

West Gate Tunnel Project

Report of Andrew Kalitsis

1 Introduction

My firm Golder Associates Pty Ltd (Golder) prepared the technical report titled West Gate Tunnel Project, Technical Report B – Impact Assessment Contaminated Soil and Spoil Management 1521107-6005-R-Rev0 (Technical Report) which is included as Technical Report B to the Environment Effects Statement (EES) for the West Gate Tunnel Project (Project).

The role that I had in preparing the Technical Report was lead author of the Technical Report, Appendix C, Appendix F and peer review of Appendix A, B and E. Other significant contributors to the Technical Report and their expertise is set out as follows:

- Libby Kiernan (Senior Environmental Scientist) Golder, who prepared the report titled, West Gate Tunnel Project Technical Report B, Appendix A – Site History 1521107-6005-AppendixA-Rev0.
- Claire Miller (Senior Hydrogeologist) Golder, who prepared the report titled, West Gate Tunnel Project Technical Report B, Appendix B – Contamination and Spoil Management Site Investigation 1521107-6005-Appendix B-Rev0.
- Project Co, who prepared the report titled, West Gate Tunnel Project, Contaminated Soil and Spoil Management – Volume Estimates (Appendix D).
- Scott Ambridge (Senior Environmental Engineer) Golder, who prepared the report titled West Gate Tunnel Project Technical Report B, Appendix E – Environmental characterisation of spoil (natural soil and rock) 1521107-6005-Appendix-E-Rev0.
- Bruce Dawson (Principal) Golder provided peer review of the Technical Report.
- Robyn Madsen (Principal and Environment Protection Authority (EPA) appointed Environmental Auditor) of GHD and Mark Clough (Principal Scientist) of GHD who both provided peer review.

I adopt the Technical Report, in combination with this document, as my written expert evidence for the purposes of the West Gate Tunnel Project Inquiry and Advisory Committee's review of the EES, draft planning scheme amendment and works approval application.

2 Qualifications and experience

Appendix A contains a statement setting out my qualifications and experience, and the other matters raised by Planning Panels Victoria 'Guide to Expert Evidence'.

A copy of my curriculum vitae is provided in Appendix B.

3 Further work since preparation of the Technical Report

Since the Technical Report was finalised, I have undertaken further work in relation to available landfill capacity for the disposal of prescribed industrial waste (PIW), waste acid sulfate soil (WASS) arising from the West Gate Tunnel Project and the Melbourne Metro Rail Project. An assessment of the location and capacity of facilities to treat PIW (particularly Category A PIW) was also undertaken.

The additional work included preparing a questionnaire, contacting the relevant facilities and summarising the results in a brief report. The facilities contacted included:

- Hanson Landfill Services, Wollert
- Hi Quality, Bulla
- Barro Group, Kealba
- Cleanaway Ravenhall (Melbourne Regional landfill)
- SUEZ, Lyndhurst
- Veolia, Brooklyn
- Lantrak, Elder Street Heatherton
- Western Land Reclamation Pty Ltd, Brooklyn

A summary of my findings in relation to this further work confirms there is sufficient capacity in available landfills for the disposal of PIW and WASS generated from these projects. Facilities licensed by the EPA that can treat PIW also have sufficient capacity to treat the estimated volumes of PIW (Category A).

These landfills are licensed by the EPA to accept PIW and WASS or have an EPA approved Environment Management Plan to accept WASS. The landfill capacities are based on current approved capacity and not pending approval by the EPA.

This further work has not caused me to materially change my opinions as expressed in the Technical Report.

4 Written Submissions

4.1 Submissions Received

I have read the public submissions to the EES that are relevant to the Technical Report and my area of expertise.. These include the following submissions:

78, 106, 123, 158, 326, 344, 368, 378, 389, 434 & 454.

4.2 Summary of Issues Raised

The submissions have raised the following issues relevant to my area of expertise:

- Concerns about potential contamination of food business due to the proximity of large quantities of contaminated and uncontaminated spoil near the northern portal site (submission numbers: 78, 389)
- Adequacy of information to assess potential impacts and compliance with environmental regulatory requirements (submission number: 368)
- Concerns about approach to management of spoil (submission numbers: 106, 123, 326, 344, 368, 378, 434, 454)
- Concerns about approach to reuse of spoil (submission numbers: 368, 434)

4.3 Response to Issues Raised

Set out below are my comments and response to the issues raised by the written submissions relevant to the area of my expertise.

Concerns about potential contamination of food business due to the proximity of large quantities of contaminated and uncontaminated spoil near the northern portal site

Submission numbers: 78, 389

Concerns have been raised by operators of food business located at 1,2 Somerville Road Yarraville, which is located adjacent to southwestern end of the northern portal and the Owners Corporation of the properties at 107 – 109 Whitehall Street Footscray, which is located approximately 250 metres to the northwest of the closest point of the northern portal. The concerns relate to potential impacts posed by dust (including contaminated dust) generated during construction activities.

The Technical Report provided information on the nature and extent of contamination in the vicinity of the property. This information can be used by Project Co to establish appropriate control measures consistent with the relevant EPR's to manage potential impacts associated with contaminated dust arising from excavation and transport of this material. The Technical Report did not identify the presence of contamination that would require measures beyond controls typically applied in major projects of this type.

Environmental Performance Requirements (EPRs) have been developed that govern the construction and operation of the West Gate Tunnel Project. The EPRs relevant to management of dust require the construction activities to be carried out in a manner that does not cause pollution of the environment (CSP1) and identify how the works are carried out and the control measures to prevent pollution from occurring (CSP2 and AQP6). Pollution of the environment includes consideration of potential impacts of airborne dust (including that associated with contaminated spoil). Project Co is required to prepare an Environmental Management Strategy (EMS) that would include development and implementation of a suite of plans and procedures relevant to either or both the design and construction or the operations and maintenance phases of the project. Amongst these plans and procedures would be a Construction Environment Management Plan (CEMP), Work Site Environmental Management Plans (WEMPs) and an Air Quality Management and Monitoring Plan (AQM&MP) that describe how the spoil will be managed, the control measures to prevent pollution from occurring, methods to monitor performance and corrective actions should monitoring identify instances of non-compliance including concerns raised by neighbouring businesses and the community.

CEMP and WEMPs would need to be prepared by Project Co and preliminary information provided by Project Co indicates that spoil generated from construction of the northern portal and tunnel boring activities would be conveyed via fully enclosed conveyors to two fully enclosed spoil sheds located at 221 Whitehall Street. These sheds will only store spoil for a short term pending classification for offsite disposal or reuse purposes.

The CEMP and WEMPs and their implementation during construction would be reviewed by the Western Distributor Authority (WDA) and the Independent Reviewer and Environment Auditor (IREA), which would include amongst other matters how the CEMP and WEMPs and their implementation comply with the relevant standards, guidelines, statutory requirements and best practice.

I am satisfied the investigations carried out are sufficient to characterise soil contamination for the purposes of the EES. I am also satisfied the control measures identified in the EES and Technical Report to manage dust generated by spoil excavation are consistent with Best Practice¹ guidelines and proper implementation of these measures would minimise generation of dust. I do not have the expertise to comment on the potential impacts posed by atmospheric dust and its impacts on operators of food business.

¹ EPA Publication 480, Best Practice Management, Environmental Guidelines for Major Construction Sites

Adequacy of information to assess potential impacts and compliance with environmental regulatory requirements

Submission numbers: 158, 368, 378, 434

Comments have been provided requiring more information than what is currently available in the EES documentation to consider the interaction of project construction activities with existing contaminated soil and applicability of relevant regulatory requirements administered by the EPA.

To understand the potential impacts posed by contaminated soil and spoil management, the Technical Report assessed the nature and extent of contamination in the study area through;

- consideration of site geology;
- development of a site history based on review of publicly available documents; and
- carrying out a targeted sampling and analysis program to identify and assess the significance of contaminated soil relevant to construction of the project.

Therefore, in my opinion the information presented in the Technical Report is sufficient to inform the EES of the potential impacts and mitigation measures to address the identified impacts. I am also satisfied these measures and the further assessment to be conducted by Project Co in accordance with the EPR's are consistent with achieving environmental regulatory requirements.

The additional information that has been requested would be documented by Project Co during the detailed design phase of the project. The detailed design phase would provide further information relating to:

- The extent of the project boundary to assist in appropriate determination by the EPA in relation to relevant approvals required for the beneficial reuse of spoil as part of the project.
- The extent of excavations and earthworks relating to the construction activities.
- The nature, extent and significance of identified contaminated soil that would be encountered during construction or areas proposed for future land uses (such as open spaces) to meet regulatory requirements for managing contaminated soils that are contained in the Environment Protection Act (EP Act), regulations, State Environment Protection Policies (SEPPs) and other materials such as, National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM).
- Methods for the assessment and management of spoil impacted by per- and polyfluoroalkyl substances (PFAS), including consultation with the EPA to agree on treatment, long term management and disposal options.
- Methods for stockpiling and handling of spoil for the purpose of classification prior to identifying reuse, treatment or disposal endpoints.
- Methods for identifying risks to environment and human receptors posed by construction activities and mitigation measures to address these risks.
- The proposed locations for spoil reuse or disposal (and when required, where treatment of contaminated spoil would occur).
- The proposed routes for transporting spoil.
- Consultation with the community and relevant stakeholders whose interests may be affected by the proposed spoil management methods.

In relation to available capacity of landfills that can accept PIW and WASS, Section 3 of my report provides relevant information and concludes there is sufficient capacity in existing facilities.

Plans would be prepared by Project Co to address the abovementioned matters. These plans would be reviewed by the IREA and consultation with the EPA would occur so that all regulatory requirements are met prior to commence of construction.

In relation to compliance with the methods set out in the CEMP, this would be undertaken by Project Co as part of auditing requirements in the CEMP and would be independently verified by the IREA.

Concerns about approach to management of spoil

Submission numbers: 106, 123, 158, 326, 344, 368, 378, 434, 454

Concerns have been raised about a number of matters that relate to the existing conditions within the project boundary and activities during construction. These are summarised as:

Item	Submission number
Applying global standards in managing constructions impacts, treating and reuse of contaminated spoil.	106, 454
Identification and characterisation of existing sources of contamination within the project boundary.	123
Impacts to environmental and human receptors posed by handling and stockpiling of spoil and identification of control measures.	158
Contamination risks posed by contaminated sediments in Kororoit Creek, Stony Creek, Maribyrnong River and Moonee Ponds Creek.	344
The location of off-site facilities to treat prescribed industrial waste (Category A) and proposed transport routes. Identifying approved capacity of existing landfills that are licensed to receive prescribed industrial waste and waste acid sulphate soil. Details of the CEMP which should include, landfills proposed for spoil disposal; transport routes; regulatory requirements for transport of PIW and WASS; and compliance monitoring.	378, 434

In relation to issues raised in these submissions I am of the opinion the approach applied in the Technical Report to identify and manage contaminated spoil is adequate to inform the impacts posed by the project activities because:

- The main sources of contaminated land likely to be intersected by constructing the West Gate Tunnel Project have been identified by:
 - undertaking a review of publically available documents to identify known and potential sources of contamination; and
 - performing targeted site investigations involving collection and laboratory analyses of soil samples to characterise how the construction of the project interacts with these sources of contamination.
- The potential impacts posed by excavating, handling, transporting and disposal of contaminated spoil have been assessed by:

- understanding where excavations are proposed based on designs provided by Project Co;
 - understanding the spoil categories that would be encountered;
 - identifying the disposal options and the routes of transporting the spoil; and
 - identifying possible opportunities for reuse of spoil and managing potential environmental impacts.
- Mitigation measures to prevent adverse impacts associated with construction have been identified and these measures are consistent with Best Practice and Victorian policies, regulations and guidelines for assessing contaminated land and management and disposal of spoil.
 - Existing facilities have sufficient capacity to treat and or dispose the wastes likely to be generated by both the West Gate Tunnel Project and the Melbourne Metro Rail Project, as outlined in section 3.0 of my report.

EPRs have been developed that govern the construction and operation of the West Gate Tunnel Project. In particular, CSP2 will require Project Co to carry out detailed investigations to further characterise potential sources of contamination where excavations are carried out (such as, historic filled quarries or contaminated sediments that may be present in rivers and creeks). CSP2 also requires Project Co to develop a CEMP in accordance with Best Practice that would include methods for management of potential construction impacts; spoil management; spoil transport; methods of spoil treatment and location of the treatment facilities; and location of the proposed spoil disposal facilities.

Submission 368 (Section 4e), has recommended that CSP2 be amended to *‘The CEMP must include requirements and methods for contaminated soil and spoil management developed **to the satisfaction** of EPA Victoria’*. Engagement with the EPA has been occurring during preparation of the EES and would continue to occur to ensure the content of the CEMP is developed to meet the relevant standards, guidelines, statutory requirements and best practice. My expertise does not cover the specific wording for approvals required by government authorities, which should be addressed by others.

Submission 368 has raised concerns about PFAS impacted spoil and the release of PFAS chemicals into the environment during construction.

Within the study area of the West Gate Tunnel Project, the Technical Report has undertaken a detailed review of historic and current activities, potential sources of contamination and likely chemicals of potential concern (sections 6.1.2, 7.1.2, 8.1.2 and Appendix A – Site History). The review identified the following areas within the study area that may be sources of PFAS:

- Soil beneath the former petroleum storage facility at Simcock Avenue due to historic use of Aqueous Film Forming Foams (AFFF), which contain PFAS.
- Historic operations of the former Bradmill textile factory in Brooklyn, located adjacent to the West Gate Freeway. PFAS chemicals are known to have been used in textile manufacturing.
- Soil adjacent to the proposed Mackenzie Road ramps. PFAS chemicals may be encountered due to AFFF use during a historic fire at the former Coode Island chemical storage facility.

Construction of the MacKenzie Road ramps and Hyde Street connection ramps would involve construction of bored piles and surface excavations. These works would generate small volumes of spoil and may encounter soil contaminated by PFAS.

Widening of the West Gate Freeway component adjacent to the former Bradmill textile factory would involve construction of bored pile foundations as part of the elevated structure over the railway. Similarly, these works would generate small volumes of spoil and may encounter soil contaminated by PFAS.

It is possible that other localised sources of PFAS impacted soil may be present within the project area, particularly within the port, CityLink and city connections component. Because construction works in this area would mainly involve surface excavations and construction of bored piles, the volume of spoil would be small. Methods for characterising soil potentially impacted by PFAS are a requirement of EPR CSP2.

There are options for treatment and disposal of PFAS impacted soil if required. These options can include mixing of soil with proprietary products to limit their mobility to enter the environment or specific containment within an onsite facility. Should PFAS be identified in the spoil, advice would be required from the EPA on appropriate classification and disposal requirements.

Overall, I am satisfied the methods applied to the identification and management of spoil potentially impacted by PFAS does not change the assessment of impacts contained in the Technical Report.

Submission 378 (Section 4.1), has recommended that CSP4 be amended. I have reviewed the proposed changes and propose CSP4 not be amended. The following reasons are provided:

1st proposed amendment: *Identify the areas of contamination that may pose an odour risk.*

Reason not to amend: Identification of sources of contamination which may pose an odour risk is already covered in CSP2.

2nd proposed amendment: *Periodic monitoring of the aesthetics of material excavated and proposed for transportation.*

Reason not to amend: CSP4 covers odour related matters. Aesthetic impacts relate to the appearance of the spoil properties and would be covered in CSP2 as part of the CEMP under spoil classification.

3rd proposed amendment: *Segregation and odour emissions assessment with appropriate monitoring equipment if odorous material is identified.*

Reason not to amend: This is a method to assist with spoil classification and will be included in the CEMP under spoil classification.

Concerns about approach to reuse of spoil

Submission numbers: 368, 434

The information presented in the Technical Report is sufficient to inform the EES regarding spoil classification, treatment and reuse options. I am satisfied facilities for treatment of PIW (Category A) are available and there is sufficient capacity to treat spoil generated from the West Gate Tunnel Project. I am also satisfied there are sufficient options available in the greater Melbourne area for reuse of Fill Material for beneficial purposes (such as rehabilitation of former quarry sites).

5 Response to the Preliminary Matters and Further Information Request issued by the West Gate Tunnel Project Inquiry and Advisory Committee

I have read the *Preliminary Matters and Further Information Request (18 July 2017)* issued by the West Gate Tunnel Project Inquiry and Advisory Committee and have been requested to provide responses to questions 41, 43, 44 and 45. My responses to these questions relative to the Technical Report and my area of expertise are provided below.

Question 41

Any identified environmental and/or human health risks that might reasonably arise from the management or reuse of contaminated soil and spoil and any information that may be available regarding how WDA/Project Co. proposes to manage/mitigate those risks.

Design details to be prepared by Project Co would identify specific excavation profiles and how this would interact with existing soil contamination. The likely nature and extent of contaminated soil that would be encountered would utilise information in the Technical Report and be augmented by Project Co's additional investigations as required by CSP2. The environmental and/or human health risks may be unique to each construction area and the identification and measures for mitigating these risks would be included in the CEMP and WEMPs.

Preliminary information provided by Project Co indicates that spoil categorised as fill material would be reused as a priority for a beneficial reuse such as, rehabilitation of former quarry holes or on a more local scale for use in engineered embankments. Reuse of fill material would be subject to procedures set out in the CEMP (CSP2) that would identify controls to mitigate potential environmental and human health impacts. Examples of impacts posed by reuse of fill material and possible control measures may include:

- Dust generated during spoil handling would be controlled by water suppressants and use of covered trailers.
- Soil and rock geologic formations (such as the Newer Volcanic Basalts, Older Volcanic Basalts, Brighton Group and Fyansford geologic formations) that are not impacted by anthropogenic contamination sources can contain elevated levels of metals (such as arsenic and nickel). Spoil generated from such sources may be used as fill material². The reuse of fill material with elevated levels of metals needs to be considered to ensure that the receiving environment is not adversely affected by contaminated stormwater runoff. Therefore an appropriate assessment of the site proposed for reuse of this fill material would need to be undertaken to understand potentially sensitive environmental receptors and how to manage stormwater runoff to protect the receiving environment.

Project Co has considered potential impacts to the receiving environment by spoil categorised as WASS generated during tunnelling excavations. The addition of soil conditioning additives primarily used in the tunnelling process would also provide a secondary benefit to reduce the acidity from WASS therefore, mitigating the potential impacts to the receiving environment. A management plan for assessment and treatment of WASS tunnel spoil would need to be implemented by Project Co (CSP2 and 3).

All other PIW materials are regulated by the EPA which includes measures to categorise, transport and dispose of the PIW to facilities licensed by the EPA for disposal or treatment. Project Co has also identified opportunities for treatment and beneficial reuse of PIW within the project, such as uses in engineered structures. However, details of these opportunities including feasibility assessment and concept designs have not yet been provided. If Project Co proceeds with reuse of PIW within the project boundary, this would be subject to consideration of contaminant concentrations, potential future use of land where reuse is proposed and establishment of relevant controls to protect people and the environment during and after construction. Construction of engineered structures(s) for containment of PIW may require a Works Approval in accordance with relevant statutory requirements and approval by the EPA. Such structures(s) may also require future monitoring as part of the operation of the West Gate Tunnel Project to ensure there are no adverse impacts to the receiving environment (such as beneficial uses of surface waters, groundwater and land).

Even though Project Co has not finalised its spoil management plan, I am satisfied that there are appropriate controls that require Project Co to identify and develop measures to mitigate risks to human health and the environment.

Question 43

Further detail of what is meant by 'Minimal spoil is likely to be generated requiring management and exposure risks to human health can be managed by health and safety planning'. Does the WDA mean

² Environment Protection (Industrial Waste Resource) Regulations 2009. Publication IWRG600.2 - December 2010

health and safety for its construction workforce or is the reference for a broader risk to the community which may require such measures?

This reference relates to construction workers.

Question 44

Understanding of the health and safety measures proposed for the wider community.

Identified impacts posed by construction activities and measures to mitigate these impacts have been detailed in section 6.5.1, 7.5.1 and 8.5.1 of the Technical Report. The measures to mitigate potential impacts to the wider community are summarised as:

- Project Co would carry out further characterisation of soil to inform the most appropriate methods for handling and disposal.
- Where soil containing asbestos is identified, appropriate methods would be developed by Project Co in accordance with WorkSafe regulations.
- Transport of contaminated soil (PIW) would be carried out in vehicles licensed by the EPA and along designated transport routes.
- PIW and WASS would be disposed only at locations licensed by the EPA or at locations approved by the EPA.
- Stormwater controls would be developed around excavation and stockpiling areas to prevent release of contaminated stormwater into receiving water ways. Impacts to water quality are discussed further in *Technical Report E – Surface Water*.
- Assessing potential for accumulation of harmful gases and vapours and release of air pollutants would be further characterised by Project Co. As required controls for the treatment of gases and vapours would be implemented by Project Co. Air quality impacts are discussed further in *Technical Reports G (Air Quality) and J (Human Health)*.

My area of expertise does not cover the potential chemical exposure or safety risks to the community and should be addressed by others. The specific methods detailing the risks and mitigation measures would be included in the CEMP and WEMPs to be prepared by Project Co.

Question 45

Information on what the appropriate mitigation measures might be for offensive odours referred to in the above reference.

The source of potential offensive odours relates to the potential presence of gasworks wastes and spoil impacted by petroleum hydrocarbons that may be encountered during ground excavations within the port, CityLink and city connection component.

Historic information indicates that the former West Melbourne Swamp Lagoon and the historic alignment of the Yarra River have been filled with unknown wastes. It is possible that gasworks waste was disposed into these areas. Low lying areas through Docklands were also reclaimed and is known to have received gasworks waste from the former West Melbourne Gasworks, which is well documented in Environmental Audits undertaken in this area.

The South Dynon railyards have been extensively investigated by VicTrack and contamination by petroleum hydrocarbons is known to be present in the soil and groundwater. Construction activities around the South Dynon area would involve construction of bored piles and surface excavations associated with elevated roadways and ramps. These excavations would be small in area and left exposed for short periods of time; therefore, they are not likely to be a significant source of vapour.

Potential mitigation measures may include avoidance or minimising excavations in these areas by consideration of alternative footing designs; addition of ameliorants to suppress or mask the odours; or depending on the site conditions and extent of excavations using tent facilities with odour controls. The specific details would be included in CEMP and WEMPs to be prepared by Project Co.

Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Inquiry and Advisory Committee.



.....
Signed

Date: 1 August 2017

Appendix A Matters Raised by PPV Guide to Expert Evidence

- (a) the name and address of the expert;

Andrew Kalitsis
Building 7, Botanica Corporate Park,
570-588 Swan Street
Richmond, Victoria 3121

- (b) the expert's qualifications and experience;

Andrew has completed a Bachelor of Applied Science (Geology). Andrew has over 28 years of experience in the field of environmental assessment and impact assessment, specifically in the areas of land contamination, groundwater contamination, remediation feasibility assessments, spoil management, spoil reuse, land use strategies and contamination liability assessments. For over 15 years, Andrew has lead the contamination impact assessment for a range infrastructure and industrial facilities.

- (c) a statement identifying the expert's area of expertise to make the report;

Andrew has provided expert advice relating to land contamination and spoil management for infrastructure projects and industrial sites. Specifically, Andrew has provided expert advice for the following:

- Federal Government (Australian National) rail divestment.
- East West Link bidder, contamination management specialist.
- Rail Transformation Consortium, grade separation contamination advisor.
- Department of Justice land suitability assessment former Defence facility Victoria.
- Department of Defence, principal environmental advisor, former explosive manufacturing facility Victoria.
- VicTrack, contamination advisor, multiple sites.

- (d) a statement identifying all other significant contributors to the report and where necessary outlining their expertise;

Libby Kiernan (Senior Environmental Scientist), was the lead author of Appendix A – Site History. Libby has over 10 years of experience in carrying environmental site assessments involving assessment of site history of former industrial sites and carrying out detailed soil and groundwater investigations.

Claire Miller (Senior Hydrogeologist), was the lead author of Appendix B – Contamination and Spoil Management Site Investigation. Claire has over 9 years of experience involving detailed soil and groundwater investigations.

Project Co, who prepared the report titled, West Gate Tunnel Project, Contaminated Soil and Spoil Management – Volume Estimates (Appendix D).

Scott Ambridge (Senior Environmental Engineer), was the lead author of Appendix E – Environmental characterisation of spoil (natural soil and rock). Scott has over 13 years of experience in the assessment of land contamination including characterisation of acid sulphate soil / rock, characterisation of naturally occurring metals in geological formations and statistical analyses of volume estimates. Scott is also providing land contamination advice for the Melbourne Metro Rail Project.

Robyn Madsen (Principal and EPA appointed Environmental Auditor) of GHD and Mark Clough (Principal Scientist) of GHD who both provided peer review.

- (e) all instructions that define the scope of the report (original and supplementary and whether in writing or oral);

The scoping requirements for the EES that were prepared by the Department of Environment Land Water and Planning (DELWP) specify the evaluation objectives and provide the context for the technical studies informing the EES. The relevant evaluation objective for contaminated soil and spoil management is:

Waste management – To manage excavated spoil and other waste streams generated by the project in accordance with the (waste hierarchy) and relevant best practice principles.

In addition, the evaluation objective for hydrology and water quality is also relevant to contaminated soil and spoil management, which is:

Hydrology and water quality - To avoid or minimise adverse effects on surface water and groundwater quality and hydrology in particular resulting from the disturbance of contaminated or acid-forming materials, and to maintain functions and values of floodplain environments.

The requirements relevant to contaminated soil and spoil management are described in the table below:

Aspect	Scoping requirements	Sections in the Technical Report
Key issues	Management of substantial quantities of excavation and tunnelling spoil, including temporary stockpiling and on-site treatment, transporting material away from works sites and reuse or disposal.	Sections 6.2, 7.2 and 8.2
	Management of a range of waste streams from the project	Sections 6.3, 7.3 and 8.3 Also Technical Report C Groundwater and E Surface Water
	Potential for disturbance of anthropogenically contaminated soil or groundwater or naturally occurring acid sulphate soils.	Sections 6.1, 6.5, 7.1, 7.5, 8.1 and 8.5 Also Technical Report C Groundwater and E Surface Water
Priorities for characterising the existing environment	Identify likely occurrence of acid sulphate soils, contaminated soil, and other potential sources of contaminated materials in the project boundary and their approximate location.	Sections 6.1, 7.1, and 8.1
	Identify volumes and characteristics of excavated spoil.	Sections 6.2, 7.2 and 8.2

Aspect	Scoping requirements	Sections in the Technical Report
	Characterise other key waste streams from the project.	Sections 6.3, 7.3 and 8.3 Also Technical Report C Groundwater and E Surface Water
	Identify suitable off-site disposal options for waste materials.	Sections 6.2.2, 7.2.4 and 8.2.3 Also Technical Report E Surface Water
	Identify possible capacity issues that could affect either the management of waste on-site or disposal off-site, particularly given other proposed works (such as the Metro Tunnel project) that would also be generating spoil.	Section 9.0
	Identify known and potentially contaminated sites and ground conditions indicative of acid sulphate soils.	Sections 6.1, 7.1 and 8.1 Also Technical Report C Groundwater and E Surface Water
Design and mitigation measures	Identify options for treating, reusing or disposing of excavation spoil with reference to the waste hierarchy and relevant best practice principles, including for both contaminated and clean materials, and identify the routes and destinations for spoil material to be transported away from the project work sites.	Sections 6.2, 7.2 and 8.2
	Describe and evaluate proposed design, management or site protection measures that could avoid or mitigate potential adverse effects of the excavated spoil or other waste streams generated by the project on land or water values, especially with regard to the project construction activities.	Sections 6.4, 7.4 and 8.4 Also Technical Report C Groundwater
Assessment of likely effects	Analyse residual effects on land and water values from project waste streams	Sections 6.5, 7.5 and 8.5 Also Technical Report C Groundwater and E Surface Water

Aspect	Scoping requirements	Sections in the Technical Report
	Assess residual effects on surface and groundwater users or environmental values from contaminated soil, acid sulphate soils or contaminated groundwater.	Sections 6.5, 7.5 and 8.5 Also Technical Report C Groundwater and E Surface Water
Approach to manage performance	Describe principles to be adopted for monitoring management of spoil and other waste streams.	Sections 3.1, 6.6, 7.6 and 8.6 Also Technical Report C Groundwater and E Surface Water

I was engaged by Clayton Utz (6 July 2017) as the expert witness – contaminated soil and spoil management to carry out the following work:

- Review the public submissions and identify those relevant to my area of expertise.
- Review the Technical report and identify whether there are any changes to the conclusions of the report arising out of the issues raised by the public submissions or as a consequence of the any other relevant matter.
- Prepare an expert report that:
 - responds to the public submissions relevant to my area of expertise;
 - addresses my previous Technical Report and any changes to the conclusions reached; and
 - other matters that I consider relevant to my area of expertise.

I was again engaged by Clayton Utz (24 July 2017) to prepare a response to questions 41, 43, 44, and 45 of the *Request from the IAC (West Gate Tunnel Project, Preliminary Matters and Further Information Request, 18 July 2017)*.

- (f) the identity of the person who carried out any tests or experiments upon which the expert relied in making this report and the qualifications of that person;

ALS Limited and Eurofins performed the environmental testing of soil samples. ALS and Eurofins are accredited by the National Association of Testing Authorities (NATA) for the analyses undertaken for this assessment.

- (g) a statement setting out the key assumptions made in preparing the report;

- All submissions relevant to my area of expertise have been allocated to me by WDA and I have not reviewed any other submissions other than those allocated to me.
- The Technical Report relies on Project Co’s design and information gathered within the study area. Assessment of soil contamination along the west bound tunnel west of Williamstown Rd to the portal has relied on historic reports and limited new borehole data.
- The Technical Report was prepared to characterise potential impacts posed by existing contamination associated with construction of the West Gate Tunnel Project and spoil

likely to be generated from construction works. It is not intended to be an assessment of potentially contaminated land consistent with all the requirements stated in The National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM). Investigations to characterise soil for reuse or off-site disposal is required under the EPRs and would be carried out by the Project Co in accordance with relevant guidelines.

- Investigation locations for the purpose of assessing land contamination were sited based on concurrent geotechnical and groundwater investigations and in some cases investigation specific areas were not possible due to access restrictions posed by existing roads, below ground infrastructure and third party property access limitations.
- Interpretation of sub-surface conditions and the nature and extent of contamination is based on field observations and chemical analytical data from widely-spaced sampling locations. Site investigations identify sub-surface conditions only at those points where sub-surface tests were conducted or samples were taken. It is possible that contamination exists in areas that were not investigated, sampled or analysed.
- The Technical Report is based on conditions that existed at the time the assessment was completed. Its findings and conclusions may be affected by the passage of time, by man-made events such as construction within or adjacent to the project boundary and by new releases of hazardous substances.
- Construction spoil volumes in the Technical Report have been based on information provided by Project Co. Verification of the spoil volumes of the portals and tunnels has been undertaken based on interpretations made on the tunnel boring and excavation profiles of the portals. Estimation of quantities of spoil types (such as PIW, fill material, etc) has been based on the assumptions provided in Project Cos Volume Estimate report (Appendix D of the Technical Report).

(h) a statement setting out any questions falling outside the expert's expertise and also a statement indicating whether the report is incomplete or inaccurate in any respect.

There are no further questions falling outside my area of expertise and I do not have any knowledge that my Report is incomplete or inaccurate.

Appendix B CV



Education

Bachelor of Applied Science (Geology), RMIT, 1987

Relevant Experience

Land contamination management and strategy development

Multi-disciplinary project management and direction

Project planning, management & delivery

Golder Associates Pty Ltd – Melbourne

Principal, Geo-environmental Scientist

Andrew has completed a Bachelor of Applied Science (Geology). Andrew has over 28 years of experience in the field of environmental assessment and impact assessment, specifically in the areas of land contamination, groundwater contamination, remediation feasibility assessments, spoil management, spoil reuse, land use strategies and contamination liability assessments.

Andrew has been Involved in over five hundred projects involving environmental site assessment / remediation & contamination liability management. Andrew's role has included technical lead, project director, technical review, project manager as well as involvement in field investigation programs. Andrew has lead projects for the purpose of statutory and non-statutory environmental audit as well as contributing in a technical review role. Clients have included Federal, State and local government, industrial (manufacturing, mining, chemical and process industries), telecommunication, banking, legal and finance as well as property developers.

Rail and Infrastructure Projects

East West Link - Land contamination specialist for contractor's design and construct bid. Assist contractor identify and quantify contamination risks. Advise design team of contamination risks and options to mitigate risks. Assessment of site investigation data and preparation of contamination and spoil management interpretative report to support the contractor's bid. Key issues included, assessment of potential impacts to the construction posed by contamination sources, quantification and classification of spoil categories and assessment of acid sulphate soil and rock.

West Gate Tunnel Project (on-going) – Contamination and spoil management technical lead for the West Gate Tunnel project team. Key activities included preparation of technical reports to support the EES, design feasibility and review of tenders.

VicTrack - Andrew has been Project Director for over 50 sites including railway workshops and railway yards requiring environmental compliance assessment, investigation of contaminated land, preparation of remediation advice and preparation of site management plans.

Expert Advice

Andrew has provided expert advice relating land contamination and spoil management for infrastructure projects and industrial sites. Specifically, Andrew has provided expert advice for the following:

- Federal Government (Australian National) rail divestment.
- East West Link bidder, contamination management specialist.
- Rail Transformation Consortium, grade separation contamination advisor.
- Department of Justice land suitability assessment former Defence facility Victoria.
- Department of Defence, principal environmental advisor, former explosive manufacturing facility Victoria.
- VicTrack, contamination advisor, multiple sites.

Andrew can be contacted on +61 3 8862 3587 or akalitsis@golder.com.au.