6.3 Site Establishment

Prior to remediation of the site, the nominated site supervisor or remediation contractor will ensure that the necessary environmental management and safety controls are in place. These will include but are not limited to:

- Site Specific Health and Safety Plan and site induction.
- Necessary environmental controls and safety measures.

Site establishment is to be undertaken in accordance with the above documents as prepared by the contractor.

Adequate water supply will be required for dust control purposes.

Requirements for environmental management and occupational health and safety are discussed in Section 7.

6.4 Sampling Programme- Dwellings and Sheds

Following demolition of site structures, soil samples will be collected to a depth of 0.2 mBGL at a rate of 1 per 50m^2 within shed and dwelling footprints. Samples are to be analysed for heavy metals, OC/OP pesticides and asbestos in soil.

Should fill be identified, all samples containing fill shall be further analysed for TPH, BTEX and PAH in addition to heavy metals, OCP/OPP and asbestos in soil.

Results of this investigation are to be reviewed against adopted SIL guidelines as outlined in Section 2 and documented.

Should any samples be identified to exceed adopted investigation criteria, an addendum to this RAP will be prepared addressing remediation requirements.

6.5 Asbestos Survey

The identification of potential ACM materials at various rubbish piles across the site necessitates the need for a detailed survey in the general vicinity of identified rubbish piles.

The survey will include the following:

- Visual inspection of the identified areas.
- Marking of any newly identified ACM material.

- Preparation of an asbestos management plan (see Section 7.3).

The asbestos survey and management plan will be added as an addendum to the RAP.

6.6 Soil Remediation Strategy

6.6.1 Soil Remediation

Full time supervision of remediation and validation will be undertaken by MA and will be completed in general accordance with NSW EPA (1995). A photographic record of works shall be compiled as part of remediation procedures.

1. Remedial Excavation

   Remedial excavation will target and excavate the area identified in MA (2012) as "Area B" and, following asbestos survey, any areas found to contain ACM. Remediation procedure includes:

   i. Remedial excavations completed by contractor under supervision and guidance of an experienced MA environmental engineer.

   ii. An isobutylene calibrated photo-ionisation detector (PID) will be utilised for field screening for volatile organic compounds (VOC) in soil prior to sampling. Soil samples will be placed in "zip-lock" bags and allowed to equilibrate prior to screening of head-space VOC. PID readings, locations, and depths will be documented and used to direct remedial excavation.

   iii. Validation conducted in accordance with Section 6.5.

2. Stockpiling Contaminated Soils

   Excavated spoil from each remedial excavation shall be stockpiled separately for waste classification assessment. Stockpile location and volume shall be recorded by MA. This procedure shall be adopted to eliminate mixing of wastes between stockpiles and minimise cost of disposal.

3. Site Surveying

   Site survey shall be required to identify validation extents and quantify volumes of remediated spoil and fill excavated from site. We recommend a survey is completed at completion of remedial excavation, once excavation extents are validated.

6.7 Soil Validation Procedures

Soil validation procedure is:

i. Samples will be collected from excavation walls at rate of 1 per 10 lineal metres for each identified contaminated soil zone or layer.

ii. Samples collected from excavation floors. Final sampling rate to be determined following site inspection. Where soil excavation base typical sampling rates are 1 per 25 m^2. Where rock excavation base, visual inspection may be adopted..

iii. As a minimum, one floor sample and one sample per wall section will be collected from each excavation.

iv. Sample depth and location within excavation will be documented.

v. Validation samples collected for laboratory analysis will be preferably taken directly from surface being sampled. Where sampling utilises excavation machinery, samples shall be taken from the centre of the excavator bucket from undisturbed bulk soil material.

vi. Validation samples will be analysed by a NATA accredited testing laboratory, for criteria listed in Table 3 and compared against remediation criteria provided.

vii. Where validation samples exceed adopted remediation criteria, further remedial excavation shall be completed followed by further validation testing until validation is complete.

6.8 Waste Management

6.8.1 Waste Classification Assessment

All excavated spoil to be removed from site is to be assessed in accordance with NSW DECC (2009) waste classification guidelines. Spoil excavated from the identified contamination point(s), shall be placed into separate stockpiles for waste classification. Sampling and analytical requirements are as follows:

- Stockpiles shall be sampled at a rate of 1 per 25 m^3.
- Analysed for TRH/BTEX, PAH, OC/OP pesticides, PCB, heavy metals, and asbestos.
- Where concentrations exceed contamination thresholds (CT1 or CT2) in NSW DECC (2009) TCLP analysis shall be undertaken to assess leachable concentrations.
- Preparation of a waste classification document for offsite disposal of spoil to licensed landfill.

6.8.2 Waste Disposal, Materials Tracking and Management

Stockpiled contaminated spoil shall be recorded on a site diagram and daily site logs by the remediation contractor and supervising MA engineer. These documents shall be updated daily and kept in the site office. The daily site log shall record the area in which work was conducted for that day, general description of the works completed, onsite movement of materials, etc.

Material being disposed of offsite will require tracking. This shall entail recording of vehicle registration numbers, number of truck movements, approximate volumes of materials transported. Materials tracking documentation is to be supplied to MA upon completion of remediation works, along with tipping documents supplied by the accepting landfill.

Contaminated spoil should be disposed of to a landfill suitably licensed to accept the specified waste. The disposal of contaminated material to landfill should be undertaken by appropriately qualified and licensed (where applicable) contractor.

6.9 Quality Control/Quality Assurance

The following field QA/QC measures will be completed and reported for all material sampled:

- Collection of intra-laboratory duplicate samples at a rate of 1 per 10 primary samples (minimum 1 per day of sampling) to assess sampling analytical process and laboratory replication of results.
- Collection of daily equipment rinsate samples to assess decontamination procedures.
- Daily trip spikes and trip blanks to assess VOC cross-contamination and losses.

All samples will be analysed by a NATA accredited testing laboratory. The analytical laboratory will be required to perform internal quality control procedures specific to analytical methods and guidance documents. These include, but not limited to the following:

- Laboratory blanks - Analysed with each set of samples to assess analytical accuracy.
- Duplicate - Complete duplicate analysis of a sample from the process batch to assess reproducibility of results.
- Matrix Spike – Used to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
- Surrogate Spike – Assessment of matrix effects and sample preparation losses.

6.10 Data Assessment

Laboratory data will be reviewed by MA and assessed by applying data validation guidelines. The data will be compared to the remediation criteria. Statistical interpretation of validation data may be required to establish that the remediation goals have been met. Based on comparison, areas that have under gone satisfactory remediation will be identified and will be designated by MA as "No Further Action Required." Where the remediation criteria have not been met, MA will communicate to the client which parts of the site require further remediation and repeat remediation and validation process.

6.11 Reporting

6.11.1 Validation Reporting

A site validation report will be prepared at the completion of remediation works. This report shall document the remediation and validation sequence, detail all validation sampling and results of assessment. The document shall also include details regarding any remaining site contamination, and identify residual risks posed by remaining contaminants.

7 Site Management Plan for Remediation

7.1 Site Management Plan

A site management plan (SMP) for the remediation to be prepared by the Civil Contractor prior to commencing remediation works. The objectives of the site management plan will be to:

- Protect the health of site workers and the general public during the remediation works.
- Ensure the works do not negatively impact on potentially sensitive environmental receptors and comply with applicable environmental legislation.

The SMP should include (but not necessarily be limited to):

- Site access and security.
- Worker facilities.
- Surface water and groundwater management.
- Soil management.
- Stockpile management.
- Noise and vibration control.
- Air quality.
- Traffic management.
- Hazardous materials (including potential asbestos contaminated materials, fuel and chemical management).
- Control of spillages and vehicular tracking of impacted soils off site.
- Transport and disposal of contaminated soil.
- Waste management.
- Site signage and contact numbers.
- Material tracking and documentation.

- Designation, delineation and control of access to various work zones.
- Community consultation.
- Occupational health and safety (including risks posed by contamination).
- Inductions and awareness of personnel accessing the site during remediation.
- Contingency management.
- Monitoring requirements.

A Health and Safety Plan (HSP) for the remediation will be prepared by the contractor in accordance with relevant legislation, codes of practice and guidelines. The HSP will address (but not necessarily be limited to):

- Roles and responsibilities.
- Training and Competency.
- Hazard Identification and Risk Assessment (including asbestos).
- Control Measures including Personal Protective Equipment (PPE).
- Site Access and Signage.
- Incident and Emergency Response.
- SWMS.
- Audits.

Health and safety and environmental control measures will be as per the approved plans prepared by the Contractor. Some potential measures that could be adopted to protect from hazards posed by contamination are discussed in the following sections. Note that these are provided as guidance only. All parties involved in the remediation and validation of the site are responsible for assessing the risks posed by their activities and adopted appropriate control measures.

7.2 Monitoring Requirements

During excavation and movement of identified contaminated materials onsite, it is recommended that an MA engineer is present on site during this process to observe and record the condition of the material. This is additional to ACM matters covered in Section 7.3 and project contingency plan arrangements (Section 9). Such recorded observations will be included in a Validation Report, to be completed at the conclusion of remediation.

7.3 Asbestos Management Plan

Following the asbestos survey and prior to remedial excavation works, an Asbestos Management Plan (AMP) shall be produced outlining:

- Occupation health and safety requirements.
- Personnel responsibilities.
- Purpose of the remediation.
- Description of works.
- Decontamination processes.
- Waste disposal.
- Contingency plans.

The appropriately licenced contractor undertaking the asbestos works may, in addition to the AMP, require a NATA Accredited Air Monitoring Consultant / Occupational Hygienist to conduct asbestos air monitoring to determine and report on airborne asbestos fibre generated during normal operations and activities, as per Enhealth (2005) guidelines.

7.4 Site Access

It is recommended that a fence is constructed along the proposed remediation area boundary, with signage erected. A gate should be installed to allow access; access controls must remain in place during site remediation. During asbestos works, signs identifying "No unauthorised access" asbestos removal works in progress are required.

7.5 Traffic Management

Prior to exiting the site, vehicles shall be required to pass through a stabilised exit point to remove potentially contaminated soil that may have accumulated while onsite. Prior to leaving the site, during the decontamination phase, earthworks machinery are required to decontaminate upon plastic sheeting laid beneath vehicles, with all accumulated potentially contaminated soil removed. Plastic sheeting and contaminated soils collected should be disposed of with classified waste, or placed in plastic bags marked "Asbestos Waste" for subsequent offsite disposal.

7.6 Worker Facilities

Facilities for workers at the site must be supplied in accordance with the NSW Work Health and Safety Regulation 2011 including the relevant Codes of Practice.

During asbestos works a decontamination area will be required to be established for workers immediately adjacent to the designated work area. Disposable coveralls and respiratory mask, once removed will be disposed of in bags marked "Asbestos Waste" for subsequent offsite disposal. Footwear will also be decontaminated in this area.

Lunch rooms and toilet/washing facilities shall be separate from decontamination areas and designated work areas.

7.7 Site Inductions

Prior to starting works, site workers involved in the project shall attend a site-specific safety induction.

Documented evidence of the safety induction/s must be readily available on site and will be recorded on forms. The contractor should supply site workers including visitors to the site with appropriate PPE as outlined in Section 7.11.

7.8 Stormwater and Soil Management

The contractor will put in place adequate stormwater runoff, run-on and sediment control measures for the remedial works to avoid sediment discharge to adjacent areas and the storm water system (if present) and degradation of the water quality in nearby waterways.