

# REMEDIATION ACTION PLAN (RAP)

30 SANDSPIT ROAD, SHELLY PARK, AUCKLAND



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## STATEMENT

This plan has been prepared in acknowledgement of the Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations 2011. It has been authorised by a suitably qualified and experienced practitioner (SQEP); and has been prepared with the intention of providing practices and procedures for the management of potentially contaminated land that meets the criteria of the NES, the MfE guidelines and the requirements of Box Property Investments Ltd.'s development plans.

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## 1 INTRODUCTION

It is proposed to develop the piece of land identified as 30 Sandspit Road, Shelly Park, and hereafter referred to as 'the site' in this report, and the adjacent properties through the demolition of the existing buildings on site and the construction of new residential apartment buildings. The proposed development will construct 70 dwellings, comprising 3 apartment buildings and 12 terraced houses.

The property is legally described as LOT 2 DP 334191 and has a total area of 3,781 m<sup>2</sup> (Figure 1).

The proposed development is expected to require substantial earthworks in order to achieve the proposed basement and foundation levels. Earthworks will be required across the full extent of the site and will encompass discrete aspects of remedial earthworks to address actual and potential contamination on site.

A detailed site investigation completed in November 2017 identified two discrete areas of the site that contain concentrations in excess of the MfE *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand* Tier 1 soil acceptance criteria for residential landuse, and the BRANZ *New Zealand Guidelines for Assessing and Managing Asbestos in Soil* Tier 1 human health risk assessment threshold limit for fibrous asbestos and asbestos fines in soil.

In accordance with the NES, and AUP(OP) remedial earthworks are required to address these exceedances and ensure that any residual soil is fit for the intended end landuse. To ensure appropriate practices and procedures are implemented during these works, this Remediation Action Plan has been prepared to a scale and degree commensurate with the actual and potential risks associated with the analytical results obtained. The specific measures in this RAP have been prepared to facilitate the removal of contaminated soil from the area impacted by petroleum asbestos fibres and petroleum hydrocarbons within two discrete areas of the site located at 30 Sandspit Road, Shelly Beach. It is to be submitted to Auckland Council for approval prior to works commencing on site.

## 2 FORMER INVESTIGATIONS AND POTENTIAL CONTAMINANTS

Geosciences Ltd (GSL) have undertaken the following site investigations in accordance with the Ministry for the Environment Contaminated Land Management Guidelines (CLMG) No. 1 - "*Reporting on Contaminated Sites in New Zealand*" and No. 5 - "*Site Investigation and Analysis of Soils*".

### 2.1 GEOSCIENCES PRELIMINARY SITE INVESTIGATION 2017

GSL conducted a preliminary site investigation (PSI) of the piece of land encompassed by 30 & 40 Sandspit Road and 2-4 Reydon Place in July 2017, the findings of which are summarised in GSL report *Rep 1063/PSI/Jul17*. The PSI identified that 30 Sandspit Road (the site) has been the location of a motor vehicle workshop (HAIL Item F.4) from prior to 1959 until recently, a petrol station (HAIL Item A.13) from pre 1963 until 2011, and also potentially the location of uncertified filling in a gully on site.

The PSI concluded that the site had been the location of activities included on the MfE HAIL, and therefore recommended that further intrusive investigation be undertaken in order to establish whether or not those activities had impacted the soil quality on site.

### **2.1.1 ENVIRONMENTAL RESOURCE MANAGEMENT SOIL VALIDATION REPORT**

The PSI also involved the review of a soil validation report prepared by ERM which was contained in the property file for the site. The report detailed the removal of the underground storage tanks including the removal of:

- one 30,000 l 91 octane petrol tank
- one 20,000 l 96 octane petrol tank
- one 10,000 l diesel tank,
- one 10,000 l waste oil tank; and
- associated infrastructure including dispensers, fuel lines, vents, and remote fill points.

The report concluded that there were no unacceptable risks to human health, or the environment associated with the petroleum hydrocarbons stored in the former underground tanks for the sites ongoing commercial landuse.

GSL reviewed the validation soil sampling results from ERM's investigation in light of the proposed residential landuse for the site, finding that two of the validation soil samples contained concentrations of total petroleum hydrocarbons (TPH) and benzene respectively which exceed the residential landuse criteria of the MfE *"Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand"*. Fourteen soil samples collected during soil validation works returned detectable concentrations of organic compounds that were within the applicable landuse criteria.

## **2.2 GEOSCIENCES DETAILED SITE INVESTIGATION**

Following the completion of the PSI, GSL completed a detailed site investigation (DSI) on the site (30 Sandspit Road) in November 2017, the findings of the investigation are detailed in GSL report *Rep 1063a/DSI/Nov17*. The DSI included a targeted soil sampling regime based on the conceptual model of potential contamination developed during the PSI, which identified non-engineered fill, a motor vehicle workshop, and the bulk storage of fuel in underground storage tanks as potentially contaminating activities. Discrete soil samples were collected from fourteen locations identified in the PSI as the locations of HAIL activities, using a tractor mounted drill rig and auger bit. Soil samples were submitted to an accredited laboratory for analysis for the contaminants of concern relating to the HAIL activities identified in the PSI. GSL noted that sandy backfill was present in the tank pit of the former petrol station, therefore soil samples in this area were assessed against the Petroleum Guidelines criteria for both sand, and silty clay soil types.

While onsite undertaking soil sampling, GSL personnel identified partially buried asbestos containing materials in the northeast corner of the site, and an ACM clad fence. GSL collected two discrete soil samples, one from the location of the buried ACM and the other from along the fence line for the analysis of semi-quantitative asbestos fibre concentration.

Analytical results revealed that:

- No TPH, or PAH were detected in soil samples from the former petrol station forecourt;
- soil samples from the former motor vehicle workshop returned concentrations of heavy metals within the expected naturally occurring background concentration range for non-volcanic soils in the Auckland Region and concentrations of PAH below the laboratory limit of reporting;
- soil samples from the unverified fill returned concentrations of heavy metals in excess of the background ranges, and detectable traces of PAH in all soil samples; and
- one soil sample collected from the area of buried ACM returned concentrations of ACM and asbestos fines in excess of the then WorkSafe endorsed *Guidelines for the Assessment, Remediation, and Management of Asbestos-Contaminated Sites in Western Australia* human health standard for all site users (GSL notes that the WA Guidelines have now been superseded in New Zealand by the BRANZ *New Zealand Guidelines for the Assessment and Management of Asbestos in Soil (BRANZ Guidelines)* which were published in November 2017)

### 3 EXTENT OF IMPACTED SOIL

#### 3.1 IMPACTS REQUIRING REMEDIAL WORKS

Soil samples collected during GSL's DSI indicated that the detectable TPH and BTEX identified by previous investigations are limited to a discrete area under the former petrol station forecourt. GSL has identified that the hotspot is limited to an area of approximately 114 m<sup>2</sup> and a depth of at least 500 mm below relative ground level. However, the vertical extent of impacted soil in the forecourt has not been fully delineated and as such, validation soil sampling is required. GSL estimates that at least 57 m<sup>3</sup> of impacted soil requires remediation in the forecourt.

With respect to asbestos, an area of buried ACM (Super 6 sheeting) was identified in the eastern corner of the site behind the garage. Soil sampling in this area has identified friable asbestos in the soil matrix in one soil sample. The estimated extent of the area is approximately 15 m<sup>2</sup>, and while the depth of the buried ACM has not been established, it is not expected to be significant.

While ACM was also identified on the boundary fence between 30 and 40 Sandspit Road, this was noted to be in good condition, and suspended above the ground surface and as such, was not considered to present a risk of soil contamination. That said, it will require removal in a controlled manner in accordance with the *Health and Safety at Work (Asbestos) Regulations 2016 (HSWAR)* and should be undertaken alongside the removal of ACM impacted soil by a Class A licensed asbestos removal contractor in order to ensure that no soil contamination arises through that removal process.

#### 3.2 LOW LEVEL IMPACTS / NON CLEANFILL SOILS FOR REUSE OR DISPOSAL

With reference to unverified fill on the site, fill material appears to be constrained on site by the lower terrace and detectable concentrations of PAH have been found to be uniformly distributed throughout this fill horizon. The fill is greater than 5m in depth in the northernmost portion of the



site, grading out to approximately 0.4 m depth by the garage in the eastern corner of the site. While this fill material will not meet the MfE or AUP(OP) definition of cleanfill as a result of the elevated concentrations of heavy metals and detectable PAHs, there material may be reused on site, providing it is geotechnically sound, compliant with the end land use standard, and can be encompassed within the development plans. Section 9 below provides appropriate mechanisms for characterisation of fill quality and handling.

## 4 STATUTORY REQUIREMENTS

In order to address the requirements of the NES and the AUP(OP), GSL has prepared the following site-specific remediation action plan to document the remedial process for the removal of actually and potentially ACM impacted soil in the area behind the garage in the eastern corner of the site, and the remedial process for the removal of actually and potentially hydrocarbon impacted soil from underneath the former petroleum filling station canopy. The following RAP documents the practises and procedures to be implemented to ensure that any risks to human health and the environment as a result of the potential mobilisation of contaminants in soil are managed to an acceptably low level. Procedures have also been included to ensure that all potentially impacted soil is appropriately handled and disposed of at a facility that is licensed to accept soil of this nature.

## 5 REMEDIATION ACTION PLAN

This site-specific remediation action plan (RAP) provides procedures for the handling of actually and potentially contaminated excavated soil material because of the proposed development at 30 Sandspit Road, Shelley Park (Figure 1). It is to be submitted to Auckland Council for approval before works commence on site.

### 5.1 REMEDIATION GOALS

The NES and AUP(OP) do not set specific soil contaminant standards for petroleum hydrocarbon concentrations but instead acknowledge the Tier 1 criteria as specified in the MfE *“Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand”*. Where applicable, the residential landuse criteria set by these guidelines have been applied as a remediation goal for the forecourt area. As noted above, both sandy backfill and silty clay soils are present in the former petrol station forecourt, and as the extent of the sandy backfill is not known at this point, the remediation goal for petroleum hydrocarbons includes both the criteria for sand, and for silty clay soils. Validation soil samples in this area will be assessed based on the observations made during validation.

With respect to asbestos, the NES does not contain specific soil contaminant standard for the protection of human health, nor is there any expected environmental impact. Therefore, it is appropriate to default to applicable guidelines as set out in the hierarchy defined in CLMG No. 2. The Tier 1 Risk Assessment threshold for all site users on a weight / weight concentrations as defined by the *BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil* have been implemented as a suitably conservative remedial goal for the protection of human health for residential landuse.

The remediation goals for the project are presented in Table 1 below.

**TABLE 1: REMEDIATION GOALS**

Contaminant	Remediation Goal	
	Surface <1m	Depth >1m
TPH C7-C9	2,700 <sup>1</sup>	7,300 <sup>2</sup>
TPH C10-C14	560 <sup>1</sup>	2,700 <sup>2</sup>
TPH C15-C36	20,000 <sup>1</sup>	20,000 <sup>2</sup>
Benzene	1.7 <sup>1</sup>	4.6 <sup>2</sup>
Asbestos	No visible asbestos on surface soil <sup>3</sup> 0.04 w/w ACM (bonded) <sup>3</sup> 0.001 % w/w FA and/or AF <sup>3</sup>	

**Notes:**

- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Residential Landuse (Silty Clay) <1 m Soil Acceptance Criteria
- Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand - Residential Landuse (Silty Clay) >1 m Soil Acceptance Criteria
- BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil - Tier 1 Risk Assessment for all site users

## 5.2 RESPONSIBILITIES

The appointed earthworks contractor will assign a 'site manager' to the project that will be responsible for the implementation of this RAP, or an alternative RAP that is acceptable to the Council Consents Team, for the proposed works at the site.

Following the appointment of a site manager, it will be their responsibility to ensure the contact details for the responsible parties with respect to this RAP are provided in Table 2 below.

**TABLE 2: RESPONSIBLE PARTIES**

Position	Contact Name & Company	Telephone Number
Main Construction Contactor		
Project Manager		
Site Manager/supervisor		
Asbestos Removal Contractor		
Certificate of Competence Holder		
Contaminated Land Advisor	Carl O'Brien Geosciences Ltd	027 228 5556 09 475 0222 / 06 281 2454

### 5.3 ENGAGEMENT OF CONTAMINATED LAND ADVISOR

Geosciences Ltd will be available to provide on-call direction in relation to contamination / disposal issues for the project. Geosciences Ltd is a professional consultancy, with personnel suitably qualified and experienced in the investigation, reporting, remediation, and validation of contaminated land.

The main functions of the CLA are to:

- Assist in inspecting / screening potentially contaminated material;
- Assess the effectiveness of environmental control measures;
- Manage the collection and analysis of any soil samples (if required) in accordance with the Ministry for the Environment's (MfE) Contaminated Land Management Guideline No 1, (Reference 5);
- Provide assessments of the investigation;
- Make recommendations based on findings; and
- Maintain regular liaison with the authorities if necessary.

### 5.4 BRIEFING SESSIONS

The site manager is to commission a briefing session for relevant staff and subcontractors prior to the commencement of works. The briefing session will include as a minimum:

- Known areas of impacted soil material;
- Appropriate PPE and safety measures;
- Familiarisation with the requirements of the RAP;
- Guidance for identifying contaminated material as works progress (Appendix A); and
- Procedures to be followed should contaminated material be encountered (Appendix A).

### 5.5 HEALTH AND SAFETY PROCEDURES

While this RAP provides steps that are required because of the presence of asbestos fines (friable asbestos) in the soil in a discrete area of the site and for the disturbance of soil actually and potentially impacted by petroleum hydrocarbons, the appointed contractors are ultimately responsible for the H&S procedures related to the earthworks and asbestos removal.

The Health and Safety Guidelines on the Clean-up of Contaminated Sites developed by Occupational Safety and Health Services (OSH) provides reference to appropriate H&S measures that can be adopted for contaminated sites. A copy of this guideline can be provided upon request. Specific requirements for both asbestos related and hydrocarbon related works are documented in turn below.

### 5.5.1 ASBESTOS RELATED REMEDIAL WORKS

A Class A Licensed asbestos removal contractor will be appointed to undertake the necessary asbestos removal works on site and will be responsible for health and safety procedures to be in place for the duration of asbestos removal works. Prior to the commencement of removal works, the asbestos removal contractor will provide Box Property with an Asbestos Removal Control Plan (ARCP) detailing the removal methodology, handling, and disposal of asbestos containing materials (ACM), as well as a site plan noting the locations of environmental control measures, monitoring devices, and decontamination facilities.

For the duration of the assessment, handling, and removal, and validation of asbestos contaminated soil at site, a site induction familiarising all staff entering the site with the requirements of this RAP, the ARCP, and the site specific H&S requirements of the principle contractor is required. The asbestos removal contractor will be responsible for completing the induction process.

The concentration of asbestos in the soil within the area of remediation exceeds the Tier 1 risk assessment threshold for all site users set in the BRANZ Guidelines and is therefore considered to present a risk to the health of site workers in this area. Consequently, provisions in accordance with the HSWAR must be established, and adhered to, to ensure the health and safety of workers during soil disturbance in this area. Inhalation is the most important exposure risk related to airborne asbestos in dust, it is therefore imperative that dust controls are in place and adhered to for the duration of works. Specific controls are set out in Section 7 below.

### 5.5.2 PETROL STATION FORECOURT REMEDIAL WORKS

The concentration of TPH in one soil sample from under the petrol station forecourt exceeds the Petroleum Guidelines Tier 1 soil acceptance criteria for commercial / industrial landuse. As such, the soil in the remediation area may present a risk to the health of workers in this area and provisions must be established, and adhered to, in order to ensure the health and safety of workers during soil disturbance in this area.

Inhalation of vapour or ingestion of impacted soil are the considered the priority exposure risks related to airborne contaminants in dust while direct contact with skin or eyes is the secondary route of entry in this case.

GSL notes that direct dermal contact with soil should be limited where possible by using mechanical excavators. Where direct contact with soil is required, appropriate PPE as set out in Section 8.1 below must be work by personnel and appropriate actions implemented to decontaminate prior to eating, drinking, or smoking.

## 6 PROPOSED STAGING OF DEVELOPMENT WORKS

GSL recommends that a staged approach is undertaken with regards to the remediation, and development of the site. The PSI has identified the potential for ACM to have been used in the buildings on the wider piece of land (30-40 Sandspit Road, and 2-4 Reydon Place) and the fence / buried ACM noted in the DSI as described above. Therefore in accordance with the Health and Safety at Work (Asbestos) Regulations 2016 these buildings must be subject to a Type-3 Hazardous

Building Materials Survey prior to demolition. The findings of the survey will form the basis of an asbestos removal control plan, which will be provided by the appointed removal contractor.

The proposed development works, including remedial works detailed in the sections below will be conducted in the following stages, while remedial works will be undertaken as two separate work streams as below:

- **Hazardous Building Materials Survey:** all building on site, and the wider piece of land under development will be subject to a Type-3 fully intrusive hazardous building material survey which will be undertaken by a licensed asbestos assessor. The survey will document the amount and location of asbestos in the buildings across the full extent of the piece of land and will form the basis for an asbestos removal control plan, which is to be provided by the appointed removal contractor.
- **Asbestos Removal:** remedial earthworks and off-site disposal of soil related to the buried ACM onsite followed by validation through systematic visual inspection of excavations and the collection of validation soil samples, these can be conducted concurrently with asbestos removal from the buildings on site;
- **Demolition:** following the completion of asbestos removal works the controlled demolition of the buildings on site, and the wider piece of land under development can be undertaken; and
- **Petrol Station Forecourt:** remedial excavations for off-site disposal of identified petroleum hydrocarbon and benzene impacted soil from the petrol station forecourt, followed by visual inspection of excavations and collection of validation soil samples.
- **Site Preparatory Earthworks:** following the completion of the remedial work streams above, bulk earthworks can commence on the site. Should these earthworks require the disturbance of the band of fill identified on the northeast portion of the site, then the site management controls required under the NES are detailed in Section 9 below.

GSL notes as the two remedial areas are located on separate areas of the site, there is no reason that the two remedial work streams cannot be undertaken concurrently provided sufficient access is available in and around the forecourt structure. In the event that concurrent excavations are undertaken, an exclusion zone of a minimum of 10 m around the asbestos removal works in accordance with the HSWAR must be maintained.

## 7 REMEDIATION EARTHWORKS PROCEDURES - ASBESTOS REMOVAL

Box Property Investments Ltd or their appointed site manager, will appoint a Class-A Licensed asbestos removal contractor for the earthworks associated with the removal of buried ACM, and for the removal of identified ACM on the buildings as identified in the Type-3 survey. All the asbestos removal works will be undertaken as “Class A” works under the appropriate controls under the HSWAR. The removal contractor will provide an asbestos removal control plan and will arrange for the appropriate health and safety requirements under the HSWAR, including control air monitoring be an independent person during removal works and the notification to WorkSafe of Class-A asbestos removal works being undertaken if necessary.

As the depth of buried ACM is not currently known, the estimated volume of soil material to be disturbed because of the remedial earthworks is not expected to exceed 15 m<sup>3</sup>. However, it is noted that the remedial excavation will continue until such a time as no visible fragments of potentially ACM are observed. This material will consist mostly of topsoil and underlying natural clay material.

In addition to the specific controls set out in the asbestos removal control plan, the procedures below will be followed to ensure that potentially contaminated soil is adequately handled and disposed of off-site.

- The affected area, as shown in Figure 2, will be marked with fluorescent paint in the field;
- An exclusion zone of 10 m will be set up around the area of works;
- Prior to earthworks commencing, the Asbestos Removalist will arrange for the off-site disposal of ACM impacted soil to a suitably licensed receiving facility;
- excavated soil will be loaded directly into a lined truck or trailer and taken directly to a facility authorised to receive soil of this kind;
- the ground surface beneath the truck loading area will be protected through the use of an impermeable surface barrier (e.g. 200 µm plastic sheeting);
- water sprayers or similar water dust suppression equipment will be available at all times during the removal works to eliminate dust generation during handling and removal;
- The CLA will be notified and inspect any suspicious or noxious material that might be encountered during the earthworks. If necessary, the CLA will take soil samples for analysis of any foreign material that is discovered. The CLA will advise on the disposal of any such material;
- Upon completion of the excavation the site manager shall ensure that plant and equipment are cleaned and decontaminated appropriately; and
- A landfill manifest or weigh bridge dockets of all material disposed of at a managed fill or landfill facility will be kept.

## **7.1 PERSONAL PROTECTIVE EQUIPMENT**

Personal Protective Equipment (PPE) which should be available on-site will be in accordance with the asbestos removal control plan. Additional PPE that may be required include:

- P3 rated half masks (paper masks are unacceptably
- Safety glasses
- Disposable Cat 3 coveralls;
- Washable gumboots; and
- Nitrile gloves

The licensed Asbestos Removalist will use his discretion regarding the use of additional PPE and might call upon the CLA for advice on this matter.

## 7.2 DUST CONTROL

As inhalation is the most important exposure risk related to airborne asbestos fibre contaminants in dust, it is imperative that the potential generation of dust, and therefore potential asbestos fibres, is eliminated during the remediation of the asbestos impacted soil on site. The principle contractor and licensed asbestos removal specialist have the responsibility of managing the suppression of dust on site for the duration of the asbestos soil remedial work. Water spraying should be frequent enough to suppress the generation of dust but not as heavy as to generate sediment laden water run-off

The earthworks contractor and licensed asbestos removal specialist will use their discretion with regard to dust suppression and will be ultimately responsible for ensuring the control of dust during earthworks on site. However, for the duration of the assessment, handling, removal, and validation of asbestos contaminated soil on site, the following minimum dust suppression and control requirements are expected:

- All soil and aggregate on site to be pre-wet to a soil moisture content no less than 15% (refer *'The Release of Dispersed Asbestos Fibres from Soil'* J Addison, A Robertson, RJ Wiley, September 1988). A value of 15% soil moisture or higher can generally be indicated as being 'damp to the touch' and not subject to wind disturbance if dropped by hand;
- dust generation during remedial earthworks to be controlled by use of fog-cannons or light frequent spraying. Water usage should be frequent enough to suppress the generation of dust, but not so heavy as to produce sediment laden run-off;
- Avoidance of cross-contamination of other areas through use of 200 µm plastic side sheeting on all removal trucks and loadout areas as detailed above; and
- stockpiles of potentially asbestos contaminated soil on site to be maintained at 15% moisture content and / or covered with tarpaulin or other protective measures if left unattended for more than 24 hours

## 7.3 STORMWATER PROTECTION

To prevent generation of contaminated sediment laden run-off, stormwater protection measures shall be incorporated around the perimeter of the proposed works in accordance with Auckland Council Guidance Document GD05 *"Erosion and Sediment Control Guide for Land Disturbing Activities in New Zealand, June 2016"* shall be sufficient to ensure compliance with these requirements. These controls shall include appropriate measures such as:

- Protection of the proposed works perimeter with silt-socks to trap sediment / asbestos fibres in stormwater; and
- the use of diversion trenches to direct surface water to a designated stormwater collection pond.

Following the completion of asbestos contaminated soil removal from the site as specified above, any erosion and sediment control devices must be disposed of alongside the asbestos impacted soils

## 7.4 ACM REMOVAL VALIDATION

Following the removal of the ACM fencing material, all impacted soil and visible fragments of ACM from the identified areas of ACM, remedial works will be validated by a suitably qualified and experienced environmental practitioner.

Site validation will include:

- A visual inspection of the full extent of the remedial excavation, and a visual inspection of the ground surface underlying the ACM fence line in order to provide visual clearance that all visible fragments of ACM have been removed; and
- following visual clearance, the collection of five discrete soil samples; one from each side wall of the excavation and one from the base of the excavation for the analysis of semi-quantitative asbestos fibre concentration in accordance with the BRANZ Guidelines. Should the analytical results exceed the remediation goal set in Section 5.1 above, then remedial works as above will continue until all soil samples comply with the remedial goal of <0.001% w/w asbestos fines and fibrous asbestos. Once compliant results have been achieved the exclusion zone will be removed and this area of the site will be regarded as validated and fit for residential landuse.

With regards to the ACM fence, while the panels of the fence are suspended above the ground surface and no asbestos was detected in the soil sample submitted in the DSI, as a suitably conservative measure, GSL will collect one validation soil sample per 10 linear m along the fence line.

## 8 REMEDIATION EARTHWORKS PROCEDURES - PETROL STATION FORECOURT

The volume of soil to be removed from site is estimated to be at least 57 m<sup>3</sup> over an area of 114 m<sup>2</sup> contained within the footprint of the former petrol station forecourt, hydrocarbon impacted soil is expected to an average depth of at least 500 mm, with deeper excavations of up to at least 3.6m required in places. However, while the portions of the site have been identified to be impacted by hydrocarbons at depth, the full depth of contamination onsite has not been fully delineated at this point. Excavated soil based on observations during the DSI, is expected to consist of silty clay soils, sandy backfill material, and underlying sandy-silty-clay subgrade of the East Coast Bays Formation.

As the depth of contamination has not been fully defined in this area, the initial remedial excavation will entail the excavation of 500 mm over the impacted area unless otherwise indicated in Figure 2. Following the completion of the initial scrape the site manager will inspect the excavation for visual or olfactory indication of hydrocarbon contamination (strong odours / visual staining / separate phase hydrocarbon), should these be identified then further excavation will be undertaken until these are no longer evident. Once no distinct evidence remains, the CLA will be notified to undertake validation soil sampling in accordance with Section 8.3 below.

It is proposed that hydrocarbon impacted soil from the former petrol station forecourt will be excavated and disposed of off-site at a suitably licensed waste receiving facility. The following practises and procedures will be followed during the remedial works to ensure that any risks associated with the potential mobilisation of contaminants are managed to an acceptably low level:



- The site manager will arrange for disposal of all impacted soil at a suitably licensed landfill facility prior to the works commencing;
- the affected area, as defined in Section 3 above (Figure 2) will be marked out in the field using fluorescent paint;
- erosion and sediment controls will be implemented prior to earthworks commencing in accordance with Auckland Council Guidance Document GD05 *Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region*;
- excavated soil / materials will be loaded directly into covered truck or trailer units and taken directly to the arranged disposal location;
- the site manager will be responsible for controlling dust emissions in accordance with the *Good Practice Guide for Assessing and Managing the Environmental Risks of Dust Emissions* (MfE, 2001) for the duration of works on site;
- the site manager will provide wash-down facilities for workers to use prior to eating, drinking, or smoking to minimise any potential contaminant exposure pathways (ingestion / inhalation);
- soil disturbance works will be primarily undertaken using a mechanical excavator and direct contact with soil minimised as far as practicable;
- a leak-proof skip bin will be available for the temporary storage of material of a suspicious nature that might be encountered during the earthworks;
- any temporary stockpiles will be managed (kept damp) to ensure that there is no excess dust generated from the stockpiles;
- silt fencing will be placed around any temporary stockpiles (if any) to ensure that there is no excessive sediment-laden run off from the stockpiles;
- the CLA will be notified and inspect any suspicious or noxious material that might be encountered during the earthworks. If necessary, the CLA will take soil samples for analysis of any foreign material that is discovered. The CLA will advise on the disposal of any such material;
- upon completion of the excavation, the site manager will ensure that plant and equipment area cleaned and decontaminated appropriately; and
- a landfill manifest or weighbridge docket of all material disposed of at a landfill facility will be kept.

If it is confirmed that additional potentially contaminated material has been discovered onsite, then the Auckland Council's contaminated land team will be notified as soon as possible following the confirmation of the discovery.

## 8.1 PERSONAL PROTECTIVE EQUIPMENT

The minimum PPE which should be available onsite will be in accordance with the contractor's specific health and safety plan. Additional PPE that may be required include:

- Protective leather or rubber gloves

- Safety glasses
- Dust masks

The site manager will use his discretion with regard to the use of additional PPE and might call on the CLA for advice on this matter.

## 8.2 DUST CONTROL

Dust controls in accordance with the *Good Practise Guide for Assessing and Managing the Environmental Effects of Dust Emission* (MfE, 2001) are required to minimise contaminants becoming airborne and reduce stormwater sediment loads. If the proposed earthworks are undertaken in dry conditions, dust can be suppressed by light frequent water spraying and the covering of any stockpiled materials. Water spraying should be frequent enough to suppress the generation of dust but not so heavy as to generate sediment laden run-off.

The site manager will use his discretion with regard to dust suppression and will be ultimately responsible for ensuring the control of dust during earthworks on site.

## 8.3 HYDROCARBON VAPOURS

Given the presence of hydrocarbon impacted material onsite, there is potential for hydrocarbon vapours to be released from impacted material as part of remedial excavations. In the event that hydrocarbon odour/vapour is present within the former service station forecourt, the contractor will implement measures to minimise the generation of odours during remedial excavations, including but not limited to:

- undertaking excavation works in a staged manner to limit the exposed surface area of potentially odorous material;
- wetting-down of excavations;
- application of odour suppressants if necessary;
- covering any portion of the site that is generating odour when not being remediated;
- covering stockpiled soil with sheeting to suppress the potential release of odours;
- routinely backfilling excavations; and/or
- any other measures available from the contractors experience obtained during hydrocarbon impacted site remediation.

The concentrations of hydrocarbons detected during the DSI are not anticipated to be sufficient to generate vapour in concentrations which would pose a risk to site workers, however as a precaution, all remedial works for hydrocarbon impacted soil will be undertaken using an excavator, with impacted material loaded directly into a truck and/or trailer unit. Site workers will not enter any remedial pit until remediation is successfully completed and validated. In the event that worker need to enter a testpit during times when petroleum odour is present, then a PID gas measurement will be taken to ensure it is safe to do so and all relevant practices and procedures for entering such excavations (including confined space requirements) will be followed.

### 8.3.1 EXPLOSION RISK

It is not anticipated that there is a risk of explosion from hydrocarbon impacted material onsite given the hydrocarbon concentration returned during the DSI. However if during remedial works, separate phase hydrocarbons are encountered, or there is an identifiable discharge of hydrocarbon vapours to the atmosphere from the work area, **ALL WORKS WILL CEASE** and the work area evacuated.

The site contractor will notify the CLA, and if necessary emergency authorities, to assess the risk and implement appropriate controls to minimise any explosion risk. Works will only continue once appropriate controls have been implemented and gas level monitoring can be implemented to ensure that any residual contamination remains outside of the explosive risk thresholds.

## 8.4 GROUNDWATER

The quality of groundwater at the site has not been characterised as part of previous investigations and is therefore considered to exceed the ANZECC guideline values for the protection of 95% freshwater species unless otherwise characterised.

In the event that remedial earthworks encounter the seepage of groundwater into the area of works, accumulated water will be pumped out and disposed of at an appropriate receiving facility appropriate facility via a licence liquid waste contractor, or if permission is obtained from Watercare, via a trade waste discharge into the sewerage network.

In the event that any groundwater encountered at the site is characterised as compliant with the ANZECC 95% freshwater guideline values, groundwater encountered may be disposed of within the local stormwater network.

## 8.5 PETROL STATION FORECOURT VALIDATION

Following the confirmation from the site manager that remedial excavations have been completed in the former petrol station forecourt, validation will include:

- a visual inspection of the excavation to confirm depth of cut, and confirm that no visual or olfactory indications of contamination remain; and
- the collection of five discrete validation soil samples from each area of remedial excavations; one from the base of the excavation and one from each of the sidewalls of the excavation, for the analysis of total petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylenes (BTEX). Should any validation soil sample fail to meet the remediation goal set in Section 5.1 then remedial excavations as described above will continue until all validation soil sample comply with the remediation goals.

## 9 NON-ENGINEERED FILL

Non-engineered fill has been identified across portions of the site, and concentrated within the northern portion of the site, extending to depths greater than 5m. While the surficial fill material (<1m) has been characterised as not posing a risk to human health or the receiving environment,

further characterisation of fill beyond this depth in light of the proposed excavations (>3m) is required to confirm that all fill is of uniform quality as determined within the DSI.

## 9.1 FILL QUALITY CHARACTERISATION

In conjunction with validation of the petrol forecourt soil validation outlined in Section 8.5 above, or at a convenient point within the development timeframes, further intrusive investigation of the emplaced fill material will be undertaken to confirm the quality of deeper emplaced fill material and determine whether any further controls or remedial works are necessary.

The intrusive investigation shall include a minimum of three test pits (Figure 3) advanced to into the fill material profile to depths of up to 5m. During excavations, fill material will be visually assessed for visual and olfactory indicators of contamination (i.e. staining, odours, building rubble, asbestos containing materials), and soil samples collected for analysis based on testpit observations. Visual assessment will look for signs of stratification within the emplaced fill as well as evidence of staining, discoloration or other visual or olfactory indicators

As a minimum, three discrete soil samples from varying depths below 1m will be collected from each test pit. All soil samples shall be submitted for laboratory analysis of a suite of heavy metals and polycyclic aromatic hydrocarbons. Further analytes may be considered based on the test pit observations.

Upon receipt of the analytical results, an assessment shall be undertaken to determine whether the emplaced fill material poses a human health or environmental discharge risk, and if necessary an addendum or revision of this RAP issued summarising the additional works and/or measures required when handling this material, which may include, but not be limited to, further remedial works, soil validation, and worker protection controls.

## 9.2 NON-ENGINEERED FILL EARTHWORKS PROCEDURES

The following controls will be implemented as a minimum during disturbance of emplaced fill, due to the detection of the elevated heavy metal concentrations and PAHs within the fill profile. These controls shall be updated in the event further intrusive investigation identifies contaminant concentrations which pose a risk to end land users, site workers, and/or the receiving environment.

Should the emplaced fill material be characterised as not posing a risk to end land users or the receiving environment, there is no reason that this material cannot be reused on site as landscaping, or if geotechnically suitable as engineered fill.

The minimum controls that will be implemented during the disturbance of emplaced fill material are as follows:

- Prior to earthworks commencing, the contractor will arrange for the disposal of any excess soil at a suitably licensed managed fill / landfill facility;
- an area on site will be prepared for the temporary stockpiling of material of a suspicious nature that might be encountered during the earthworks;
- any excavated soil for off-site disposal will be loaded directly into covered truck or trailer units and taken directly to a pre-arranged facility that is suitably licensed to accept material of this nature;

- any temporary stockpiles will be managed (kept damp) to ensure there is no excess dust generated by the stockpiles;
- silt fencing will be placed around any temporary stockpiles (if any) to ensure that there is no excessive sediment-laden run off from the stockpiles;
- the CLA will be notified and inspect any suspicious or noxious material that might be encountered during the earthworks. If necessary, the CLA will take soil samples for analysis of any foreign material that is discovered. The CLA will advise on the disposal of any such material;
- upon completion of the excavation, the site manager will ensure that plant and equipment area cleaned and decontaminated appropriately; and
- a landfill manifest or weighbridge docket of all material disposed of at a landfill facility will be kept

### 9.3 DUST CONTROL

GSL considers that the same dust controls as detailed in Section 8.2 above are sufficient to manage any risks associated with the mobilisation of contaminants in dust during general earthworks.

### 9.4 EROSION AND SEDIMENT CONTROL

For the duration of earthworks erosion and sediment controls in accordance with Auckland Council Guidance Document GD05 “*Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*” will be in place until the land is returned to an erosion resistant state following earthworks.

## 10 CONTINGENCIES

Where any unidentified soil contamination is encountered on the site during the works (a range of examples are provided in Appendix A), the site manager will:

- Immediately cease works within 20m of the area of discovery, including where practicable, shutting down earthmoving machinery and removing these from the area of discovery;
- Contact GSL as the CLA for immediate advice on necessary controls to minimise any discharge of contaminants into the environment; and
- Secure the area of discovery to prevent access and inform wider relevant parties including Auckland Council.

Following notification, GSL as the CLA will undertake an initial assessment and provide information to Council on the type of discovery, associated risk and response to address the discovery. The CLA will either:

- Identify the material in situ if possible (staining, odour, visible fibres or refuse etc.); or
- Undertake sampling in-situ to advice on management, and removal and disposal options once analytical results are returned.

GSL has produced a contaminated soil discovery guideline (CSDG) document that outlines the signs, risks, and remedial actions required for contamination scenarios that may be encountered during remedial earthworks (Appendix A). The purpose of this document is to provide information to the contractor on common signs of potential contamination and is to be supplementary to the requirements of this SMP.

If any staff, contractors, or consultants discover contamination, they should notify the site manager immediately, who should enact the provisions of the plan.

### 10.1 ADDITIONAL FIBROUS MATERIAL (ASBESTOS)

While this RAP details the procedures for the removal of ACM impacted soil in one discrete area of the site, and potentially ACM has been identified on buildings on the development area, it is not anticipated that any further asbestos materials will be encountered on the site. That being said, the presence of further unidentified buried ACM (buried pipes et.) cannot be ruled out during excavations, due care should be taken and the site manager and excavator operator should be vigilant while excavations are undertaken.

Where any further ACM are identified in the soil matrix, all works shall cease (including the excavation and disposal of affected materials) until the provisions of the *Health and Safety at Work (Asbestos) Regulations 2016* are exercised.

ACM identification will be primarily through visual inspection by a suitably competent person. Any fibrous material observed during the excavation will be visually inspected, photographed, and representative samples submitted to an accredited laboratory for analysis. Following the receipt of analytical results, the site manager, in conjunction with the CLA shall determine what, if any further remedial steps are required, including the provisions of asbestos removal control plans, semi-quantitative analysis, or site management under the *BRANZ New Zealand Guidelines for the Assessment and Management of Asbestos in Soil* (November 2017).

## 11 REPORTING AND RECORD KEEPING

At completion of the earthworks, the site manager shall provide a report to Box Property Investments Ltd that shall include records of the:

- Volume and nature of any material removed from site and all managed-fill/landfill disposal dockets;
- A log of any unknown or suspicious materials encountered during earthworks;
- Laboratory reports, if any;
- Any complaints or incidents; and
- Site photographs of all excavations and re-instatement works.

## 12 SITE VALIDATION REPORT

The individual validation testing and inspection requirements for each stream of remedial works are outlined in Sections 7.4 and 8.3 respectively.

Upon completion of the remedial works and validation by a Suitably Qualified and Experienced Environmental Practitioner, a site validation report (SVR) will be completed and provided to Auckland Council. The SVR will include:

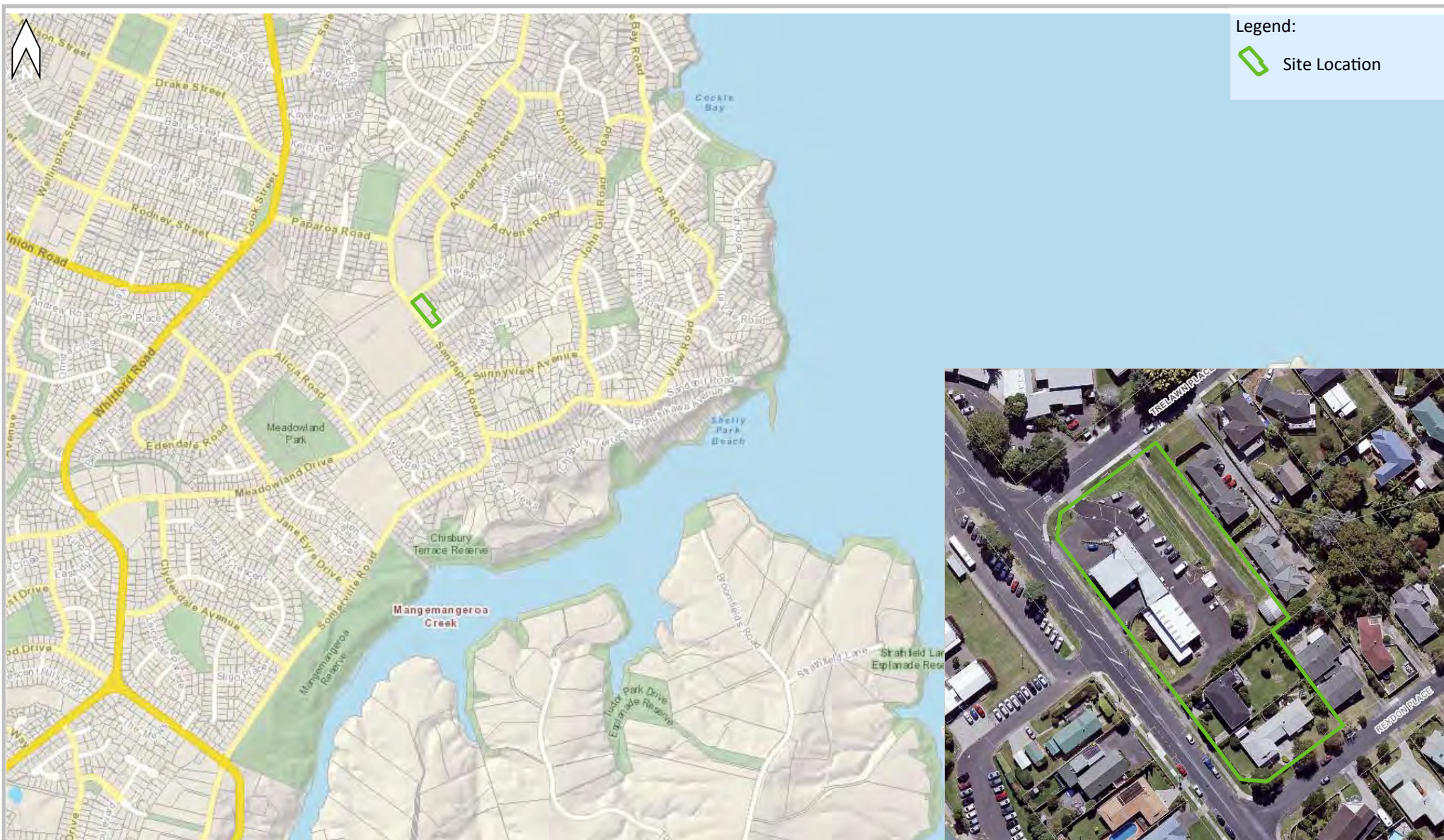
- A description of remedial works undertaken;
- The quantity of soil material removed from site, including copies of the disposal manifests;
- A description of any unforeseen contaminated soil material encountered during the remedial works;
- Laboratory analytical results from any soil testing that occurred during the remedial works; and
- Any incidences or complaints that occurred during the earthworks.

## 13 REFERENCES

1. Ministry for the Environment (2011) - Draft Users Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Ministry for the Environment, Wellington, New Zealand.
2. Ministry for the Environment (2011) – *Methodology for Deriving Standards for contaminants in Soil to Protect Human Health*. Ministry for the Environment, Wellington, New Zealand.
3. Ministry for the Environment (2021) — *Contaminated Land Management Guidelines No.1: Reporting on contaminated Sites in New Zealand*. Ministry for the Environment, Wellington, New Zealand.
4. Ministry for the Environment (2021) — *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*. Ministry for the Environment, Wellington, New Zealand.
5. Department of Labour (1999) — *Health and Safety Guidelines on the Cleanup of Contaminated Sites*. Occupational Safety and Health Services. Department of Labour. Wellington. ISBN 0-477-03546-9.
6. BRANZ (2017) - *New Zealand Guidelines for Assessing and Managing Asbestos in Soil*. BRANZ,



## FIGURES



**geosciences** Ltd  
ENVIRONMENTAL

Level 1, 47 Clyde Road, Browns Bay, 0630  
Tel: (09) 475 0222

Title:

**Figure 1 - Site Location**

Project name:

30 Sandspit Road, Shelly Park, Auckland

Reference: J1063b

Date: 20 Sep 2018

Drawn: BR

Approved: COB





Title:	<b>Figure 2 - Areas to be Remediated</b>	Reference: J1063b
Project name:	30 Sandspit Road, Shelly Park, Auckland	Date: 20 Sep 2018
<b>geosciences</b> Ltd <small>ENVIRONMENTAL</small>	Level 1, 47 Clyde Road, Browns Bay, 0630, Tel: (09) 475 0222	Drawn: BR
		Approved: COB



<b>Title:</b>	<b>Figure 3 - Future Fill Quality Testpit Locations</b>	<b>Reference:</b> J1063b
<b>Project name:</b>	30 Sandspit Road, Shelly Park, Auckland	<b>Date:</b> 22 Jul 2020
<b>geosciences</b> <small>ENVIRONMENTAL</small>	Level 1, 47 Clyde Road, Browns Bay, 0630, Tel: (09) 475 0222	<b>Drawn:</b> BR
		<b>Approved:</b> COB

## APPENDIX A: CONTAMINATED SOIL DISCOVERY GUIDELINES