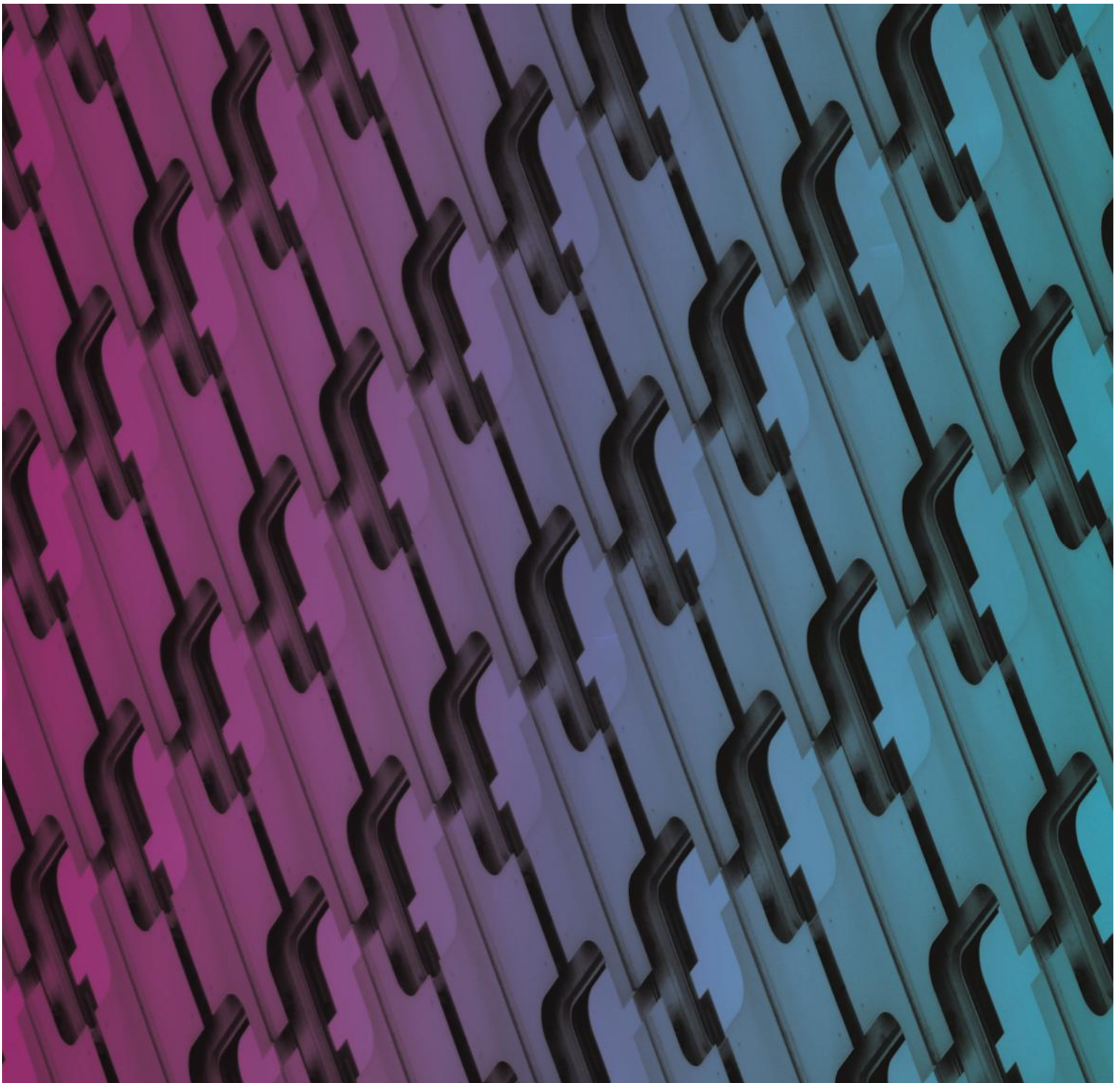


Phase 1 Contamination Due Diligence

Lend Lease Circular Quay



Phase 1 Contamination Due Diligence

Lend Lease Circular Quay

Client: Lend Lease Development Pty Ltd

ABN: 33 000 311 277

Prepared by

AECOM Australia Pty Ltd

Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com
ABN 20 093 846 925

16-Oct-2015

Job No.: 60282887.02

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

Quality Information

Document Phase 1 Contamination Due Diligence
 Ref 60282887.02
 Date 16-Oct-2015
 Prepared by Susan Dillon
 Reviewed by Brad Eismen

Revision History


Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	21-Oct- 2013	Contamination Due Diligence Review	Brad Eismen Technical Director - Environment	
B	25-Oct-2013	Updated with Client comments	Brad Eismen Technical Director - Environment	
C	25-Nov-2013	Updated to include Rugby Club	Brad Eismen Technical Director - Environment	
0	29-Nov-2013	Final	Brad Eismen Technical Director - Environment	
1	16-Oct-2015	Amended	Brad Eismen Technical Director - Environment	

Table of Contents

Executive Summary		i
1.0	Introduction	1
	1.1 Objective	1
	1.2 Scope of Work	1
2.0	Site Information	2
	2.1 Location	2
	2.2 Identification	2
3.0	Site and Surrounding Area History	5
	3.1 Client Supplied Information	5
	3.2 Previous Investigations	5
	3.3 Aerial Photograph Review	7
	3.4 Certificates of Title	8
	3.5 Section 149 Certificate	9
	3.6 NSW EPA Register	10
	3.7 WorkCover Dangerous Goods	10
4.0	Site Condition and Surrounding Environment	11
	4.1 Current Land Use	11
	4.2 Surrounding Land Use	11
	4.3 Topography and Drainage	11
	4.4 Geology	11
	4.5 Hydrogeology	12
5.0	Site Inspection	13
	5.1 Site Observations	13
	5.1.1 174 – 176a George Street, Sydney	13
	5.1.2 182 George Street	13
	5.1.3 33 - 35 Pitt Street	13
	5.1.4 Mirvac Triangle	14
	5.1.5 Crane Lane	14
	5.1.6 The Rugby Club (off 31 Pitt Street)	14
	5.1.7 Adjacent Sites	14
6.0	Preliminary Conceptual Site Model (CSM)	15
	6.1 Potential Contamination Sources	15
	6.2 Potential Contamination Pathways and Receptors	15
	6.3 Summary	15
7.0	Conclusions and Recommendations	16
Appendix A		
	Figures	A
Appendix B		
	174 – 176a Property Layout	B
Appendix C		
	Plates	C

List of Tables

Table 1	174 - 176a George Street Summary	2
Table 2	182 George Street Identification Summary	2
Table 3	33 - 35 Pitt Street Identification Summary	3
Table 4	Mirvac Triangle Identification Summary	3
Table 5	Crane Place (Laneway)	4
Table 6	31 Pitt Street Identification Summary	4
Table 7	Summary of Previous Investigations	5
Table 8	Historical Aerial Photo Review	7

Table 9	Summary of Certificate of title Information	9
Table 10	Current Land Use	11

List of Figures

Figure 1	Site Location	A
Figure 2	Site Plan	A
Figure 3	Site Inspection Observations	A
Figure 4	Aerial Photograph - 1930	A
Figure 5	Aerial Photograph - 1942	A
Figure 6	Aerial Photograph - 1951	A
Figure 7	Aerial Photograph - 1960	A
Figure 8	Aerial Photograph - 1961	A
Figure 9	Aerial Photograph - 1972	A
Figure 10	Aerial Photograph - 1983	A
Figure 11	Aerial Photograph - 1999	A
Figure 12	Aerial Photograph - 2002	A
Figure 13	City of Sydney Acid Sulphate Soil Map	A

Executive Summary

As part of the Lend Lease Circular Quay (LLCQ) proposal, Lend Lease Development Pty Ltd (Lend Lease) engaged AECOM Australia Pty Ltd to conduct a due diligence Phase 1 land contamination assessment of several properties located between Pitt Street and George Street at the northern end of the Sydney CBD (the Site). The properties comprise:

- 174 – 176a George Street, Sydney, NSW (Lot 181 DP 606865)
- 182 George Street, Sydney, NSW (Lot 182 DP 606865 – Part 1 and 2)
- 33 - 35 Pitt Street, Sydney, NSW (Lot 7 DP 629694)
- Portion of 190 - 200 George Street (Portion of Lot 1 DP 69466 and portion of Lot 4 DP 57434) – known as the Mirvac Triangle
- Crane Lane (Lot 1 and Lot 2 DP880891)
- The Rugby Club (optional site), Rugby Place, off 31 Pitt Street, Sydney NSW (Lot 180 DP 606866)

The overall objective of the Phase 1 contamination assessment is to support Lend Lease's Planning Proposal for the proposed LLCQ development, and to demonstrate that the Site is, or can be made suitable for the land use(s) proposed under the Planning Proposal

AECOM completed this Phase 1 contamination assessment to support Lend Lease's Planning Proposal for the LLCQ development, in general accordance with the requirements of NSW EPA endorsed and published guidelines. AECOM considers that the Phase 1 contamination assessment is adequate for the purpose of enabling City of Sydney Council to assess and determine the Planning Proposal, with respect to contamination of land.

Based on the findings of the Phase 1 contamination assessment, the potential for presence of contamination has been identified at the Site, associated with fill materials, a UST located at 182 George Street, a potential former bowser and fuel dispensing area at 33 - 35 Pitt Street, and a grease trap and chemical storage in the basement of Jackson on George at 174 - 176a George Street.

Risks to current Site users under the existing Site use is generally considered to be low. However, the potential for vapour migration associated with the UST at 182 George Street should be considered. Integrity testing records for the UST located at 182 George Street have indicated that while the integrity of the tank was confirmed, the return pipework may have leaked, and further investigations should be undertaken to confirm the nature and extent of any resultant contamination and to assess the potential for leaks from this feature to impact on the Site and/or be resulting in off-site migration of contamination.

In addition, if redevelopment is undertaken at the Site that exposes fill materials beneath the basement, there is potential for contact with contaminated materials.

It is recommended that intrusive investigations are undertaken where potential sources of contamination were identified and to characterise the fill material and groundwater quality beneath the Site, and assess the requirements for remediation, if any. These investigations should be undertaken prior to lodgement of a Development Application for the LLCQ development.

AECOM considers that the Site is suitable for ongoing commercial land use in its current form, and can be made suitable for the land use(s) proposed by the LLCQ development, including commercial (office, hotel and retail) and public open space, subject to the above investigations being completed and remediation (if recommended) being undertaken using what are proven, industry standard techniques.

1.0 Introduction

As part of the Lend Lease Circular Quay project, Lend Lease Development Pty Ltd (Lend Lease) engaged AECOM Australia Pty Ltd (AECOM) to conduct a due diligence Phase 1 contamination assessment of the following properties located in Sydney, NSW:

- 174 – 176a George Street, Sydney, NSW (Lot 181 DP 606865)
- 182 George Street, Sydney, NSW (Lot 182 DP 606865 – Part 1 and 2)
- 33 - 35 Pitt Street, Sydney, NSW (Lot 7 DP 629694)
- Portion of 190 - 200 George Street (Portion of Lot 1 DP 69466 and portion of Lot 4 DP 57434) – known as the Mirvac Triangle
- Crane Lane (Lot 1 and Lot 2 DP 880891)
- The Rugby Club (optional site), Rugby Place off 31 Pitt Street, Sydney NSW (Lot 180 DP 606866)

The properties are collectively referred to herein as 'the Site'. The location of the Site and layout of the properties is shown in **Figure 1** and **Figure 2** of **Appendix A**.

1.1 Objective

The overall objective of the Phase 1 contamination assessment is to support Lend Lease's Planning Proposal for the LLCQ development, and to demonstrate that the Site is, or can be made suitable for the land use(s) proposed under the Planning Proposal.

In particular the assessment is to:

- Determine if contamination is likely to exist and what remediation would likely be required at the Site;
- Provide recommendations for remediation (if required) to inform commercial assessments;
- Provide advice on groundwater impacts and management requirements; and
- Confirm that the Site is suitable for ongoing commercial land use in its current form, and can be made suitable for the land use(s) proposed by the LLCQ development, including commercial (office and retail) and public open space, subject to appropriate investigations being completed and remediation (if recommended) being undertaken using proven, industry standard techniques.

1.2 Scope of Work

The following scope of work was conducted:

- Review certificates of title;
- Source and review historic aerial photographs and include pertinent copies within the report;
- Review published maps of the area to gain an understanding of surface and subsurface conditions (e.g. geology, soil/sediment and topography);
- Search/review information readily available through the internet (e.g. historic parish maps, NSW EPA contaminated sites register and registered groundwater bore database);
- Undertake a detailed Site inspection, to ground truth the background information;
- Determine of whether contamination may be present that requires additional assessment / management / remediation; and
- Produce this Phase 1 Contamination Due Diligence report.

2.0 Site Information

2.1 Location

The Site is located at the northern end of Sydney central business district and comprises the following properties:

- 174 – 176a George Street, Sydney, NSW (Lot 181 DP 606865)
- 182 George Street, Sydney, NSW (Lot 182 DP 606865 – Part 1 and 2,)
- 33 - 35 Pitt Street, Sydney, NSW (Lot 7 DP 629694)
- Portion of 190 - 200 George Street (Portion of Lot 1 DP 69466 and portion of Lot 4 DP 57434) – known as the Mirvac Triangle
- Crane Lane (Part 2 DP880891)
- The Rugby Club (optional site), Rugby Place off 31 Pitt Street, Sydney, NSW (Lot 180 DP 606866)

The Site location is shown on **Figure 1** in **Appendix A**. The location of each of the properties is provided in **Figure 2** in **Appendix A**.

2.2 Identification

Table 1 174 - 176a George Street Summary

Item	Description
Site Owner ⁽¹⁾	Lend Lease Development Pty Limited
Site Address	174 - 176a George Street, Sydney
Legal Description (Lot and DP) ⁽²⁾	Lot 181 DP 606865
Local Government Authority ⁽²⁾	City of Sydney
Current Zoning	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Commercial (Hotel)
Proposed Land Use	Commercial (Hotel)
Site Area	486 m ²
Site Elevation (m AHD) ⁽³⁾	Approximately RL 6.4 m on George Street boundary Approximately RL 3.7 m at eastern property boundary
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A) and Appendix B.

Notes
 (1) As per Certificate of Title
 (2) As per Section 149 Certificate
 (3) as per 2/11/2012 Rygate drawing

Table 2 182 George Street Identification Summary

Item	Description
Site Owner ⁽⁴⁾	Lend Lease Circular Quay Pty Ltd
Site Address	182 (also identified as 178 – 186) George Street, Sydney, NSW 2000
Legal Description (Lot and DP) ⁽⁵⁾	Lot 182 DP 606865
Local Government Authority ⁽⁵⁾	City of Sydney
Current Zoning ⁽¹⁾	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Commercial
Proposed Land Use	Commercial (office and retail) and public open space

Item	Description
Site Area	1,125 m ²
Site Elevation (m AHD) ⁽⁶⁾	Approximately RL 6.8 m on George Street boundary Approximately RL 3.9 m on eastern boundary
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A)

Notes : (4) As advised by Client
(5) As per provided Section 149 Certificate
(6) as per 3/3/2011 Rygate drawing

Table 3 33 - 35 Pitt Street Identification Summary

Item	Description
Site Owner ⁽⁴⁾	Lend Lease Circular Quay Pty Ltd
Site Address	33 - 35 Pitt Street, Sydney, NSW 2000
Legal Description (Lot and DP) ⁽⁷⁾	Lot 7 DP 629694
Local Government Authority ⁽⁷⁾	City of Sydney
Current Zoning	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Commercial
Proposed Land Use	Commercial (office and retail) and public open space
Site Area	2,589 m ²
Site Elevation (m AHD) ⁽⁸⁾	Approximately RL 4.0 m on Crane Place boundary Approximately RL 2.5 m on Pitt Street boundary
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A)

Notes : (7) As per provided Section 149 Certificate
(8) as per 3/3/2011 Rygate drawing

Table 4 Mirvac Triangle Identification Summary

Item	Description
Site Owner	Mirvac
Site Address	190 George Street, Sydney, NSW 2000
Legal Description (Lot and DP) ⁽⁹⁾	Portion of Lot 4 DP 57434 and portion of Lot 1 DP 69466
Local Government Authority ⁽⁹⁾	City of Sydney
Current Zoning	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Commercial
Proposed Land Use	Commercial (office and retail) and public open space
Site Area	Approximately 200 m ²
Site Elevation (m AHD) ⁽¹⁰⁾	Approximately RL 3 m
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A)

Notes : (9) As per provided Section 149 Certificate
(10) as per 3/3/2011 Rygate drawing

Table 5 Crane Place (Laneway)

Item	Description
Site Owner	Sydney City Council
Site Address	Crane Lane, Sydney
Legal Description (Lot and DP) ⁽¹¹⁾⁽¹²⁾	Lot 1 and Lot 2 DP 880891
Local Government Authority ⁽¹¹⁾	City of Sydney
Current Zoning	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Road (Laneway)
Proposed Land Use	Commercial (office and retail) and public open space
Site Area ⁽¹⁰⁾	176.6 m ²
Site Elevation (m AHD) ⁽¹³⁾	Approximately RL 3.8 m
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A)

Notes: (11) as per Land Title Documentation
(12) it is noted that Lot 1 in DP 880891 comprises a walkway over Crane Lane and is a stratum lot which sits within and is surrounded by Lot 2 in DP 880891
(13) as per 3/3/2011 Rygate drawing

Table 6 31 Pitt Street Identification Summary

Item	Description
Site Owner ⁽⁴⁾	Wanda One Sydney Pty Ltd
Site Address	Off 31 Pitt Street, Sydney, NSW 2000
Legal Description (Lot and DP) ⁽¹⁴⁾	Lot 180 DP 606866
Local Government Authority ⁽¹⁴⁾	City of Sydney
Current Zoning	Zone B8 Metropolitan Centre – Sydney Local Environmental Plan 2012
Current Land Use	Commercial (office/hotel)
Proposed Land Use	Commercial (office/hotel/retail)) and public open space
Site Area	432.9 m ²
Site Elevation (m AHD) ⁽¹⁵⁾	Approximately RL 3.6 m
Site Location Plan	Figure 1 (Appendix A)
Property Layout	Figure 2 (Appendix A)

Notes : (14) As per provided Section 149 Certificate
(15) as per 3/3/2011 Rygate drawing

3.0 Site and Surrounding Area History

3.1 Client Supplied Information

The following information was provided by Lend Lease for the Site and surrounding properties:

- Various background searches for properties located within the Site (including titles, Section 149 certificates, survey plans for the surrounding area, sewer diagrams, etc.).
- Colliers International Investment Services (2011). Information Memorandum. 174-176a George Street, Sydney. July.
- Coffey. 2010. Stage 1 Preliminary Site Contamination Assessment, 1 Alfred Street, Sydney, NSW. 18 November.
- Coffey. 2012a. Geotechnical Investigation, Proposed Commercial Development, 200 George Street, Sydney. 20 April.
- Coffey. 2012b. Contamination Assessment, 200 George Street Redevelopment. 4 May.
- Coffey. 2012c. Remediation Action Plan, 200 George Street Redevelopment, Sydney, NSW. 26 September.
- Coffey. 2012d. Geotechnical Desktop Study, 33-35 Pitt Street, Sydney. 28 November.
- Coffey. 2013. Updated Geotechnical Desk Study 33-35 Pitt Street, Sydney. 23 August [encompassing 33-35 Pitt Street, 182 George Street, Crane Lane, 174-176a George Street, Mirvac Triangle and 31 Pitt Street].
- Godden McKay Logan. 2010. Heritage Impact Statement and Archaeology Assessment, 1 Alfred Street.
- Lend Lease. 2012. Proposed Basement drawing concepts for 33-35 Pitt Street. 14 November.
- Rappaport. 2010. Statement of Heritage Impact, proposed new building at 19-33 Pitt St.

3.2 Previous Investigations

The following table provides a summary of previous investigations undertaken at or near the Site.

Table 7 Summary of Previous Investigations

Document	Summary
Coffey, 2010 (1 Alfred Street, undertaken for Valad Fields Trust)	<p>Coffey undertook a Stage 1 Preliminary Contamination Assessment for proposed redevelopment of the site at 1 Alfred Street, Sydney, currently occupied by Gold Fields House. It is understood that the proposed works would include the redevelopment the site into two high density residential and commercial-use towers and deepening the existing two storey basement to a seven level basement. The assessment included a site walkover, and desktop review of land ownership titles, historical aerial photography and searches of the NSW WorkCover dangerous goods records and NSW DECCW (now Office of Environment and Heritage, OEH) contaminated land register. The site walkover observed surface staining on a concrete floor associated with an on-site grease trap.</p> <p>The report concluded that the risk of potential contamination to site soils and groundwater associated with the grease trap was low, based on the observed integrity of the concrete floors. Fill material was likely limited to the footprint of the car park ramp and was determined to have a low to medium risk of contamination based on the findings of the desktop assessment. Coffey determined that any fill material would unlikely pose a significant risk of harm should it be present on site, but concluded that a suitable management strategy be employed should any fill be encountered.</p> <p>Coffey concluded that the site was likely suitable for the proposed commercial and high density residential land use.</p>

Document	Summary
Coffey, 2012a (200 George Street, undertaken for Mirvac Projects Pty Ltd)	Coffey undertook a geotechnical investigation for proposed redevelopment of 190 George Street, 200 George Street and 4 Dalley Street to a commercial development to be known as 200 George Street. Fieldwork carried out in April 2012 comprised the advancement of eleven boreholes (BH1/MW1 to BH11) all of which were located within existing basements beneath 190 George Street, 200 George Street and 4 Dalley Street. Six boreholes were cored into rock (BH1, BH2, BH3, BH5, BH6 and BH9) and 3 converted into piezometers (BH1, BH2 and BH9) for groundwater observations. Fill material (gravelly sands and sandy clays) was encountered in all locations. Sandstone bedrock was observed at 0.7m in BH7 on, located on the western side of the site, and increased in depth to 5.4m in BH6 at the eastern boundary. Groundwater was measured at 9.8 m below ground level (RL-8m AHD) in the borehole drilled in the basement of 190 George Street. Groundwater seepage was noted at 3.5 m below ground level (about RL+0.3m AHD) in fill material encountered in BH6 located towards the eastern side of 200 George Street. The investigation determined that groundwater was likely present in the alluvium associated with the former Tank Stream and within fill material historically placed to reclaim formerly swampy ground associated with the estuary.
Coffey, 2012b (200 George Street, undertaken for Mirvac Projects Pty Ltd)	Coffey undertook a contamination assessment for associated redevelopment works at 200 George Street. The assessment included the advancement of eleven soil bores (BH1 to BH11) to depths between 0.26m and 13.21m below ground level and collection of soil samples. Three of the soil bores were converted into groundwater wells (MW1-MW3) which were subsequently sampled and submitted to a laboratory for analysis. A moderate hydrocarbon odour was noted in clayey sand in BH8. TPH C10-C36 was detected in three samples from BH8 up to a maximum concentration of 50,960 mg/kg. The inspection of the site identified the presence of a fuel storage facility in the basement of the building at 4 Dalley Street. The samples analysed for BTEX, PAH, metals, OCP/OPP and PCB all reported concentrations below the laboratory LOR and the adopted soil investigation levels. Asbestos was not detected in the samples submitted for analysis. Based on the desktop, field assessment and subsequent laboratory analysis, Coffey recommended that the petroleum hydrocarbon contamination identified in soils in the vicinity of the USTs be delineated to facilitate remediation and/or management and the preparation of a Remediation Action Plan to address management of asbestos pipework.
Coffey, 2012c (200 George Street, undertaken for Mirvac Projects Pty Ltd)	Coffey produced a Remediation Action Plan (RAP) for implementation during the proposed redevelopment of 200 George Street. TPH impact identified between 0.5m and ≥3.0m below ground level was the target of the remedial works, associated with former fuel infrastructure. The adopted strategy recommended by the RAP included: <ul style="list-style-type: none"> - Removal of the UST and associated infrastructure and disposal off-site; - Excavation of contaminated soil using olfactory and visual indicators and disposal off-site; and - Validation of excavation faces
Coffey, 2013 (33-35 Pitt Street, undertaken for Lend Lease)	Coffey undertook a desktop geotechnical investigation for proposed redevelopment of 33-35 Pitt Street, Sydney [encompassing 33-35 Pitt Street, 182 George Street, Crane Lane, 174-176a George Street, Mirvac Triangle and The Rugby Club]. The investigation was undertaken in 2012, and updated with the inclusion of additional borehole data in August 2013. The investigation indicated that the geology in the study area comprised fill materials, overlying alluvium and sandstone bedrock. Fill materials, generally composed of sand, gravel, clay and construction materials, varied in thickness between approximately 1.5 m and 5 m and were found to increase in thickness to the east of the Site, towards a valley associated with the Tank Stream, roughly aligned with the eastern side of Pitt Street. Groundwater was encountered in fill and alluvium and was considered to flow in general alignment with Tank Stream and to the north, towards Sydney Harbour. Saline impacts and tidal influences were also considered likely. Borehole JBH2C was located in Crane Lane, immediately east of the St George Building and roughly near the centre of the Site. A cross-section including this location indicated a ground level of 3.9 m AHD, with fill materials directly overlying medium to highly weathered sandstone. Fill material at this location appeared to be approximately 2 m thick.

Document	Summary
GML, 2010 (1 Alfred Street, undertaken for Valad Fields Trust)	GML undertook a Heritage Impact Statement (HIS) for proposed redevelopment of the site occupied by Gold Fields House (1 Albert Street) in order to assess potential heritage impacts to the built heritage of the site and surrounding area. An Archaeological Assessment report was incorporated into the report. GML reported that Gold Fields House was listed on any authoritative agencies as having any heritage value. However, it was reported that the site was in the vicinity of locations listed on the Sydney Local Environment Plan 2005 (SLEP 2005) and is also placed within the "Circular Quay Special Area". The archaeological assessment determined that there was no risk of disturbing or destroying any archaeological relics or objects based on the understanding that the construction of basement levels of Gold Fields House had likely impacted on any potential archaeological materials. The assessment also concluded that the redevelopment works would not impact the Tank Stream, understood to be located within 3 m of the statutory curtilage established by the NSW Heritage Act.
Rappaport, 2010 (19 Pitt Street, understood to have been conducted for Ringmer Pacific)	Rappoport Pty Ltd – Heritage Consultants (Rappoport) produced a statement of heritage impact for a proposed new building located at 19-31 Pitt St, Sydney. A historical and archaeological review determined that the subject building was not considered to have any cultural significance and was not listed on and heritage register. The assessment concluded that based on the typical post-war medium-rise architecture of the building and the lack of distinctive or remarkable features, the building did not contribute to the heritage values of the city. Rappoport did recommend further assessment to determine the impact to the ambient heritage values of the CBD based on the proximity of the proposed redevelopment to identified heritage listed items.

3.3 Aerial Photograph Review

Aerial photographs were obtained for the Site for the period 1930 – 2005. The aerial photography indicates that the Site was occupied by various buildings from at least 1930, and underwent a demolition or refurbishment between 1972 and 1983. The aerial photograph review is summarised in **Table 8**, below and pertinent aerial photographs are provided in **Figures 4 -12** in **Appendix A**.

Table 8 Historical Aerial Photo Review

Year	Site	Surrounding Area
1930	The 1930 photograph had poor resolution, however the Site appears entirely occupied by several buildings.	Several buildings were apparent in the immediate surrounding area. George Street was visible to the immediate west of the Site in generally its current alignment. Circular Quay and ferry berths were present to the north and railway lines and sidings were noted further west of the Site.
1942	Again the resolution of the photograph is poor, however the Site appeared similar to the 1930's photograph and was occupied by a number of buildings.	No significant changes were noted in the surrounding areas. The Harbour Bridge was visible to the north west of the Site and the railway sidings to the west appeared to have been replaced by a roadway. Land reclamation of Circular Quay ferry terminal appear to have occurred.
1951	The Site is occupied by several buildings. Crane Place appears as a laneway in its current alignment, joining Pitt Street with George Street. A building has now been constructed within the current Rugby Club site.	The building to the immediate north of the Site appeared to have been demolished. Underwood Street is evident immediately south of the Site. No other significant changes were observed.

Year	Site	Surrounding Area
1960/1961	No significant changes were noted with the buildings that occupy the Site, with the exception of one small building located within the current 33-35 Pitt Street address. Cars were noted parked in the area where the building had been demolished and also the centre of the Site.	Several buildings to the north of the Site had been demolished and the Albert Street road alignment had been altered. The Cahill Expressway, running east-west, was visible.
1970/1972	A building has been constructed in the west of the Site. The rest of the Site appears unchanged.	Significant development in the vicinity of the Site was noted. Several buildings to the north and north-east of the Site had been demolished, and a large multi-storey building (Goldfields House) was present to the immediate north east of the Site. Other new multi-storey buildings were visible in the vicinity of the Site, including fronting to Pitt Street to the east of the Site.
1983/1986	The Site had been entirely redeveloped with all new buildings evident within the Site, including multilevel buildings with frontages to George Street and Pitt Streets. Crane Lane was still evident and remained in its previous alignment.	Buildings on the western side of George Street, opposite the Site, had also been demolished and a large building, consistent with the current Four Seasons Hotel, was visible. An area of cleared land was also noted on the western side of George Street, to the south west of the Site, which by 1986 showed a high-rise building under construction.
1999	No significant changes noted.	New multi-storey developments in the vicinity on the Site were noted, including immediately south of the Site, fronting Dalley Street and to the south west on the western side of George Street.
2002/2005	No significant changes noted.	No significant changes noted.
2013 Google maps image	No significant changes noted.	No significant changes noted.

3.4 Certificates of Title

The certificates of title were obtained for the properties which make up the Site from Advanced Legal Searchers. In addition, Lend Lease provided certificates of titles for the property located at 174-176a George Street. A summary of the title information for each of the properties is provided below.

Table 9 Summary of Certificate of title Information

Address	Lot / Deposited Plan	Title Information
174 – 176a George Street, Sydney	Lot 181 DP 606865	Current land ownership described as Lend Lease Development Pty Limited (since 6 November 2013). This site was previously owned by Marsico Holdings Pty Ltd (since 1989), prior to which, the Site was owned by Tooth and Co. Limited (a brewery) from 1974, with various commercial leases. It is considered likely that the Site operated as a hotel or public house throughout this period. Site owners prior to 1974 comprised various corporations and individuals. A number of commercial leases regarding office space, since 1910, were also noted on the certificate. It is not considered that these landowners are indicative of significant potentially contaminating land uses. A number of easements, rights of footway and rights of carriageway associated with the Site and the surrounding area were shown on the Site plan accompanying the certificate of title (registered on 21 January 1981). In addition, the plan noted the “Port Jackson Hotel (to be demolished)” on Lot 182 to the immediate south of the Site. It is understood from anecdotal evidence that the Site was formerly known as the Port Jackson Hotel.
182 George Street, Sydney	Lot 182 DP 606865	Current land ownership described as St George Bank Limited. No additional historic information provided indicated the presence of potentially contaminating activities.
33 – 35 Pitt Street, Sydney	Lot 7 DP 629694	Current land ownership described as St George Bank Limited. A number of commercial leases and dealings regarding the previous buildings and current office space, since 1905, were noted however none indicated the presence of potentially contaminating activities. No additional historic information provided indicated the presence of potentially contaminating activities.
Crane Place	Lot 1 and Lot 2 DP 8808091	Current land ownership is Sydney City Council, who acquired the land in 1973. Prior to this, the land was privately owned. No additional historic information provided indicated the presence of potentially contaminating activities.
Mirvac Triangle	Lot 1 in DP 69466 and Lot 4 in DP 57434	Mirvac. No additional historic information provided indicated the presence of potentially contaminating activities.
The Rugby Club, off 31 Pitt Street, Sydney (optional site)	Lot 180 DP 606866	Current land ownership described as Rugby Club Limited who acquired the land in 1992, prior to which the land was owned by the Rugby Union Club from 1952. Site owners prior to 1952 comprised a number of corporations and individuals, including a grazier and stock & station agent, a solicitor and an underwriter. None of the information provided indicates the presence of potentially contaminating activities on this parcel of land.

3.5 Section 149 Certificate

Copies of the Section 149 Certificates under the NSW *Environmental Planning and Assessment Act 1979* were obtained from the City of Sydney Council for the subject properties. The certificates indicated the following related to potential contamination and acid sulphate soils (ASS):

- **Contaminated Land Potential:** Council records do not have sufficient information about the uses (including previous uses) of the land which is the subject of this section 149 certificate to confirm that the land has not been used for a purpose which would be likely to have contaminated the land. Parties should make their own enquiries as to whether the land may be contaminated.

- **Hazard Risk Restriction:** The City of Sydney Local Environmental Plan 2012 incorporates Acid Sulfate soil maps. Development on the land identified in those maps should have regard to Part 4, Division 4 clause 7.14 of the LEP.

The LEP ASS map indicates that the eastern half of the Site and land to the immediate east of the Site is underlain by Class 2 ASS, which is consistent with the presence of Tank Stream and the former Sydney Cove shoreline as suggested in Coffey (2013). The LEP ASS map is provided in **Appendix A**.

3.6 NSW EPA Register

Based on a review of the NSW EPA contaminated sites register, there are no declared sites near the Site and no nearby properties have been reported to NSW EPA under Section 60 of the *Contaminated Land Management Act 1997*. The nearest declared site (former Miller Street gasworks at Barangaroo) is located approximately 500m to the west of George Street.

3.7 WorkCover Dangerous Goods

No records were able to be obtained from WorkCover.

Cylinders of carbon dioxide were stored at the loading dock at the rear of the 182 George Street (in Blue Anchor Lane), which were observed to be restrained as required by current workplace health and safety legislation.

A 10,000L diesel UST is known to be present at the western side of the basement in 182 George Street for emergency backup power and is reportedly tested approximately once a month. Discussions with on-site personnel indicated the tank has been periodically tested for leaks and has passed testing. Lend Lease provided a UPSS Integrity Test Report by OPEC Technical Services (March 2013), which concluded that the UST was “tight” at the time of testing. However it was noted that the return line was isolated from the tank top due to prior failures testing the system with this line connected. Further investigations were recommended to ascertain the exact location of any leak(s) and either repair or replace the return line.

4.0 Site Condition and Surrounding Environment

4.1 Current Land Use

At the time of preparing this report, the Site was occupied by laneways and commercial buildings including offices, car parking, ground floor coffee shops, 'Jacksons on George' (a four level entertainment venue including bars, a night club, restaurant, bistro and gaming room) and The Rugby Club, a multi-level licensed club including function rooms, bar and bistro. The Site layout is provided in **Figure 2**.

Table 10 Current Land Use

Address	Title Details	Current Use
174 – 176a George Street, Sydney	Lot 181 DP 606865	'Jackson on George' Hotel
182 George Street, Sydney	Lot 182 DP 606865	St George Bank Head Office
33 – 35 Pitt Street, Sydney	Lot 7 DP 629694	Commercial Office Building
Mirvac Triangle	Part Lot 4 DP 57434 and part Lot 1 DP 69466	Disused Garden Area
Crane Lane	Lot 1 and Lot 2 DP 8808091	Road / Lane way
The Rugby Club, off 31 Pitt Street, Sydney	Lot 180 DP 606866	The Rugby Club Sydney, licensed club

4.2 Surrounding Land Use

Land uses surrounding the Site comprised:

- **North:** Goldfields House, a multi-storey commercial building, with Circular Quay and Sydney Harbour beyond.
- **East:** Fairfax House (commercial multi-storey building), and Pitt Street with multi-storey commercial building beyond.
- **South:** Underwood Street with multi-storey commercial buildings beyond.
- **West:** George Street, with Four Seasons Hotel and other commercial buildings beyond.

4.3 Topography and Drainage

The Site generally sloped from the south-west to the north-east. Survey plans provided by Lend Lease indicated that the ground elevation at the Site ranges from approximately relative level (RL) 6.9 m at the George Street boundary to approximately RL 2.5 m at the Pitt Street boundary. A slight regional grade to the north, towards Circular Quay was apparent.

Stormwater around the Site would generally be managed by municipal infrastructure, directing surface water to the north and east towards the harbour and via the Tank Stream (a stormwater culvert draining to Circular Quay).

4.4 Geology

A review of the 1:100,000 Sydney Series Geological Sheet (9130) indicated that the site is underlain by Middle-Triassic Hawkesbury Sandstone, comprising medium to coarse grained quartz sandstone with very minor shale and laminate lenses. To the immediate east of the Site, an area of man-made ground was shown, comprising dredged estuarine sand and mud, demolition rubble, industrial and household waste, overlying alluvial and estuarine sediments (silty to peaty sand, silt and clay with shell layers). Soils are underlain by Hawkesbury Sandstone which is described as being a medium to coarse-grained quartz sandstone with very minor shale and laminate lenses.

The Soil Landscapes of Sydney 1:100,000 sheet indicated the subject site is located near identified disturbed terrain. Historical maps indicated that the area was an estuary associated with the terminal outwash of the Tank Stream, a former freshwater course that drained into Sydney Cove. Today, the Tank Stream is an underground, enclosed stormwater drain that terminates at Circular Quay. Land reclamation works undertaken in the early years of settlement in Sydney resulted in the deposition of fill material overlying the natural estuarine sediments.

4.5 Hydrogeology

Based on Coffey (2013) groundwater is expected to be present within the underlying fill material and alluvium associated with the former Tank Stream at depths ranging from RL 0.2 to RL -0.4. Groundwater is also likely to occur within the underlying sandstone bedrock in fractures.

Groundwater flow is expected to be locally towards the Tank Stream to the east and regionally, towards Sydney Harbour to the north. The presence of basement structures associated with the buildings is likely to influence shallow groundwater flow directions.

5.0 Site Inspection

5.1 Site Observations

Site inspections were conducted of the properties which comprise the Site. The observations made, with respect to potential contamination, are summarised on **Figure 3** in **Appendix A** and detailed below. Photographs from the Site inspections are provided in **Appendix C**.

5.1.1 174 – 176a George Street, Sydney

An inspection of the Jacksons on George property was conducted on 26 August 2013, by Susan Dillon of AECOM, accompanied by Mr Damon Crawford of Jacksons on George.

The Site was entirely occupied by a four level building, comprising:

- **Basement Level:** 'Bottom of the Harbour Bar' comprising a sports bar and gaming room, with access from Blue Anchor Lane (the southern Site boundary). Entrance to the south western corner of the building via a loading dock was also available on this level from Blue Anchor Lane/Rugby Place. The loading dock and cellar area were used for the storage of gas cylinders, cleaning chemicals and restaurant and bar supplies. The main building switch room was also located on this level as was a small room containing laundry facilities (one washing machine and dryer) and access to the grease trap. The basement level had a concrete floor that appeared to be in good condition. In-floor drains were observed, directing surface flows towards the grease trap and sewer.
- **Ground Level:** Fronting George Street, this level comprised a bar and restaurant, with an outdoor seating area, kitchen and amenities.
- **Level 1:** Bar area and night club, with amenities and staff offices.
- **Level 2:** Bar, including outdoor seating area and amenities.

Each level was accessed via stairs at the south western end of the building with no lift at the premises. No deep basements were present at the Site and Mr Crawford advised that no basements from adjacent properties underlay the Site.

5.1.2 182 George Street

An inspection of the 182 George Street property was conducted on 19 December 2012 by Brad Eismen of AECOM, accompanied by Mr Rick Murphy of DTZ (facilities management).

The George Street property consists of a multi-storey building with a split level basement car park. The northern part of the building overhangs Blue Anchor Lane, which connects George Street to Crane Lane. The George and Pitt Street properties are joined by upper levels but do not share a basement.

A 10,000 litre diesel UST is present in the upper split level of the basement (Plate No. 7). It is fed by a fill point located on the north side of the building in the adjacent laneway on the north side of the building. The fill point is contained within a box approximately 1.5m above the ground (Plate No.6).

The lower basement level had numerous concrete cuts that appeared to be trenched. No anecdotal information could be provided as to what they might have related to. There appeared to be copper coloured patches in the concrete cuts (Plate No. 8). No additional information was able to be provided by site personnel.

5.1.3 33 - 35 Pitt Street

An inspection of the 33-35 Pitt Street property was conducted on 19 December 2012 by Brad Eismen of AECOM, accompanied by Mr Rick Murphy of DTZ (facilities management).

The Pitt Street property consists of two multi-storey buildings with 33 Pitt Street containing 3 levels of car parking and a roof top garden area. Neither building reportedly contains a basement nor was there any indication of a basement being present during the site inspection.

Two concreted UST fill points were observed adjacent to 33 Pitt Street on the Underwood Street footpath (Plate Nos. 1 and 2). A covered "inspection pit" was observed within the western side of building (Plate No. 3). A raised island, which appeared to have housed fuel bowsers, was present east of the inspection pit and north of the fill points (Plate No. 4). There were cars parked over the area where an associated UST would have been located. A number of areas of concrete repairs were observed in the area east of the possible bowser island (Plate No. 5).

5.1.4 Mirvac Triangle

The Mirvac Triangle was not accessible during the site inspection conducted by Brad Eismen of AECOM on 19 December 2012. It was observed from the third storey of the 33 Pitt Street building and consisted of a disused garden area (Plate Nos. 9 and 10).

5.1.5 Crane Lane

An inspection of Crane Lane property was conducted on 4 October 2013, by Ainslie Sumner of AECOM.

Numerous drains, grates and manhole covers for underground services were noted within the roadway.

The southern section of the laneway was unable to be inspected as it had been blocked for construction work on the adjacent property.

5.1.6 The Rugby Club (off 31 Pitt Street)

The Rugby Club comprised a six-storey building, which is used as a licensed club with three function rooms, a public bar and bistro and associated infrastructure and amenities. It is understood that The Rugby Club occupies four levels of the building (Ground, 1, 2 and 3). The building occupies the entire lot, with the exception of an outdoor courtyard area on the ground floor, which extends over Rugby Place.

No internal inspection was undertaken as part of preparing this report. It is understood that The Rugby Club is an optional site under the LLCQ proposal, and development in this area would likely comprise the refurbishment and continued commercial use of the existing building, together with associated public realm improvements.

An inspection of the external areas indicated that the ground floor is primarily occupied by a licensed bar and entrance hallways. An outdoor courtyard area was also present, occupying the laneway immediately south of The Rugby Club building. Domestic and recycling bins were observed at the western end of the building, adjacent to the Jacksons on George loading dock and car park entry for Goldfields House to the north.

5.1.7 Adjacent Sites

The surrounding area was largely occupied by multi-storey commercial buildings, laneways and small areas of hard landscaping.

Additional operational UST fill points were observed at the western end of Underwood Street (Plate 11), consistent with the description in Coffey (2012b and c).

Two monitoring well covers were observed in the southern end of Underwood Street near the intersection of Dailey Street (Plate No. 12). There is no indication of the presence of these well in the Coffey reports.

A building site (Mircac, 200 George Street) was noted to the south of the 182 George Street property. Boarding around the building site displayed archaeological information about the area, including a map from 1802 that showed the presence of the original shoreline of Sydney Cove directly to the east of the Site, a painting from 1809 that showed a house ("James Underwood's House") and slipway close to the location of the Site and noted that by circa 1918, Nock and Kirby hardware store was open at this location.

6.0 Preliminary Conceptual Site Model (CSM)

6.1 Potential Contamination Sources

Based on the Phase 1 assessment, potential sources of contamination at the Site are considered to comprise:

- Fill materials underlying the Site. It is understood that fill materials may have been imported to the Site to backfill and reclaim the former topographical features associated with the nearby Tank Stream. In addition, the possible demolition of buildings on the Site in the late 1970s/early 1980s may have resulted in building wastes being retained beneath the new structures. Coffey (2013) indicated that the fill within, and in the vicinity of, the Site contained construction materials, and fill materials used in Sydney CBD are known to often contain ash and slag waste. Likely contaminants of potential concern (CoPC) associated with fill materials include asbestos, metals, total petroleum (TPH) and polycyclic aromatic hydrocarbons (PAHs).
- The UST identified at 182 George Street. Records indicated that the tank was “tight” but that leaks from return pipework may have occurred. CoPC comprise TPH, PAH and lead.
- The potential former bowser area and fill points identified at 33-35 Pitt Street. CoPC comprise TPH, BTEX, PAH and lead.
- The grease trap identified in the basement level of 174 – 176a George Street. Good condition concrete in the basement and reported regular cleaning of this feature indicates that the likelihood of associated contamination is low, but cannot be precluded.
- Chemical storage in the basement of 174 – 176a George Street. No obvious staining or cracks in the concrete floor and the limited volume of chemicals stored indicates that significant contamination resulting from chemical storage is unlikely, however cannot be precluded at this stage.
- Groundwater samples collected by Coffey (2012b and c) from a well installed adjacent the Mirvac Triangle reported the presence of copper, mercury, nickel and zinc greater than the ANZECC freshwater guidelines, though it was concluded that these results may be representative of naturally occurring conditions.

6.2 Potential Contamination Pathways and Receptors

Potential pathways between the identified sources of contamination and sensitive receptors include:

- Direct contact between Site users and contaminated soils and/or groundwater: unlikely under the current Site use but may occur during redevelopment of the Site, for example during excavation of fill materials.
- Ingestion of contaminated soil and/or groundwater by Site users: unlikely under the current Site use but may occur during redevelopment of the Site.
- Inhalation of dust by Site users: unlikely under the current Site use but may occur during redevelopment of the Site, for example during excavation of fill materials.
- Inhalation of vapours by Site users: limited potential for Site users in the basement if contaminated groundwater (from the UST, bowser or other unknown source) has migrated beneath the Site. Unlikely due to current basement ventilation systems, but may occur during development, such as removal on concrete slabs during building demolition or refurbishment.
- Impact to ecological receptors via migration of contaminated groundwater: potential impact to ecosystems in Sydney Harbour if contamination is leaching from fill/soil and migrating off-site via groundwater.
- Impact to recreational uses of Sydney Harbour: potential impact if contamination is migrating off-site via groundwater.

6.3 Summary

Under the current land use scenario at the Site, the preliminary CSM identified complete source-pathway-receptors linkages associated with off-site migration of potential contamination via leaching and groundwater flow, with exposure to current Site users considered unlikely.

During development, it was considered possible that exposure pathways between Site users (i.e. construction workers) may be created, which would require management.

7.0 Conclusions and Recommendations

AECOM has completed this Phase 1 contamination assessment to support Lend Lease's Planning Proposal for the LLCQ development, in general accordance with the requirements of NSW EPA endorsed and published guidelines. AECOM considers that the Phase 1 contamination assessment is adequate for the purpose of enabling City of Sydney Council to assess and determine the Planning Proposal, with respect to contamination.

Based on the findings of the Phase 1 contamination assessment, the potential for presence of contamination has been identified at the Site, associated with fill materials, a UST located at 182 George Street, a potential former bowser and fuel dispensing area at 33 - 35 Pitt Street, and a grease trap and chemical storage in the basement of *Jackson on George* at 174 - 176a George Street.

Risks to current Site users under the existing Site use is generally considered to be low. However, the potential for vapour migration associated with the UST at 182 George Street should be considered. Integrity testing records for the UST located at 182 George Street have indicated that while the integrity of the tank was confirmed, the return pipework may have leaked, and further investigations should be undertaken to confirm the nature and extent of any resultant contamination and to assess the potential for leaks from this feature to impact on the Site and/or be resulting in off-site migration of contamination..

In addition, if redevelopment is undertaken at the Site that exposes fill materials beneath the basement, there is potential for contact with contaminated materials.

It is recommended that intrusive investigations are undertaken where potential sources of contamination were identified and to characterise the fill material and groundwater quality beneath the Site, and assess the requirements for remediation, if any. These investigations should be undertaken prior to lodgement of a Development Application for the LLCQ development.

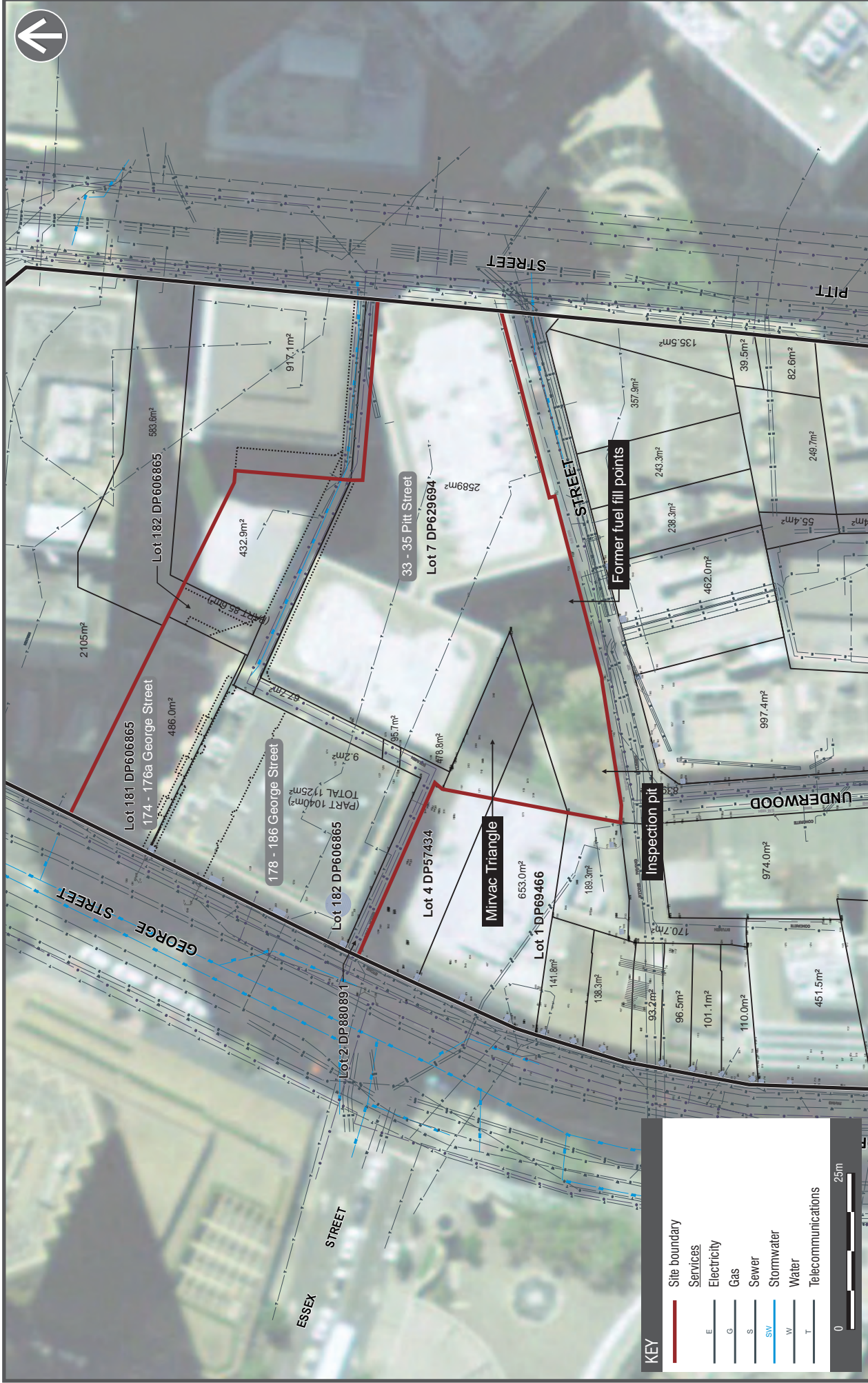
AECOM considers that the Site is suitable for ongoing commercial land use in its current form, and can be made suitable for the land use(s) proposed by the LLCQ development including commercial (office, hotel and retail) and public open space, subject to the above investigations being completed and remediation (if recommended) being undertaken using industry standard techniques.

Appendix A

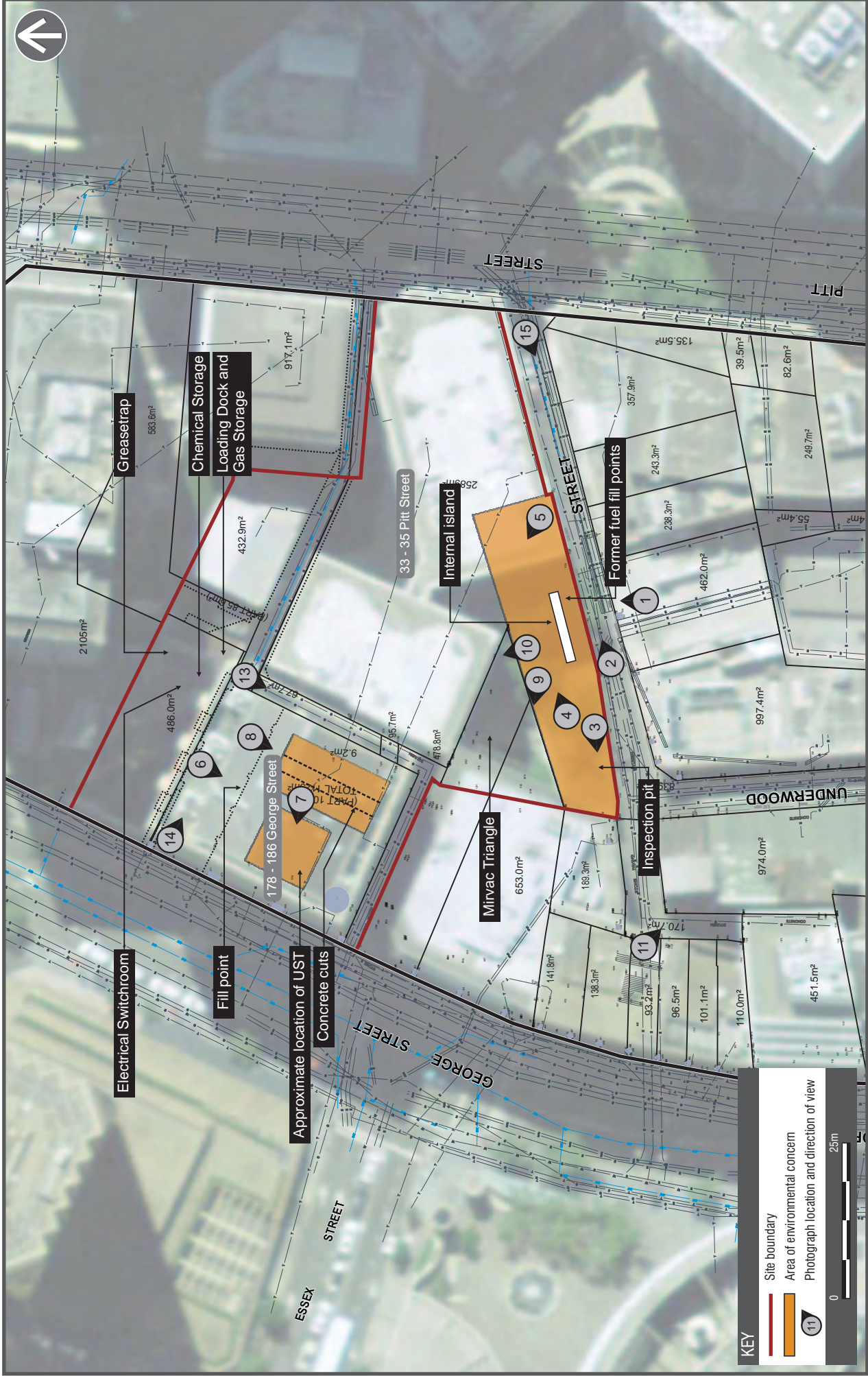
Figures



V:\Groups\ENV\GIS\602 Projects\60228287_182 George Street\FIGURES\Combined Phase 1 ESA\60228287 F1 Site Location 25.11.2013 TO Rev.B



Groups\EN\GIS\1602 Projects\16022887 182 George Street\FIGURES\Combined Phase 1 ESA\6022887 F2 Site Plan 25 11 2013 TO Rev B



Groups\EN\GIS\1602 Projects\6022887 182 George Street\FIGURES\Combined Phase 1 ESA\6022887 F3 Site Inspection Observations 25 11 2013 TO Rev A



\\Groups\ENV\GIS\602 Projects\610282887_182_George Street\FIGURES\Comined Phase 1 ESA\610282887_F4 Aerial Photograph - 1930_16_10_2015 TO Rev.A



AERIAL PHOTOGRAPH - 1930

Phase 1 Assessment

174 - 176a George Street, Sydney

178 - 186 George Street & 33 - 35 Pitt Street, Sydney

FIGURE 4



\\Groups\ENV\GIS\602 Projects\610282887_182_George Street\FIGURES\Combined Phase 1 ESA\610282887 F5 Aerial Photograph - 1942 25 11 2013 TO



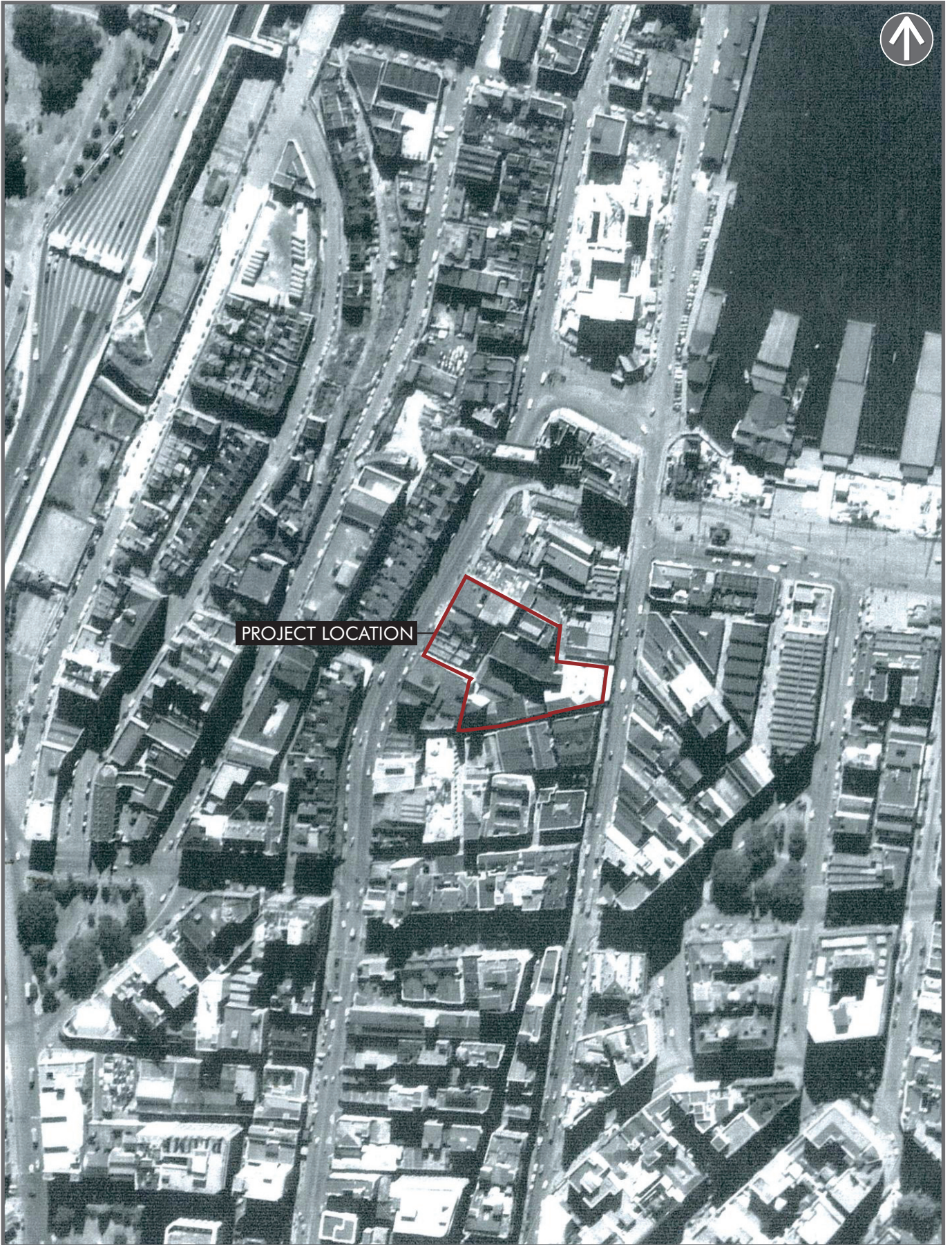
AERIAL PHOTOGRAPH - 1942

Phase 1 Assessment

174 - 176a George Street, Sydney

178 - 186 George Street & 33 - 35 Pitt Street, Sydney

FIGURE 5



V:\Groups\ENV\GIS\602 Projects\60228287_182_George Street\FIGURES\Combined Phase 1 ESA\60228287_F6 Aerial Photograph - 1951_16_10_2015 TO Rev A

AECOM

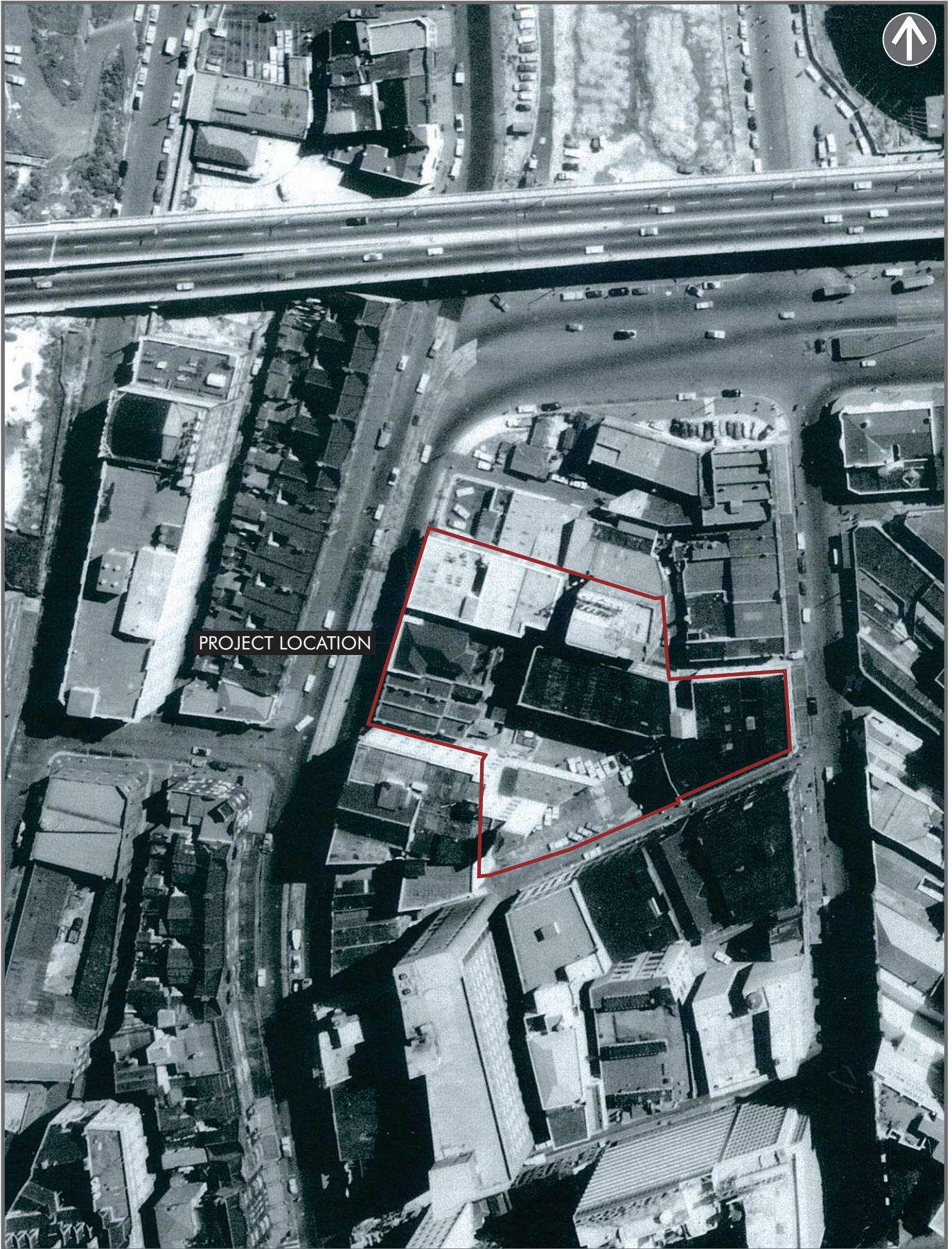
AERIAL PHOTOGRAPH - 1951

Phase 1 Assessment

174 - 176a George Street, Sydney

178 - 186 George Street & 33 - 35 Pitt Street, Sydney

FIGURE 6



PROJECT LOCATION

V:\Groups\ENV\GIS\602 Projects\610282887_182_George Street\FIGURES\Combined Phase 1 ESA\610282887_F7 Aerial Photograph - 1960 16 10 2015 TO Rev A

AECOM

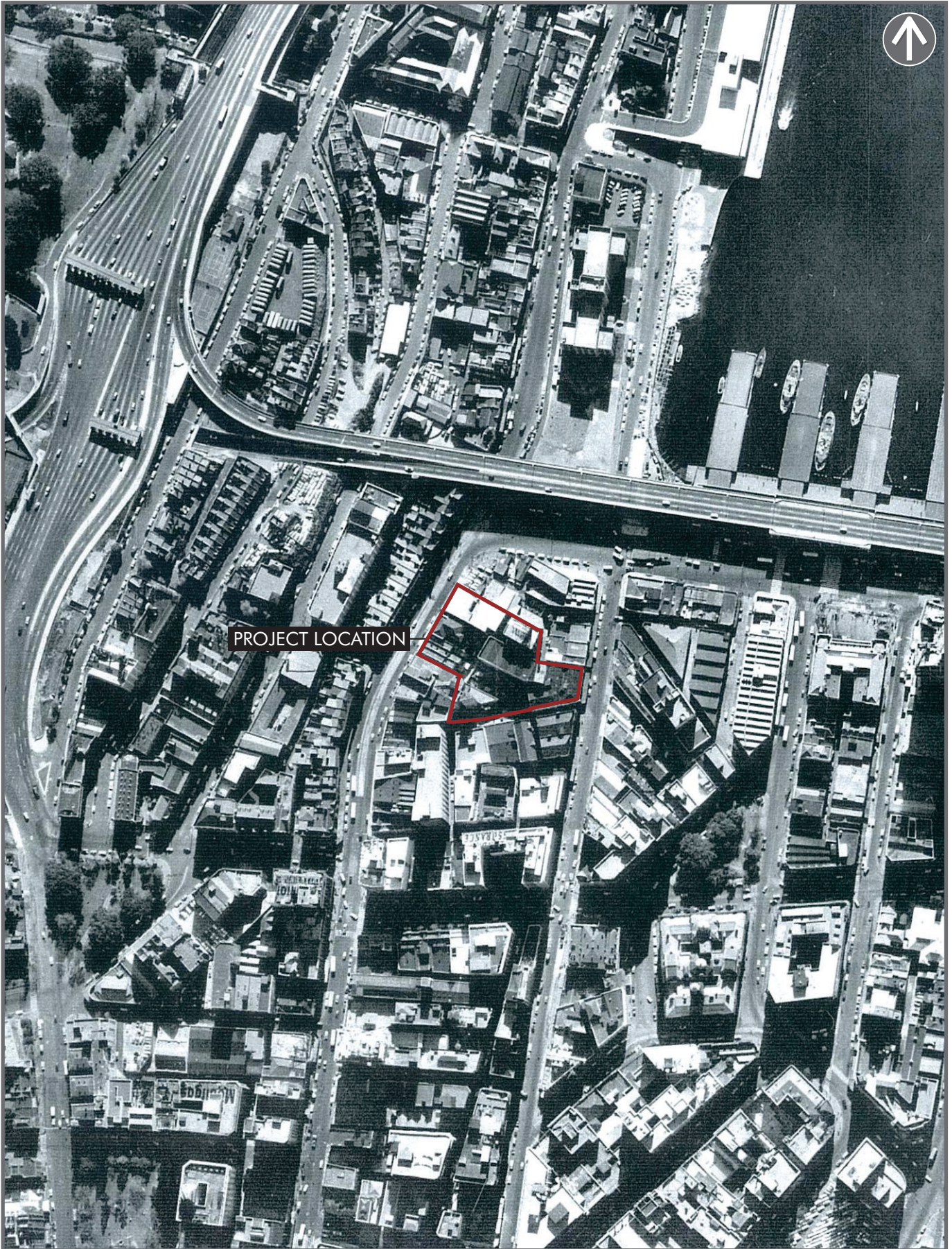
AERIAL PHOTOGRAPH - 1960

Phase 1 Assessment

174 - 176a George Street, Sydney

178 - 186 George Street & 33 - 35 Pitt Street, Sydney

FIGURE 7



I:\Groups\ENV\GIS\602\Projects\602\2887_182_George_Street\FIGURES\Combined_Phase_1_ESA\602\2887_F8_Aerial_Photograph_-_1961_16_10_2015_TO_Rev_A

AECOM

AERIAL PHOTOGRAPH - 1961

Phase 1 Assessment

174 - 176a George Street, Sydney

178 - 186 George Street & 33 - 35 Pitt Street, Sydney

FIGURE 8