in the north of the site zoned E2 Environmental Conservation. The Environmental Planning Instrument is the State Environmental Planning Policy (Western Sydney Employment Area) 2009.

The DSI reported that the former site zoning was RU2 Rural Residential land under the Penrith City Council Local Environmental Plan 2010.

2.3 Adjacent Uses

The site has approximately 950 m of frontage to Mamre Road and is located within an area consisting of predominantly rural residential land use. The land uses immediately surrounding the site are:

- North – rural residential properties
- South – rural residential properties including market gardens
- East – rural residential properties
- West – Mamre road, with rural residential properties located immediately west of Mamre Road

2.4 Site Condition

The site contains buildings and structures associated with rural residential and agricultural land use including market gardening and poultry farming. The layout is presented on Attachment 2, Appendix A.

A summary of observations from the PSI is provided in Table 2.1.

Table 2.1: Summary of Observations from the PSI

Lot	Summary of Observations from the PSI
Lot 54 DP 259135	Western portion notably elevated, sloping upward from Mamre Road to a high point within the vicinity of a red brick residential building. A septic tank was to the southwest of the residence. Electrical transformer to the north of the residence. Some minor staining and odours (hydrocarbon/chemical) were noted in adjacent topsoil. Sheds and warehouse structures contained general farming equipment, minor chemical and petroleum storage. Sheds were constructed of corrugated iron, sheet metal and sheet board.

Lot	Summary of Observations from the PSI
	Potential ACM construction were observed in the central portion of the Lot (chicken coups associated with poultry farming). Minor underground infrastructure provided each warehouse with water and LPG to run heaters within each coup. A refrigerated container was observed to the west of the coups to store deceased poultry awaiting offsite disposal. The eastern portion of the site comprised open pastoral/agricultural land and a single large dam. Embankments appeared to comprise natural reworked soil. The eastern portion of the site was historically utilised for horticultural purposes and contained market gardens.
Lot 55 DP 259135	Three residential properties containing free-standing residential dwellings, associated garage/shed structures and landscaped garden beds were located in the western portion. Structures included a garage workshop and storage including sheet metal, stockpiled building materials (bricks, metal sheeting), stockpiled soils, demolition waste (scrap metal, timber), PVC piping, BBQ's, a lawnmower, discarded tyres, car parts, bicycles, exercise equipment, paint tins, general agricultural/farming equipment, discarded farming machinery, tractor engines, tyres and some minor building and demolition waste. The central west and eastern portion contained a series of tilled market gardens and drainage channels. Surface soils within the garden beds and channels were observed to contain minor plastic fragments (PVC and small fragments of black plastic sheeting). The central portion of the site contained evidence of historic market gardens and contained two dams. The dam embankments were raised approximately 3 m above natural grade and were observed to comprise reworked natural soils. Two septic tank pits were located in the central west.
Lot 56 DP 259135	Two brick residential dwellings and two associated septic tanks were located in the southwest. The western portion comprised pastoral agricultural land with three large market gardens located in the northwest. A single open plan timber frame/corrugated iron barn was located in the central south and contained building materials, stored farming equipment, discarded fridges, batteries, a single petroleum drum (no indicators of leaks or spills) and general waste. Suspected ACM sheeting was noted along the northern and southern walls of the shed. Several fragments of potential sheet board were observed in surface soils adjacent to the structure. Metal irrigation pipes and several empty petroleum drums were located to the immediate east of the shed. A large dam was located in the central portion with the northern embankment raised approximately 3 m above natural grade. Stockpiles of building materials (brick/concrete pavers), irrigation pipes, old water tanks, firewood and a dilapidated timber boat were noted within the area north of the dam. A small timber shed located atop the embankment was observed to contain irrigation infrastructure. Asbestos containing conduit was identified in-ground to extend for a length of approximately 400 m. The location of the ACM conduit is shown on Attachment 10, Appendix A. The eastern portion comprised open pastoral paddocks with no evidence of ground disturbance or historic site structures.
Lot 57 DP 259135	The south-western portion contained a residential dwelling, sheds, garages and minor landscaped garden beds. Stockpiled and discarded farming equipment, building materials and demolition waste were observed. Soil to the immediate north of the residential dwelling were observed to contain building and demolition materials (large bricks and concrete rubble), adjacent to which was a series of small market gardens. A large warehouse was located in the north-western portion. Stockpiles of building materials (road base gravel, masonry materials, soils with inclusions of crushed brick, concrete, igneous gravel and bitumen) were located adjacent to the warehouse. Exposed surface soils within the western portion of the site and within an area to the east of the site appeared to comprise similar fill material. Based on communications with the landowner, it is understood this material had been imported to the site and spread across the Lot surfaces via the use of a bobcat. The majority of the material appeared to be free from any overt indicators of contamination with the exception of two small suspected asbestos containing materials fragments, observed in close proximity two one another within fill materials in the central west of the Lot. A large dam was situated in the central portion of the Lot. One stockpile of anthropogenic building waste (metal roofing, timber, bricks) and one stockpile of sandstone boulders was observed in vicinity to the western embankment. The eastern portion of the site housed two free-standing rundown sheet metal/timber storage sheds. The sheds and surface soils surrounding them contained building materials (window frames, timber, metal, fibre sheet

Lot	Summary of Observations from the PSI
	board (potential ACM)) demolition waste (bricks/concrete), an abandoned car and general agricultural/household waste (empty petroleum drums/bathtubs (no observed staining). The creek shown in Attachment 2, Appendix A was not observed on the site.
Lot 58 DP 259135	A large dam located in the central southern portion with the western embankment raised approximately 3 m above natural grade. The creek shown on Attachment 3, Appendix A was a dry drainage depression. The eastern portion of the site comprised open pastoral paddocks with no evidence of ground disturbance or historic site structures. One shed was the only standing structure on the Lot, located in the northwest with various piles of rubbish and redundant piping, steel and timber from onsite market gardens surrounding it. There were some fuel containers in the shed (no indications of leaks or spills of fuel inside). Several stockpiles of rock (boulders, cobbles and fines) were located scattered throughout the eastern portion of site. A dry watercourse from the dam ran through the middle of the Lot towards Mamre Road in the west (Attachment 3, Appendix A). The central portion of the site contained several patches of market gardens.

2.5 Proposed Development

The site is proposed to be redeveloped into a warehouse and distribution centre, including 11 compounds (warehouse and office) and associated infrastructure (roadways and on grade car parks).

The proposed redevelopment will include the grading of site levels and bulk earthworks will include both cutting (up to 10 m) and filling (up to 10 m) (Attachment 4, Appendix A).

Topsoil will be stripped and blended at a ratio of 1:8 for use as fill material. Blended topsoil will not be placed within 1 m of the final bulk earthworks level. The RAP states where more than 1 m of fill is proposed to be placed, it is anticipated the topsoil will remain.

Approximately 270,482 m^3 of material is anticipated to be imported to the site to support earthworks undertaken as part of site redevelopment works.

Existing dams will be drained and sediment at the base excavated and removed prior to filing. The saturated sediments are to be "land farmed" to remove excess water. The dam embankment soils, and the drained sediments are likely to be reused to infill the dam voids or elsewhere onsite.

The proposed development is considered to fall within a 'commercial/industrial use' exposure scenario.

3. SITE HISTORY

A site history was presented in the PSI based on historic aerial photographs, land titles records, Search of the NSW EPA's public registers including the Per- and Poly- Fluoroalkyl Substances Register, a search of the Australian and NSW Heritage Register, and review of Planning Certificates.

The site originally comprised scattered woodlands/pastoral land and was used for agricultural grazing and dairy farming (based on communications with landowners). Since 1986, land use has varied from agricultural practices including grazing, market gardening, chicken farming and rural residential land uses.

3.1 Auditor's Opinion

Details regarding specific site usage are lacking. The PSI and DSI were adequate to confirm that the overall risk of significant contamination is low and activities that may have impacted the site are largely related to minor storage of fuel and chemicals, importation of uncontrolled fill, and hazardous building materials. Furthermore, once the buildings have been demolished, the RAP proposes further assessment of building footprints followed by remediation and validation as required prior to bulk earthworks. The proposed bulk earthworks are extensive across the site and will provide a good opportunity for unexpected finds (e.g. waste burials, underground services such as asbestos pipes) to be encountered and adequately managed through the UFP.

4. CONTAMINANTS OF CONCERN

The PSI identified areas of environmental concern as summarised in Figure 4.1

Area of Environmental Concern (AEC) / Media	Contaminant of Potential Concern (COPC)
Historical and existing site structures	Heavy metals, and asbestos
Storage and maintenance of equipment and consumables including fuel, oil and chemicals including above ground storage tanks (Lot 55 DP 259135)	Heavy metals, polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRH) benzene, toluene, ethylbenzene, xylene (BTEX) and volatile organic compounds (VOCs)
Fill materials	Heavy metals, PAH, TRH/ BTEX, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs) and asbestos
Livestock barns and potential burial pits associated poultry /cattle and /or equine farming practices and underground septic tanks	Biological hazards (E. coli, faecal coliforms, esoteric viruses), heavy metals
Historical and current agricultural practices / features including market gardens, dams and fill materials used to create dam embankments.	Heavy metals, PAHs, TRH/BTEX, OCPs, organophosphorous pesticides (OPPs), PCBs and asbestos.
Historical irrigation lines/culverts	Asbestos
Aesthetic impacts	Stockpiled rubbish, building and demolition / fly tipped wastes and odours

Figure 4.1 Areas of Environmental Concern and Associated Contaminants of Potential Concern (source: PSI)

The DSI stated that the probable distribution of contamination on site will be localised to source point areas, such as structures, material handling areas and areas with uniform land use, e.g. market gardening. Paddock and grazing areas are generally low risk unless specific hotspots are observed.

4.1 Auditor's Opinion

The identified contaminants of potential concern are consistent with the site history and condition. The analyte list used for soil, sediment, surface water and groundwater investigations were adequate to assess the identified contaminants of potential concern.

The contamination identified at the site based on the PSI and DSI relates to hazardous building materials (asbestos), petroleum hydrocarbons related to minor leakage from a fuel storage drum, hydrocarbons, copper and zinc associated with the electrical transformer on Lot 54 and zinc probably from galvanised building or fencing materials.

The proposed analyte list for waste classification and validation samples included in the RAP is also consistent with the identified contaminants of concerns.

5. STRATIGRAPHY, HYDROLOGY AND HYDROGEOLOGY

5.1 Stratigraphy

The regional topography consists of a gentle gradient southwest towards Kemps Creek. The site has an elevation of between approximately 40 to 50 m Australian Height Datum. The site is within a generally flat alluvial plain with localised undulating rises/falls, generally sloping toward Kemps Creek to the west.

The site is predominantly underlain by Bringelly Shale which forms the upper formation of the Wianamatta Group. Other units which may be encountered across site include Quaternary fluvial sand, silt and clay (around existing and old creeks and waterways), surficial topsoil and residual clays (derived from weathering of shale bedrock).

Soil identified across the site during investigations was described by JBS&G and Arcadis as red/brown and grey mottled clays grading to weathered shale at depth. Natural soil is expected across the majority of the site, with the exception of fill materials associated with raised landforms, tilled market gardens (historic and current), gravelled roadways and dam embankments (re-worked natural soil).

Fill materials were observed to an approximate depth of 0.3 m and consisted of heterogeneous red/brown clay with inclusions of crushed concrete, brick, terracotta, minor timber and bitumen fragments resultant from importation, stockpiling and spreading activities in Lot 57.

Loose gravelly red brown clays with inclusions of lithic angular igneous gravels, minor concrete and terracotta/brick were associated with base coarse and/or gravelled driveways.

Reworked natural materials were observed within dam embankments and within the exposed soil of the raised landform (Lot 54). Reworked natural materials forming embankments and landforms were observed to be raised to a maximum of approximately 5 m above the natural grade. Reworked natural materials (tilled soils) were also associated with existing and historic market gardens to depths of approximately 0.5 m. Minor fragments of black plastic sheeting and white PVC pipe were associated with these areas.

5.2 Hydrology

Surface water features are shown on Attachment 3, Appendix A.

Five dams are located across the site and were predominately utilised for stock watering and irrigation. The dams are constructed along a natural watercourse.

The site is predominately surfaced with grass cover and surface water generated during periods of rainfall is likely to infiltrate the ground surface or result in overland flow into onsite dams and ultimately towards Kemps Creek, following the topographic gradient. Kemps Creek is the closest surface water body, located approximately 600 m southwest of the site. Kemps Creek traverses to the northwest, joining South Creek approximately 900 m west of the site before discharging into the Hawksbury River located approximately 26 km to the north of the site.

5.3 Hydrogeology

Groundwater was encountered during the DSI within the shale between depths of 6.0 m and 11.5 m in a confined aquifer. Standing water levels were measured at between 2.5 to 9.5 m. The groundwater flow direction was interpreted to be to the northwest, towards South Creek.

Typically, the Bringelly Shale yields low volumes of saline groundwater, which is consistent with groundwater physico-chemical observations from the DSI (salinity ranged between approximately 14,000 to 25,000 µS/cm).

Registered bore information from the NSW Office of Water reported in the PSI and DSI identified that there were no groundwater bores located within a 2 km radius of the site.

5.4 Auditor's Opinion

The stratigraphy, hydrology and hydrogeology were adequately characterised for the purpose of the Audit.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the contamination data by review of the information presented in the PSI and DSI, supplemented by field observations. The data sources are summarised in Table 6.1.

Table 6.1: Summary of Investigations

Stage of Works	Field Data	Analytical Data
PSI *Fieldwork: November 2018 to January 2019* Attachment 5, Appendix A	*Soil* 29 boreholes (HA01-22, BH01-07) 2 test pits (TP01-02) 7 stockpile samples (SP01-06, Stockpile). 3 fragments ACM (Frag01-03) *Dam Water* 1 dam water (pond)	*Soil* Metals, TRH, BTEXN, PAHs, OCPs, PCBs, hexachlorobenzene, asbestos *TCLP* Metals, PAHs (1 sample only HA15) *Dam Water* Metals, TRH, BTEXN, OCPs, hexachlorobenzene
DSI *Fieldwork: October to November 2019* Attachments 6 to 9, Appendix A	*Soil* 15 test pits (TP101-115) 6 boreholes (MW01-06) 5 surface soil samples near timber posts (SO01-05) 2 hand auger soil samples (0.05 m and 0.2 m) near each of HA01, HA06 and HA18 to vertically delineate heavy metal EIL exceedances recorded in the PSI. 6 hand auger samples (up to 0.8 m) from two soil boreholes (HA15B and HA15C) to vertically delineate TRH contamination recorded at HA15 during the PSI. 4 fragments (ACM) (ASB01-04) *Groundwater* 6 monitoring wells (MW01-06) *Dam Water* 5 dam water (Dam01-05) *Dam Sediment* 5 sediment (DS01-05)	*Soil* Metals, TRH, BTEXN, PAHs, OCPs, OPPs, PCBs, phenolics *Timber Post Soil* Metals, copper chrome arsenate, creosote, phenols *Groundwater* Metals, TRH, BTEXN, PAHs, OCP, OPPs, PBCs, phenolics, SVOCs *Dam Water* Metals, TRH, BTEXN, PAHs, OCP, OPPs, PBCs, phenolics *Dam Sediment* Metals, TRH, BTEX, PAH, OPP, OCPs, PBCs

The Auditor's assessment of data quality follows in Tables 6.2 and 6.3.

Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Data Quality Objectives (DQO) Specific DQOs were defined for the PSI, DSI and the RAP. The DQOs for the RAP are summarised as follows: 1. Remediation is required prior to the site being redeveloped into an industrial estate. 2. Do the validation results meet the adopted remediation criteria? Have remediation works met the remediation objectives and achieved the desired outcome for the proposed industrial/commercial land use? 3. Field investigation including validation sampling and data for remediated areas to assess if contamination has been	The proposed data gap assessment, remediation and validation in conjunction with the UFP and IFP to be implemented during bulk earthworks should be adequate to render the site suitable for the proposed use. The DQOs are adequately consistent with this.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
managed in accordance with the adopted remediation criteria and site remediation objectives. 4. Study boundaries are the remediation areas within the site. 5. Concentrations of contaminants of concern are to be below the relevant adopted guidelines. 6. Specific DQIs stated. 7. Remediation design and sampling in accordance with guidance.	
Sampling pattern, locations, density, depth and methodology *PSI* Sample locations for the PSI were selected to target areas of potential environmental concern based on historical/current land use and field observations. They were manually advanced using hand tools and soil samples were collected at regular intervals from the surface soils (<0.1 m) to a maximum depth of 0.3 m below ground level (bgl). Two test pits were advanced by excavator and soil samples were collected directly from the bucket of the excavator at regular intervals from the surface soils (<0.1 m), 0.3 m, 0.5 m then at every meter interval to maximum depth of 3.1 mbgl. Seven samples were collected from stockpiled material observed during the investigation and were obtained from approximately 0.2 m into the stockpile surface. The surface water sample was collected from the dam on Lot 58. *DSI* Sample locations for the DSI were also based on a judgemental approach. Test pit and monitoring well locations were selected to assess data gaps for soil and groundwater which were identified from the PSI. The locations also provided general coverage. Seven of the test pits were excavated within Lot 57 to assess the spread fill material, the dam embankment and to provide coverage. The remainder were located across Lots 54 to 56 to assess dam embankments, market garden areas, the poultry sheds, stockpiled material and to provide coverage. Test pits were excavated to 0.5 m into natural material or a maximum depth of 3 m. Soil samples were collected from the bucket of the backhoe at regular intervals (0.2 m, 0.5 m and 1.0 m) at each location with additional samples at changes of lithology, water strike or if signs of contamination were detected. One 10 L sample from test pit locations (0 to 0.1 m) and additional sub-surface samples where contamination was suspected, were collected for assessment of ACM. The six monitoring wells were installed to target site features and to provide coverage as follows: • MW01 – north-western corner of the site to assess local groundwater conditions near a shed where chemical storage has historically taken place • MW02 - north-eastern corner of the site to assess local groundwater conditions • MW03 - near the transformer and chicken farm area in the south-western corner of the site • MW04 - adjacent DAM02 to the south on Lot 56, and in close proximity to a petroleum drum identified in the PSI. • MW05 – near PSI sample 'HA15', which was noted to have TRH exceedances of ESL criteria. This sample was taken to assess if TRH from a nearby oil drum had impacted groundwater. • MW06 – near the eastern edge of the site to assess local groundwater conditions. Soil samples from boreholes were collected at regular intervals from auger flights (surface, 0.5 m, 1.0 m, 1.5 m, 2.0 m, and at 1.0 m intervals thereafter). Soil samples from hand augers were collected at 0.05 m and 0.2 m. Sediment and dam water samples were collected from the outer edge of each on site dam. A decontaminated spatula was used to loosen	The sampling pattern, locations, density and depths were adequate to inform an adequate scope of works to address data gaps and to inform the remedial framework. The sampling locations of the PSI and DSI targeted potential sources of contamination and were not systematic. The lower sampling density is therefore considered acceptable to identify and quantify the most significant contamination based on the site use and history. The RAP and UFP are appropriate to address unidentified contamination during remediation and bulk earthworks.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
sediment from the surface and placed into laboratory supplied sample containers. Dam water samples were collected using a laboratory supplied sample container attached to a sampling pole and lowered upside down into the surface water. The container was rotated and brought up through the water column. The overall soil sampling density during the PSI and DSI comprised 57 locations over an area of 56.3 ha. The density is significantly less than the minimum number of sampling points proposed in the NSW EPA (1995) *Sampling Design Guidelines* for detection of hot spots using a systematic sampling pattern.	
Well construction and sampling methodology The groundwater monitoring wells were installed at a depth of ~8 to 12 m with 3 m of screen within shale or residual clay. They were constructed using Class 18 PVC pipe, 50 mm tubing, factory slotted screens with blank casing. The annulus around the screen was backfilled with a gravel filter pack to ~0.25 m above the top of the screen and sealed with bentonite. The wells were developed using a stainless-steel bailer and Wattera foot valve until the majority of sediment was removed. Where practicable, a minimum quantity of three casing volumes of water was removed and the water was confirmed to be low in suspended solids. The well was then left to stabilise (seven days) prior to purging and sampling. Wells were gauged using an interface probe and purged and sampled using new clean dedicated LDPE tubing and a low flow peristaltic pump to ensure minimal loss of VOCs. The wells were purged until recorded water quality parameters stabilised.	Adequate
Decontamination procedures Non-disposable sampling equipment was decontaminated between each sample location. New nitrile gloves were utilised for the collection of each soil sample to avoid cross contamination between samples and locations.	Acceptable
Sample handling and containers Samples were collected into laboratory supplied containers and were transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratories. Chain-of-custody forms was completed and forwarded with the samples to the testing laboratory. Groundwater samples for dissolved metals analysis were filtered in the field using a 0.45 micron filter and placed into a preserved laboratory supplied sample bottle.	Acceptable
Chain of Custody (COC) Completed COCs were provided.	Acceptable
Detailed description of field screening protocols and calibration Soil samples collected for the PSI and DSI were screened on site using a photo-ionisation detector (PID) to assess the potential presence of VOCs including petroleum hydrocarbons. Samples obtained for PID screening were placed in a sealed plastic bag prior to a PID being attached to the bag. The PIDs were calibrated. PID screening results were recorded on the bore logs. The physico-chemical parameters of groundwater were recorded using a calibrated YSI water quality meter. Calibration certificates were provided in the PSI and DSI.	Acceptable
Sampling logs Soil logs are provided within the PSI and DSI, indicating sample depth, PID readings and lithology. Field observations were described in the reports.	Adequate.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Groundwater and surface water field sampling records were provided. Field sheets for asbestos bulk screening were provided.	

Table 6.3: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Auditor's Opinion
Field quality control samples and results For the PSI, Field duplicates and triplicates were analysed at a rate of 1/15 primary samples. Rinsate samples were obtained from all reusable sampling equipment per day of sampling, and trip spike and trip blank samples accompanied the soil samples for each batch of samples submitted to the laboratory. For the DSI, two intra-laboratory and two inter-laboratory samples, collected at the rate of 1:20, as well as a trip blank, trip spike and equipment rinsate sample were sent with samples and analysed for selected analytes. Results were within acceptable control levels with some minor non-conformances relating mostly to sample heterogeneity.	Acceptable. The minor non-conformances did not have a material bearing on the outcomes.
NATA registered laboratory and NATA endorsed methods Eurofins | MGT (Eurofins) as the primary laboratory all analyses. The secondary laboratory was Envirolab Services Pty Ltd (Envirolab).	Acceptable
Analytical methods Analytical methods were included in the laboratory test certificates.	Acceptable
Holding times Most samples were analysed within holding time. Some breaches for SVOCs were reported by the secondary laboratory for the DSI for one batch due to being one day late for extraction.	The holding time breaches were minor and did not have a material bearing on outcomes.
Laboratory Limits of Reporting (LORs) The LORs were below the assessment criteria for the key contaminants of concern.	Acceptable
Laboratory quality control samples and results Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks, internal standards and duplicates were undertaken by the laboratory. Non-conformances were reported for some samples. These non-conformances were sporadic and minor and were not considered to be indicative of systematic sampling or analytical errors.	Acceptable. The non-conformances did not have a material bearing on outcomes.
Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy) An assessment of QA/QC was undertaken for the PSI by review of DQIs. It was concluded *"…that the field sampling, inspection and handling procedures produced QA/QC results which indicated that the data set is of an acceptable quality and suitable for use in site characterisation. The NATA certified laboratory results indicate that the project laboratories were generally achieving levels of performance within their recommended control limits during the period when the samples from this program were analysed. On the basis of the results of the field and laboratory QA/QC program, the data set is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the assessment area."* The DSI reviewed the various aspects of the field and laboratory QA/QC and concluded: *"Documentation completeness: – Soil logs, chain-of-custody forms, calibration were complete and appropriate. Data completeness: – Samples were received by the laboratories and analytical results reported including laboratory QA/QC. Data comparability: – Arcadis standard operating procedures, Australian Standards and industry recommended practice were followed during sampling;* *Consistent field conditions and similarly trained staff were used during sampling; and – The limits of reporting are appropriate and generally consistent*	An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.

Field and Lab QA/QC	Auditor's Opinion
from each laboratory. Data representativeness: – The frequency of laboratory blanks was acceptable, and the results were within specified ranges. Precision: – Intra-laboratory and inter-laboratory duplicates were collected at the following rates: Soil intra-laboratory and inter-laboratory duplicates were collected at a frequency of 1:20. Surface water/groundwater intra-laboratory and inter-laboratory duplicates were collected at a frequency of 1:9. QA/QC sample collection rate follows the guidance provided in the Australian Standard Field procedures (AS1482.1 2005)."	

Auditor's Opinion

In considering the site history and the proposed remediation and bulk earthwork activities, the data are considered to be adequately precise, accurate, representative, comparable and complete to inform the remedial strategy.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the results against Tier 1 criteria from National Environmental Protection Council (NEPC) *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as Amended 2013 (NEPM, 2013). Other guidance has been adopted where NEPM (2013) is not applicable or criteria are not provided.

The development is considered to comprise a commercial/industrial exposure scenario and includes significant cut and fill earthworks as described in Section 2.5 and shown on Attachment 4, Appendix A.

7.1 Soil and Dam Sediments

The Auditor has assessed the soil and dam sediment data with reference to the following criteria:

- Human Health Assessment
  - Health Based Investigation Levels (HIL D).
  - Soil Health Screening Levels (HSL D) for Vapour Intrusion. The most conservative criteria were adopted i.e. assumed depth to source <1 m and sand.
  - Limit of reporting (LOR) has been adopted as an initial screen for some organic contaminants.
- Terrestrial Ecological Assessment
  - Ecological Screening Levels (ESLs).
  - Ecological Investigation Levels (EILs). The PSI used site specific soil data on pH, clay content, cation exchange capacity and background concentrations to calculate site specific EILs. These were also adopted for the DSI and are summarised in Table 8.1.
  - Canadian Council of Ministers of the Environment (CCME) (2010) *Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs)* soil quality guideline (SQG) for benzo(a)pyrene for 'Commercial/Industrial' land use. The SQG has been adopted in place of the NEPM (2013) ESL as it is based on a larger and more up-to-date toxicity database than the low reliability NEPM (2013) ESL.

7.2 Groundwater and Dam Water

The Auditor has assessed the groundwater data with reference to the following criteria:

- Human Health Assessment
  - NEPM (2013) HSLs for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a clay soil type and a depth to groundwater of 4 to <8 m.
  - NHMRC (2011) *National Water Quality Management Strategy, Australian Drinking-Water Guidelines* (ADWG), Version 3.5 Updated August 2018.
  - NHMRC (2008) *Guidelines for Managing Risks in Recreational Water* (GMRRW). The GMRRW indicates that a qualitative assessment of recreational use can be undertaken using 10 times the concentrations of chemicals stipulated in the ADWG. This is based on an assumed contribution for swimming equivalent to 10% of drinking water consumption. This adjustment only accounts for a reduced intake of groundwater, and therefore can only be applied to criteria derived based on health considerations and cannot be applied to criteria derived for aesthetic reasons (e.g. copper). The adjustment should also not be applied to volatile compounds (e.g. benzene) where inhalation is the primary pathway of concern. Where a 'health-based' and an 'aesthetic-based' criteria is provided, the 'health-based' criteria was adopted.

- Ecological Assessment
  - ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (www.waterquality.gov.au/anz-guidelines). Criteria for freshwater and 95% level of protection were adopted.

7.3 Auditor's Opinion

The criteria adopted by the Auditor were largely consistent with those adopted for the PSI and DSI. However, the DSI assessed the dam sediment results against ANZG (2018) Interim Sediment Quality Guideline Trigger Values which are more conservative. However, as the dams are to be decommissioned and the sediment is to be dried and reused on site, the Auditor assessed the sediment data against the soil criteria. The DDS also referred to use of soil criteria to assess the sediments. This discrepancy in adopted sediment criteria did not affect the overall conclusions reached by Arcadis and the Auditor.

8. SUMMARY OF SOIL AND DAM SEDIMENT INVESTIGATION RESULTS

8.1 Soil

Soil analytical results from the PSI and DSI have been assessed against the environmental quality criteria and are summarised in Table 8.1. Soil sampling locations are shown as Attachments 5 and 6, Appendix A.

Table 8.1: Soil Investigation Analytical Results

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Ecological Screening
Asbestos from FA & AF (~500 mL)	22	0	ND	0 above HSL of 0.05 %w/w	-
Asbestos from ACM (~500 mL)	22	1	0.0003%w/w	0 above HSL of 0.001%w/w	-
Benzene	63	0	<0.1	0 above HSL D 0-1 m, sand 3 mg/kg	0 above ESL of 75 mg/kg
Toluene	63	0	<0.1	0 above HSL D 0-1 m, sand NL	0 above ESL of 135 mg/kg
Ethylbenzene	63	0	<0.1	0 above HSL D 0-1 m, sand NL	0 above ESL of 165 mg/kg
Total Xylenes	63	0	<0.3	0 above HSL D 0-1 m, sand 230 mg/kg	0 above ESL of 180 mg/kg
Naphthalene	71	2	37	0 above HSL D 0-1 m, sand NL	0 above Generic EIL of 370 mg/kg
F1 (TRH C_6–C_{10} minus BTEX)	63	0	<20	0 above HSL D 0-1 m, sand 260 mg/kg	0 above ESL of 215 mg/kg
F2 (TRH >C_{10}–C_{16} minus naphthalene)	63	3	**19,000**	0 above HSL D 0-1 m, sand NL	**3 above ESL of 170 mg/kg**
TRH C_6–C_{10}	63	0	<20	0 above ML of 700 mg/kg	-
TRH >C_{10}-C_{16}	63	3	**19,000**	**2 above ML of 1,000 mg/kg**	**-**
TRH >C_{16}-C_{34}	63	15	**48,000**	**1 above ML of 3,500 mg/kg**	**3 above ESL of 1,700 mg/kg**
TRH >C_{34}-C_{40}	63	5	440	0 above ML of 10,000 mg/kg	0 above ESL of 3,300 mg/kg
Benzo(a)pyrene TEQ	65	1	2.6	0 above HIL D 40 mg/kg	-
Benzo(a)pyrene	65	2	1.5	-	0 above CCME SQG (commercial/industrial) 72 mg/kg
Total PAHs	65	6	38	0 above HIL D 4,000 mg/kg	-
Arsenic	66	63	21	0 above HIL D 3,000 mg/kg	0 above Generic EIL of 160 mg/kg
Cadmium	66	2	1.5	0 above HIL D 900 mg/kg	-
Chromium	66	65	50	0 above HIL D 3,600 mg/kg	0 above EIL of 321 mg/kg

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Ecological Screening
Copper	66	66	**900**	0 above HIL D 240,000 mg/kg	**2 above EIL of 108 mg/kg**
Lead	66	65	270	0 above HIL D 1,500 mg/kg	0 above EIL of 1,961 mg/kg
Mercury	66	1	0.1	0 above HIL D 730 mg/kg	-
Nickel	66	64	44	0 above HIL B 6,000 mg/kg	0 above EIL of 60 mg/kg
Zinc	70	70	**520**	0 above HIL B 400,000 mg/kg	**5 above EIL of 215 mg/kg**
PCB	17	0	<5	0 above HIL D 7 mg/kg	-
OCPs	43	0	<0.1	0 above LOR	0 above Generic EIL for DDT of 640
OPPs	17	0	<0.2	0 above LOR	-
Hexachlorobenzene	38	0	<0.05	0 above LOR	-
Phenols	3	0	<LOR	0 above LOR	-

n number of samples
- No criteria available/used
<LOR Less than the limit or reporting

Fill materials comprising both imported gravels and soil associated with structural base coarse and/or road base were identified within four boreholes (HA02, HA07, HA10 and HA18).

Fill materials containing anthropogenic inclusions of unknown origin were observed in several stockpiles and at eight locations across a large portion of Lot 57 (HA19, HA20, HA21, HA22, TP101, TP102, TP103 and TP113). Fill was observed to a depth of up to 0.5 m and was associated with the uncontrolled import and spreading of materials. No ACM was observed within the fill, however, two fragments of suspected ACM were observed on the ground surface near HA20.

Fill materials containing road base were observed in TP104 to a depth of 0.3 m between the poultry sheds on Lot 54. This did not appear to be associated with elevated concentration of contaminants. Potential ACM fragments were noted by the Auditor on the ground surface to the east of the poultry sheds during the site inspection.

The HMS identified site structures containing ACM on all Lots. Chrysotile asbestos as fibrous asbestos (FA) with a total estimated asbestos concentration of 0.00032 % w/w was detected in the surface soil sample collected from location HA13 0-0.1, which was located adjacent to a shed on Lot 56.

Localised odorous and stained soils were observed during site investigations at two locations in the vicinity of a leaking petroleum drum (HA15) and an electrical transformer (HA01). An elevated concentration of TRH F2 of 19,000 mg/kg was reported in soil sample HA15 0-0.1m, which was collected from surface soils underlying the drum. This concentration exceeded the adopted ESL and management limit. The impact is considered to be highly localised to the area of the drum. Slightly elevated concentrations of copper, lead, and zinc (above EILs) and low concentrations of heavy TRH close to the LOR were reported in the sample from the staining near the transformer.

A small number of other minor zinc impacts to surface soils were also identified.

An ACM conduit approximately 400 m in length was identified on Lot 56 by the client. The location and known extent of the conduit is shown on Attachment 10, Appendix A.

Auditor's Opinion

The results are consistent with the site history and field observations. An asbestos pipe and minor areas of impact associated with building materials, uncontrolled fill, a leaking drum and transformer have been identified. Remediation is proposed for these areas. Data gaps associated with the building footprints are to be assessed and any further remediation requirements determined. This is considered a reasonable approach.

8.2 Dam Sediment

Sediment analytical results from the DSI have been assessed against the environmental quality criteria and are summarised in Table 8.2 (including duplicates). Soil sampling locations are shown as Attachment 8, Appendix A.

Table 8.2: Dam Sediment Investigation Analytical Results

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Ecological Screening
BTEXN	7	0	<LOR	0 above HSL D	0 above ESL
TRH	7	0	<LOR	0 above HSL D/ML	0 above ESL
PAHs	7	0	<LOR	0 above HIL D	0 above CCME SQG
Arsenic	7	7	22	0 above HIL D 3,000 mg/kg	0 above Generic EIL of 160 mg/kg
Cadmium	7	0	<1	0 above HIL D 900 mg/kg	-
Chromium	7	7	66	0 above HIL D 3,600 mg/kg	0 above EIL of 321 mg/kg
Copper	7	7	59	0 above HIL D 240,000 mg/kg	0 above ACL of 108 mg/kg
Lead	7	7	53	0 above HIL D 1500 mg/kg	0 above EIL of 1961
Mercury	7	0	<0.1	0 above HIL D 730 mg/kg	-
Nickel	7	7	41	0 above HIL B 6,000 mg/kg	0 above EIL of 60 mg/kg
Zinc	7	7	120	0 above HIL B 400,000 mg/kg	0 above EIL of 215 mg/kg
PCB	6	0	<0.5	0 above HIL D 7 mg/kg	-
OCPs	7	0	<1	0 above LOR	0 above Generic EIL for DDT of 640 mg/kg
OPPs	7	1	0.2	0 above HIL D	-
Hexachlorobenzene	7	0	<0.05	0 above LOR	-
Herbicides	6	0	<LOR	0 above LOR	-

n number of samples
- No criteria available/used
<LOR Less than the limit or reporting

Auditor's Opinion

Dam sediments do not appear to have been significantly impacted by site activities. A minor detection of the OPP Disulfoton was detected in sediment from Dam 2 on Lot 56. The detection was equal to the LOR.

The DSI states additional sediment sampling is recommended to be conducted once dams have been dewatered to appropriately characterise the material. It is understood that dam sediments

are to be landfarmed to removed water and then reused onsite. Details of the process and sampling are provided in the RAP and the DDS.

8.3 Leachate

A toxicity characteristic leaching procedure (TCLP) was completed on one surface soil sample, HA15 (0-0.1 m), collected from the minor area of staining near the leaking fuel drum. Analysis of the leachate from this sample for metals and PAHs indicated some minor leachability of zinc and PAHs.

Auditor's Opinion

The area of impacted soils surrounding HA15 is proposed to be remediated which would remove the impacted soil and any associated leaching potential. The TCLP results are not representative of site conditions given the use of an acidic leaching procedure, however suggest that significant migration of contamination is unlikely.

9. SUMMARY OF GROUNDWATER AND DAM WATER RESULTS

9.1 Groundwater

Groundwater samples were collected from six groundwater monitoring wells during the DSI. These samples were analysed for metals, TRH, BTEX, PAHs, phenols, PCBs, OCPs, OPPs, halogenated benzenes and SVOCs. Monitoring well locations are shown on Attachment 7, Appendix A.

Analytical results for contaminants were below the LOR with the exception of metals which are summarised in Table 9.1 and a minor detection of heavy end TRH in MW03 of 70 µg/L.

Table 9.1: Summary of Groundwater Results (µg/L)

	ANZG	ADWG	ADWG x10	n	Detection	Maximum	
Arsenic	13	10	100	8	3	4	0 above criteria
Cadmium	0.2	2	20	8	2	**0.3**	**1 above ANZG**
Chromium	1	50	500	8	0	<1	0 above criteria
Copper	1.4	200	2000	8	1	**2**	**1 above ANZG**
Lead	3.4	10	100	8	0	<1	0 above criteria
Mercury	0.1	1	10	8	0	<0.1	0 above criteria
Nickel	11	20	200	8	6	9	0 above criteria
Zinc	8	-	**-**	8	6	**47**	**4 above ANZG**

\- No criteria adopted
Bold exceeds criteria

Auditor's Opinion

Results are low and consistent with expected background conditions. The groundwater data indicates groundwater has not been significantly impacted by site activities. No further assessment of groundwater is considered necessary with respect to the Audit.

9.2 Dam Water

A sample of water from each of the five dams (DAM01-05) was collected during the DSI and one from DAM01 was collected during the PSI. These samples were analysed for metals, TRH, BTEX, PAHs, phenols, PCBs, OCPs, OPPs and hexachlorobenzenes. Analytical results were below the LOR in all samples, with the exception of arsenic and nickel which were low and close to the LOR. Concentrations of arsenic ranged from 0.001 to 0.002 mg/L which were well below ANZG (2018) of 0.013 mg/L and the ADWG of 0.01 mg/L. Concentrations of nickel ranged from <0.001 to 0.002 mg/L which were well below ANZG (2018) of 0.011 mg/L and the ADWG of 0.02 mg/L.

Auditor's Opinion

Results are low and consistent with expected background conditions. Results did not indicate significant contamination to dam water from site activities. The DDS is to be implemented along with the UFP procedure during dewatering of the dams during development.

10. REMEDIATION REQUIREMENTS

10.1 Conceptual Site Model

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. CSMs were developed in the investigation reports. A CSM was developed as part of the DSI and was updated in the RAP based on the results of the investigation outcomes to summarise the potential source-receptor pathways that may exist on or off site and which are deemed to pose a potential risk to the environment or human health.

Sources with potentially complete pathway and receptor linkages to humans or terrestrial ecology were identified in the RAP and have been grouped by the Auditor as follows:

- Remediation required
  - Localised heavy end petroleum hydrocarbon impact beneath a leaking fuel drum (HA15)
  - Slightly elevated metals (zinc) exceeding ecological criteria at various locations
  - Localised black staining and elevated TRH, copper and zinc concentrations beneath transformer (HA01)
  - Fragments of asbestos containing materials on site surface
  - Asbestos building materials
  - Buries asbestos pipe
- Further Assessment Required
  - Building footprints
  - Dam sediments
- Potential for Unexpected Finds
  - Associated with storage of various materials (such as fuel drums)
  - Associated with the fill across lot 57 – potential aesthetic risk, potential for unidentified ACM
  - Possible waste disposal/burials.

Auditor's Opinion

The CSM presented in the RAP provided a reasonable representation of potential risks and was sufficient to inform a remedial framework that is consistent with the objectives for the site.

10.2 Proposed Remediation

A summary of proposed remedial actions presented in the RAP is provided in Figure 10.1. The remediation areas are shown on Attachment 10, Appendix A.

Contaminant	Location	Preferred remediation option
Cu	HA01	Excavate material, blend with stripped topsoil and re-use on site as first fill layer within NW corner of proposed Lot 1, under 8 – 10m of imported fill.
Zn	HA01, HA06, HA08, HA13, HA18, SO01 and SO03	
TRH	HA15	Excavate, collect additional waste classification samples and dispose offsite as hazardous waste or restricted waste.
Asbestos pipe	Lot 56 and 57	Excavate and dispose off site as special waste.
Surface ACM fragments	ASB01, ASB02, ASB04 PACM soil surface around buildings	Environmental Scientist to conduct via Emu bob and licenced asbestos removalist to disposal of ACM offsite.
Hazardous building material –including ACM cladding, lead paint, SMF	Existing buildings/structures – Lots 54-58	Engage HAZMAT specialist to removal HAZMAT from buildings prior to demolition and validate footprints post demolition.
Building footprints – non-hazardous material	Existing buildings/structures – Lots 54-58	Validation soil sampling post demolition, pre cut/fill works.

Figure 10.1: Summary of Proposed Remedial Actions (Source: RAP)

Auditor's Opinion

The proposed remedial framework is consistent with the CSM. The RAP, if implemented competently along with the IFP and UFP during earthworks, should be sufficient to render the site suitable for the proposed land use. A report is to be prepared after completion of investigations associated with the building footprints identifying any associated further remedial actions. Further assessment of the dam sediments is required to confirm they are suitable for use on site.

10.3 Proposed Validation

A summary of proposed validation activities presented in the RAP is provided in Table 10.1.

Table 10.1: Summary of Proposed Validation Activities

Remediation Area	Proposed Validation
Cu and Zn Hotspots (HA01, HA06, HA08, HA13, HA18, SO01 and SO03)	• Visual inspection. • A minimum of two soil samples will be collected from the remediation surface and submitted for Zn analysis. Cu will also be analysed at HA01.
TRH hotspot (HA15)	• Visual inspection. • A minimum of two samples from the remediation surface (depth of excavation ~0.8 m). Approximately two samples from each wall of the excavation at a depth of approximately 0.0 and 0.5, targeting areas of concern or with higher PID readings or residual staining. Samples to be analysed for TRH. • Once stockpiled TRH impacted material has been appropriately classified and disposed offsite, the underlying soil should be validated to verify no cross-contamination occurred. • A minimum of two samples analysed for TRH.
Asbestos pipe	• Validation sampling in accordance with the WA DOH (2009) asbestos guideline. As the ACM pipe is believed to be within natural material, validation by visual inspection is recommended. • In the event the base or walls of the excavation are suspected of containing ACM, validation sampling at a rate of at least one sample per 5 m length is recommended. • Validation sampling is to include 10 L bulk screening and 500 mL sample for asbestos.

Remediation Area	Proposed Validation
	• The number of samples submitted for analysis is to be determined based on material encountered during test pitting and using judgemental sampling taking into consideration Table A of the NSW EPA (2015) *Sampling Design Guidelines*. • Remediation/loading zones to be remediated and validated via hand picking, with raking if deemed necessary. The surface is to be free of ACM. • Air quality monitoring during works.
Surface ACM fragments (ASB01, ASB02 and ASB04; building footprints, building surroundings)	• Where hand picking surface fragments has been completed, 10 L bulk screening and 500 mL sample for asbestos will be collected. • Number of samples submitted for analysis to be determined based on material encountered during test pitting and using judgemental sampling taking into consideration Table A of the NSW EPA (2015) *Sampling Design Guidelines*.
Hazardous material – including ACM cladding and building footprints	• HAZMAT specialist to conduct clearance testing/report prior to demolition and post demolition (building footprints). Validation sampling to be conducted where soil impact may be present through 10 L bulk screening and 500 mL sample. • Number of samples submitted for analysis to be determined based on material encountered during test pitting and using judgemental sampling taking into consideration Table A of the NSW EPA (2015) *Sampling Design Guidelines*.
Building footprints – non-hazardous material	• Footprint validation sampling will be conducted using judgmental sampling at a density meeting Table A of the NSW EPA (1995) *Sampling Design Guidelines*. • Laboratory analysis will include metals, TRH, BTEXN, PAH, Asbestos (10 L bulk screening and 500 mL laboratory analyses), OCPs and OPPs. • Additional analytes may be assessed based on conditions encountered on site, staining, odours, and/or additional information obtained about the historical usage of the building.
Poultry Sheds (Lot 54)	• In addition to the above 'building footprint' validation requirements, analysis for the presence of pathogens at the poultry shed footprints may be required.
Fill containing anthropogenic material	• Validation sampling will include 10 L bulk screening and 500 mL sample analysis for asbestos. • Number of samples submitted for analysis to be determined based on material encountered during test pitting and using judgemental sampling taking into consideration Table A of the NSW EPA (2015) *Sampling Design Guidelines*. • In the event validation samples exceed the adopted remediation criteria, the lateral and vertical extent of impacted fill material will be delineated. The material is to be appropriately classified and disposed offsite.

Interim validation reports are to be prepared and submitted to the Auditor for review at the follow stages of work:

- Remediation and validation of building footprints.
  - Report is to summarise demolition, remediation and validation sampling conducted for the building footprints as per the RAP.
  - Determine requirement for any additional remediation required post-demolition.
- Post-remediation, prior to commencement of bulk earthworks.
  - Report is to summarise all remediation and validation work conducted at the site.
  - Report should be reviewed by the Auditor prior to the commencement of bulk earthworks.

At the completion of the remediation works a final validation report will be prepared.

Auditor's Opinion

The proposed framework for validation sampling and reporting is reasonable and, subject to competent implementation and completeness of reporting, should be adequate to demonstrate remediation has addressed the objectives for the site. Interim reports are expected as described above.

10.4 Evaluation of RAP

The Auditor has assessed the RAP by comparison with the checklist included in NSW EPA (2020) *Consultants Reporting on Contaminated Land*. The RAP was found to address the required information, as detailed in Table 10.2.

Table 10.2: Auditor Evaluation of RAP

Remedial Action Plan	Auditor Comments
Remedial Goal The objectives are to remediate the site to make it suitable for the proposed industrial land use without the need for a long-term Environmental Management Plan and notification on Title.	Adequate
Discussion of the Extent of Remediation Required Remediation required for each area was discussed within the RAP and is described in Section 10.2 above.	Adequate
Remedial Options Various options were reviewed including: • On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level. • Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site. • Consolidation and isolation of the soil on-site by containment within a properly designed barrier. • Removal of contaminated soil to an approved site or facility, followed, where necessary, by replacement with clean fill • Management strategy.	Adequate
Selected Preferred Option and Rationale The selected preferred options are described in Section 10.2 above Rationale for the preferred option were discussed in the RAP.	The preferred options are consistent with the remedial objectives and would be expected to be achievable
Proposed Remediation/Validation Criteria These are listed in the RAP and are based on: • EILs and ESLs for commercial/industrial land use • HILs and HSLs for commercial/industrial land use including for asbestos • Management limits for commercial/industrial land use • No visible asbestos on ground surface	Adequate
Proposed Validation Strategy The proposed validation strategy is described in Section 10.3 above. In addition, the Validation Report will include: • Details of the remediation works conducted. • Details of the landfill and recycling sites where material has been disposed. • A copy of disposal dockets. • Details of the air monitoring program during remediation of asbestos. • Sample results for waste classification and remediation acceptance criteria. • Documentation confirming earthworks personnel were adequately inducted into the UFP and IFP. • Documentation confirming earthworks personnel were adequately briefed in how to identify potential contamination and the protocol to be implement when potential contamination was identified. • Details of unexpected finds. • If no unexpected finds were encountered, a clear statement is required to that effect. • Inclusion of surveys showing cut and fill thickness across the site, including locations of areas of concern identified. Unexpected find locations encountered during the site works should also be included. • Details of environmental incidents occurring during the remedial works and the actions undertaken in response to these incidents. • Other information as appropriate, including requirements (if any) for ongoing monitoring/ management.	Adequate

Remedial Action Plan	Auditor Comments
• Demonstration that imported fill suitable for use. Importation of fill is to be conducted in accordance with the IFP and is to be VENM, ENM or other suitable material classified under a Resource Recovery Order and Eemption. Proposed management controls include: • Training and induction of site personnel • Materials Tracking Documentation • Material Inspection Prior to Acceptance • Supervision During Unloading and Spreading • Stockpile Management • Identification of Unsuitable Material and Unexpected Finds • Records Keeping	
Interim Site Management Plan (before remediation) No interim management is required.	Adequate
Unexpected Finds The UFP outlines the actions which must be implemented in the event that potentially contaminated materials, waste or asbestos is unexpectedly encountered during bulk earthworks and material importation at the site. Proposed management controls include: • Training and induction of site personnel • Establishment of an exclusion zone • Record on register • Assessment of the find • Remediation and validation • Reporting	Adequate
Staged Progress Reporting Interim reporting is to be prepared as described in Section 10.3. The final validation report is to be completed after bulk earthworks have been undertaken and confirmation that the UFP and IFP were implemented.	Adequate
Site Management Plan (operation phase) A framework for health and safety associated with contamination is provided.	Adequate
Contingency Plan if Selected Remedial Strategy Fails The remedial strategy has a low risk of failure, as validation failure would lead to further excavation. However, should validation be deemed not suitable for the sites intended land uses, the RAP will be required to be revised to manage exposure pathways and potential risks to site users. In this case, other remediation options may need to be considered. Contingency procedures are provided for the unexpected finds.	Adequate
Remediation Schedule and Hours of Operation The RAP states the remediation schedule is to be advised. Hours of operation are stated.	Adequate
Licence and Approvals Soil will be classified, managed, and disposed in accordance with the NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste*. Contractors/workers are to be supervised by an appropriately qualified person as required by the relevant legislation when works involving asbestos impacted materials is expected or identified (i.e. Class-A or Class-B licensed contractor). An appropriately licensed landfill should be selected and the material tracked from the site to the landfill.	Adequate
Contacts/Community Relations Contacts not provided but will be displayed on signs.	Adequate

Auditor's Opinion

The proposed remediation works are appropriate. If adequately implemented, the RAP should be adequate to render the site suitable for the proposed use through further assessment of building footprints, remediation of the identified areas of concern and implementation of the UFP and IFP. Successful validation will be required to confirm this.

11. CONCLUSIONS AND RECOMMENDATIONS

Arcadis concluded in the RAP that "*…the objectives of the onsite remediation will be achieved subject to the successful implementation of the actions contained in the RAP, which will enable the site to be suitable for proposed commercial / industrial land use"*.

Based on the information presented in Arcadis reports and observations made on site, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the site can be made suitable for the proposed 'commercial/industrial' use if remediated in accordance with the following RAP:

- 'Remedial Action Plan, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 3 Final', Arcadis, 15 October 2020.

In the Auditor's opinion the nature and extent of contamination has been broadly characterised for the purpose of developing the remediation framework. The remediation framework provided in the RAP acknowledges that building footprints are required to be assessed after demolition and prior to bulk earthworks with additional remediation and validation being undertaken if required.

The site is large and there may be unidentified structures such as buried pipes containing asbestos, further areas of filling or waste burials. The UFP is considered adequate to manage the associated risks.

It is recommended that interim reports are prepared for Auditor review prior to commencing bulk earthworks documenting the following:

- Assessment of building footprints and identification of any additional areas requiring remediation.
- Validation of the dam sediments for reuse on site prior to placement.
- Validation of the identified remediation areas.

The competent implementation of the RAP, along with the DDS, UFP and IFP, should be adequate to render the site is suitable for the proposed use. Successful validation will be required to confirm this along with appropriate management and assessment of any unexpected finds of contamination and confirmation imported materials are suitable for use.

It is recommended that an Audit be completed at the completion of works assessing the suitability of the site for the proposed land use.

12. OTHER RELEVANT INFORMATION

This Audit was conducted on the behalf of Mirvac Projects Pty Ltd for the purpose of assessing whether the land is suitable for the proposed residential with minimal opportunities for soil access uses i.e. a "Site Audit" as defined in Section 4 (definition of a 'site audit' (b)(v)) of the CLM Act.

This summary report may not be suitable for other uses. The reports listed in Section 1.3 included limitations. The Audit must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

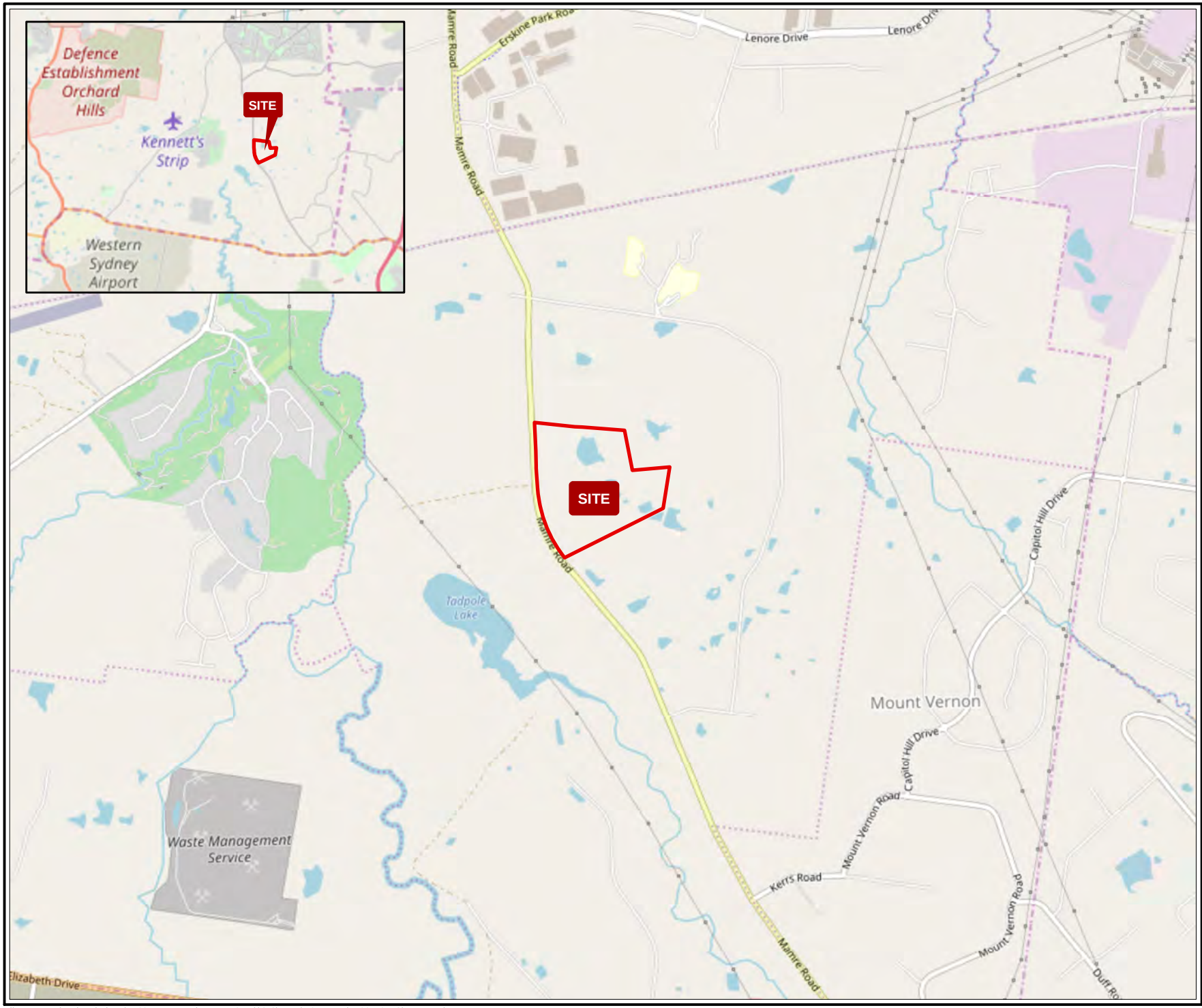
The Auditor has relied on the documents referenced in Section 1.2 of the Site Audit Report in preparing the Auditor's opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in a Site Audit Report to present all data which could be of interest to all readers of this report. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

APPENDIX A
ATTACHMENTS

Attachment 1: Site Location
Attachment 2: Site Layout
Attachment 3: Location of Kemps and South Creeks
Attachment 4: Cut and Fill Contours for Proposed Bulk Earthworks
Attachment 5: PSI Investigation Locations
Attachment 6: DSI Soil Investigation Locations
Attachment 7: DSI Surface Water and Groundwater Investigation Locations
Attachment 8: DSI Sediment Investigation Locations
Attachment 9: DSI Hand Auger Delineation Sample Locations
Attachment 10: Proposed Remediation Excavation Locations

Attachment 1: Site Location



Legend:

Approximate Site Boundary

JBS&G

Job No: 55607	
Client: Mirvac	
Version: R01 Rev A	Date 30/01/2019
Drawn By: AV	Checked By: CK
Scale 1:35,000	

0 420 840

metres

Coord. Sys. GDA 1994 MGA Zone 56

Lot 54-58 DP 259135
Kemps Creek, NSW

SITE LOCATION

FIGURE 1

File Name: N:\Projects\Mirvac\55607 Mamre Rd, Kemps Creek\GIS\Maps\R01 Rev A\55607_01_SiteLoc.mxd

10035157 - Aspect Industrial Estate - Detailed Site Investigation

Legend

- Approximate Extent of Fill
- Elevated Embankment
- Former Chicken Farm Area
- Market Gardens
- Stockpiled Wastes
- Dams
- Creek
- Lot Boundaries
- Site Boundary

1:4,000 at A3

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ARCADIS Design & Consultancy for natural and built assets

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: February 14, 2020

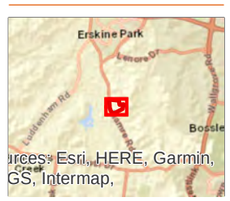


Figure 2a - Site Layout

0 40 80 160 240 320
m

Date: 14/02/2020 Path: H:\AAP_ER_GIS\Projects\10035157\DSI\Figure 2 - Site Layout.mxd
Created by : Environmental Restoration
QA by : Environmental Restoration

10035157 - Aspect Industrial Estate - Detailed Site Investigation

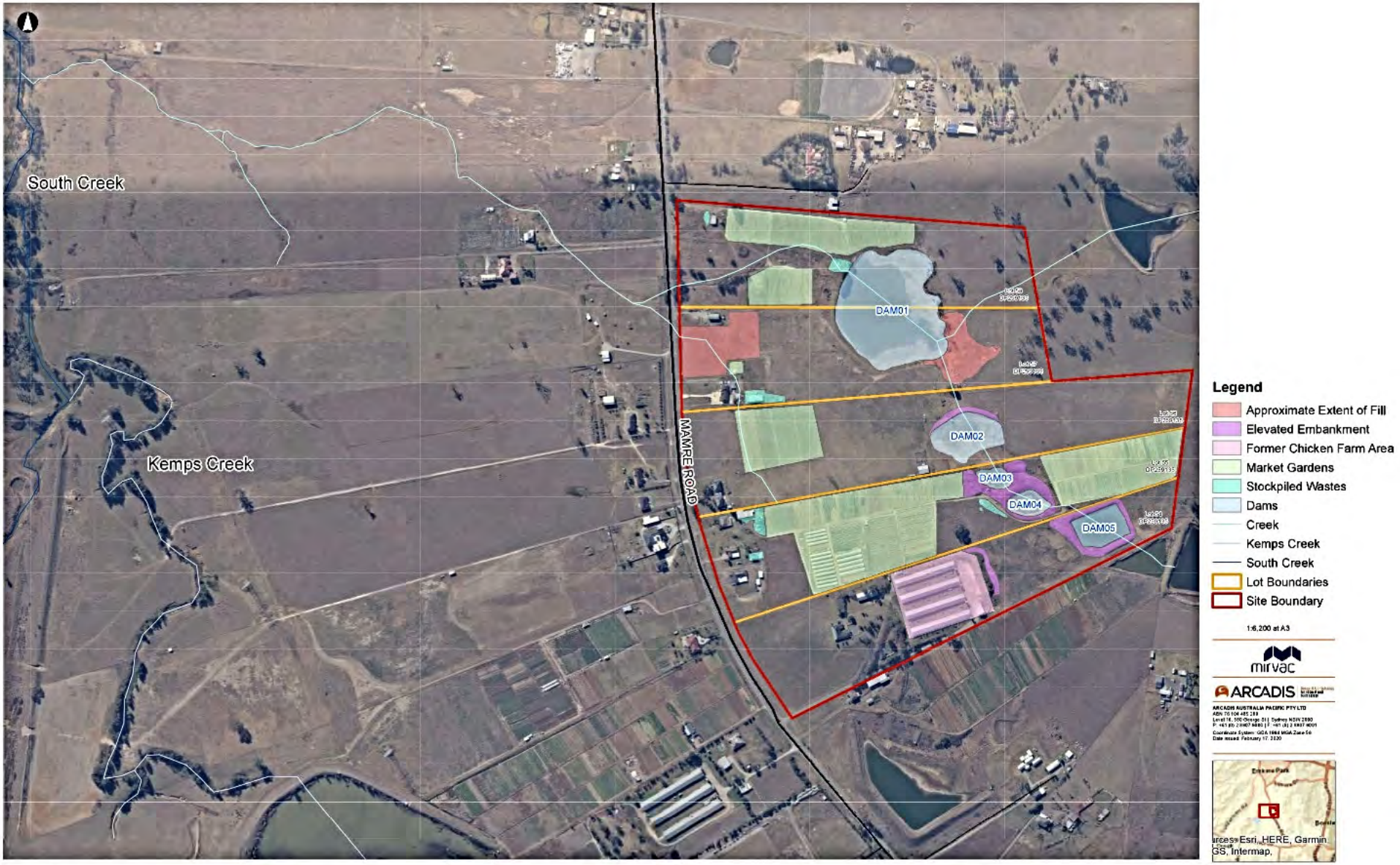
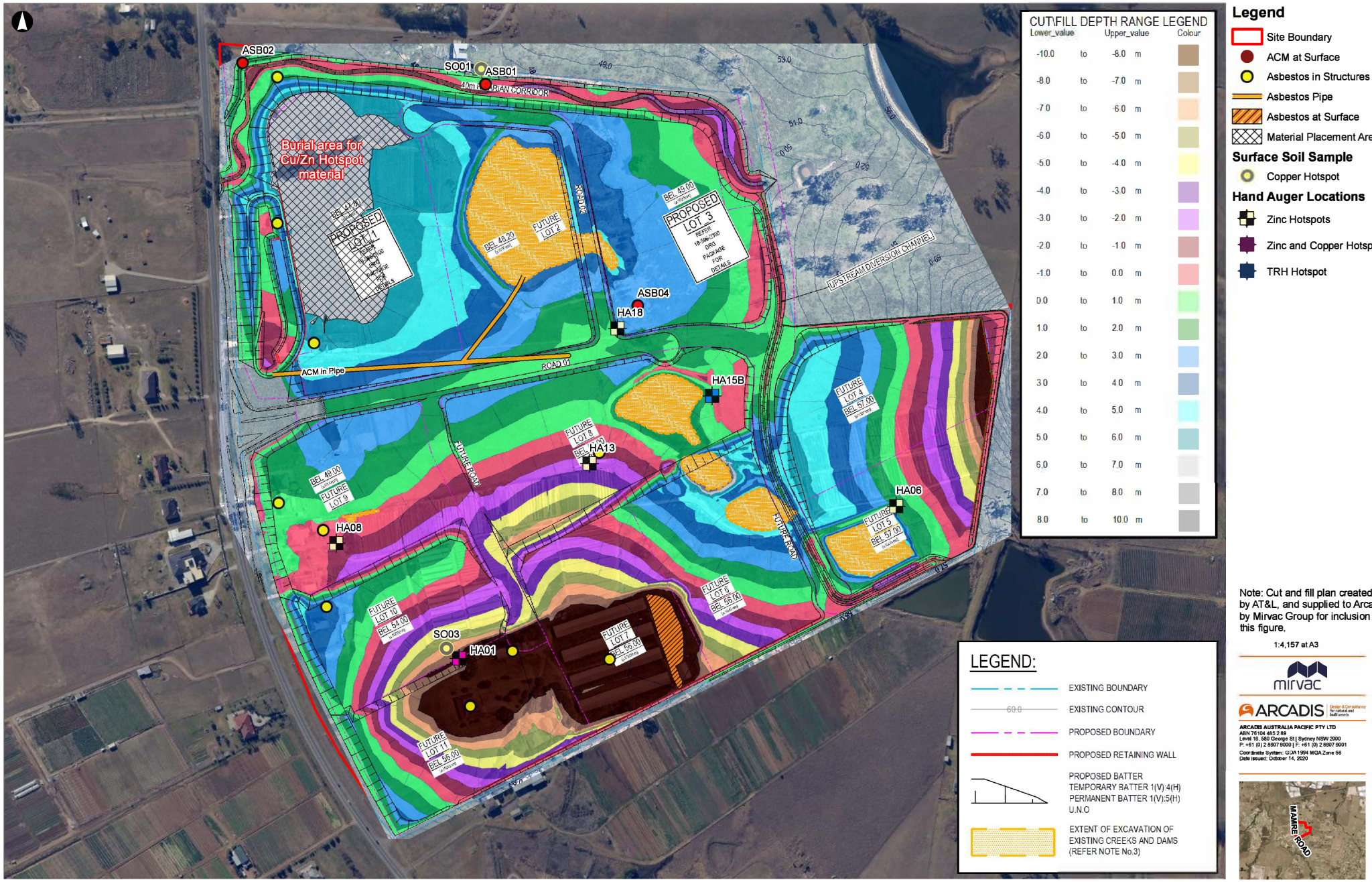


Figure 2a - Site Layout

0 62.5 125 250 375 500
m

Attachment 4: Cut and Fill Contours for Proposed Bulk Earthworks



Legend

- Site Boundary
- ACM at Surface
- Asbestos in Structures
- Asbestos Pipe
- Asbestos at Surface
- Material Placement Area

Surface Soil Sample

- Copper Hotspot

Hand Auger Locations

- Zinc Hotspots
- Zinc and Copper Hotspots
- TRH Hotspot

Note: Cut and fill plan created by AT&L, and supplied to Arcadis by Mirvac Group for inclusion in this figure.

1:4,157 at A3

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ARCADIS Design & Consultancy for natural and built assets

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ABN 76104 485 2 89
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date Issued: October 14, 2020

Figure 3 - RAP Remediation Requirements

Attachment 5: PSI Investigation Locations

Legend:

- Approximate Site Boundary

Sample Locations

- Hand Auger Sample
- Materials Sample
- Stockpile Sample
- Testpit Sample
- Surface Water Sample

JBS&G

Job No: 55607	
Client: Mirvac	
Version: R01 Rev A	Date 30/01/2019
Drawn By: AV	Checked By: CK
Scale 1:5,200	

0 60 120
metres

Coord. Sys. GDA 1994 MGA Zone 56

Lot 54-58 DP 259135
Kemps Creek, NSW

SAMPLE LOCATIONS

FIGURE 3

File Name: N:\Projects\Mirvac\55607 Mamre Rd, Kemps Creek\GIS\Maps\R01 Rev A\55607_03_SampleLoc.mxd
Reference: Nearmap - nearmap.com.au - Imagery 29-12-2018

10035157 - Aspect Industrial Estate - Detailed Site Investigation

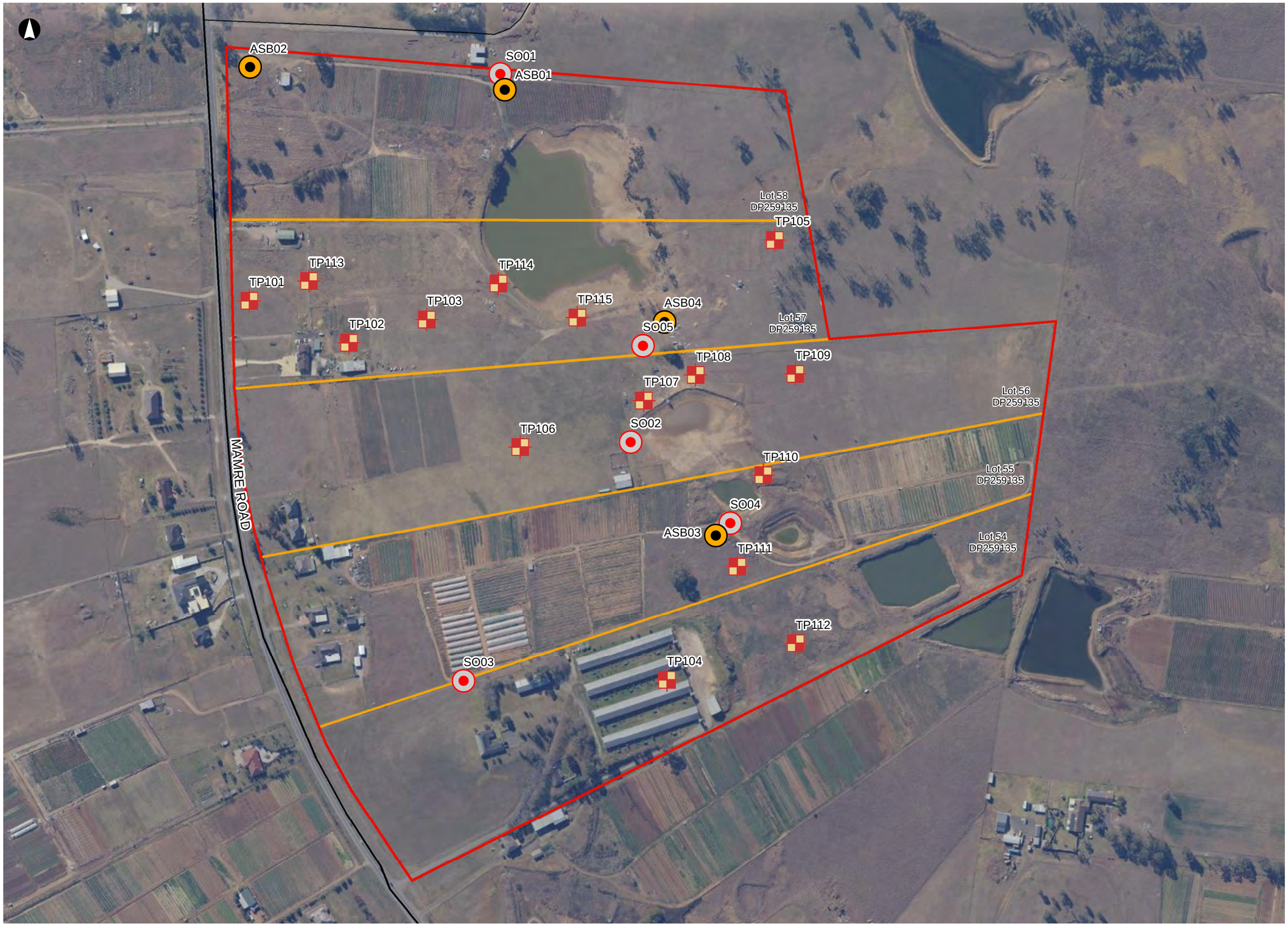
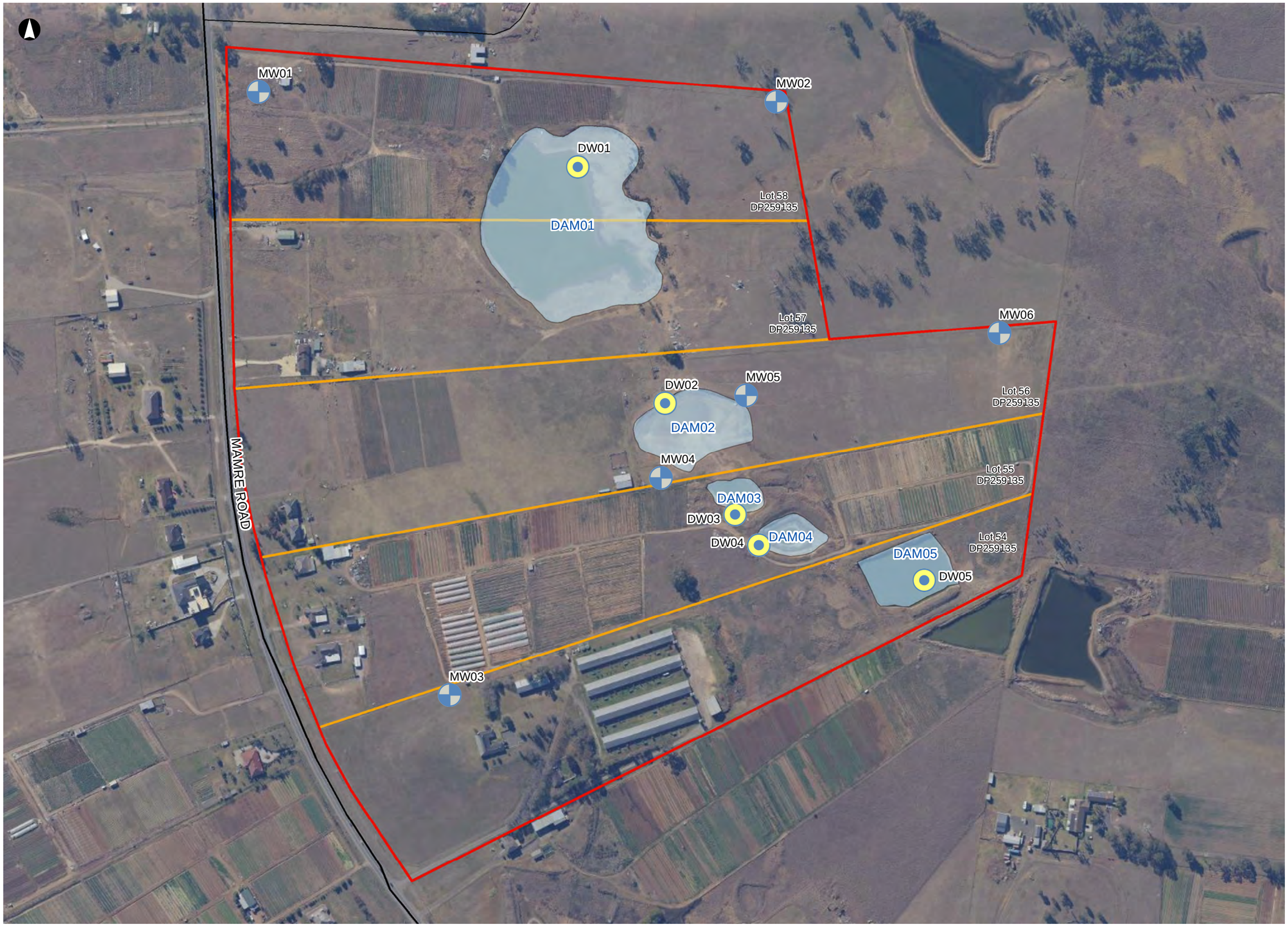


Figure 3a - Sample Locations - Testpits and Surface Soil Samples

Date: 30/10/2019 Path: H:\AAP_ER_GIS\Projects\10035157\DSI\Figure 3av2 - Sample Locations - Testpits and Surface Soil and PACM.mxd
Created by : Environmental Restoration
QA by : Environmental Restoration

10035157 - Aspect Industrial Estate - Detailed Site Investigation



Legend

- Surface Water Samples
- Groundwater Wells
- Dams
- Site Boundary
- Lot Boundaries

1:4,133 at A3

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Coordinate System: GDA 1994 MGA Zone 56
Date issued: October 24, 2019

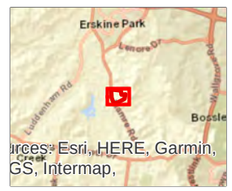

Figure 3b - Sample Locations - Groundwater and Surface Water

0 40 80 160 240 320
m

Date: 24/10/2019 Path: H:\AAP_ER_GIS\Projects\10035157\DSI\Figure 3b - Sample Locations - SW and GW.mxd
Created by : Environmental Restoration
QA by : Environmental Restoration

10035157 - Aspect Industrial Estate - Dam Decommissioning Strategy

Figure 2 - Dam locations and Surface Water Samples

Date: 24/10/2019 Path: H:\AAP_ER_GIS\Projects\10035157\DDS\Figure 2 - Sample Locations - Dam Locations and SW.mxd
Created by : Environmental Restoration
QA by : Environmental Restoration

Attachment 9: DSI Hand Auger Delineation Sample Locations

10035157 - Aspect Industrial Estate - Detailed Site Investigation

Legend

- Hand Auger Locations
- Dams
- Lot Boundaries
- Site Boundary

1:2,300 at A3

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ARCADIS AUSTRALIA PACIFIC PTY LTD

Figure 7 - Hand Auger Locations

0 20 40 80 120 160
m

Attachment 10:Proposed Remediation Excavation Locations

10035157 - Mirvac Group - Aspect Industrial Estate, Kemps Creek, NSW - Remedial Action Plan

Legend

- Site Boundary
- Major roads
- Local road
- Building Footprints
- Proposed Areas of Excavation
- Excavation Area of Asbestos Pipe
- Asbestos at Surface
- Asbestos Pipe
- ACM at Surface

Surface Soil Sample

- Copper Hotspot

Hand Auger Locations

- Zinc Hotspots
- Zinc and Copper Hotspots
- TRH Hotspot

Notes:
- Proposed excavation areas are not to scale.
- Asbestos pipe excavation proposed to be extended 0.5 metres to either side of pipe and 0.5 m deep.
- The remainder of remedial hotspot excavations are proposed to be 3 metres x 3 metres in area.

Note: Cut and fill plan created by AT&L, and supplied to Arcadis by Mirvac Group for inclusion in this figure.

1:4,153 at A3

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 16, 580 George St | Sydney NSW 2000
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 4, 2020

Figure 4 - RAP Indicative Remediation Locations and Areas

0 50 100 200 300 400 500 m

Date: 4/06/2020 Path: H:\AAP_ER_GIS\Projects\10035157\RAP\Remediation Area - no CF plan.mxd
Created by : CC
QA by : RB

APPENDIX B
SITE AUDIT STATEMENT

NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. TO-066

This site audit is a:

☐ statutory audit

☒ non-statutory audit

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name: *Tom Onus*

Company: *Ramboll Australia Pty Ltd*

Address: *Level 3*

100 Pacific Highway, North Sydney

Postcode: *2060*

Phone: *02 9954 8133*

Email: *tonus@ramboll.com*

Site details

Address: *788-882 Mamre Road, Kemps Creek, NSW*

Postcode: *2178*

Property description

(Attach a separate list if several properties are included in the site audit.)

Lots 54 to 58 DP259135

Local government area: *Penrith City Council*

Area of site (include units, e.g. hectares): *56.3 ha*

Current zoning: *IN1 General Industrial, E2 Environmental Conservation and SP2 Infrastructure under the State Environmental Planning Policy (Western Sydney Employment Area) 2009*

Regulation and notification

To the best of my knowledge:

☐ **the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985,* as follows: (provide the no. if applicable)

- ☐ Declaration no.
- ☐ Order no.
- ☐ Proposal no.
- ☐ Notice no.

☒ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

☒ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name: *Russell Hogan*

Company: *Mirvac Projects Pty Ltd*

Address: *Level 28, 200 George Street, Sydney NSW*

Postcode: *2000*

Phone: *9080 8154*

Email: *russell.hogan@mirvac.com*

Contact details for contact person (if different from above)

Name:

Phone:

Email:

Nature of statutory requirements (not applicable for non-statutory audits)

☐ Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)

☐ Requirements imposed by an environmental planning instrument (please specify, including date of issue)

☐ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

☐ Requirements under other legislation (please specify, including date of issue)

Purpose of site audit

☐ **A1** To determine land use suitability

Intended uses of the land:

OR

☐ **A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land:

OR

(Tick all that apply)

☒ **B1** To determine the nature and extent of contamination

☒ **B2** To determine the appropriateness of:

- ☐ an investigation plan
- ☒ a remediation plan
- ☐ a management plan

☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

☐ **B4** To determine the compliance with an approved:

- ☐ **voluntary management proposal** or
- ☐ **management order** under the *Contaminated Land Management Act 1997*

☒ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land: *commercial/industrial*

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

- *JBS&G Australia Pty Ltd (JBS&G)*
- *Arcadis Australia Pacific Pty Ltd (Arcadis)*
- *Airsafe OHC Pty Ltd (Airsafe)*

Titles of reports reviewed:

- *'Preliminary Site Investigation, Mamre Road, Kemps Creek, NSW', JBS&G, 30 January 2019*
- *'Dam Decommissioning Study, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis, 1 November 2019*

- *'Unexpected Finds Protocol, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis, 22 November 2019*
- *'Imported Fill Protocol, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW', Arcadis, 22 November 2019*
- *'Hazardous Materials Survey, Lot 54-58 Mamre Road, Kemps Creek', Airsafe, 10 December 2019*
- *'Detailed Site Investigation - Aspect Industrial Estate, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 2 Final', Arcadis, 5 May 2020*
- *'Remedial Action Plan, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 3 Final', Arcadis, 15 October 2020.*

Other information reviewed, including previous site audit reports and statements relating to the site:

Site audit report details

Title:	*Site Audit Report - Remedial Action Plan, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW*		
Report no.:	*TO-066 (Ramboll Ref: 318000834)*	Date:	*16 October 2020*

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
    - (B1) the nature and extent of contamination, and/or
    - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
    - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
    - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
    - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

_____

OR

☐ I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.

Overall comments:

_____

_____

_____

_____

_____

_____

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

EMP details

Title:

Author:

Date: No. of pages:

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Section B

Purpose of the plan[4] which is the subject of this audit:

Provide a remediation framework to render the site suitable for the proposed commercial/industrial land use.

I certify that, in my opinion:

(B1)

☒ The nature and extent of the contamination **has** been appropriately determined

☐ ~~The nature and extent of the contamination **has not** been appropriately determined~~

AND/OR (B2)

☒ The investigation, remediation or management plan **is** appropriate for the purpose stated above

☐ ~~The investigation, remediation or management plan **is not** appropriate for the purpose stated above~~

~~AND/OR (B3)~~

☐ ~~The site testing plan:~~

☐ ~~**is** appropriate to determine~~

☐ ~~**is not** appropriate to determine~~

~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

~~AND/OR (B4)~~

☐ ~~The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):~~

☐ ~~**have** been complied with~~

☐ ~~**have not** been complied with.~~

~~*voluntary management proposal no.~~

~~**management order no.~~

AND/OR (B5)

☒ The site **can be made suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ ~~Residential, including substantial vegetable garden and poultry~~

☐ ~~Residential, including substantial vegetable garden, excluding poultry~~

☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

[4] For simplicity, this statement uses the term ‘plan’ to refer to both plans and reports.

~~☐ Day care centre, preschool, primary school~~

~~☐ Residential with minimal opportunity for soil access, including units~~

~~☐ Secondary school~~

~~☐ Park, recreational open space, playing field~~

☒ Commercial/industrial

~~☐ Other (please specify):~~

IF the site is remediated~~/managed~~* in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title: *'Remedial Action Plan, Aspect Industrial Estate, Mamre Road, Kemps Creek, NSW 2178 – Rev 3 Final'*

Plan author: *Arcadis Australia Pacific Pty Ltd*

Plan date: *15 October 2020*

No. of pages: *266*

SUBJECT to compliance with the following condition(s):

- *Successful validation of the site including appropriate management and assessment of any unexpected finds of contamination and confirmation imported materials are suitable for use*
- *Preparation of a Section A Site Audit assessing the suitability of the site for commercial/industrial land use at completion of bulk earthworks*

Overall comments:

The remediation framework provided in the remedial action plan (RAP) acknowledges that building footprints are required to be assessed after demolition and prior to bulk earthworks with additional remediation and validation being undertaken if required.

The site is large and there may be unidentified structures such as buried pipes containing asbestos, further areas of filling or waste burials. The unexpected finds protocol is considered adequate to manage the associated risks.

It is recommended that interim reports are prepared for Auditor review prior to commencing bulk earthworks documenting the following:

- *Assessment of building footprints and identification of any additional areas requiring remediation.*
- *Validation of the dam sediments for reuse on site prior to placement.*
- *Validation of the identified remediation areas.*

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. 1505

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed 

Date 16 October 2020

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**: nswauditors@epa.nsw.gov.au or as specified by the EPA

  AND

- the **local council** for the land which is the subject of the audit.

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