

25 June 2021

[REDACTED]
[REDACTED]
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RE: Remediation Design Specification – Chullora Railway Workshops, Worth Street, Chullora, NSW

Dear [REDACTED]

1. Introduction and Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Sydney Trains (the client) to provide environmental consultancy services related to a portion of the property identified as the Chullora Railway Workshops (CRW) at Worth Street, Chullora NSW (the site). The site is legally identified as part Lot 1 in DP 883526. The site location and layout are shown on **Figures 1** and **2** respectively.

The site has been used for rail-related activities since the early 1920's. It is currently vacant, but is proposed to be redeveloped by adaptive re-use of existing warehouse structures for rail related maintenance, repair and storage activities.

Historical activities at the site have resulted in chlorinated hydrocarbon impacts to site soil, groundwater and soil vapour. JBS&G recently completed a sub-slab vapour investigation to delineate the extent of chlorinated ethene impacts within soil vapour that will require remediation / management to remove any potentially unacceptable health risks (via vapour intrusion) to future commercial occupants of the buildings.

The JBS&G investigation identified tetrachloroethylene (PCE), trichloroethylene (TCE) and vinyl chloride (VC) impacts within sub-slab vapour as shown on **Figure 5**. It was considered that the VC impacts located adjacent to the former wash bay in the north-eastern portion of Area D require remediation or otherwise ongoing management to control potential future vapour intrusion to this portion of the building.

Following discussion on-site, it has been agreed with Sydney Trans representative that an active in-situ management approach is the most appropriate means to control this impact and allow an ongoing use of the building. Please find this correspondence to detail the proposed remedial design specifications to manage the identified impacts as per the agreed in-situ approach.

2. Remediation Principle

It is proposed to install an active venting system to allow for the sub-slab vapour impacts to be preferentially vented outside the building space – instead of being drawn into the building by potential advective gradients as formed between the building sub-surface and the building atmosphere.

This will be achieved by the installation of 100 mm slotted polyvinyl chloride (PVC) extraction pipes as installed horizontally within high permeability trenches in the area of impact (shown on **Figure 6**). The extraction pipes will be connected to whirlybirds on the outside of the building to create a negative pressure differential underlying the slab relative to indoor air within the building. A low

levels of soil vapour discharge will occur through the whirly birds venting the extraction pipes. The design details are outlined in the sections below.

3. Extent of Remediation

The lateral extent of impacts that require remediation are shown on **Figure 6**. The area measures 20 m x 40 m (800 m²) from the northern and eastern extents of the building respectively.

4. Remediation Design

4.1 Trenches

Eight trenches are required to be excavated on a 5 m spacing within the area of impact as shown on **Figure 6**. The trench dimensions will be 0.5 m deep (measured from underside of slab), 0.5 m wide and 20 m in length. The trenches will contain the horizontal extraction pipes (see below) and will be backfilled with a high permeability aggregate material that has a particle size of ≥ 20 mm. A cross-section of the trench design is shown on **Figure 7**. The trenches will be covered with a concrete slab to be reinstated level with the existing ground floor slab.

4.2 Extraction Pipes

The horizontal extraction pipes will comprise of 100 mm diameter slotted PVC pipes. The pipes will be required to be installed on a strictly levelled sub-base anticipated to consist of bedding aggregate material (and just below the slab) to allow for a sufficient vacuum to extend across the length of the horizontal extraction pipe. The horizontal extraction pipes will be connected to solid vertical PVC pipes (i.e. with no slots) via elbow joints (at an angle of 45°) on the outside of the building. The solid vertical PVC pipes will extend to the roof of the building and be connected to whirlybirds.

4.3 Venting and Assessment

It is preferred that the stand-pipe from each of the horizontally installed pipes are able to be separately accessed at a surface location, and at ground level. In the first instances it is proposed that that each of the pipes will be connected in pairs to a vertical pipe as attached to the exterior of the building and terminating in a whirlybird at the top of the building.

Measurements shall be undertaken of vapour levels and wind flow through the piping at the timing of system commissioning to determine:

- Whether the whirlybirds will require to be extended horizontally above the height of the building roof to prevent potential building downwash effects of emissions; and
- Whether more than four stand-pipes (noting that of eight horizontal sections will be connected in pairs to a single stand-pipe) are required to ensure sufficient airflow / extraction pressure through the system. This may result in an additional four vertical pipe sections being required to be installed (one as specific to each extraction pipe run).

The measurements are further anticipated to confirm, whether required by system alteration or otherwise, that the emissions from the system do not pose a potential pollution risk.

5. On-going Management

The venting system will be required to be functional for the life of the building or until such time that the levels of chlorinated hydrocarbon within sub-slab vapour have attenuated to levels that do not pose a risk occupants of the building. The performance of the system will be informed by a program of indoor air monitoring that will be detailed in an Environmental Management Plan (EMP) to be implemented during the operation of the site.

Vapour measurements as undertaken at system commissioning will be able to inform the likely duration of the operation of the system.

Should you require clarification, please contact the undersigned on [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Attachments:

1. Limitations
2. Site Figures

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

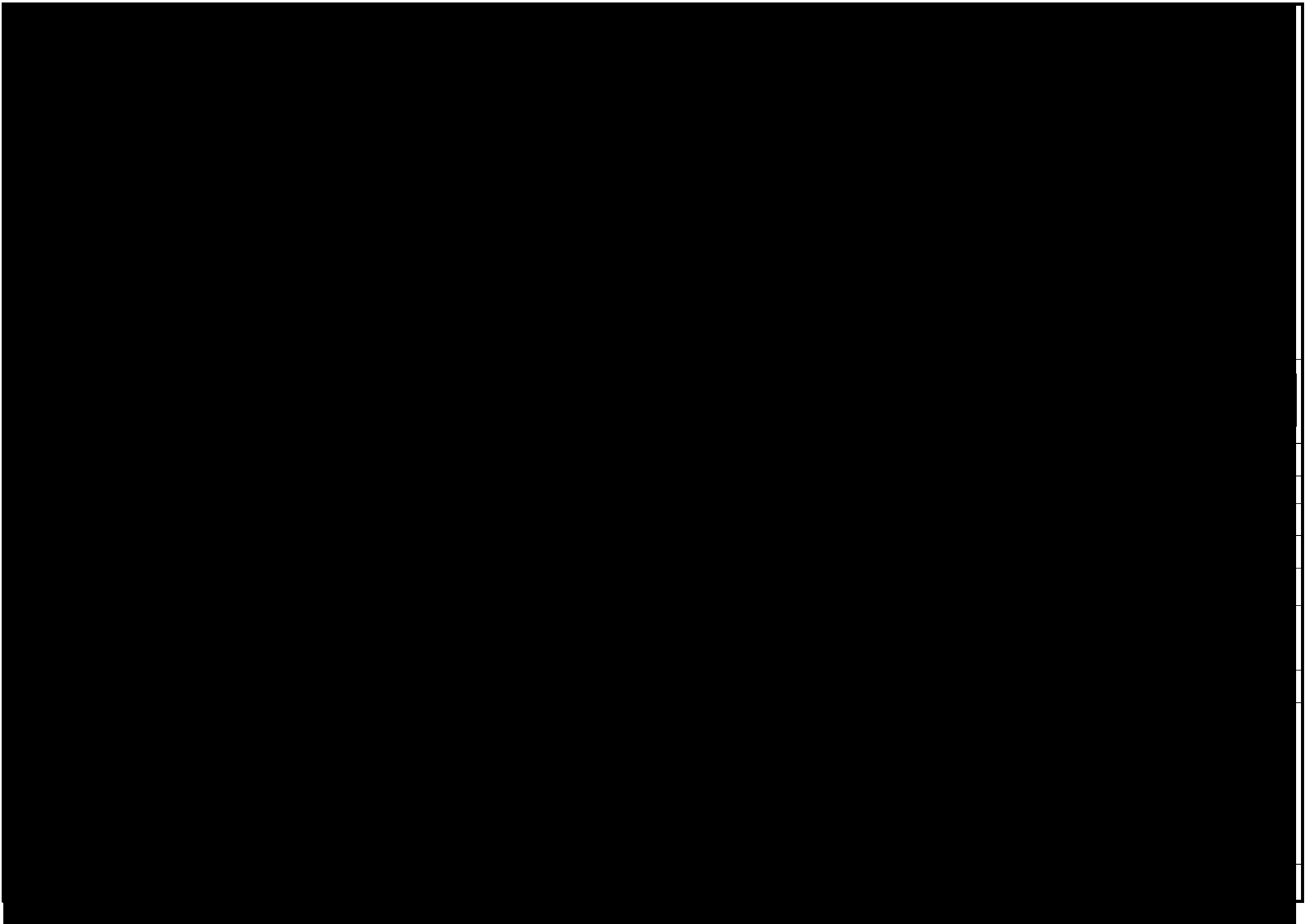
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

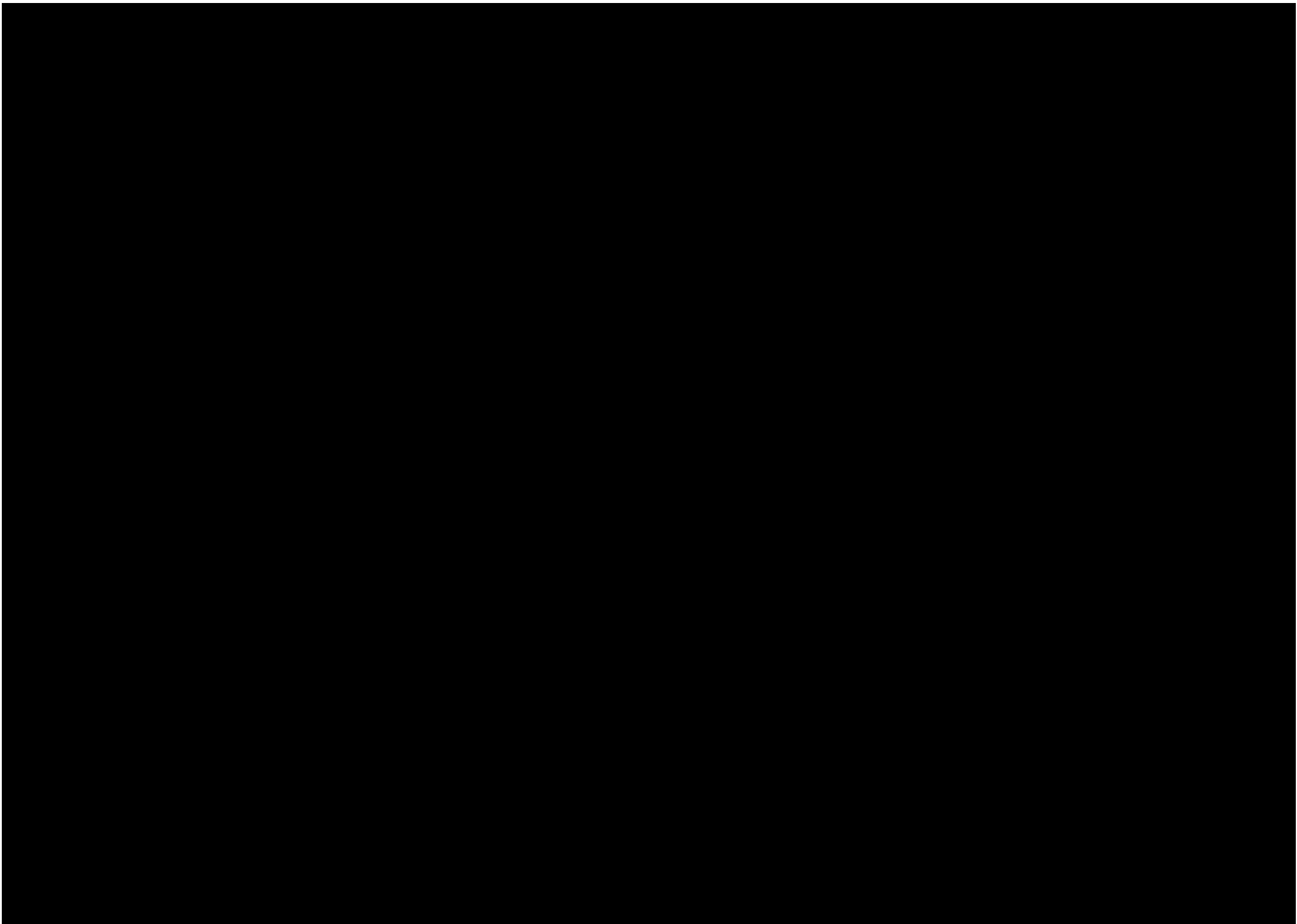
Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

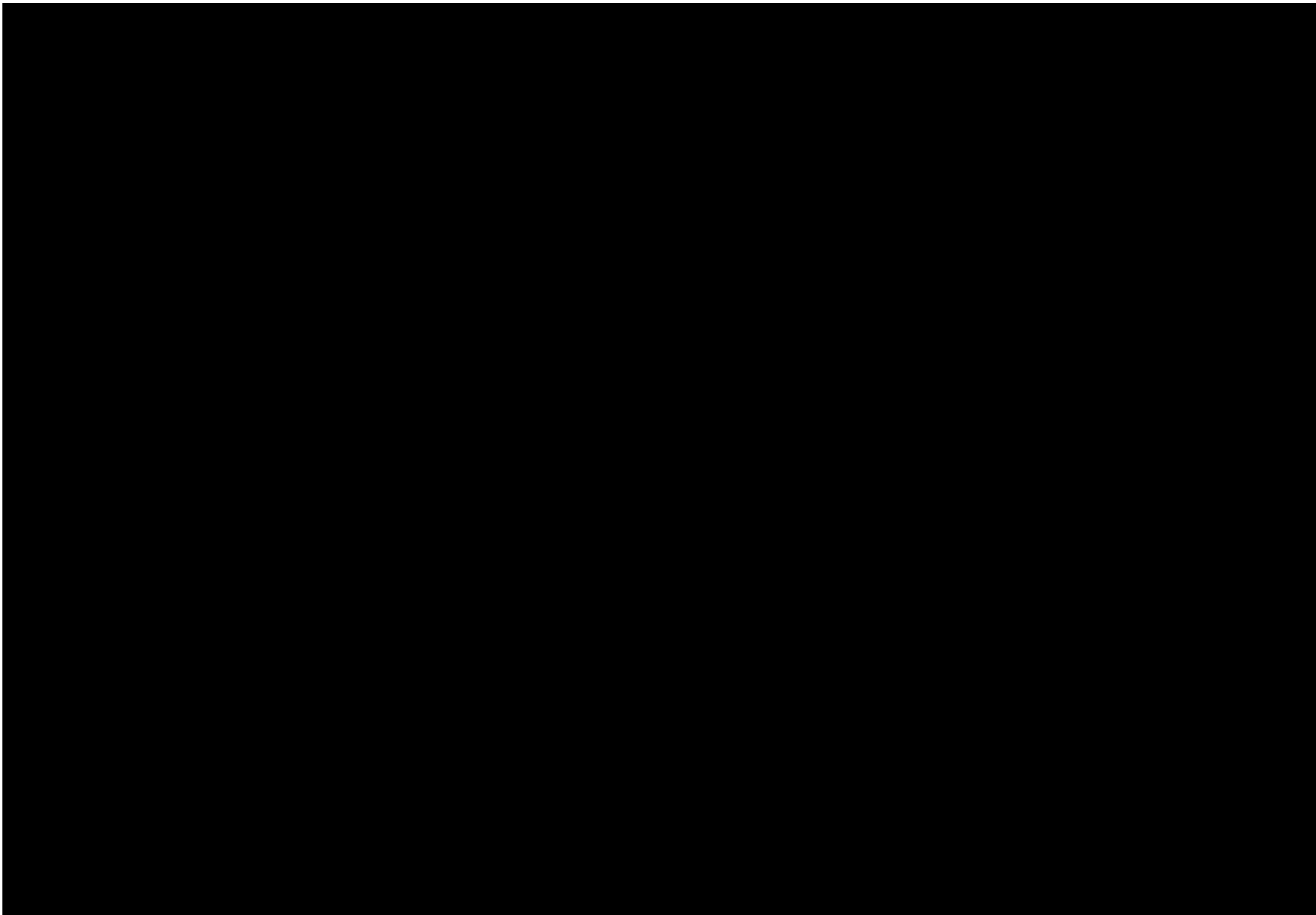
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

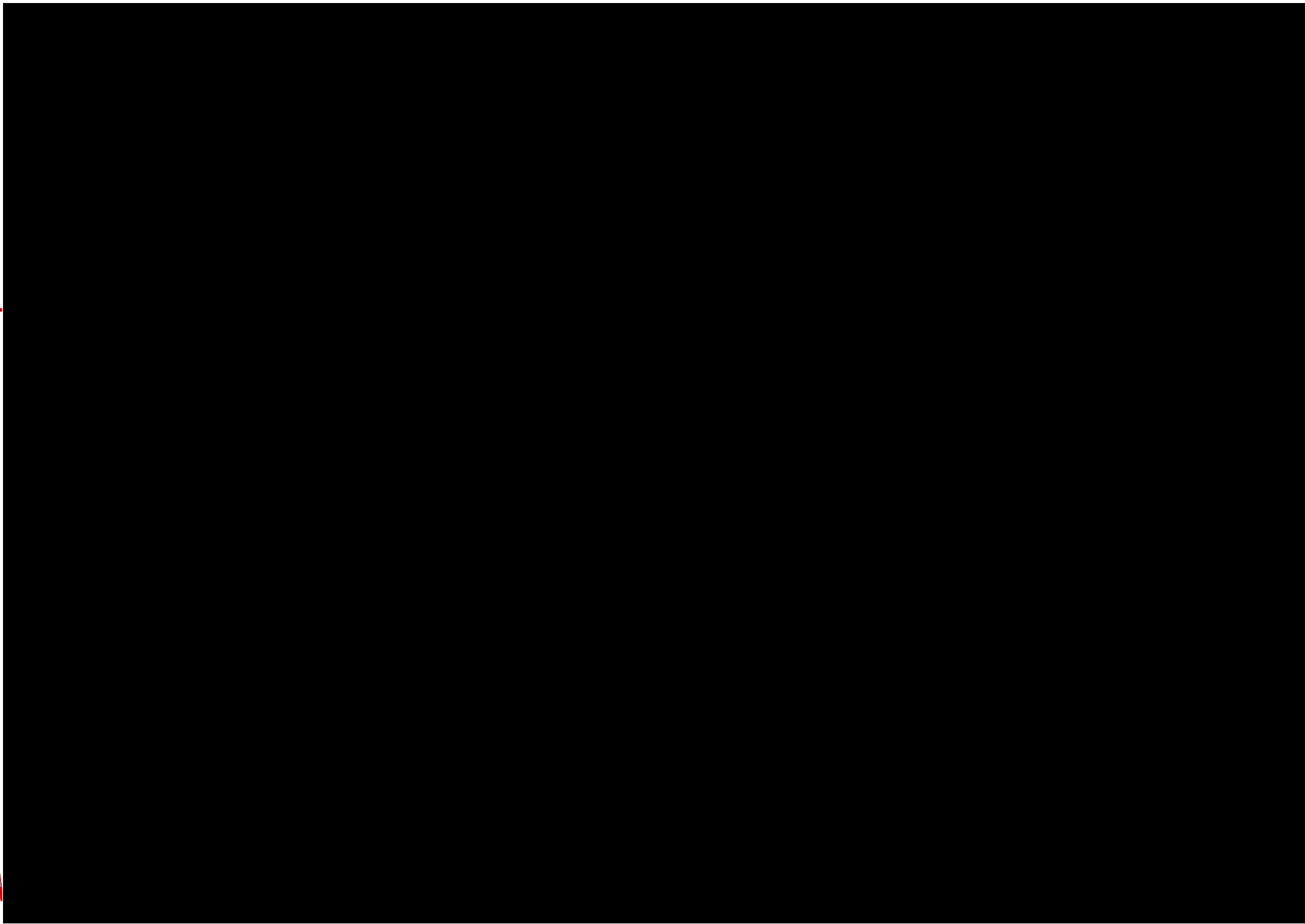
This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

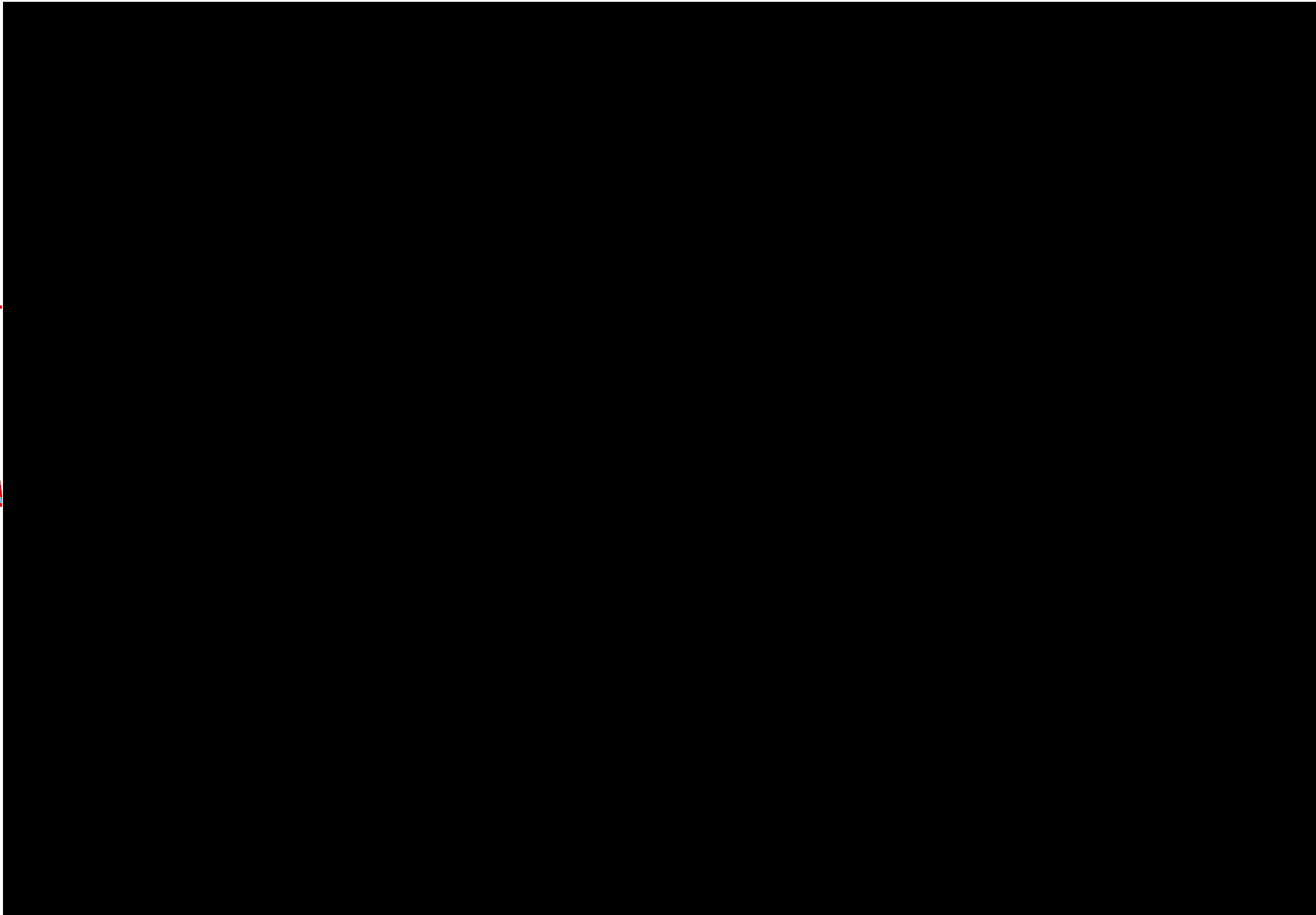
Attachment 2 – Site Figures

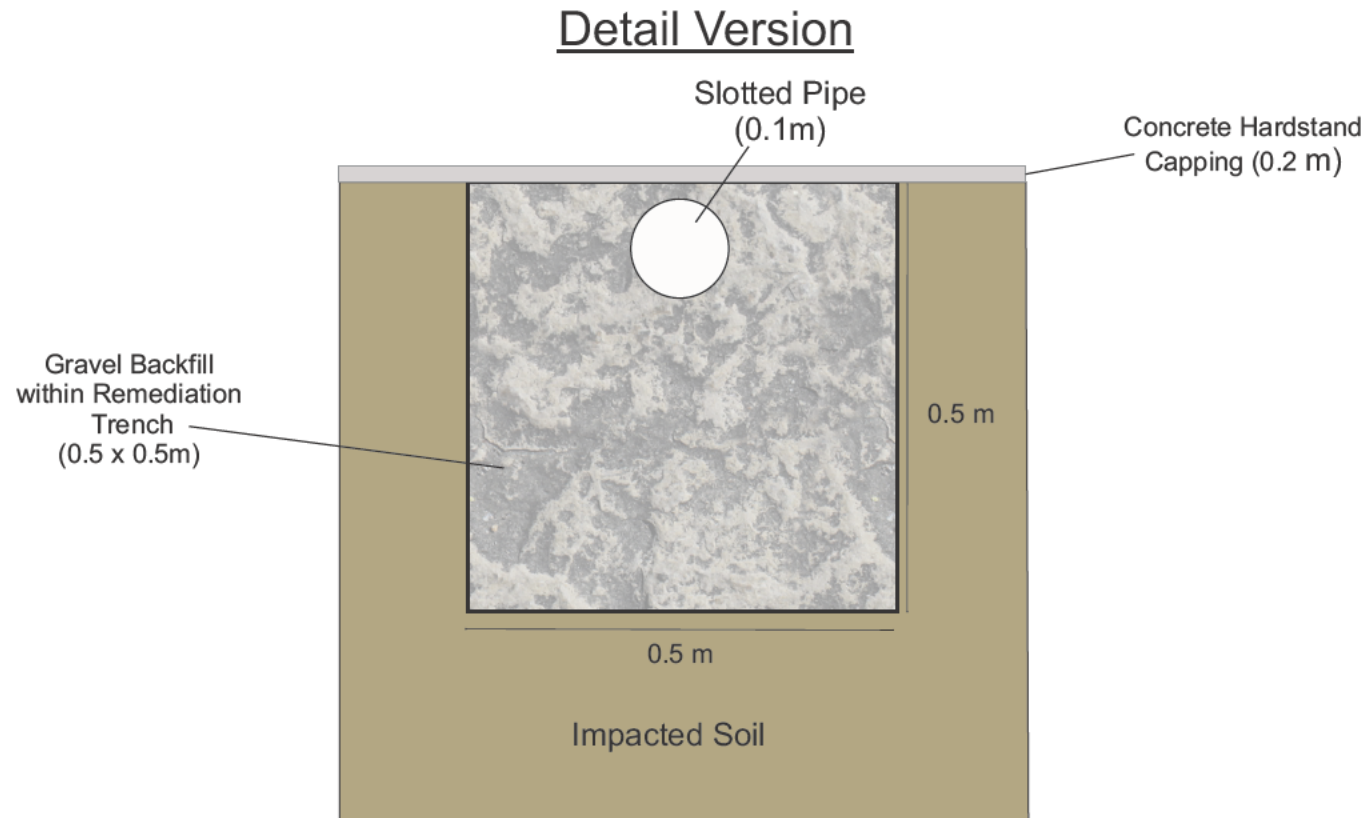
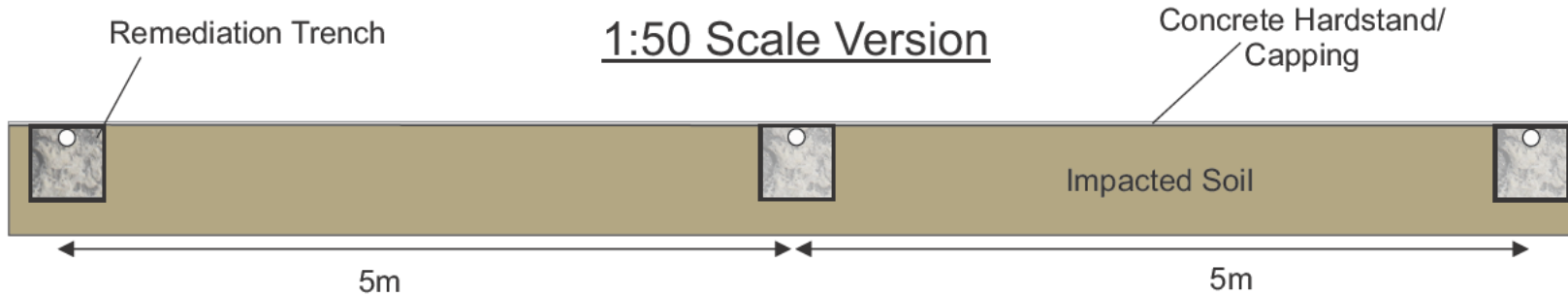














Legend:

-  Impacted Soil
-  Gravel Backfill
-  Concrete Capping/Hardstand



Job No 60534:

Client [REDACTED]

Version: R01 Rev A

Date: 25/06/2021

Drawn By: RH

Checked By: CB

Scale Approximate

Coord. Sys. GDA 1994 MGA Zone 56

**Chullora Railway Workshops
Worth Street, Chullora**

**INDICATIVE CROSS SECTION -
REMEDICATION TRENCHES WITHIN
AREA REQUIRING REMEDIATION**

FIGURE 7