

Prepared for

GHT Holdings Pty Ltd

Prepared by

Ramboll Australia Pty Ltd

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SITE AUDIT REPORT

107-117 SWAN STREET, MORPETH

2 February 2022

GHT Holdings Pty Ltd
C/O- Erin Daniel
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260 Maitland Road
Mayfield NSW 2304

By email: erin@perceptionplanning.com.au

Dear Erin,

SITE AUDIT REPORT - 107-117 SWAN STREET, MORPETH

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 of the Site Audit Report. The Audit was commissioned by GHT Holdings Pty Ltd to assess the suitability of a remedial action plan.

This Site Audit Report is not currently required by regulation or legislation and is therefore a non-statutory audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 0421 311 066 if you have any questions.

Yours faithfully,
Ramboll Australia Pty Ltd



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EPA Accredited Site Auditor 1506

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APPENDICES

Appendix A

Attachments

Appendix B

Site Audit Statement

LIST OF ABBREVIATIONS

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

ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
ADWG	Australian Drinking Water Guidelines
AF	Asbestos Fines
AHD	Australian Height Datum
ALS	Australian Laboratory Services
ANZG	Australian & New Zealand Guidelines
ASS	Acid Sulphate Soil
AST	Aboveground Storage Tank
ANZECC	Australian and New Zealand Environment and Conservation Council
BaP	Benzo(a)pyrene
BGL	Below Ground Level
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
Coffey	Coffey Services Australia Pty Ltd
COPC	Contaminants of Potential Concern
Council	City of Maitland 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
ENM	Excavated Natural Material
EPA	Environment Protection Authority (NSW)
EPL	Environment Protection Licence
ESL	Ecological Screening Level
FA	Fibrous Asbestos
HIL	Health Investigation Level
HSL	Health Screening Level
LCS	Laboratory Control Sample
LEP	Local Environment Plan
LOR	Limit of Reporting
MAH	Monocyclic Aromatic Hydrocarbons
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
ML	Management Limits
n	Number of Samples
NATA	National Association of Testing Authorities
ND	Not Detected
NEPM	National Environment Protection Measure
NL	Non-Limiting
OCP	Organochlorine Pesticides

OH&S	Occupational Health & Safety
OPP	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PFAS	Per- and Poly-fluoroalkyl substances
pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd
RAP	Remediation Action Plan
RL	Relative Level
RPD	Relative Percent Difference
SAQP	Sampling Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SILs	Soil Investigation Levels
SQG	Soil Quality Guidelines
TEQ	Toxic Equivalence Quotient
TPHs	Total Petroleum Hydrocarbons
TRHs	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UPSS	Underground Petroleum Storage System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VSAQP	Validation Sampling and Analytical Quality Plan
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1 Audit Details

A site contamination audit has been conducted in relation to the site at 107-117 Swan Street, Morpeth.

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 site is proposed to be redeveloped comprising a multi-house dwelling (DA/2021/821), and Maitland City Council (Council) require a site audit statement (SAS) to be provided clearly stating that the site is, or can be made, suitable for the intended use prior to consideration of development consent. The audit is not currently a statutory requirement.

Details of the Audit are:

Requested by:	Chris Unicomb of GHT Holdings Pty Ltd
Request/Commencement Date:	8 October 2021
Auditor:	Fiona Robinson
Accreditation No.:	1506

1.2 Scope of the Audit

The scope of the Audit included:

- Review of the following reports:
 - 'Phase Two Soil Contamination Assessment, 107-117 Swan Street Morpeth NSW', 4 November 2019, Pacific Environmental (PE) (*the Contamination Assessment*).
 - 'GHT Holdings Pty Ltd, Additional Site Contamination Investigation – 107 - 117 Swan Street, Morpeth NSW', 9 September 2021, Coffey Services Australia Pty Ltd (Coffey) (*the Additional Investigation*).
 - 'GHT Holdings Pty Ltd, Remedial Action Plan, 107-117 Swan Street, Morpeth', 20 December 2021 (and earlier drafts), Coffey (*the RAP*).
- A site visit by the Auditor on 13 December 2021 and discussions with Chris Unicomb of GHT Holdings.
- Discussions with Perception Planning, and with Coffey who prepared the RAP. The investigations were completed prior to the Auditor's engagement.

2. SITE DETAILS

2.1 Location

The site locality is shown on **Attachment 1, Appendix A**.

The site details are as follows:

Street address:	107-117 Swan Street, Morpeth, NSW 2321
Identifier:	Lots 1 and 3 DP 538510, Lot 1 DP 521620 and Lot 321 DP 1226898
Local Government:	Maitland City Council
Owner:	GHT Holdings Pty Ltd
Site Area:	Approximately 0.28 ha

The boundaries of the site are well defined by streets and adjoining properties (**Attachment 2, Appendix A**).

2.2 Zoning

The current zoning of the site is R1 General Residential under the Maitland City Council Local Environment Plan (LEP).

2.3 Adjacent Uses

The site is located within an area of residential and commercial use. The surrounding site use includes:

- North: Swan Street, followed by commercial properties and Hunter River beyond.
- East: William Street, followed by commercial properties and residential properties beyond.
- South: Residential properties, and Close Street beyond.
- West: Market Street, followed by commercial and residential properties.

The closest sensitive environment is the Hunter River, located approximately 65 m north of the site.

2.4 Site Condition

Coffey reported a derelict house is located in the western portion of the site, with a concrete and brick building slab located in the eastern portion. A stockpile is located on the concrete slab, expected to comprise the spoil generated from a 1 m deep excavation around the slab. Grasses and trees are present in the southern portion of the site.

The following was noted by the Auditor during the site visit on 13 December 2021:

- Buildings were present on the western portion of the site as shown in **Attachment 2, Appendix A** and demolition had commenced. Mr Unicomb indicated demolition early works to comprise asbestos removal works. There was evidence of an in ground hoist cylinder in the eastern most retained building. There was no evidence of underground or above ground storage tanks.
- The building shown on **Attachment 2, Appendix A** on the eastern side had previously been removed and this area contained a soil stockpile. A shallow excavation existed to the west and southwest of the soil stockpile.
- The remainder of the site was grassed. The site sloped to the north toward Swan Street and was elevated above the river height.

2.5 Proposed Development

It is understood that the site is to be redeveloped for future residential use comprising ten attached dwellings and associated demolition, earthworks and strata title subdivision. The current landscaping plan shows shrubs and trees planted around the boundary with a few decorative landscaping beds within the property boundary. The ground floor layout of the proposed development is included as **Attachment 3, Appendix A**.

For the purposes of this audit, the 'residential with minimal access' exposure scenario has been adopted.

3. SITE HISTORY

PE provided a summary of the site history based on review of aerial photographs, section 10.7 certificates, previous reports and an archaeological assessment prepared in December 2006. The site was reported to have been developed by the Sim Family in 1858 and utilised until 1930 as a blacksmith, iron foundry (metal forging and casting), brass old ware repair/sales and wheelwright, predominantly on 109-111 Swan Street (centre of the site), whilst 107 Swan Street (east of the site) contained a residential dwelling. The remainder of the site, 113-117 Swan Street (west of the site), was understood to have remained free from permanent structures. PE reported that heritage reports indicated that as town water was not available in Morpeth until the late 1800s, water was collected from the roof and stored in three underground water tanks, but it was suggested that two of these tanks were actually used for the disposal of "spoil work" rather than water storage. The location of the tanks is suspected to be in "the vacant area to the south of the existing shed" and may be now on a property fronting Close Street.

The site transferred ownership in the 1940s, and in 1948 a service station and workshop was constructed on 109 and 111 Swan Street whilst 113-117 Swan Street was developed as semi-detached residential and commercial buildings. The residence formerly located on 107 Swan Street was believed to have been demolished after the construction of the service station and residential and commercial buildings.

PE also reviewed reports prepared by RCA in 1999 regarding the removal and validation of a number of underground storage tanks (USTs), an aboveground storage tank (AST) used for the storage of diesel and associated bowsers. PE noted that soil contamination remained in the walls and base of the UST excavations and in the vicinity of the former AST.

3.1 Auditor's Opinion

Details regarding specific site usage and locations for former underground storage tanks are lacking. The absence of site-specific history has been compensated for by a high density of sampling and analyses and proposed further sampling outlined in the RAP.

4. CONTAMINANTS OF CONCERN

Coffey provided a list of the contaminants of concern and potentially contaminating activities in the Additional Investigation and RAP. These have been tabulated in **Table 4.1**.

Table 4.1: Contaminants of Concern

Area	Activity	Potential Contaminants
Entire site	Former site activities (foundry activities, mechanic workshop) impacting quality of fill in upper 1.0 m layer	Polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRHs), asbestos and lead
Northern boundary in vicinity of former petroleum tanks and service station operation	Former site activities impacting quality of fill and residual soils to depths 2.2-2.3 m below ground level (mbgl)	TRH and benzene

4.1 Auditor's Opinion

The Auditor considers that the analyte list used by Coffey adequately reflects the site history, however, the Auditor also considers the contaminants of concern should also include metals, PAHs, TRH, polychlorinated biphenyls (PCBs), organochlorine pesticides and organophosphorus pesticides (OCP/OPPs) and asbestos from fill material and hazardous building materials. Further comment is provided in **Section 10.1**.

There has been no assessment by the consultants for the presence of per- and poly-fluoroalkyl substances (PFAS) but in the Auditor's opinion there are no indications in the site history that they would be potential contaminants of concern.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1 Stratigraphy

Coffey reviewed the Newcastle Coalfield 1:100,000 Regional Geology Maps (Series Sheet 9231 and part of 9131, 9132 and 9232 Edition 1 1995) and reported that the site is underlain by Tomago Coal Measures typically comprising sandstone, minor siltstone, claystone, coal and tuff.

Coffey undertook 21 boreholes across the site, and the general sub-surface profile of the site encountered by Coffey is summarised by the Auditor in **Table 5.1**.

Table 5.1: Stratigraphy

Approximate Depth (mbgl)	Subsurface Profile
0.0 – 0.5	Fill comprising brown sandy gravel, sand and clayey sand, with traces of brick and tile fragments and slag (up to 1.4 mbgl in some locations).
0.5 – 1.2	Silty clay, black, high plasticity
1.2 to depth	Sandy clay/gravelly sandy clay, orange to brown and white, fine to coarse grained, high plasticity

mbgl – metres below ground level

The Auditor undertook a review of potential acid sulfate soils (PASS) in the LEP, indicating that acid sulfate soils (ASS) are Class 5 meaning soils are within 500 m of adjacent Class 1, 2, 3 or 4 land and works that are likely to lower the water table below 1 mAHD on adjacent Class 1, 2, 3 or 4 land require management and development consent.

5.2 Hydrogeology

The Auditor undertook a search for registered bores in December 2021. One bore was identified within a 500 m radius of the site, however, is located north of the site and on the opposite side of the river. No information was available for the bore.

Whilst Coffey did not undertake a groundwater investigation, they considered groundwater beneath the site to be present at depths of 5-10 mbgl, located within weathered shale/ironstone. Groundwater was not encountered during the soil investigation, however Coffey also considered a shallow perched aquifer may be present at the interface of soil and weathered rock between 1-3 mbgl. Based on the weathered rock layer encountered, Coffey considered vertical migration of groundwater to be severely limited, with lateral dispersion more likely once surface water percolates to the depth of weathered rock, which forms a low permeability barrier to downward flow.

Regional groundwater flow is anticipated to flow to the north, towards the Hunter River located approximately 65 m north of the site.

5.3 Auditor’s Opinion

The Auditor considers that the site stratigraphy and hydrogeology are sufficiently known for the purpose of remedial planning. The Auditor considers that based on the high plasticity clays underlying the site and the low permeability bedrock encountered, and the expected depth to groundwater (the topography of the land drops approximately 5 m from the site towards the Hunter River), the potential for groundwater to be impacted from the site and the potential for migration of contamination in groundwater is low however requires this be further assessed as part of additional investigations. The Auditor agrees that perched water may be a migration pathway, however, would be intermittent and rainfall dependent.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the referenced reports, supplemented by field observations. The data sources are summarised in **Table 6.1**. The Contamination Assessment, undertaken by PE in 2019, assessed the potential for soil contamination at the site, while the Additional Investigation, undertaken by Coffey in 2021 addressed data gaps and assessed soils in previously inaccessible locations. The Auditor’s assessment of the data quality follows in **Tables 6.2** and **6.3**.

Table 6.1: Summary of Investigations

Stage of Works	Field Data	Analytical Data
<p>Stage 2 Contamination Assessment (PE, 2019)</p> <p><i>Fieldwork dates:</i></p> <ul style="list-style-type: none"> 26 July 2018 11 June 2019 	<p><i>July 2018:</i> Nine soil bore holes were drilled to a maximum depth of 2.7 mbgl and 12 primary soil samples collected and analysed.</p> <p>A further seven bore holes were reported to be drilled to 2.5 mbgl to visually inspect for buried waste and field screening for volatiles using a photoionisation detector (PID). No bore logs or results were provided for these sample locations.</p> <p><i>July 2019:</i> Seven soil samples and two surface water samples from ponded water in onsite excavations were collected analysed.</p> <p><i>Total:</i> 19 soil samples and two surface water samples. Soil samples collected between 0.3 and 2.7 mbgl. Surface water samples collected from impounded stormwater on-site.</p>	<p>Soil: TRH, BTEXN, heavy metals (arsenic (As), cadmium (Ca), chromium (Cr), copper (Cu), lead (Pb), nickel (Ni), mercury (Hg) and zinc (Zn)), PAH, OCP/OPP, pH.</p> <p>Surface water: TRH, BTEXN, PAHs and lead.</p> <p>Note – soil and water sampling sheets, bore logs and laboratory certificates and reports were not provided in the Contamination Assessment report. Nor were the OCP/OPP results tabulated in the report.</p> <p>This report was reviewed by the Auditor to provide an indication of the reliability of the data presented. Information regarding the data quality presented in the Contamination Assessment is provided in Tables 6.2 and 6.3.</p>
<p>Additional Site Contamination Investigation (Coffey, 2021)</p> <p><i>Fieldwork dates:</i></p> <ul style="list-style-type: none"> 22 – 24 June 2020 	<p>Twenty-one boreholes to approximately 2 mbgl were drilled.</p> <p>A total of 63 primary soil samples and 10 stockpiled soil samples were collected and analysed.</p>	<p>TRH, BTEXN, PAH, asbestos (presence/absence), heavy metals (As, Ca, Cr, Cu, iron (Fe), Pb, Hg, Ni, Zn)</p>

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

Sampling and Analysis Plan and Sampling Methodology	Auditor’s Opinion
<p><i>Data Quality Objectives (DQO)</i></p> <p>PE 2019</p> <p>PE listed DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013).</p> <p>Although described elsewhere in the report, the first step of the DQOs to describe the problem lacked information about the proposed residential land use of the site.</p> <p>PE did not present study questions as DQO decisions but instead identified the objective of the study which was to identify the extent of contamination on-site.</p> <p>PE did not define the vertical boundary of the study area in Step 4.</p>	<p>PE’s assessment of DQOs was not adequate and did not describe the problem, objective or extent of investigation.</p> <p>Coffey identified DQOs that were considered appropriate for the investigation conducted.</p>

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p>Although other report chapters described the assessment criteria to be used, the DQO decision rule did not specify an analytical approach or an Action Level to define contamination.</p> <p>A sampling methodology was provided as Appendix C, however both Step 7 of the DQO process for optimising data and the sampling methodology did not define the number of samples to be collected per unit area nor did PE rationalise sample collection per unit area with relevant sampling guidelines.</p> <p>The remainder of the DQO steps described the study inputs, and decision errors. However, the DQOs did not provide procedures to be undertaken if data did not meet the DQOs.</p> <p>Coffey 2021</p> <p>Coffey defined specific DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013). The information provided adequately described a plan to achieve DQOs and assess usability of data obtained. Step 6 described a null hypothesis which was the exceedance of investigation levels but did not provide procedures to be undertaken if data did not meet the DQOs.</p>	
<p><i>Sampling density, pattern, locations and depths</i></p> <p>PE 2019</p> <p><u>Soil</u></p> <p>Nineteen soil samples were collected and analysed from 18 bore holes across the site. One sample was reportedly collected from the stockpile present in the north-eastern portion of the site. PE described the sampling pattern as "intrusive investigation" that was adopted to characterise the whole site.</p> <p><u>Surface Water</u></p> <p>PE did not discuss pre-determined surface water sampling locations or show these locations on a site plan. The report did mention that surface water samples were collected following a request from Council for additional sampling to assess impacts of remedial works on external drainage systems and indicated these samples were collected from impounded stormwater in site excavations.</p> <p>Coffey 2021</p> <p>Sixty-three soil samples were collected and analysed from 21 bore holes drilled to a maximum depth of 2.3 mbgl across the site. One location, BH17, appears to have been relocated twice due to bore hole collapse. The sampling density of 21 locations over approximately 0.3 ha exceeds the minimum recommended by EPA (1995) <i>Sampling Design Guidelines</i> (9). The coverage provides a 95% confidence of detecting a residual hot spot of approximately 14 m diameter.</p> <p>Soil samples were collected near surface 0-0.2 mbgl, 0.8-1.0 mbgl and 1.8-2.0 mbgl (or where contamination was observed).</p>	<p>PE soil sampling provides coverage of the site. Surface water sampling locations were not shown and therefore this data cannot be interpreted.</p> <p>The Auditor considers Coffey's sampling density, pattern, location and depths to be sufficient to inform the requirement for remediation, noting further investigation has been recommended by Coffey to delineate the extent of impact in the vicinity of the former USTs following building demolition.</p>
<p><i>Well construction</i></p> <p>Not applicable.</p>	
<p><i>Sample collection method</i></p> <p>PE 2019</p> <p>The report described the sample collection method as "inspection wells" drilled using an auger. Borelogs provided for the 2018 sampling event indicate a solid flight mechanical auger was used.</p> <p>Soil samples were collected directly from the auger from soil not directly touching the auger head. The collection of soil from the auger head was aided by use of a hand trowel.</p>	<p>Sample collection from the auger flights is not ideal as it can result in loss of volatiles and sample cross contamination, although cross contamination was minimised by removing external material. Given the key contaminants at the site are volatile organics, the soil concentrations reported must be considered as indicative only and may underestimate the actual concentrations present.</p> <p>Coffey describe a large diameter auger and removal of soil for sampling. Use of</p>

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p>No information regarding sample collection methodology from the stockpile or surface water was provided in the report.</p> <p>Coffey 2021 Boreholes were drilled using a 5-tonne excavator with a 350 mm auger attachment under the supervision of a Coffey Environmental Scientist. Soil samples were collected directly from the auger after drilling to the start of the target depth, clearing the auger and then advancing through the target depth for the sample.</p>	<p>the large diameter auger is likely to reduce volatile loss.</p> <p>Sampling by augers does not allow for a detailed inspection of fill material, including identification of anthropogenic material (including asbestos containing material) and indicators of contamination (odours and staining).</p>
<p><i>Decontamination procedures</i></p> <p>PE 2019 Dedicated, single-use nitrile gloves were used when collecting samples. The auger and sampling trowel were cleaned by high pressure washing and decontaminated using 2% Decon-90 solution followed by rinsing with clean, potable water and then de-ionised water. This procedure was undertaken prior to the auguring at each sample location and before each sample was obtained.</p> <p>Coffey 2021 Samples were collected from the drill auger after drilling to the start of the target depth, clearing the auger of soil and advancing the cleared auger through to the target depth for each sample. No further information was provided about decontamination procedures, but reference was made to Coffey SOPs which were not including in this report.</p>	<p>The potential for cross contamination between sample locations has been considered by the Auditor when reviewing the results. Based on the apparent lack of transference of contaminants between sample locations, the Auditor considers decontamination procedures to be adequate.</p>
<p><i>Sample handling and containers</i></p> <p>PE 2019 Samples were placed into laboratory-supplied sample containers. Samples were placed into a 12-volt fridge at 4°C. Samples were transported by the sampler to the laboratory on the same day. Laboratory reports and therefore sample condition upon receipt by laboratory has not been made available in this report.</p> <p>Coffey 2021 Soil samples were placed into laboratory-supplied glass jars. Separate samples for asbestos analysis were placed in plastic zip lock bags. Samples were placed into ice chilled coolers and dispatched to National Association of Testing Authorities (NATA) Accredited laboratories under chain of custody (COC) conditions. Eurofins laboratory documentation noted that the condition upon receipt was that samples were in good condition and had been chilled. The temperature upon arrival was 8.2°C. ALS laboratory documentation noted that the temperature of samples upon receipt was 5.3°C.</p>	<p>Acceptable</p>
<p><i>Chain of custody (COC)</i></p> <p>PE 2019 The report mentioned that the laboratory counter signed the COCs when samples were delivered to the laboratory. However, COC forms were not provided in the report.</p> <p>Coffey 2021 Completed COC forms for samples delivered to the primary and secondary laboratory were provided in the report.</p>	<p>Acceptable. Some uncertainty exists with the PE data as COC forms were not provided.</p>
<p><i>Detailed description of field screening protocols</i></p>	<p>Limited information was provided on PE's method for sub-sampling and PID use.</p>

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
<p>PE 2019 Field screening for volatiles was undertaken using a PID. The methodology for sub-sampling for PID screening was not detailed in the report. The report did not indicate whether the PID had been calibrated prior to use.</p> <p>PE stated that PID readings were within 5% of background readings and all less than 5 ppm. A review of PID readings in the bore logs indicated that PID readings did exceed 5 ppm (sample B 0.7 measured 80 ppm). Not all samples had corresponding PID readings listed on the bore logs.</p> <p>Coffey 2021 Field screening for volatiles was undertaken using a PID. The report described measuring the headspace of samples for VOC but did not describe a sub-sampling procedure.</p> <p>Coffey stated that PID readings ranged between 0 and 1702 ppm. These results were consistent with PID readings recorded on the bore logs.</p>	<p>The Auditor was not able to evaluate adequacy.</p> <p>Coffey provided sufficient information for PID use and this was considered acceptable.</p> <p>Field screening of samples for fragments of asbestos containing material (ACM) in accordance with NEPM (2013) was not undertaken.</p>
<p><i>Calibration of field equipment</i></p> <p>PE 2019 The report did not detail any calibration of the field equipment (PID) used. Calibration certificates were not provided,</p> <p>Coffey 2021 The PID was bump testing and fresh air calibrated at the start of each day.</p> <p>A calibration certificate for the PID was provided in the report. The PID was calibrated with 100 ppm isobutylene.</p>	<p>PE data was insufficient to assess adequacy.</p> <p>Coffey PID process was considered acceptable.</p>
<p><i>Sampling logs</i></p> <p>PE 2019 Bore logs were provided for one of the two sampling events. The bore logs provided from the July 2018 sampling event comprised bore holes A to I (nine locations). Not included were bore logs for the seven bore holes drilled to inspect for buried waste and undertake further screening using a PID.</p> <p>Bore logs which were provided within the report indicated sample depth, PID readings and lithology.</p> <p>The logs indicated hydrocarbon odour and a PID reading of 80 ppm during sampling of sample B0.7. However, the report describes all PID readings as being within 5% of background levels and does not discuss these field observations.</p> <p>A sample register was not provided.</p> <p>Coffey 2021 Bore logs were provided for all sample locations described in the report (21 bore holes).</p> <p>The total number of primary samples stated in the report (76 samples) was inconsistent with the number of samples recorded in the bore logs (63 primary soil samples and 10 stockpile soil samples).</p> <p>The bore logs provided within the report indicated sample collection depth, PID readings and lithology.</p> <p>A sample register was not provided.</p>	<p>PE bore logs were incomplete. As a sample register and bore logs for some locations were not provided there is some uncertainty on sample type.</p> <p>Sufficient information was provided in the Coffey report and whilst a sampling register was not provided, bore logs were included that provided sufficient information to detail the samples collected.</p>

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

Field and Lab QA/QC	Auditor's Opinion
<p><i>Field quality control samples</i></p> <p>PE 2019 Inter-laboratory duplicate sampling was not undertaken. PE report a NATA Accredited laboratory (SGS Laboratories) was used however no laboratory reports or COCs were provided to verify this.</p> <p><u>August 2018 Soil Sampling Event</u> Although the report stated that intra-laboratory duplicates, rinsate blank, trip blank and spike sampling was undertaken, evidence/analytical results were only provided for the intra-laboratory duplicate and trip blank and spike. Intra-laboratory duplicate, trip blank and spike samples were undertaken at appropriate frequencies. Considering a hand trowel was used to collect sample, rinsate samples were not collected at appropriate frequencies.</p> <p><u>June 2019 Sampling Event</u> For soil sampling, an intra-laboratory duplicate was collected at an appropriate frequency. Considering a hand trowel was used and volatiles were present, rinsate and trip blank and spike sampling was not undertaken at appropriate frequencies. No field quality samples were undertaken for the surface water sampling.</p> <p>Coffey 2021 Field quality control samples including four intra-laboratory duplicates, four inter-laboratory duplicates, one trip spike, one trip blank, and one rinsate blank were collected and analysed. All field quality control sampling was undertaken at appropriate frequencies.</p>	<p>PE information is insufficient to assess adequacy. Coffey information was acceptable</p>
<p><i>Field quality control results</i></p> <p>PE 2019 Only results for field intra-laboratory duplicates were made available. The results of intra-laboratory field duplicates were generally within appropriate limits. The following exceptions were noted:</p> <p><u>August 2018 Sampling Event</u></p> <ul style="list-style-type: none"> • 30.3% RPD for lead. Results for lead were both greater than 100 times the laboratory limit of reporting (LOR). PE did not discuss. • 40% RPD for zinc. Results for zinc were both greater than 100 times the laboratory LOR. PE did not discuss. • 51.57% RPD for TRH F3. Results for TRH F3 were both greater than 10 times the laboratory LOR. PE did not discuss. • 42.42% RPD for TRH F4. The primary result for TRH F4 was slightly less than 10 times the laboratory LOR. • 66.67% RPD for xylene. Results for xylene were less than 10 times the laboratory LOR. <p><u>June 2019 Sampling Event</u></p> <ul style="list-style-type: none"> • 100.48% RPD for benzo(a)pyrene TEQ. Results for benzo(a)pyrene TEQ were less than 10 times the laboratory LOR. The report also acknowledged that the results were less than 10 times the laboratory LOR. • 92.49% RPD for PAH. Results for PAH were greater than 10 times the laboratory LOR. PE did not discuss. <p>Coffey 2021 The results of intra-laboratory and inter-laboratory field duplicates were generally within appropriate limits. The report explained that many of the RPD exceedances were attributed to low results (less than 10 times the LOR), except for arsenic</p>	<p>The Auditor was unable to validate the RPDs calculated by PE due to the absence of laboratory reports. PE did not discuss all exceedances in RPDs determined however generally the Auditor considers the RPDs reasonable in the context of the heavy clays present at the site and the likelihood of sample heterogeneity.</p> <p>The data presented by Coffey was adequate and in the context of the dataset reported, the elevated RPD results are not considered significant and the field quality control results are acceptable.</p>

Field and Lab QA/QC	Auditor's Opinion
<p>(40% to 91%), chromium (42% to 93%), copper (61% to 95%), lead (31% to 117%), mercury (67% and 100%), nickel (32% to 74%), zinc (35% to 66%), various TRH fractions (39% to 67%) and various PAH fractions (38% to 133%).</p> <p>Coffey considered the discrepancies, particularly in heavy metals and PAHs, to be associated with differing abundances of fine fractions which typically adsorb metals and variability in composition of primary and duplicate samples, and adopted the higher value reported in their assessment.</p> <p>Results for rinsate blank and trip blanks were below LORs for all analytes. Trip spike recoveries were within an acceptable range.</p>	
<p><i>NATA registered laboratory and NATA endorsed methods</i> PE 2019 Laboratories used: SGS Laboratories as stated in report but cannot be verified as laboratory certificates and reports were not provided.</p> <p>Coffey 2021 Laboratories used: Eurofins (primary) and ALS (secondary). Laboratory certificates were NATA stamped.</p>	<p>PE: Unable to be verified. Coffey: Acceptable</p>
<p><i>Analytical methods</i> PE 2019 Laboratory certificates and reports were not provided in the report.</p> <p>Coffey 2021 Analytical methods were included in the laboratory test certificates. Both Eurofins and ALS provided brief method summaries of in-house NATA accredited methods used based on USEPA and/or APHA methods (excluding asbestos) for extraction and analysis in accordance with the NEPM (2013). Asbestos identification was conducted by Eurofins using polarised light microscopy with dispersion staining by method AS4964-2004 <i>Method for the Qualitative Identification of Asbestos Bulk Samples</i>.</p>	<p>PE: Unable to be verified. Coffey: Acceptable, however noting that sampling analysis for asbestos was not undertaken in accordance with NEPM (2013).</p>
<p><i>Holding times</i> PE 2019 Laboratory documentation has not been provided and therefore a review of holding times cannot be completed.</p> <p>Coffey 2021 A review of COCs and laboratory certificates indicate that holding times have been met. Coffey also reported that holding times have been met.</p>	<p>PE: Unable to be verified. Coffey: Acceptable</p>
<p><i>Practical Quantitation Limits (PQLs)</i> PE 2019 PQLs were less than threshold criteria for the contaminants of concern.</p> <p>Coffey 2021 PQLs were less than threshold criteria for the main contaminants of concern. Assessment of asbestos was presence/absence and therefore the PQL was not appropriate for assessment against criteria in NEPM (2013).</p>	<p>Overall the soil PQLs are acceptable noting that assessment for asbestos can be undertaken during remediation and validation of the site.</p>
<p><i>Laboratory quality control samples</i> PE 2019</p>	<p>PE: Unable to be verified. Coffey: Acceptable</p>

Field and Lab QA/QC	Auditor's Opinion
<p>Laboratory certificates and reports were not provided in the report.</p> <p>Coffey 2021</p> <p>Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks and duplicates were undertaken by the laboratories.</p>	
<p><i>Laboratory quality control results</i></p> <p>PE 2019</p> <p>Laboratory certificates and reports were not provided in the report.</p> <p>Coffey 2021</p> <p>The results of laboratory quality control samples were generally within appropriate limits, with the following exceptions:</p> <p><u>Soil</u></p> <ul style="list-style-type: none"> • RPD of 37% for Arsenic. However, the result passed internal laboratory QC criteria. • RPD of 36% for Chromium. However, the result passed internal laboratory QC criteria. • RPD of 43% for Copper. Further analysis indicated sample heterogeneity as the cause. • RPD of 53% for Copper. However, the result passed internal laboratory QC criteria. • RPD of 43% for Lead. However, the result passed internal laboratory QC criteria. • RPD of 53% for Nickel. However, the result passed internal laboratory QC criteria. • RPD of 42% for Benz(a)anthracene. However, the result passed internal laboratory QC criteria. • RPD of 42% for Benzo(a)pyrene. However, the result passed internal laboratory QC criteria. • RPD of 34% for Naphthalene. However, the result passed internal laboratory QC criteria. • RPD of 35% for Phenanthrene. However, the result passed internal laboratory QC criteria. • RPD of 91% for TRH C₁₀-C₁₄. However, the result passed internal laboratory QC criteria. • RPD of 35% for TRH C₁₅-C₂₈. However, the result passed internal laboratory QC criteria. • RPD of 33% for TRH >C₁₆-C₃₄. However, the result passed internal laboratory QC criteria. • RPD of 48% for TRH >C₃₄-C₄₀. However, the result passed internal laboratory QC criteria. <p><u>Water (Rinsate and Trip Blank/Spike)</u></p> <ul style="list-style-type: none"> • RPD of 42% for TRH C₆-C₁₀. However, the result passed internal laboratory QC criteria. • RPD of 43% for TRH C₆-C₉. However, the result passed internal laboratory QC criteria. <p>Review of the laboratory documentation indicates the RPD discrepancies to be due to sample heterogeneity and the RPDs actually passed Eurofins internal QC acceptance criteria.</p>	<p>PE: Unable to be verified.</p> <p>Coffey: In the context of the dataset reported, the elevated RPDs are not considered significant and the laboratory quality control results are acceptable. The results indicate that contaminant concentrations in fill material are variable.</p>
<p><i>Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy)</i></p> <p>PE 2019</p> <p>Although reference was made to DQIs in the report, PE did not define DQIs and did not undertake a formal QA/QC data evaluation against the five category areas.</p>	<p>An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.</p>

Field and Lab QA/QC	Auditor's Opinion
<p>Coffey 2021</p> <p>Predetermined DQIs were set for laboratory analyses including trip blanks, trip spike, field duplicates and triplicates, laboratory duplicates, method blank and matrix spikes. These were discussed with regard to the five category areas.</p> <p>Not included within the DQIs were laboratory control samples, surrogate spikes, method blanks and rinsate blanks.</p>	

6.1 Auditor's Opinion

In considering the data presented by Coffey, the Auditor concludes that:

- The data collected by Coffey is considered to be representative of soil conditions on the site. However, the Auditor does consider that there is the potential for volatile loss and cross contamination based on the sample collection method (direct from auger) and although this was minimised by use of a large diameter auger this uncertainty has been considered when reviewing the results.
- Elevated RPDs in field and laboratory duplicates for the contaminants of concern indicate that concentrations in fill material are highly variable within a location and within a discrete sample. This should be considered during validation of remediation.
- The data in the Coffey report is substantially complete. Where data was not collected these omissions were considered minor in the context of the data set available and the conclusions and recommendations made by the consultant in this report. Based on the high plasticity clays underlying the site, and the expected depth to groundwater (the topography of the land drops approximately 5 m from the site towards the Hunter River). Whilst the Auditor agrees the potential for contamination of groundwater is low, there is currently no sampling to confirm the depth to groundwater and the groundwater quality. The Auditor considers this to be a data gap.
- The primary laboratory provided sufficient information to conclude that data is of sufficient precision.
- Presence/ absence testing of asbestos in soil is considered acceptable based on the presence of asbestos fragments observed on the site surface and asbestos observed within building material. Care will need to be taken during building demolition and remediation and validation to ensure asbestos is not spread to soil. Further assessment of fill material for asbestos will be required during remediation and validation of the site to quantify the asbestos content for future management.

Insufficient information is presented in the PE report to assess data quality and therefore this data is considered to be of low reliability and has been incorporated as such. The Auditor considers sufficient investigation has been completed by Coffey to inform the requirement for remediation. The Auditor considers there is a low risk for impact to groundwater and soil vapour and that additional investigation is required to confirm. Also that quantification of asbestos impacts in soil is required.

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. Based on the proposed development (residential townhouses with minor landscaping and garden areas), the human health criteria for 'residential with minimal opportunities for soil access' and ecological criteria appropriate for 'urban residential and public open space' were adopted on the basis that the yard space is largely paved with small areas of lawn.

7.1 Soil Assessment Criteria

7.1.1 Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) Health Investigation Levels (HILs) for 'Residential' (HIL B) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'Low-High Density Residential' (HSL A&B) land use. The HSLs assumed a sand soil type. Depth to source adopted was <1 m as an initial screen.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Residential and Open Space' land use and assuming coarse soil texture. Criteria are relevant for operating sites where significant sub-surface leakage of petroleum hydrocarbons has occurred and when decommissioning industrial and commercial sites.
- Presence/absence of asbestos based on the sampling and analysis undertaken.
- Friebel & Nadebaum (2011) HSLs for direct contact for all land use categories, and vapour inhalation/direct contact pathways for intrusive maintenance workers.

7.1.2 Ecological Assessment Criteria

The Auditor has adopted ecological soil assessment criteria from the following sources:

- NEPM (2013) Ecological Screening Levels (ESLs) for 'Urban Residential and Public Open Space' land use, assuming coarse soil.
- NEPM (2013) Ecological Investigation Levels (EILs) for 'Urban Residential and Public Open Space' land use. Site-specific EILs have been derived using the Interactive (Excel) Calculation Spreadsheet provided in the ASC NEPM Toolbox assuming the contamination is "aged", no lead background concentrations, low traffic volume, 16.3% clay content (range 15 to 17) and using site-specific pH and cation exchange capacity (CEC) values. The pH and CEC values adopted for the natural soil were an average pH of 5.1 (range 4.1 to 6.9) and CEC of 32.3 $\mu\text{molc/kg}$ (range 24 to 43).
- 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 'Residential' 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.

7.1.3 Soil Aesthetic Considerations

The Auditor has considered the need for soil remediation based on 'aesthetic' contamination as outlined in *Section 3.6 Aesthetic Considerations* of NEPM (2013) Schedule B1, which acknowledges that there are no chemical-specific numerical aesthetic guidelines. Instead, site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7.2 Surface Water Assessment Criteria

The Auditor has adopted ecological surface water assessment criteria from the following source:

- 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 environmental quality criteria referenced by the Auditor are generally consistent with those adopted by Coffey.

8. EVALUATION OF SOIL RESULTS

8.1 Field Results

Bore logs presented in the Additional Investigation include descriptions of fill materials comprising traces of metals, water pipe, slag skulls and brick. ACM fragments were noted on the surface of the site and within remaining site buildings. ACM was not identified during the intrusive investigations, however the sampling methodology adopted did not allow for detailed inspection of fill material and analysis was not undertaken in accordance with NEPM (2013).

Elevated PID readings were reported by PE in one sample (80 ppm in sample B 0.7) Coffey at BH14 and BH17 with a maximum of 1702 ppm reported in residual gravelly sandy clay at a depth of 1.8 mbgl in the vicinity of the former USTs. These locations also recorded green staining of clay and the presence of odours at the same depth as elevated PID readings were found.

Other locations reported PID readings less than 5 ppm and an absence of olfactory signs of contamination.

8.2 Analytical Results

Soil samples were analysed for a variety of contaminants including petroleum hydrocarbons, PAHs, asbestos and heavy metals. The results from the Contamination Assessment and Additional Investigation have been assessed against the environmental quality criteria and are summarised in **Table 8.1** (intrusive locations) and **Table 8.2** (stockpile). Soil sampling locations are shown as **Attachment 2, Appendix A**.

Table 8.1: Evaluation of Soil Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Asbestos presence/absence in soil	21	0	<0.1 g/kg	0 above 0.1 g/kg	
Benzene	79	3	9.3	3 above HSL B Sand 0-1 m, 0.5 mg/kg	0 above ESL (Residential/Public Open Space) 50 mg/kg
Toluene	79	4	54	0 above HSL B Sand for relative depths	0 above ESL (Residential/Public Open Space) 85 mg/kg
Ethylbenzene	79	4	12	0 above HSL B 0-1 m, Sand 55 mg/kg	0 above ESL (Residential/Public Open Space) 70 mg/kg
Total Xylenes	79	6	73	2 above HSL B Sand 0-1 m, 40 mg/kg	2 above ESL (Residential/Public Open Space) 45 mg/kg
F1 (TRH C ₆ -C ₁₀ minus BTEX)	81	6	160	1 above HSL B Sand for relative depths 0 above ML (urban residential) 700 mg/kg	0 above ESL (Residential/Public Open Space) 180 mg/kg
F2 (TRH >C ₁₀ -C ₁₆ minus naphthalene)	81	14	2,298	5 above HSL B Sand for relative depths 1 above ML (urban residential) 1000 mg/kg	5 above ESL (Residential/Public Open Space) 120 mg/kg

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
F3 (TRH >C ₁₆ -C ₃₄)	81	33	9,300	3 above ML (urban residential) 2500 mg/kg	20 above ESL (Residential/Public Open Space) 300 mg/kg
F4 (TRH >C ₃₄ -C ₄₀)	81	21	5,300	0 above ML (urban residential) 10,000 mg/kg	2 above ESL 2800 mg/kg
Naphthalene	63	11	7.7	1 above HSL B Sand 0-1 m, 3 mg/kg	0 above EIL (urban residential) 170 mg/kg
Benzo(a)pyrene	63	16	29	-	2 above CCME SQG (residential) 20 mg/kg
Benzo(a)pyrene TEQ	81	72	45	10 above HIL B 4 mg/kg	-
Total PAHs	81	45	395.3	0 above HIL B 400 mg/kg	-
Arsenic	75	71	64	0 above HIL B 500 mg/kg	0 above EIL (Residential/Public Open space) 100 mg/kg
Cadmium	75	13	43	0 above HIL B 150 mg/kg	-
Chromium VI	12	11	28	0 above HIL B 500 mg/kg	-
Chromium III	63	3	170	-	0 above EIL (Urban Residential/Public Open space for ≥10% Clay Content) 400 mg/kg
Copper	75	53	4,300	0 above HIL B 30,000 mg/kg	13 above EIL (Site Specific Residential/Public Open space) 110 mg/kg
Lead	82	79	2,100	5 above HIL B 1200 mg/kg	5 above EIL (Residential/Public Open space) 1100 mg/kg
Mercury	75	23	2	0 above HIL B 120 mg/kg	-
Nickel	75	33	95	0 above HIL B 1200 mg/kg	0 above EIL (Site Specific Residential/Public Open space) 370 mg/kg
Zinc	75	75	1,600	0 above HIL B 60,000 mg/kg	17 above EIL (Site Specific Residential/Public Open space) 280 mg/kg

n number of samples
 - No criteria available/used
 NL Non-limiting
 <PQL Less than the practical quantitation limit

Table 8.2: Evaluation of Stockpile Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Asbestos presence/absence in soil	5	0	<0.1 g/kg	0 above 0.1 g/kg	
Benzene	10	0	<0.1	0 above HSL B Sand 0-1 m, 0.5 mg/kg	0 above ESL (Residential/Public Open Space) 50 mg/kg
Toluene	10	0	<0.1	0 above HSL B Sand for relative depths	0 above ESL (Residential/Public Open Space) 85 mg/kg
Ethylbenzene	10	0	<0.1	0 above HSL B 0-1 m, Sand 55 mg/kg	0 above ESL (Residential/Public Open Space) 70 mg/kg
Total Xylenes	10	0	<0.3	0 above HSL B Sand 0-1 m, 40 mg/kg	0 above ESL (Residential/Public Open Space) 45 mg/kg
F1 (TRH C ₆ -C ₁₀ minus BTEX)	11	0	<40	0 above HSL B Sand for relative depths 0 above ML (urban residential) of 700 mg/kg	0 above ESL (Residential/Public Open Space) 180 mg/kg
F2 (TRH >C ₁₀ -C ₁₆ minus naphthalene)	11	4	69	0 above HSL B Sand for relative depths 0 above ML (urban residential) 1000 mg/kg	0 above ESL (Residential/Public Open Space) 120 mg/kg
F3 (TRH >C ₁₆ -C ₃₄)	11	11	4,500	1 above ML (urban residential) 2500 mg/kg	11 above ESL (Residential/Public Open Space) 300 mg/kg
F4 (TRH >C ₃₄ -C ₄₀)	11	11	1,500	0 above ML (urban residential) 10,000 mg/kg	0 above ESL 2800 mg/kg
Naphthalene	10	0	<0.5	0 above HSL B Sand 0-1 m, 3 mg/kg	0 above EIL (urban residential) 170 mg/kg
Benzo(a)pyrene	63	16	29	-	0 above CCME SQG (residential) 20 mg/kg
Benzo(a)pyrene TEQ	11	11	3.2	0 above HIL B 4 mg/kg	-
Total PAHs	11	11	25.3	0 above HIL B 400 mg/kg	-
Arsenic	10	10	15	0 above HIL B 500 mg/kg	0 above EIL (Residential/Public Open space) 100 mg/kg
Cadmium	10	10	15	0 above HIL B 150 mg/kg	-
Chromium VI	0	-	-	0 above HIL B 500 mg/kg	-
Chromium III	10	10	45	-	0 above EIL (Urban Residential/Public Open space for ≥10% Clay Content) 400 mg/kg
Copper	10	10	570	0 above HIL B 30,000 mg/kg	10 above EIL (Site Specific Residential/Public

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
					Open space) 110 mg/kg
Lead	10	10	2,500	2 above HIL B 1200 mg/kg	2 above EIL (Residential/Public Open space) 1100 mg/kg
Mercury	10	10	0.4	0 above HIL B 120 mg/kg	-
Nickel	10	10	80	0 above HIL B 1200 mg/kg	0 above EIL (Site Specific Residential/Public Open space) 370 mg/kg
Zinc	10	10	1,700	0 above HIL B 60,000 mg/kg	10 above EIL (Site Specific Residential/Public Open space) 280 mg/kg

n number of samples
 - No criteria available/used
 NL Non-limiting
 <PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- Benzo(a)pyrene TEQ was reported above the adopted human health criteria in ten locations across the site, predominantly reported in fill material, but also in natural soil at three locations.
- Elevated lead concentrations above both the adopted ecological and human health criteria was reported in the fill across the site.
- Benzene, xylenes, naphthalene and TRH fractions were reported variably above the adopted human health and ecological criteria in the vicinity of the former USTs.
- Copper and zinc above their adopted ecological criteria were reported across the site.
- The samples collected from the stockpiled material located in the north-eastern corner of the site reported TRH F3 and lead above the adopted human health criteria in two samples. Lead was reported above the adopted ecological criterion in two samples from the stockpile and all samples reported TRH F3, copper and zinc above the adopted ecological criteria.
- Asbestos was not identified, however sampling and analysis was not in accordance with NEPM (2013).

8.3 Auditor’s Opinion

In the Auditor’s opinion, the soil analytical results are consistent with the site history and field observations. The results indicate that fill material, and natural material to a lesser extent, is variably impacted with PAHs, TRH and heavy metals. Coffey calculated the 95% UCL of the benzo(a)pyrene TEQ data set, which indicated benzo(a)pyrene TEQ impacts in the fill are likely to present an unacceptable risk to human health. TRH, benzene, xylenes and naphthalene contamination remains in the vicinity of the former USTs.

The stockpile is impacted by TRHs and lead above the human health criteria, and TRH, copper, lead and zinc above the adopted ecological criteria.

Assessment of fill material and the stockpiled material for asbestos was not undertaken in accordance with NEPM (2013), and the methodology did not allow for visual inspection of material. Asbestos may be present at concentrations greater than indicated by the results.

Further assessment of fill material for asbestos should be considered during remediation and validation of the site.

Based on this, the Auditor considers that remediation is required to make the site suitable for the proposed "multi-dwelling" development. Further investigation is required to delineate the extent of petroleum hydrocarbon impact in the vicinity of the former USTs in both soil, soil vapour and groundwater.

9. EVALUATION OF SURFACE WATER RESULTS

PE collected two surface water samples from ponded water in excavations onsite. As water sampling sheets and laboratory certificates were not provided within PE's Contamination Assessment report, the reliability of the dataset cannot be confirmed and the Auditor has reviewed the surface water results as an indicative screen only. The TRH, BTEXN and PAH concentrations were below the laboratory LOR except for F3 (TRH >C₁₆-C₃₄) (0.4 mg/L) and lead (0.001 and 0.002 mg/L). PE concluded that the water samples revealed no impact from the previous hydrocarbon contamination in the soil.

10. EVALUATION OF CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. Coffey developed a CSM and used it iteratively throughout the site assessment to inform decisions around investigation and management requirements. The CSM was initially developed following the site investigation and has been updated as new information became available. **Table 10.1** provides the Auditors review of the final CSM used by Coffey to inform further investigation and remediation decisions.

Table 10.1: Review of the Conceptual Site Model

Element of CSM	Consultant	Auditor Opinion
Contaminant source and mechanism	Fill and natural soil impacted from former site activities with PAHs, metals and TRHs. Fill and natural soil impacted with TRHs, benzene, toluene and naphthalene associated with former USTs and use as a service station.	Potential sources of contamination are also related degradation of hazardous building materials (lead and asbestos) and importation of impacted fill material (variable, but could include TRH, BTEX, PAHs, metals, OCPs, OPPs, PCBs and asbestos).
Affected media	Soil, including fill and natural soil	Coffey did not consider groundwater to be affected, and considered potential impacts to be low based on the expected depth to groundwater and the high plasticity/low permeability of the natural sandy/silty clay. The Auditor agrees this is likely however requires that confirmation of this assumption be validated through the installation of groundwater wells in conjunction with the hydrocarbon investigation. The Auditor also considered there is the potential for soil vapour in the vicinity of the former USTs. Investigation of groundwater will assist in assessing the risk of vapour intrusion.
Receptor identification	Residents Groundskeepers Construction workers Maintenance workers	The Auditor notes that Coffey has identified onsite human receptors, but the Auditor also considers the potential for onsite ecological receptors to include terrestrial flora and fauna. Offsite receptors include surrounding residents and workers, offsite terrestrial flora and fauna and the Hunter River.
Exposure pathways	Direct dermal contact with contaminated soil Incidental ingestion of contaminated soil Inhalation of contaminated soil as dust Inhalation of hydrocarbon vapour (northern boundary)	Potential exposure pathways have been identified adequately. Groundwater access is not proposed at the site and the groundwater aquifer is unlikely to be viable for domestic use. However, further consideration of groundwater impact is required as part of the hydrocarbon investigations including the installation of groundwater wells.
Presence of preferential pathways for contaminant movement	Not discussed	Preferential pathways have not been discussed, however risks from soil gas are considered low and will be addressing during the further investigations and remedial works.
Potentially complete source-pathway-receptor (SPR) linkages requiring remediation or management	The RAP identified potentially complete exposure pathways associated with elevated PAH, TRH, benzene, xylenes, naphthalene and metals concentrations that required remediation and/or further investigation and management.	This description is considered reasonable.

Element of CSM	Consultant	Auditor Opinion
Evaluation of data gaps	None specifically identified by Coffey, however the RAP outlines the requirements for a delineation assessment prior to any remediation and validation of the hydrocarbon impact along the northern site boundary.	The Auditor considers the delineation of the hydrocarbon impact along the northern boundary reasonable however should be supplemented with groundwater investigations. Further assessment of fill material for asbestos should be completed during remediation and validation of the site.

10.1 Auditor’s Opinion

The CSM developed is considered an adequate basis for assessing remedial requirements with the exception of:

- In **Section 4.1** the Auditor identified additional contaminants of concern that could be present at the site. The Auditor considers these contaminants of potential concern (COPC) should be included in validation sampling however additional sampling for characterisation purposes is not required given the proposed remediation comprises cap and contain or excavation.
- The Auditor considers the delineation of the hydrocarbon impact along the northern boundary reasonable however should be supplemented with groundwater investigations to confirm the hypothesis that groundwater impacts are not likely to have occurred. Soil vapour is also considered a potentially impacted media and investigations of soil and groundwater should conclude on the potential for soil vapour impacts on the future development.
- Further investigation of fill material for asbestos should be completed during remediation and validation of the site in order to quantify impact from asbestos.

11. EVALUATION OF REMEDIATION

11.1 Remediation Required

Coffey determined remedial requirements based on review of investigation results against screening criteria and consideration of aesthetic issues. The Auditor has summarised the issues identified as requiring remediation and the preferred options considered in the RAP in **Table 11.1**.

Soil has been impacted by elevated benzo(a)pyrene TEQ, TRH, benzene, xylenes, naphthalene and lead above the human-health criteria. Remedial works are proposed following removal and disposal of hazardous materials, demolition of the remainder of the buildings, lawful removal of material offsite and exposure of underlying soil.

Table 11.1: Remediation Required and Preferred Options

Description	Extent of Remediation Required	Preferred Options
PAH, TRH (mostly F3 fraction), lead, copper and zinc The BaP _{TEQ} and TRH F3 is more widely distributed across the site with multiple exceedances identified in the upper 1.0 m soil layer.	Elevated PAH, TRH and heavy metals concentrations were reported variably above HILs and EILs in fill and natural soil to an approximate depth of 1.0 mbgl in various locations across the site.	Cap and contain onsite
TRH F1 and F2, benzene, xylenes and naphthalene TRH F1 and F2, benzene, xylenes and naphthalene were primarily found impacting soils along the northern boundary, a location suspected to contain residual hydrocarbon impact from historical use as a service station.	Elevated TRH F1 and F2 fraction and benzene concentrations were reported variably above the HSLs and ESLs along the northern boundary in the vicinity of the former petroleum USTs.	Excavation and offsite disposal after delineation of extent of contamination
Stockpiled soil	Entire stockpile	Cap and contain on site or dispose offsite

11.2 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 11.2**.

Table 11.2: Evaluation of RAP

Remedial Action Plan	Auditor Comments
<i>Remedial Goal</i> Coffey state that the remedial goal is to identify management measures to ensure the site is suitable for future high density residential land use.	In the Auditor’s opinion, this goal is considered appropriate.
<i>Discussion of the Extent of Remediation Required</i> Extent of remediation was not clearly described within the RAP. A site plan showing locations of exceedances is provided as Attachment 4, Appendix A and a plan showing the delineation required along the northern boundary is shown in Attachment 4, Appendix A .	In the Auditor’s opinion the site plan showing the remediation and delineation areas adequately defines the extent of remediation required.

Remedial Action Plan	Auditor Comments
<p><i>Remedial Options</i></p> <p>Remedial options were assessed and included:</p> <ul style="list-style-type: none"> • Leave the contamination undisturbed. • Excavation and offsite disposal. • Excavation and encapsulation of impacted material below capping comprising hardstand areas and building footprints and clean soil in areas proposed for landscaping. 	<p>The Auditor considers that a range of options were considered appropriate based on the proposed development works.</p>
<p><i>Selected Preferred Option and Rationale</i></p> <p>The preferred option was discussed within the RAP and comprised a combination of excavation and offsite disposal of volatile TRH impacted material along the northern boundary and at two locations on site, excavation of landscaped areas and encapsulation on site with remaining soils. Capping is to comprise the building slab and surrounding pavements.</p>	<p>The Auditor considers the preferred option to be appropriate.</p>
<p><i>Description of Remediation to be Undertaken</i></p> <p>Section 4.5 of the RAP outlines the remedial works to be undertaken, which generally comprise the following:</p> <ul style="list-style-type: none"> • Delineation of the TRH impacted soil along the northern boundary and at two locations on site to define the extent of unacceptable impact and volume of material. • Removal of unacceptable impacted material, stockpiling on hardstand and classification for off site disposal to landfill. • Removal of fill materials from proposed landscaping areas and visual confirmation (validation) of natural soil. • Cap and contain excavated materials on site or classify material for disposal off site to landfill. • Validation of excavations. • Capping of the site, including the placement of a geotextile marker layer in landscape and garden areas prior to the importation of 300 mm of topsoil including on vertical faces to separate clean and contaminated soils. A marker layer is not proposed under hardstand or pavement. 	<p>Acceptable. The Auditor notes in landscaping areas that excavation will be to natural soils and that the depth of imported soils may be in excess of 300 mm to achieve the finished surface height. The Depth of clean soil in areas of deep rooted species should be in excess of 300 mm.</p> <p>Services are proposed to be placed below the marker layer and retained within contaminated fill.</p>
<p><i>Proposed Validation Criteria</i></p> <p>Excavations: HIL/HSL B, applicable for a high density residential land use.</p> <p>Capping validation is to comprise documentation to demonstrate the extent of capping and that the depth of clean fill meets the minimum depth requirements in the landscaping areas. The capped areas will be confirmed by survey for inclusion in the Environmental Management Plan (EMP).</p> <p>Imported fill is to be validated as VENM, ENM or otherwise meeting a resource recovery order and exemption.</p>	<p>Acceptable. The Auditor notes there is an inconsistency in the RAP where a depth of 500 mm is proposed in the validation section, whereas 300 mm is proposed in the remediation section. The Auditor understands the depth proposed is 300 mm.</p>
<p><i>Proposed Validation Testing</i></p> <p>Additional investigations are proposed in the area of the former service station following building demolition.</p> <p>Excavations: samples to be collected from the base and walls at a rate of 1 per 25 m² of excavation</p>	<p>The Auditor requires that the results of additional investigations are provided to the Auditor for review following completion of these works and prior to remediation commencing including any impacts on the extent of remediation required.</p>

Remedial Action Plan	Auditor Comments
<p>footprint and a minimum of one sample for smaller areas.</p> <p>Imported Material: Material to be imported to site is to be VENM, AS certified landscaping soil or resource recovery confirmed material. Documentation is to be provided for all imported material prior to delivery to site, and VENM sources that are not quarries will be inspected prior to receiving on site and three check samples analysed.</p>	<p>The Auditor notes that imported material must either be VENM, ENM or be classified under a Resource Recovery Order. The density of testing would need to be commensurate with the documentation provided and the consistency of the results.</p> <p>Validation sampling should include the full suite of COPC: metals, BTEXN, PAHs, TRH, PCBs, OCP/OPPs and asbestos as ACM and AF/FA.</p> <p>Prior to commencement of remediation, the Auditor requires that a validation sampling and analytical quality plan (VSAQP) be developed for review and approval.</p>
<p><i>Contingency Plan if Selected Remedial Strategy Fails</i></p> <p>The remedial strategy has a low risk of failure, as validation failure would lead to further excavation. Soils are proposed to be cap and contained on site, or disposed offsite to landfill.</p>	<p>In the Auditor's opinion, the proposed contingency is considered to be adequate and appropriate to implement.</p>
<p><i>Interim Site Management Plan (before remediation)</i></p> <p>None proposed.</p>	<p>Acceptable.</p>
<p><i>Site Management Plan (operation phase) including stormwater, soil, noise, dust, odour and OH&S</i></p> <p>Section 5 of the RAP outlines site management required during remediation, including:</p> <ul style="list-style-type: none"> • Material tracking requirements. • Soil management, including management of earthworks, stockpiles and haulage. • Air emissions, vapours and odours. • Dust and stormwater. • Noise. • Traffic management. • PPE requirements. <p>Site-specific health and safety requirements are outlined in Section 6 of the RAP. Prior to the commencement of site works, Coffey will prepare a Health, Safety, Security and Environmental Plan, and the contractor will prepare an Emergency and Incident Management Plan.</p>	<p>Acceptable. Sufficient information is provided to inform preparation of detailed documents prior to remediation works commencing.</p>
<p><i>Remediation Schedule and Hours of Operation</i></p> <p>Working hours are 7am to 6pm Monday to Friday and 7am to 5pm on Saturdays. No work is permitted on Sundays and Public Holidays.</p>	<p>Acceptable.</p>
<p><i>Contingency Plans to Respond to Site Incidents</i></p> <p>Unexpected finds protocol is outlined in Section 8 of the RAP, and is expected to include contaminated material, buried infrastructure, asbestos, potential ASS, Aboriginal and non-Aboriginal heritage items, skeletal remains.</p>	<p>The Auditor notes that the RAP provides management and contingency plans that are directly applicable for the proposed works.</p>
<p><i>Licence and Approvals</i></p> <p>The RAP details regulatory requirements and approvals (i.e. SEPP55 and Maitland City Council Contaminated Land Policy – Land Use Planning 2017 (CLP)), licences to be held by the Contractor (i.e. friable asbestos license from SafeWork NSW) and other requirements for the disposal of asbestos and contaminated waste.</p>	<p>Acceptable.</p>

Remedial Action Plan	Auditor Comments
<p>The proposed remedial works are considered to be 'Category 1 Remediation' in accordance with Maitland City Council CLP and SEPP 55 and require development consent.</p> <p>An appropriately licensed landfill should be selected and the material tracked from the site to the landfill.</p>	
<p><i>Contacts/Community Relations</i></p> <p>Contacts are not provided but will be displayed on signs located adjacent to the site access throughout the remediation program. Direct community consultation will be undertaken if required.</p>	<p>Acceptable. Council has not required community consultation on the remediation at this stage.</p>
<p><i>Staged Progress Reporting</i></p> <p>Not proposed.</p>	<p>Acceptable.</p>
<p><i>Long Term Environmental Management Plan</i></p> <p>A Environmental Management Plan (EMP) has been proposed which will identify capped impacted areas and outline mitigation measures to ensure capped contamination is not exposed. The EMP must be endorsed by the Site Auditor and will be submitted to Maitland City Council to ensure it is an appropriate mechanism for the management of residual contamination. Implementation of the EMP will be the responsibility of the Strata Management and proposed to be incorporated in the Strata by-laws</p>	<p>Acceptable. The EMP will require review by the Site Auditor. It is recommended that implementation of the EMP during occupation of the site is made a condition of consent.</p>
<p><i>Waste Management</i></p> <p>Material handling and management is outlined in Sections 5.1-5.3 and Section 7.2 of the RAP.</p>	<p>Acceptable.</p>
<p><i>Remediation Technology Pilot Trial</i></p> <p>Not applicable.</p>	<p>Acceptable.</p>

11.3 Auditor's Opinion

In the Auditors' opinion, the proposed remediation works are appropriate. If adequately implemented, the RAP should ensure that the site is suitable for the proposed land uses through the removal of petroleum hydrocarbon contamination and containment of impacted fill material. Successful validation will be required to confirm this. Additional requirements outlined by the Auditor in **Table 11.2** are to be implemented.

12. CONTAMINATION MIGRATION POTENTIAL

Following removal of petroleum hydrocarbon impacted fill, the Auditor considers that there would be little or no potential for migration of contamination from the site in surface water or dust. In the Auditor's opinion, there is no evidence of significant migration of contamination and Coffey has concluded there is a low potential for groundwater impact. However, the Auditor requires that groundwater investigations be completed in conjunction with the additional hydrocarbon investigations to confirm the hypothesis that groundwater impacts are low and to assess the potential for soil vapour impacts to the future development and downgradient properties.

13. ASSESSMENT OF RISK

Potential risks to human health and the environment from elevated TRH, PAH and heavy metals in the soil at the site will be addressed through implementation of the proposed remedial works and subsequent implementation of an EMP to manage the residual risk.

Groundwater access is not proposed for the development and is unlikely to be used in future due to the low yielding aquifer. Suitability of groundwater quality for use would need to be considered if groundwater access is proposed.

14. ONGOING SITE MANAGEMENT

Coffey indicate that long term site management following remediation will be required for any remaining residual contamination. An outline of the EMP structure is provided in the RAP. Review and approval of the EMP by the Auditor will be required. It is recommended that implementation of the EMP during occupation of the site is made a condition of consent.

15. COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS

15.1 General

The Auditor has used guidelines currently made and approved by the EPA under section 105 of the NSW *Contaminated Land Management Act 1997*.

The investigation was generally conducted in accordance with SEPP 55 Planning Guidelines and reported in accordance with the NSW EPA (2020) *Consultants Reporting on Contaminated Land*.

15.2 Notification

Coffey indicated that the proposed remediation works were classified 'Category 1' Remediation Works and would require development consent under SEPP 55.

15.3 Development Approvals

There is currently no development approval for the site. The remediation proposed in the RAP would require planning approval under the *Environment Planning and Assessment Act 1979*.

15.4 Duty to Report

Consideration has been given to the requirements of the EPA (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*.

The Auditor considers that potential risks to human health and the environment will be addressed through implementation of the proposed RAP and subsequent implementation of an EMP. The site is therefore not required to be notified under the Duty to Report requirements.

15.5 Waste Management

Coffey indicate waste will be managed in accordance with the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*.

15.6 VENM and Other Imported Materials

Coffey indicate any material to be imported to site would be VENM, AS certified landscaping soil or resource recovery confirmed material.

15.7 Licenses

Material (such as contaminated soil or water) will be disposed of at a facility licensed to receive such waste.

An asbestos licence may be required if asbestos is encountered during remediation works. Demolition early works incorporating removal of asbestos work has commenced and would also require a contractor licenced for asbestos removal work.

15.8 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.

16. CONCLUSIONS AND RECOMMENDATIONS

Based on the information presented in Coffey 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 purposes of 'residential with minimal soil access' if remediated in accordance with the following remedial action plan:

'GHT Holdings Pty Ltd, Remedial Action Plan, 107-117 Swan Street, Morpeth', 20 December 2021, Coffey.

Subject to compliance with the following conditions:

- Prior to commencing remediation, a validation Sampling and Analytical Quality Plan that details the validation sampling proposed for the additional investigation and to validate the remediation is provided to the Auditor for review and approval. Further quantitative assessment of fill material for asbestos should be undertaken during remediation and validation of the site. Further investigation of hydrocarbon impacts should include groundwater investigations and assess the potential for soil vapour to be present.
- Following completion of additional investigations in the area of the former service station, a report is prepared for Auditor review that describes the results of the investigation and any additional remediation requirements.
- During the remediation works, the Auditor is to undertake inspections of remediation activities.
- The consultant is to provide a draft EMP in accordance with Appendix B of the RAP for review and approval by the Auditor.
- Following remediation works, the consultant is to provide to the Auditor a validation report documenting the remediation completed at the site.
- Following remediation and successful validation, a Section A Site Audit Statement is prepared by the Auditor stating that the site is suitable for the proposed use.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

17. OTHER RELEVANT INFORMATION

This Audit was conducted on the behalf of GHT Holdings Pty Ltd for the purpose of assessing the suitability and appropriateness of a remedial action plan (RAP), 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. PE and Coffey included limitations in their reports. 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 of the Site Audit Report in preparing the Auditors' 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 Plan
- Attachment 2: Site Plan and Sampling Locations
- Attachment 3: Proposed Development
- Attachment 4: Extent of Remediation Required

Attachment 1: Site Location Plan




MAP PROJECTION: GDA2020 MGA ZONE 56



Scale (metres) 1:20000

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drawn	SR / AW		client:	GHT HOLDINGS PTY LTD		
approved	PW		project:	DETAILED SITE INVESTIGATION - DA17-515 107-117 SWAN STREET, MORPETH, NSW		
date	31/08/2020		title:	SITE LOCATION PLAN		
scale	AS SHOWN		project no:	754-NTLEN271167-R03	figure no:	FIGURE 1
original size	A4				rev:	A

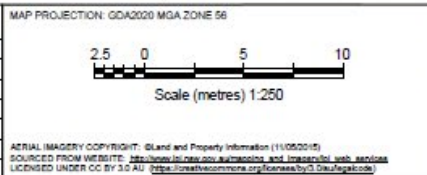
Attachment 2: Site Plan and Sampling Locations



LEGEND

- SITE BOUNDARY
- STOCKPILE SP1
- ◆ BOREHOLE LOCATION
- ⊗ STOCKPILE SAMPLE LOCATION
- DETAILED INVESTIGATION SAMPLES COLLECTED ON THE 4/8/2018 BY PE
- LOCAL COUNCIL DRAINAGE IMPACT SAMPLES

no.	description	drawn	approved	date
A	ORIGINAL ISSUE	SR/AW	PW	31/08/2020



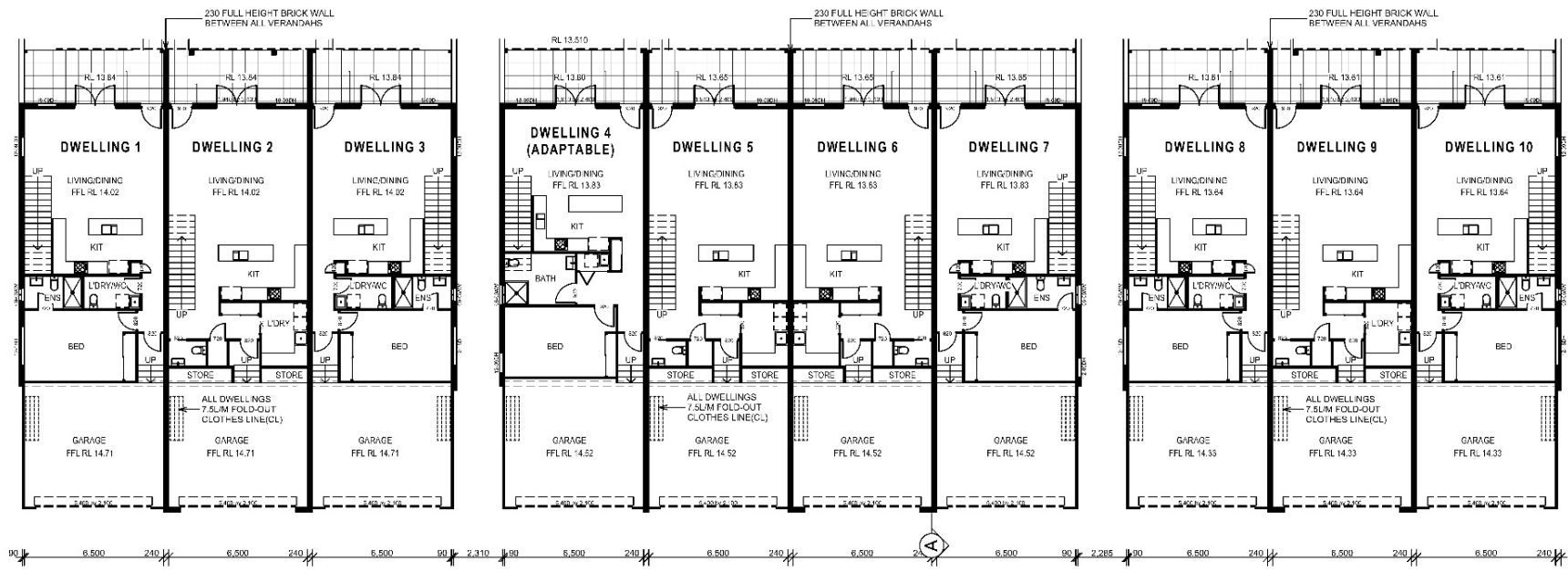
drawn	SR / AW
approved	PW
date	31/08/2020
scale	AS SHOWN
original size	A3



client:	GHT HOLDINGS PTY LTD		
project:	DETAILED SITE INVESTIGATION - DA17-515 107-117 SWAN STREET, MORPETH, NSW		
title:	BOREHOLE LOCATION PLAN		
project no:	754-NTLEN271187-R01	figure no:	FIGURE 2
rev:	A		

PLOT DATE: 29/08/2020 11:02:34 AM. DWG FILE: F:\PROJECTS\DA17-515\GHT\DA17-515-01-BOREHOLE LOCATION PLAN.dwg (1:250) 29/08/2020 11:02:34 AM

Attachment 3: Proposed Development



GROUND FLOOR / SITE PLAN
 1:200
SITE ANALYSIS AREAS

SITE AREA	2712.4m ²
BUILDING FOOTPRINT	1309.1m ²
HARDSTAND	562.0m ²
PERMEABLE PAVING	116.2m ²
LANDSCAPED AREA	331.1m ²
PRIVATE OPEN SPACE	394.0m ²
SITE COVERAGE	69%

DWELLING AREAS

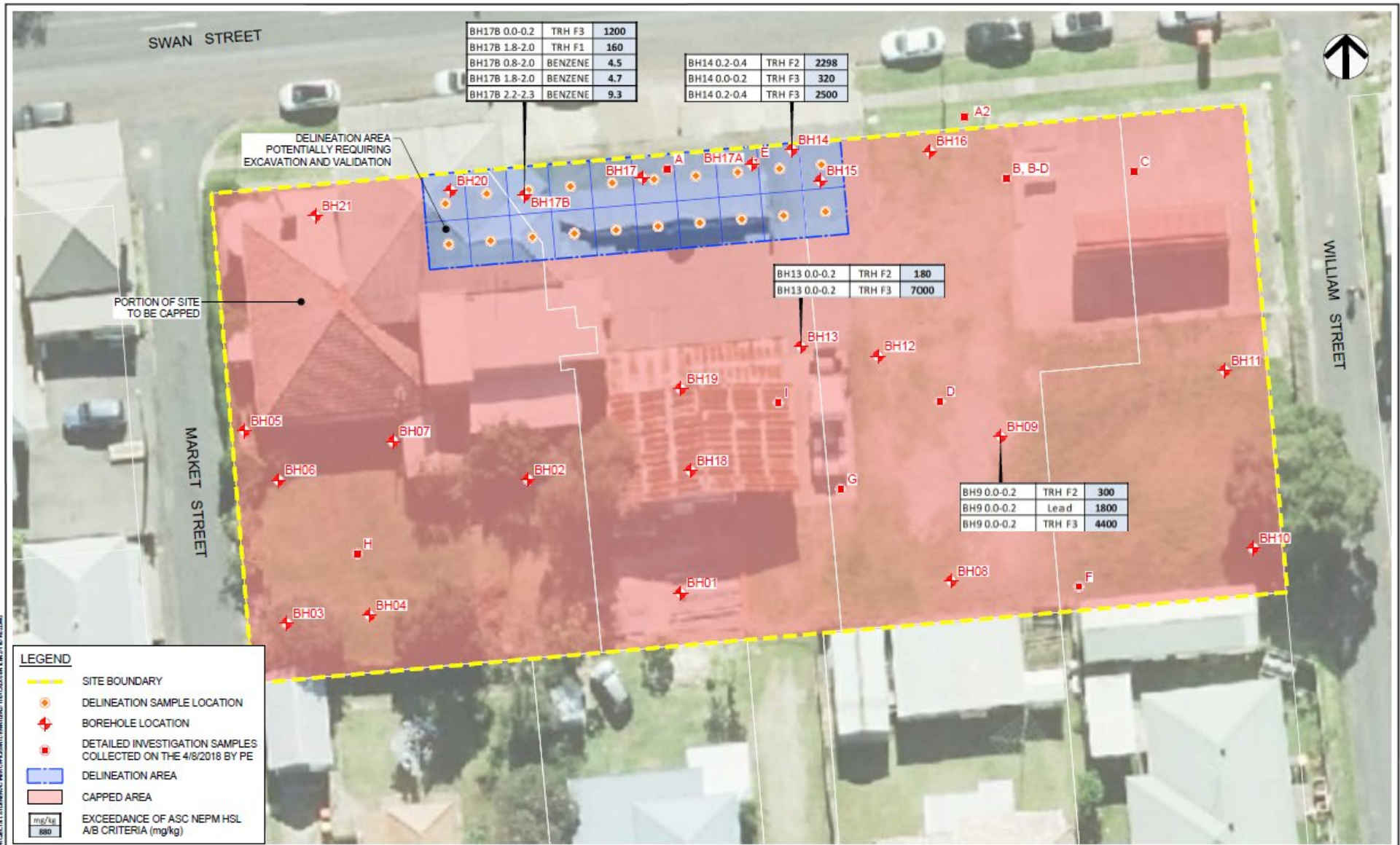
DWELLING 1	169.8m ²	DWELLING 6	201.6m ²
GARAGE	43.3m ²	GARAGE	46.95m ²
DWELLING 2	206.1m ²	DWELLING 7	169.8m ²
GARAGE	47.2m ²	GARAGE	43.3m ²
DWELLING 3	169.8m ²	DWELLING 8	169.8m ²
GARAGE	43.3m ²	GARAGE	43.3m ²
DWELLING 4	168.9m ²	DWELLING 9	206.1m ²
GARAGE	44.5m ²	GARAGE	47.2m ²
DWELLING 5	201.6m ²	DWELLING 10	169.9m ²
GARAGE	46.95m ²	GARAGE	44.5m ²

Z:



<p>D 03/09/21 - UNIT REMOVED, CORNG CHANGED TO 2,4,4, SIDE OFFSET IS INCREASED</p> <p>C 03/09/21 - REVISED DRAWING</p> <p>B 25/09/21 - DA ISSUE</p> <p>A 28/09/21 - HERB-T REDUCED</p> <p>SSU: D-1A LS</p>		<p>PROJECT: PROPOSED RESIDENCES AT 107-117 SWAN STREET MORPETH</p>
		<p>CLIENT: UNICOMB</p>
		<p>TITLE: GROUND FLOOR PLAN</p>
		<p>F.L: 2003016 DATE: 10/12/2021 SHEET: 4 OF 22</p>
<p>PLEASE CONTACT: SORENSEN DESIGN & PLANNING</p> <p>PO BOX 5100 YARRA ST MORPETH WA 6150 PH (08) 9484 5555 SALES AND VISUALS: 0800 000 000 PH (08) 9484 5544 WWW.SORENSENDESIGN.COM.AU</p>		<p>PROJECT: PROPOSED RESIDENCES AT 107-117 SWAN STREET MORPETH</p> <p>CLIENT: UNICOMB</p> <p>TITLE: GROUND FLOOR PLAN</p> <p>F.L: 2003016 DATE: 10/12/2021 SHEET: 4 OF 22</p> <p>PLEASE CONTACT: SORENSEN DESIGN & PLANNING</p>

Attachment 4: Extent of Remediation Required



no.	description	drawn	approved	date	MAP PROJECTION: GDA2020 MGA ZONE 56	drawn	PW / AW	client: GHT HOLDINGS PTY LTD	
	A ORIGINAL ISSUE					approved	PW		project: REMEDIATION ACTION PLAN 107-117 SWAN STREET, MORPETH, NSW
						date	13/01/2022		title: DELINEATION AND REMEDIATION AREAS
						scale	AS SHOWN		project no: 754-NLEN271167-R03
						original size	A3		figure no: FIGURE 8
									rev: A

Scale (metres) 1:250

**TETRA TECH
COFFEY**

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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. FR 077

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: Fiona Robinson

Company: Ramboll Australia Pty Ltd

Address: Level 2

50 Glebe Road, The Junction NSW

Postcode: 2291

Phone: 02 4962 5444

Email: frobinson@ramboll.com

Site details

Address: 107-117 Swan Street, Morpeth

Postcode: 2321

Property description

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

Lots 1 and 3 DP 538510, Lot 1 DP 521620 and Lot 321 DP 1226898

Local government area: Maitland City Council

Area of site (include units, e.g. hectares): approximately 0.28 ha

Current zoning: R1 General Residential

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: Chris Unicomb

Company: GHT Holdings Pty Ltd

Address: PO BOX 522, Maitland

Postcode: 2320

Phone: 02 4932 6005

Email: chris@unicomb.com.au

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: residential land use with minimal soil access

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Pacific Environmental (PE)

Coffey Services Australia Pty Ltd (Coffey)

Titles of reports reviewed:

'Phase Two Soil Contamination Assessment, 107-117 Swan Street Morpeth NSW', 4 November 2019, PE.

'GHT Holdings Pty Ltd, Additional Site Contamination Investigation – 107 - 117 Swan Street, Morpeth NSW', 9 September 2021, Coffey.

'GHT Holdings Pty Ltd, Remedial Action Plan, 107-117 Swan Street, Morpeth', 20 December 2021 (and earlier drafts), Coffey.

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

Site audit report details

Title: Site Audit Report - 107-117 Swan Street, Morpeth

Report no.: FR 077 (Ramboll Ref: 318001319) Date: 2 February 2022

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 plan¹, 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 plan² (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 systems³
- requires maintenance of **passive** control systems only³.

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 plan⁴ which is the subject of this audit:

To detail the additional investigations and remediation method required to render the site suitable for the proposed high density residential 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~~

⁴ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- 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):

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

*Strike out as appropriate

Plan title: 'GHT Holdings Pty Ltd, Remedial Action Plan, 107-117 Swan Street, Morpeth'

Plan author: Coffey Services Australia Pty Ltd

Plan date: 20 December 2021

No. of pages: 79

SUBJECT to compliance with the following condition(s):

- Prior to commencing remediation, a validation Sampling and Analytical Quality Plan that details the validation sampling proposed for the additional investigation and to validate the remediation is provided to the Auditor for review and approval. Further assessment of fill material for asbestos should be considered during remediation and validation of the site. Further investigation of hydrocarbon impacts should include groundwater investigations and assess the potential for soil vapour to be present.
 - Following completion of additional investigations in the area of the former service station, a report is prepared for Auditor review that describes the results of the investigation and any additional remediation requirements.
 - During the remediation works, the Auditor is to undertake inspections of remediation activities.
 - The consultant is to provide a draft EMP in accordance with Appendix B of the RAP for review and approval by the Auditor.
 - Following remediation works, the consultant is to provide to the Auditor a validation report documenting the remediation completed at the site.
 - Following remediation and successful validation, a Section A Site Audit Statement is prepared by the Auditor stating that the site is suitable for the proposed use.
-

Overall comments:

The site is a former foundry and service station, which has resulted in contamination of the soil at the site with lead, benzo(a)pyrene, benzene and total recoverable hydrocarbons (TRH) above the adopted human health criteria.

The remedial strategy comprises a combination of excavation of target areas and cap and contain of residual contamination underneath hardstand and buildings on the site to be managed through a long-term environmental management plan. Further investigation of hydrocarbon impacts is required in areas where building demolition is to be completed. Further quantitative investigation of asbestos in soils is also required as part of the remediation and validation program.

This Site Audit Statement and accompanying Site Audit Report has been prepared following recommendations by Council to engage an EPA-accredited Site Auditor to review contamination investigations and a Remediation Action Plan. The audit is therefore a non-statutory audit. A further site audit is required after completion of the remediation and validation to assess the suitability of the site for the proposed.

Part III: Auditor's declaration

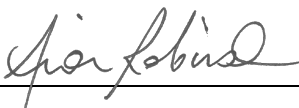
I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*.

Accreditation no. 1506

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 2 February 2022

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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