Pre-Construction Minor Works Approval Form

Minor Works are defined as any low impact activities that are undertaken prior to the commencement of 'construction' as defined in the project's applicable planning approval. However if Minor Works affect or potentially affect heritage items, threatened species, populations or endangered ecological communities, these works are defined as 'construction' unless otherwise determined by the applicable planning authority.

Minor Works approvals do not remove any obligation to comply with the project's applicable planning approval conditions (including requirements prior to 'any works' commencing) or obtain any other applicable permits, licenses or approvals as necessary.

This application and all supporting information must be submitted to TfNSW/the Environmental Representative as one (1) PDF file at least 10 business days prior to the commencement of the proposed Minor Works.

Part 1: Application	
Contractor:	John Holland & Laing O'Rourke joint venture (JHLOR)
Project:	Sydenham Station and Junction
Application Title: (e.g. Smith St trenching works)	Design Investigation Works – Project Wide (inside and outside of rail corridor)
Application Number:	SSJ-PCMW-002
Application Date:	18/01/2018
Planning Approval:	The Sydney Metro City and Southwest – Chatswood to Sydenham - Environmental Impact Statement The Sydney Metro City and Southwest - Environmental Impact Statement – Sydenham Station and Sydney Metro Trains Facility South Modification Report (MOD 4) The Sydney Metro City and Southwest - Environmental Impact Statement – Sydenham Station and Sydney Metro Trains Facility South Modification Submissions Report
Minor Works Categories: • Highlight as applicable. • If Items 4, 8 or 11 are applicable, this form must be endorsed by an Environmental Representative.	1. Survey, survey facilitation and investigations works (including road and building dilapidation survey works, drilling and excavation). 2. Treatment of contaminated sites. 3. Establishment of ancillary facilities (excluding demolition), including construction of ancillary facility access roads and providing facility utilities. 4. Operation of ancillary facilities that have minimal impact on the environment and community. 5. Minor clearing and relocation of vegetation (including native). 6. Installation of mitigation measures, including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments. 7. Property acquisition adjustment works, including installation of property fencing and utility relocation and adjustments to properties. 8. Utility relocation and connections. 9. Maintenance of existing buildings and structures. 10. Archaeological testing under the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010) or archaeological monitoring undertaken in association with other Minor Works to ensure there is no impact on heritage items. 11. Any other activities that have minimal environmental impact, including construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access.
Planning Authority Determination: Will the proposed works affect or have the potential to affect heritage items, threatened species,	*If 'Yes', this completed form must be endorsed by an Environmental Representative, approved by TfNSW and submitted to the applicable planning authority to determine that the works are not defined as 'construction'.* No – in accordance with the information presented within the EIS and Modification Report there will be no impacts associated with the works that will affect heritage

populations or endangered ecological communities?	items, threatened species, populations or endangered ecological communities. An addendum Historical Archaeological Research Design (ARD) for the Sydenham Station and Sydney Metro Trains Facility South (the project as modified) was completed by Artefact (January, 2018). The report concluded that an Unexpected Finds Procedure would be sufficient for managing works within the project area. See Appendix 2.

Part 2: Details	
Describe the proposed Minor Works: Including work methodologies, site location(s) and site description(s) (e.g. landscape type, waterways, etc.).	**Site Description Overview** As the proposed minor works described below may be undertaken across the entire site, a general description of the site is provided within this overview. This overview is based on information from the EIS, Modification Report and Modification Submissions Report. The site is a typical rail site with track, rail and ballast extending from Bedwins Road Bridge at the city end and branching out past Sydenham Station towards Tempe Station on the T4 line, Marrickville Station on the T3 line and the XPT Maintenance Facility. There are a number of buildings and structures on the site including the State Heritage listed Sydenham Station and the Sydenham Pit and Pump Station. Other buildings and structures include the XPT Maintenance Facility, the Geotechnical Site Office and the Sydenham Signal Control Centre. Vegetation on the site includes grasses, shrubs, weeds and planted street trees. The site includes the Sydenham Pit, which receives water from the local Marrickville catchment. A concrete channel, known as the "Eastern Channel", runs through the site from north to south and discharges stormwater from the wider catchment and the Sydenham Pit to the Cooks River. There is a number of drainage pits located throughout the site, including a number of pits located within the track. The area is surrounded by a mixture of industrial/commercial properties and residential properties. There are no major arterial roads in the vicinity of the project. **Survey works** Hand held survey equipment will be used to undertake survey of the project site to inform design. Survey will be undertaken across the site. The survey team will be instructed to not remove any vegetation or break any tree branches. Traffic control and Road Occupancy Licences will be put in place as required. **CCTV Pipe Inspections** CCTV inspections will be undertaken on a number of pipes and culverts throughout the project site and within the immediate surrounds. The works will involve a remote controlled camera that will traverse pipes and culverts, relaying images to a van. Traffic control and Road Occupancy Licences will be put in place as required. **Service Searching** Non Destructive Digging by hand digging and vacuum trucks will occur for the purpose of locating existing services. Service searching must occur to inform design and for identifying risks associated with geotechnical testing excavations. Service searching may be undertaken site wide (apart from within the heritage curtilage for Sydenham Station and the Sydenham Pit) and within the immediate surrounds. No trees are to be removed or pruned as part of this work. The area is to be stabilised following any works. Any water used during the works will be controlled and will not leave the project site or enter any stormwater pit or channel. Plant will be positioned away from sensitive receivers where possible. Workers will assess their works on an ongoing basis in view of minimising noise. Traffic control and Road Occupancy Licences will be put in place as required. **Geotechnical Investigations** This includes hand digging and the use of drill rigs, augurs and small excavators to undertake geotechnical investigations and soil sampling. For the purpose of this application geotechnical investigations includes contamination investigations. Geotechnical investigations may be undertaken site wide (apart from within the heritage curtilage for Sydenham Station and the Sydenham Pit) and within the immediate surrounds. No trees are to be removed or pruned as part of this work. The area is to be stabilised following any works. Any water used during the works will be controlled and will not leave the project site or enter any stormwater pit or channel. Plant will be positioned away from sensitive receivers where possible. Workers will minimise noise. Traffic control and Road Occupancy Licences will be put in place as required.

	Safety Fencing Vorktok (or equivalent) safety fencing will be installed adjacent to the track to segregate workers from the active train lines.
Planned Commencement Date:	17th of February 2018
Local Sensitivities: Describe the presence (if any) of local sensitive environmental areas and community receptors	• There are a number of residential properties located in the vicinity of the project area. These properties may be sensitive to excessive noise. The works are not expected to be noisy – refer to the Environmental Risk Assessment in Appendix 1 • Heritage – there are a number of heritage structures within the project footprint including Sydenham Station and the Sydenham Pit and Pump Station. Intrusive works will occur outside of the curtilage areas of these structures. Survey works may occur within the curtilage of these heritage structures.

Part 3: Environmental Risk Assessment and Management

Prepare an Environmental Risk Assessment (in accordance with the *Sydney Metro Risk Management Standard*) and an Environmental Control Map for the proposed Minor Works and attach as Appendix 1.

If an Environmental Risk Assessment and/or an Environmental Control Map for the proposed Minor Works is/are already contained in existing documentation, attach the relevant section(s) as Appendix 1.

Documentation: List any existing documents (including those referenced above) that the proposed Minor Works will be undertaken in accordance with and attach as Appendix 2 (e.g. plans, procedures, procedures, etc.).	An Environmental Risk Assessment and an ECM for the Works is included within Appendix 1. Unexpected finds procedures for contamination and items or deposits with heritage significance, and the ARD are included in Appendix 2.

Part 4: Workforce Notification

How will the environmental and community risks and associated mitigation measures of the proposed Minor Works be communicated to the contractor's workforce?	A site induction will be provided to all personnel working on the project site. The induction will include relevant environmental aspects and risks associated with works on the project site. Works will be undertaken in accordance with a SWMS or JSEA (depending on whether the works meets the definition of High Risk Construction Works in accordance with Clause 291 WHS Regulation). SWMS will be reviewed by the JHLOR Environmental Manager.

Part 5: Community Consultation

What community consultation has been undertaken already?	Notifications were distributed for investigation works under a previously approved minor works approval in December 2017.
What community consultation is planned to be undertaken?	New notifications will be distributed in accordance with the contract and Community Liaison Implementation Plan (CLIP) requirements and prior to any Out of Hours Works.
If drafted already, attach applicable Community Notification as Appendix 3.	

Part 6: Contact Details

Nominate contractor's project manager, environmental and communications contact(s).					
Name:	Neil Ivison	**Position:**	Project Director	**Phone:**	0458 288 625
	Cameron Newling		Environmental Manager		0419 727 445
	Laura Stewart		Communications Manager		0455 092 638

Part 7: Signature			
This signature acknowledges that the proposed Minor Works will be undertaken in accordance with this application, have minimal environmental impact and are not defined as 'construction' in accordance with the applicable planning approval.			
Name:	Cameron Newling		
Signature:		**Date:**	14/1/18

Determination Page

(TfNSW/Environmental Representative Use Only)

12. Endorsement/Approval

These signatures represent formal endorsement/approval for the proposed Minor Works to commence in accordance with this application and the applicable planning approval requirements (subject to any determination from the applicable planning authority as may be required by the planning approval conditions).

	TfNSW Principal Manager, Communication & Engagement – Endorsement (required for all applications)	TfNSW Principal Manager, Sustainability, Environment & Planning – Approval (required for all applications)	Environmental Representative – Endorsement (required as necessary in accordance with the applicable planning approval, optional for all other circumstances)
Signature:	pp Morrisby on behalf of Natalie Calderwood		
Name:	Fiona Morrisby	FIC Cerone	Annabelle Tungol Reyes
Date:	19/1/18	30/1/18	22/01/2018
Comments:	-Note: property access cannot be granted for 1-11 Sydenham Rd. Any work outside the corridor requires signage, hoarding & Aframes.		~~Supporting letter attached as Appendix 4 if necessary.~~ I concur with Comms comments and conditions.
Conditions:	- If notification expires & work is not complete a new notification must be issued. - If any night works are required another notification must be issued.	1) No intrusive works to be undertaken in state heritage listed areas.	~~Supporting letter attached as Appendix 4 if necessary.~~

☑	Approved (by TfNSW)
☐	Endorsed (by Environmental Representative)
☐	Rejected

Appendix 1: Cover Page

Environmental Risk Assessment and Environmental Control Map.

Appendix A: Sydney Metro Risk Matrix

A1 Consequence Table

Consequence Table						
Rating	**C6**	**C5**	**C4**	**C3**	**C2**	**C1**
Descriptor/ Impact Area	**Insignificant**	**Minor**	**Moderate**	**Major**	**Severe**	**Catastrophic**
Health and Safety (Injury and Disease)	Illness, first aid or injury not requiring medical treatment.	Illness or minor injuries requiring medical treatment.	Single recoverable lost time injury or illness, alternate/restricted duties injury, or short-term occupational illness.	1-10 major injuries requiring hospitalisation and numerous days lost, or medium-term occupational illness.	Single fatality and/or 10-20 major injuries/permanent disabilities/chronic diseases.	Multiple fatalities and/or >20 major injuries/permanent disabilities/chronic diseases.
Environment	No appreciable changes to environment and/or highly localised event.	Change from normal conditions within environmental regulatory limits and environmental effects are within site boundaries.	Short-term and/or well-contained environmental effects. Minor remedial actions probably required.	Impacts external ecosystem and considerable remediation is required.	Long-term environmental impairment in neighbouring or valued ecosystems. Extensive remediation required.	Irreversible large-scale environmental impact with loss of valued ecosystems.
Customer Experience/ Operational Reliability	Short duration disruptions affecting part of one transport mode.	Minor disruptions affecting several parts of one transport mode.	Serious disruptions affecting operation of one complete transport mode.	Major disruptions affecting operations of one transport mode with network-wide effects on one or more other modes of transport.	Short duration shutdowns or substantial disruptions affecting multiple transport modes with sector-wide cascading effects.	Extensive shutdowns or extended disruptions with economy-wide effects.
Government/ Stakeholder / Public Trust/ Confidence	Negative article in local media. No discernible reaction/apprehension. Goodwill, confidence and trust retained.	Unease – Series of negative articles in local/state media. Confidence remains with some minor loss of goodwill or trust. Recoverable with little effort or cost. Some continuing scrutiny/attention.	Disappointment – Extended negative local/state media coverage. Confidence and trust dented but are quickly recoverable at modest cost within existing budget and resources.	Concern – Short-term negative state/national media coverage. Confidence and trust are diminished but are recoverable with time, staff effort and additional funding.	Displeasure – Extended negative state/national media coverage. Confidence and trust are damaged but recoverable at considerable cost, time and staff effort.	Outrage – Material change in the public perception of the organisation. Confidence and trust are severely damaged, possibly irreparably, and full recovery both questionable and costly.
Regulatory or Legal Breach	Low-level non-compliance with legal and/or regulatory requirement or duty by individuals or TfNSW.	Minor non-compliance with legal and/or regulatory requirement or duty. Investigation and/or report to authority.	Moderate non-compliance. Subject to comment and monitoring from applicable regulator. Small fine and no disruption to services.	Major breach resulting in enforcement action and/or prohibition notices. Substantial fine and no disruption to services.	Substantial breach resulting in prosecution, fines and/or litigation. Licence or accreditation restricted or conditional affecting ability to operate.	Prosecution leading to imprisonment of TfNSW executive. Loss of operating licence.
Management Effort/ Organisational Fatigue	An event, the impact of which can be absorbed as part of normal activity.	An event, the impact of which can be absorbed but some additional management effort is required.	An event, the impact of which can be absorbed but much broader management effort is required.	Major event which can be absorbed, but substantial management effort is required.	Severe event which requires extensive management effort but can be survived.	Catastrophic event with the clear potential to lead to the collapse of the organisation.
Benefit Realisation of Initiative, Program or Project	No time delay with initiative or project but it will incur a slight decrease in the benefits realised.	Minor delay with the initiative and/or a minor decrease in the benefits realised; or minor delay on the project or another project, with no public implications.	Several delays with the initiative and/or moderate decrease in benefits realised; or completion date missed for non-critical path project.	Major delays with the initiative and/or major decrease in benefits realised; or publicly announced portion/milestone missed or final completion date missed with demonstrable mitigating external circumstances.	Severe delays with initiative, which impacts across divisions and/or significant decrease in benefits realised; or publicly announced portion/milestone missed or final completion date missed on critical path project.	Failure to realise benefits of the initiative which adversely affects the enterprise-wide operations of TfNSW; or publicly announced portion/ milestone significantly missed or final completion date significantly missed on critical path project.
Budget, Costs or Revenue	< $100k	$100k – $1m	$1m – $10m	$10m – $50m	$50m – $100m	> $100m

A2 Likelihood Criteria

Likelihood						
Rating	**L6**	**L5**	**L4**	**L3**	**L2**	**L1**
Descriptor/ Definition	**Almost Unprecedented**	**Very Unlikely**	**Unlikely**	**Likely**	**Very Likely**	**Almost Certain**
Qualitative Expectation	Not expected to ever occur during time of activity or project	Not expected to occur during the time of activity or project	More likely not to occur than occur during time of activity or project	More likely to occur than not occur during time of activity or project	Expected to occur occasionally during time of activity or project	Expected to occur frequently during time of activity or project
Sydney Metro Probability Analysis	<10%	10-25%	25-50%	50-75%	75-90%	>90%
Quantitative Frequency	Less than once every 100 years	Once every 10 to 100 years	Once every 1 to 10 years	Once each year	1-10 times every year	10 times or more every year

A3 Risk Matrix

Risk Rating A – Very High B – High C – Medium D - Low			**Consequence**					
			Insignificant	Minor	Moderate	Major	Severe	Catastrophic
			C6	**C5**	**C4**	**C3**	**C2**	**C1**
Likelihood	Almost certain	**L1**	**C**	**B**	**B**	**A**	**A**	**A**
	Likely	**L2**	**C**	**C**	**B**	**B**	**A**	**A**
	Possible	**L3**	**D**	**C**	**C**	**B**	**B**	**A**
	Unlikely	**L4**	**D**	**D**	**C**	**C**	**B**	**B**
	Rare	**L5**	**D**	**D**	**D**	**C**	**C**	**B**
	Almost unprecedented	**L6**	**D**	**D**	**D**	**D**	**C**	**C**

Risk Assessment

This Risk Assessment has been undertaken in accordance with the requirements of *Sydney Metro Risk Management Standard*.
Note; **C** = Consequence & **L** = Likelihood as per *Sydney Metro Risk Management Standard – Appendix A Sydney Metro Risk Matrix*

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
		C X	L =	Risk		C X	L =	Risk
Survey								
Surveyors breaking tree branches to clear a line of site for their works	Damage to trees. Breach to planning approval.	**C5**	**L5**	**Low**	Induction to include vegetation management requirements.	**C5**	**L6**	**Low**
Surveyors installing control points or marking on heritage structures	Damage to heritage items. Breach to planning approval.	**C4**	**L5**	**Low**	Induction to include heritage management requirements. ECM to display heritage curtilage	**C4**	**L6**	**Low**
CCTV Pipe Inspections								
Works on public roads	Disruption to local traffic and pedestrians	**C5**	**L5**	**Low**	Engage traffic control where appropriate Obtain Road Occupancy Licences as appropriate	**C5**	**L6**	**Low**
Service Searching								
Contamination uncovered during service searching works	Mixing of contaminated materials with non-contaminated materials	**C4**	**L4**	**Med**	Induction to include contamination management requirements. Implement unexpected finds procedure	**C4**	**L5**	**Low**
Items of heritage significance uncovered during service searching works	Damage to heritage items or archaeological deposits	**C3**	**L5**	**Med**	Induction to include heritage management requirements. No works to occur within the heritage curtilage of Sydenham Station and Sydenham Pit. Implement unexpected finds procedure as per the ARD	**C3**	**L6**	**Low**

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
Works on public roads	Disruption to local traffic and pedestrians	C5	L5	Low	Engage traffic control where appropriate Obtain Road Occupancy Licences as appropriate	C5	L6	Low
Runoff from service searching process	Service searching water entering local stormwater and impacting on water quality	C5	L5	Low	Set up erosion and sediment controls as appropriate (i.e. sandbags) if service searching water is likely to generate runoff.	C5	L6	Low
Service Searching Waste	Incorrect handling or disposal of service searching waste leading to environmental degradation Exposure of Potential Acid Sulphate soils	C4	L4	Med	Service searching waste is deemed to be liquid waste. The waste must be lawfully transported and disposed of to a licenced facility. Exposed Potential Acid Sulphate Soil within the excavations will be kept wet during the works. The excavations will be backfilled immediately to prevent any Potential Acid Sulphate Soils from oxidising.	C4	L5	Low
Noise from vacuum truck	Noise from vacuum truck impacting on sensitive receivers Noise impacts outside standard construction hours	C5	L4	Low	Works to occur in during standard construction hours where possible Vacuum truck to be positioned so that the noisier part of the truck points away from sensitive receivers, where possible Follow the appropriate approvals process and submit Out of Hours Work applications for Acoustic Advisor endorsement and Environmental Representative approval. Mitigation measures to be implemented in accordance with the Construction Noise Strategy.	C5	L6	Low
Geotechnical works								
Contamination uncovered during geotechnical works	Mixing of contaminated materials with non-contaminated materials	C4	L4	Med	Induction to include contamination management requirements. Implement unexpected finds procedure	C4	L5	Low
Items of heritage significance uncovered during geotechnical	Damage to heritage items or archaeological deposits	C3	L5	Med	Induction to include heritage management requirements.	C3	L6	Low

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
works					No works to occur within the heritage curtilage of Sydenham Station and Sydenham Pit. Implement unexpected finds procedure			
Works on public roads	Disruption to local traffic and pedestrians	C5	L5	Low	Engage traffic control where appropriate Obtain Road Occupancy Licences as appropriate	C5	L6	Low
Runoff from drilling process	Drilling process water entering local stormwater and impacting on water quality	C5	L5	Low	Set up erosion and sediment controls as appropriate (i.e. sandbags) if drilling process water is likely to generate runoff.	C5	L6	Low
Waste drilling mud	Waste materials	C5	L5	Low	All drilling muds are to be removed from the project site and disposed of lawfully to a licenced facility. No drums will be left on site. Drilling mud containers must be stored appropriately and at least 20m away from drainage lines.	C5	L6	Low
Noise from drill rig	Noise from drill rig impacting on sensitive receivers Noise impacts outside standard construction hours	C5	L4	Low	Works to occur in during standard construction hours where possible Drill rig to be positioned so that the noisier part of the rig points away from sensitive receivers, where possible Follow the appropriate approvals process and submit Out of Hours Work applications for Acoustic Advisor endorsement and Environmental Representative approval. Mitigation measures to be implemented in accordance with the Construction Noise Strategy.	C5	L6	Low

Environmental Control Map

Sydenham Station and Junction – Southwest Portion

Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

FLORA AND FAUNA

No vegetation to be impacted

WASTE:

Place rubbish in appropriate bins, do not litter
Waste must only be disposed off site at licenced waste facilities, meaning they must hold an Environment Protection Licence to receive waste

IMPORTING MATERIALS:

Obtain reports/ certificate for all imported material prior to delivery to site. The paperwork must be checked by the Environment Team to ensure it meets EPA requirements

AIR QUALITY:

Dust suppression measures must be used to prevent impacting nearby residents and all loads must be covered

NOISE AND VIBRATION:

Standard construction hours are 7am to 6pm M-F; 8am—1pm Sat – all Out of Hours Works are subject to approval in accordance with the Conditions of Approval and EPL

No works Sundays or Public Holidays

No idling or parking outside residential properties

High noise impact works only permitted 8am to 5pm M-F; 8am to 1pm

Sat and in continuous blocks not exceeding 3 hours each with a minimum respite of 1 hour between each block

TRAFFIC:

Parking only within designated areas and use only approved haul routes

No queuing in residential streets before or after hours

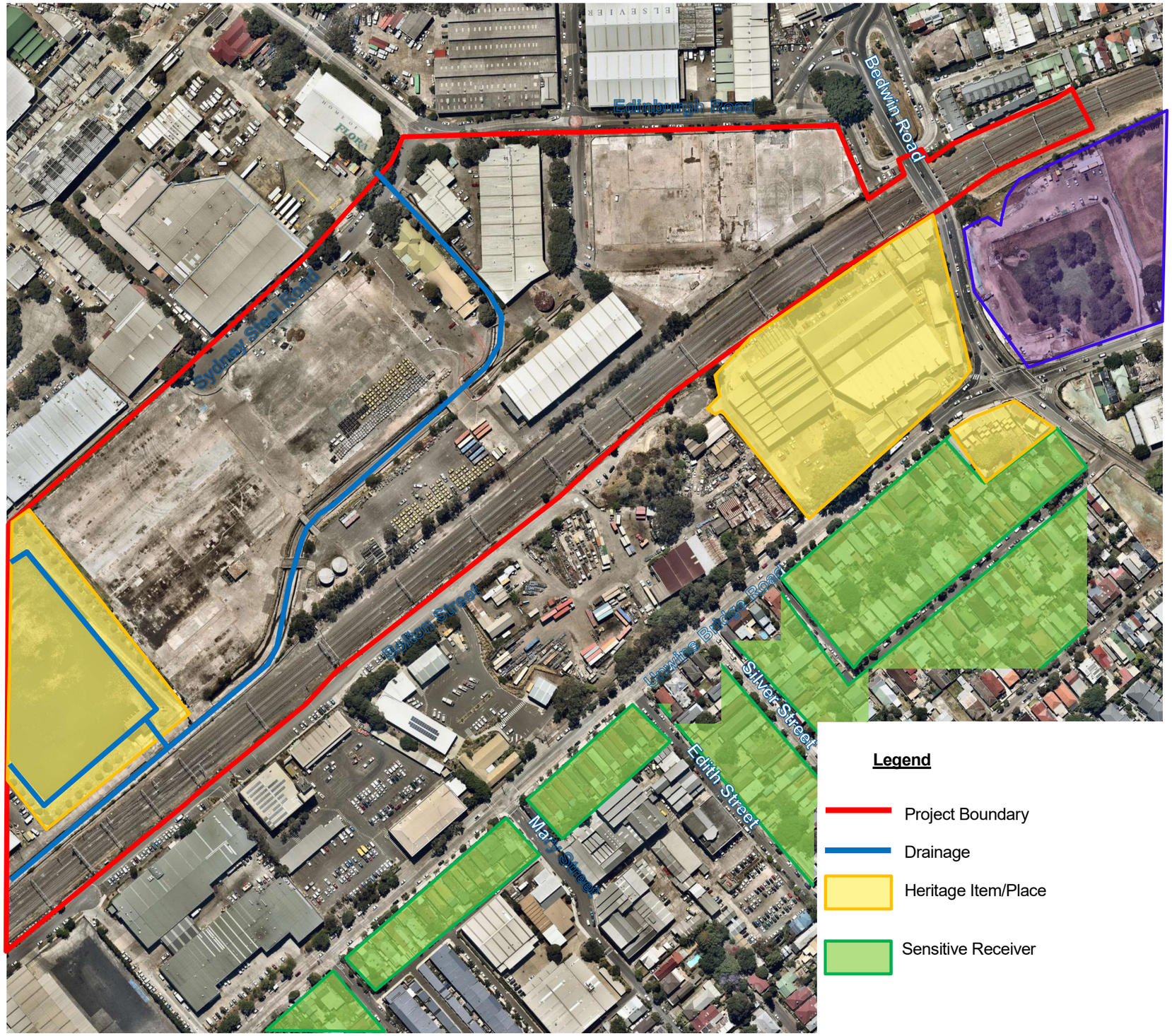
HERITAGE:

Cadastral survey only permitted in Heritage Areas

Key Contacts		
Cameron Newling	Environmental Manager	0419 727 445
Ian Butler	Utilities Manager	0409 412 394
Jamie Jack	Construction Manager Station	02 4913 7612
Paul Field	Construction Manager Sydney Water	02 9867 4211
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Environmental Control Map

Sydenham Station and Junction – Northeast Portion



Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

FLORA AND FAUNA

No vegetation to be impacted

WASTE:

Place rubbish in appropriate bins, do not litter
Waste must only be disposed off site at licenced waste facilities, meaning they must hold an Environment Protection Licence to receive waste

IMPORTING MATERIALS:

Obtain reports/ certificate for all imported material prior to delivery to site. The paperwork must be checked by the Environment Team to ensure it meets EPA requirements

AIR QUALITY:

Dust suppression measures must be used to prevent impacting nearby residents and all loads must be covered

NOISE AND VIBRATION:

Standard construction hours are 7am to 6pm M-F; 8am—1pm Sat – all Out of Hours Works are subject to approval in accordance with the Conditions of Approval and EPL

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Sat and in continuous blocks not exceeding 3 hours each with a minimum respite of 1 hour between each block

TRAFFIC:

Parking only within designated areas and use only approved haul routes

No queuing in residential streets before or after hours

HERITAGE:

Cadastral survey only permitted in Heritage Areas

Key Contacts		
Cameron Newling	Environmental Manager	0419 727 445
Ian Butler	Utilities Manager	0409 412 394
Jamie Jack	Construction Manager Station	02 4913 7612
Paul Field	Construction Manager Sydney Water	02 9867 4211
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Environmental Control Map

Sydenham Station and Junction – Centre Portion

Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

FLORA AND FAUNA

No vegetation to be impacted

WASTE:

Place rubbish in appropriate bins, do not litter
Waste must only be disposed off site at licenced waste facilities, meaning they must hold an Environment Protection Licence to receive waste

IMPORTING MATERIALS:

Obtain reports/ certificate for all imported material prior to delivery to site. The paperwork must be checked by the Environment Team to ensure it meets EPA requirements

AIR QUALITY:

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Sat and in continuous blocks not exceeding 3 hours each with a minimum respite of 1 hour between each block

TRAFFIC:

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No queuing in residential streets before or after hours

HERITAGE:

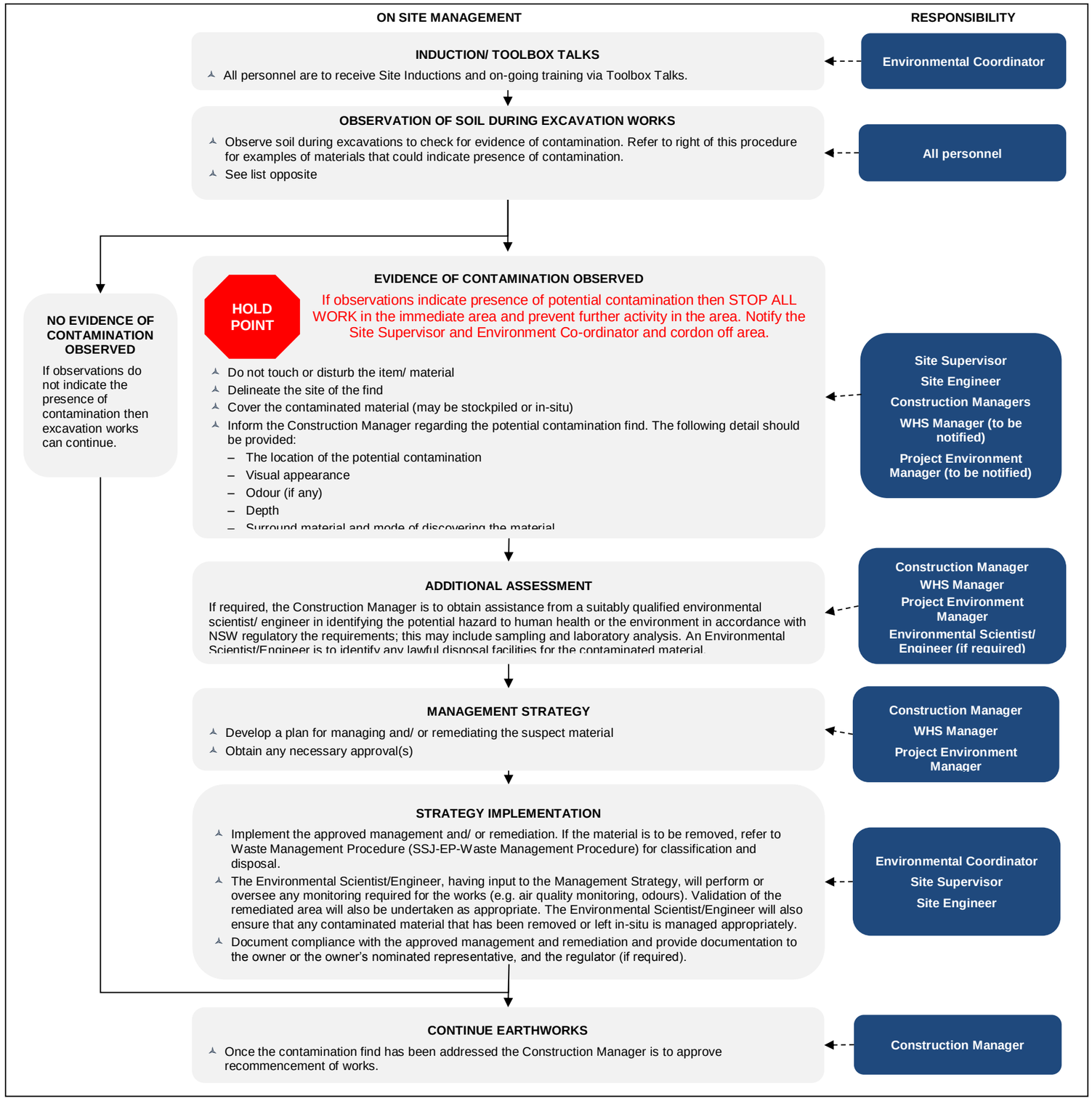
Cadastral survey only permitted in Heritage Areas

Key Contacts		
Cameron Newling	Environmental Manager	0419 727 445
Ian Butler	Utilities Manager	0409 412 394
Jamie Jack	Construction Manager Station	02 4913 7612
Paul Field	Construction Manager Sydney Water	02 9867 4211
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Appendix 2: Cover Page

Environmental Management Documentation.

CONTAMINATION AND CONTINGENCY ACID SULFATE SOILS MANAGEMENT PROCEDURE



Indicators of Contamination

Examples of materials that could indicate the presence of contamination include (but are not necessarily limited to):

- Asbestos cement fragments or other potentially asbestos containing materials
- Odorous or stained soil;
- Buried chemical drums or containers
- High proportion of waste materials or building debris
- Tarry or ashy material
- Brightly or unusually coloured material
- A yellow and/or red mottling in the soil profile indicates there may be Acid Sulfate Soils (ASS)

Asbestos

Asbestos finds are to be managed in accordance with the Project WHS Management Plan

Acid Sulfate Soils (ASS)

ASS are naturally occurring soils, sediments or organic substrates that are formed under waterlogged conditions in coastal areas. When exposed to air after being disturbed, soils containing iron sulfides produce sulfuric acid and often release toxic quantities of iron, aluminium and heavy metals.

If ASS is encountered, possible management strategies include:

- Modifying the works to avoid the area of ASS
- Delineation and removal to a suitably licenced facility
- Onsite treatment to neutralise the ASS, which could include the application of lime.

Note: The management of any ASS needs to include appropriate erosion and sedimentation controls to minimise the potential for pollution to waters.

Management and Disposal of Contaminated Material

Specific approval may be required to implement management strategies and a Safe Work Methods Statement (SWMS) must be prepared prior to undertaking any remediation work, except in emergency situations.

Contaminated material will be disposed of in accordance with the Waste Management Procedure.

Koutsamanis, Adam

From: Annabelle Reyes <annabelle.reyes@hbi.com.au>
Sent: Wednesday, 21 March 2018 5:00 PM
To: Koutsamanis, Adam
Subject: Fwd: SSJ - Water Discharge
Attachments: 20171018_091232.jpg; ID011.0018_SM-ES-PW-309 Water Discharge and Reuse Procedure.pdf

Hi Adam,

The approach is acceptable and endorsed to be appended in MWA 02.

Regards,

Annabelle Tungol Reyes

Environmental Representative – Sydney Metro City and South West -SYAB and SSJ
E: annabelle.reyes@hbi.com.au

Exemplar Global Lead Environmental Auditor
Exemplar Global Quality Auditor
SAI Global certified OHS Lead Auditor

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-------- Original message --------
From: "Newling, Cameron (SSJ)" <Cameron.Newling@jhlorjv.com.au>
Date: 21/3/18 10:04 am (GMT+10:00)
To: "Koutsamanis, Adam" <Adam.Koutsamanis@transport.nsw.gov.au>
Cc: Annabelle Reyes <annabelle.reyes@hbi.com.au>, "Armstrong, Ben" <Ben.Armstrong2@transport.nsw.gov.au>, "Williams, Nicole" <Nicole.Williams@transport.nsw.gov.au>, "Morrisby, Fiona" <Fiona.Morrisby@transport.nsw.gov.au>
Subject: SSJ - Water Discharge

Hi Adam

As per Section 11.2 of the meeting minutes, we propose dewatering works be appended to Minor Works Application No.2 as per the following:

Some accumulated water may be present within pits as shown in the above example. This water may need to be pumped out when conducting site investigation works. The procedure would be as follows:

- Visual inspection of water for oil and grease
- pH test
- Completion of discharge permit signed by Environment Team
- Water would be pumped out and used for the following:
    - Dust suppression activities
    - Pumped to a grassed area where it can be left to infiltrate and not cause runoff/erosion

- Sucker truck for offsite disposal where onsite reuse is not feasible
- Implement Sydney Metro Water and Discharge Reuse Procedure requirement in Section 4.4 and 4.5 (attached)
- No water will be discharged off site.

Thanks

Cameron Newling
Environment Manager

Sydenham Station and Junction Project (SSJ)

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Integrated Management System

Water Discharge & Reuse Procedure

SM ES PW 309/2.0

Sydney Metro Integrated Management System (IMS)

Applicable to:	Sydney Metro Northwest
Author:	Manager, Environment
System owner:	Executive Director, Safety, Sustainability & Environment
Status:	FINAL
Version:	2.0
Date of issue:	7 July 2016
Review date:	7 July 2017
Security classification:	Open Access

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1. Purpose & Scope

The purpose of this Procedure is to provide guidance to site personnel for managing, discharging and reusing excess water on Sydney Metro construction sites. This Procedure includes references to relevant industry guidelines but is not intended to replace them, nor does it override the relevant legislative and regulatory requirements.

This Procedure applies to all Sydney Metro alliances, contractors and subcontractors.

2. Accountabilities

The Deputy Project Director (DPD) Safety, Environment & Business Systems is accountable for this Procedure. Accountability includes authorising the document, monitoring its effectiveness and performing a formal document review.

Direct Reports to the Program Director are accountable for ensuring the requirements of this document are implemented within their area of responsibility.

The Direct Reports to the Program Director who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this document.

3. Definitions

All terminology in this Procedure is taken to mean the generally accepted or dictionary definition. Terms and jargon specific to this Procedure are defined within SM QM-FT-435 Integrated Management System (IMS) Glossary, or are listed below.

	Definitions
The Blue Book	*Managing Urban Stormwater: Soils & Construction* 2004, Landcom.
Environment Manager	The Alliance or Contractor Environment Manager.
pH	The measure of the acidity or alkalinity of a solution.
POEO Act	Protection of the Environment Operations Act 1997.
TSS	Total suspended solids.
Waters	(as defined in the POEO Act) means the whole or any part of: (a) any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), or (b) any water stored in artificial works, any water in water mains, water pipes or water channels, or any underground or artesian water.

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4. Water Discharge and Reuse Procedure

4.1. Legislative Requirements and Due Diligence

The Protection of the Environment Operations (NSW) Act 1997 (POEO Act) is the key piece of environment protection legislation in NSW, administered by the Environmental Protection Authority (EPA). Offences under the POEO Act are classified into three tiers, with Tier 1 offences being the most serious – attracting up to $5 million and seven years imprisonment for wilful or negligent harm to the environment. Under section 120 of this Act, any unlicensed water pollution event, no matter how minor, is illegal.

Table 1: POEO Prohibition of pollution of waters

120 Prohibition of pollution of waters
(1) A person who pollutes any waters is guilty of an offence. (2) In this section: 'pollute' waters includes cause or permit any waters to be polluted.

Note: For the definition of water pollution or pollution of waters refer to the POEO Act.

Under section 122 of the POEO Act it is a defence against prosecution under section 120 if the pollution was regulated by an Environment Protection Licence (EPL) and the conditions of that EPL relating to pollution of waters were not contravened. In the absence of any specific EPL provision, however, to avoid causing pollution and breaches of section 120, any water discharged from site must be of the same quality, or better, than the quality of the receiving waters (at the time of discharge).

It is essential that the quality of the receiving waters is established through background monitoring and sampling, prior to any discharge from site, so that the potential impact of discharge water can be determined. Monitoring of the receiving waters must be undertaken prior to any land disturbance works (to establish a baseline) as well as during construction.

It is also essential that water management standards, and particularly erosion and sediment controls, are implemented to control and treat water. Landcom's *Managing Urban Stormwater: Soils & Construction 2004 (The Blue Book)* is considered a best practice guideline for erosion and sediment control on construction sites in NSW. If implemented, *The Blue Book* will help mitigate the impacts of land disturbance activities on soils, landforms and receiving waters and minimise the potential for water pollution events to occur.

Water quality criteria given in this procedure, such as that for Total Suspended Solids (TSS), 50mg/L, as well as testing and treatment techniques, are based on *The Blue Book*. However, compliance with *The Blue Book* does not, of itself, provide any defence to an alleged breach of section 120 of the POEO Act. Examples of situations where compliance with *The Blue Book* could still lead to a breach of section 120 are as follows:

- Water discharged with TSS below 50mg/L may still cause pollution and breach section 120, if the receiving waters have a TSS less than 50mg/L at the time the discharge occurs.
- Appropriate erosion and sediment controls are in place, but a rainfall event occurs beyond the design capacity of those controls.

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Should a water pollution incident occur, being able to demonstrate due diligence in the implementation of environmental controls, and particularly erosion and sediment controls, may provide a defence against prosecution. Due diligence may be recognised if the proponent is able to demonstrate that erosion & sediment controls have been implemented in accordance with the requirements of *The Blue Book*. The Contractor must satisfy itself that appropriate management controls have been developed, implemented, maintained and documented to establish a due diligence defence.

4.2. Discharging Water

All water discharges must be documented using the SM ES-FT-412 Approval to Discharge or Reuse Water Form or site-specific equivalent. Discharge is not permitted until the Contractor Environment Manager or nominated representative has signed the discharge form. Note that in some cases the Sydney Metro Manager Environment or the Environmental Representative may be required to sign off the discharge form.

This procedure is not used for discharging water where the activity is covered by an EPL. The licence holder will have their own procedure covering the process for discharging water that addresses any site specific environmental conditions.

4.2.1. Nominated Representatives

Where this procedure is applied within the Sydney Metro Northwest/City & Southwest projecta Nominated Representative will be selected for the relevant works package. The Nominated Representative must possess environmental experience and competency in this procedure and be a representative of the client (Transport for NSW). This representative holds specific responsibilities under this procedure as outlined in Figure 1.

4.3. Requirements for Discharge to Waters

Water to be discharged must be tested and, if required, treated to ensure that it meets water quality criteria and that pollution of the receiving waters does not occur. Results of testing and details of any treatment undertaken must be noted on SM ES-FT-412 Approval to Discharge or Reuse Water Form.

Note that an EPL may authorise discharge of water from specific locations or premises, and establish criteria that differ from those given in this Procedure. In such circumstances the EPL, and any conditions and criteria of that EPL, take precedence over this Procedure.

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4.3.1.1. Criteria for Discharge to Waters

Before water can be discharged to any receiving waters (whether on or off site), it must as a minimum meet the following criteria.

Table 2: Criteria for Discharge to Waters

Parameter	Criterion	Method	Time prior to discharge
Oil and grease	No visible	Visual inspection	< 1 hour
pH	6.5-8.5	Probe/meter [1]	< 1 hour
Total Suspended Solids (TSS)	< 50mg/L [2]	Meter/grab sample [3]	< 1 hour/< 24 hours

If the criteria above are not met, the water will have to be treated and retested prior to discharge – go to Treating Water Prior to Discharge. If all criteria above are met then the water may be authorised for discharge by the Manager Environment – go to Reuse on Site.

Table 3: Salinity and TSS

1. Salinity	Salinity is determined by measuring the electrical conductivity (EC) of the water, using a meter. Setting an acceptable criteria range for salinity of discharge water is dependent on the salinity of the receiving waters and must be determined and applied on a site-specific basis following background water quality monitoring. Measuring discharge waters for salinity shall only be undertaken if required by: • the Conditions of Approval; • an EPL; or • the particular conditions of the site (soil or geology) or the receiving waters.
2. Correlating Total Suspended Solid (TSS) with Turbidity	• Consideration may be given to establishing a site-specific relationship between total suspended solids concentration (TSS) and turbidity, measured in nephelometric turbidity units (NTU). This allows the TSS to be inferred from an NTU reading. The benefit of using NTU is that it can be quickly measured on site with a hand-held meter, whereas water quality meters that measure TSS are expensive and the results from samples sent for laboratory analysis will not be available immediately. However, NTU is affected by factors other than suspended solids, such as colour (e.g. tannins may alter the NTU reading). • As such, a correlation curve (i.e. across a range of readings) must be determined between TSS and NTU that is specific to the site. The correlation must be determined via laboratory analysis, by a NATA-accredited laboratory. Thorough records of the site-specific correlation must be kept, and any recommendations and/or limitations should be documented as part of the CEMP. • For further information and guidance on correlating TSS with NTU refer to Appendix E of *The Blue Book*.

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1 Litmus paper and pool testing kits are not to be used.
2 As discussed in Section 4, a more stringent TSS criterion may need to be adopted in certain situations.
3 Samples must be analysed at a NATA accredited laboratory.

4.3.2. Treating Water Prior to Discharge

Prior to the use of any testing equipment on site, the appropriate calibrations must be conducted as per the manufacturer's recommendations and recorded for future referral if required.

Table 4: Treating water to discharge

1. Oil and grease	• Examine surface of water immediately prior to discharge for evidence of oil and grease (e.g. sheen, discolouration). • No action is required if there is no visual contamination. • If there is contamination, the contaminated water must either be disposed of at a licensed disposal facility, or treated using appropriate absorbent materials, which must be spread on the surface. • Any used absorbent materials are to be disposed of appropriately.
2. pH Levels	• If pH is outside the range 6.5-8.5 the water will need to be neutralised. This may be achieved via three methods which are dependent on site and time constraints: o Natural – allowing the water to sit for a period of time and naturally neutralise. o Mixing – by mixing with other site water of a higher or lower pH (i.e. other water has also been tested), to achieve pH 6.5-8.5. o Acid/Base Addition - If the water is above 8.5, acid is used to lower the pH, if the water is below 6.5 a base is used to raise the pH. To treat water with acid or base, safety requirements must be followed as outlined in relevant Material Safety Data Sheet (MSDS). • Re-test the water pH following treatment – repeat as necessary, until the acceptable pH 6.5 – 8.5 range is reached.
3. Total Suspended Solids (TSS)	• If TSS are greater than 50mg/L, the sediments need to settle to the bottom or be removed. This can be achieved via the following methods: o Natural settlement – this could take a long time or not occur at all (e.g. with dispersible clay soils). dependent on soil type and other characteristics, (refer to *The Blue Book*, Chapter 3 for further information). o Flocculation – chemical treatment with a flocculent (e.g. gypsum). If the flocculent is being applied manually, an even application over the surface of the water is essential. Only environmentally safe flocculants are to be used, based on the Environment Manager's review of Safety Data Sheet (SDS) information. o Filtration – pumping or gravity feeding the water through a filter medium (e.g. geofabric) to another storage area (e.g. container or sediment basin) to remove sediment. • Re-testing of water is required once treatment has been undertaken to ensure criterion for TSS is met.

Following treatment and retesting to ensure compliance with the criteria the water may be authorised for discharge by the Environment Manager – go to Reuse on Site.

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4.4. Requirements for Discharge to Land

The objective of discharging water to land (within the site boundary) is to allow the water to infiltrate into the ground, thus avoiding direct discharge to, or pollution of, waters. Any suspended solids in the water are deposited either on the surface or retained in underlying soil layers, so the TSS criterion does not apply. However, to avoid impacts to vegetation or soil contamination pH testing and a visual inspection for oil or grease must be undertaken (refer to Criteria for Discharge to Waters for criteria and testing methods).

4.4.1. Determining a Suitable Discharge Location

Consideration must be given to the following factors when determining a suitable offsite location:

(a) Direction of groundwater flow – recharging groundwater that will subsequently flow either back onto site, into excavations or low lying areas should be avoided.

(b) Erosion – the receiving area must have complete groundcover (e.g. grass) and established vegetation to minimise the risk of erosion.

(c) Flora and fauna – water must not be discharged to areas where there is potential to have an adverse effect on any flora or fauna species.

(d) Flooding – the receiving area must have the infiltration capacity to receive the volume of water to be discharged, without causing flooding or significantly increasing the risk of flooding should subsequent rainfall occur.

4.4.2. Criteria for Discharge to Land

Discharge to land within the site boundary shall only occur if:

(a) There is no visible oil or grease (otherwise treat in accordance with Treating Water Prior to Discharge).

(b) The pH levels are between 6.5 and 8.5 (otherwise treat in accordance with Treating Water Prior to Discharge).

(c) No surface runoff will be generated from the discharge and there is no potential for discharged water to reach any watercourse (within or outside the site).

(d) No erosion is caused from the discharge and appropriate erosion and sediment control are installed in accordance with *The Blue Book*.

(e) All discharge water can be wholly contained within the site boundary.

If all criteria above are met then the water may be authorised for discharge to land by the Environment Manager – go to Reuse on Site.

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4.5. Reuse on Site

Water may be reused on site, for example, for dust suppression, to assist with compaction or for watering landscape/bush regeneration areas. As with discharges to land, the TSS criterion does not apply as water will not be discharged to any watercourse. However, pH testing and a visual inspection for oil or grease must be undertaken (refer to Criteria for Discharge to Waters for criteria and testing methods).

4.5.1. Criteria for Reuse on Site

Reuse on site shall only occur if:

(a) There is no visible oil or grease (otherwise treat in accordance with Treating Water Prior to Discharge).

(b) The pH levels are between 6.5 and 8.5 (otherwise treat in accordance with Treating Water Prior to Discharge).

(c) No erosion is caused from the discharge.

(d) Any runoff generated by the reuse is controlled entirely within the site boundary and appropriate sediment controls are installed and maintained in accordance with *The Blue Book*.

If all criteria above are met then the water may be authorised for reuse by the Environment Manager – go to Reuse on Site.

4.6. Discharging Water

Once water has been tested and meets all the criteria for discharge to either waters or land, or for reuse on site, the Nominated Representative must authorise the discharge by signing the SM ES-FT-412 Approval to Discharge or Reuse Water Form. If required, the Sydney Metro Manager Environment or the Environmental Representative may also sign off the form prior to commencing the discharge.

Discharge can use a siphon system or a pump, with a priority on delivering low energy flows to downstream drainage lines, watercourses or land. The flow from the outlet must be directed onto a non-erodible surface or material and, for discharges to waters, sufficient energy must be dissipated before the flow enters the natural watercourse to ensure no erosion shall occur.

The pump inlet must be placed so that it will not disturb or take in any sediment or sediment laden water. The discharge must be monitored throughout to ensure that the water being syphoned or pumped:

- Complies with the discharge criteria.
- Does not come into contact with any soil or exposed surfaces before discharging.
- Does not mix with any sediment laden/untested water at either the inlet or outlet.

Water must never be discharged or reused onsite in a manner that exceeds the capacity of sediment controls and/or generates runoff with the potential to discharge from site.

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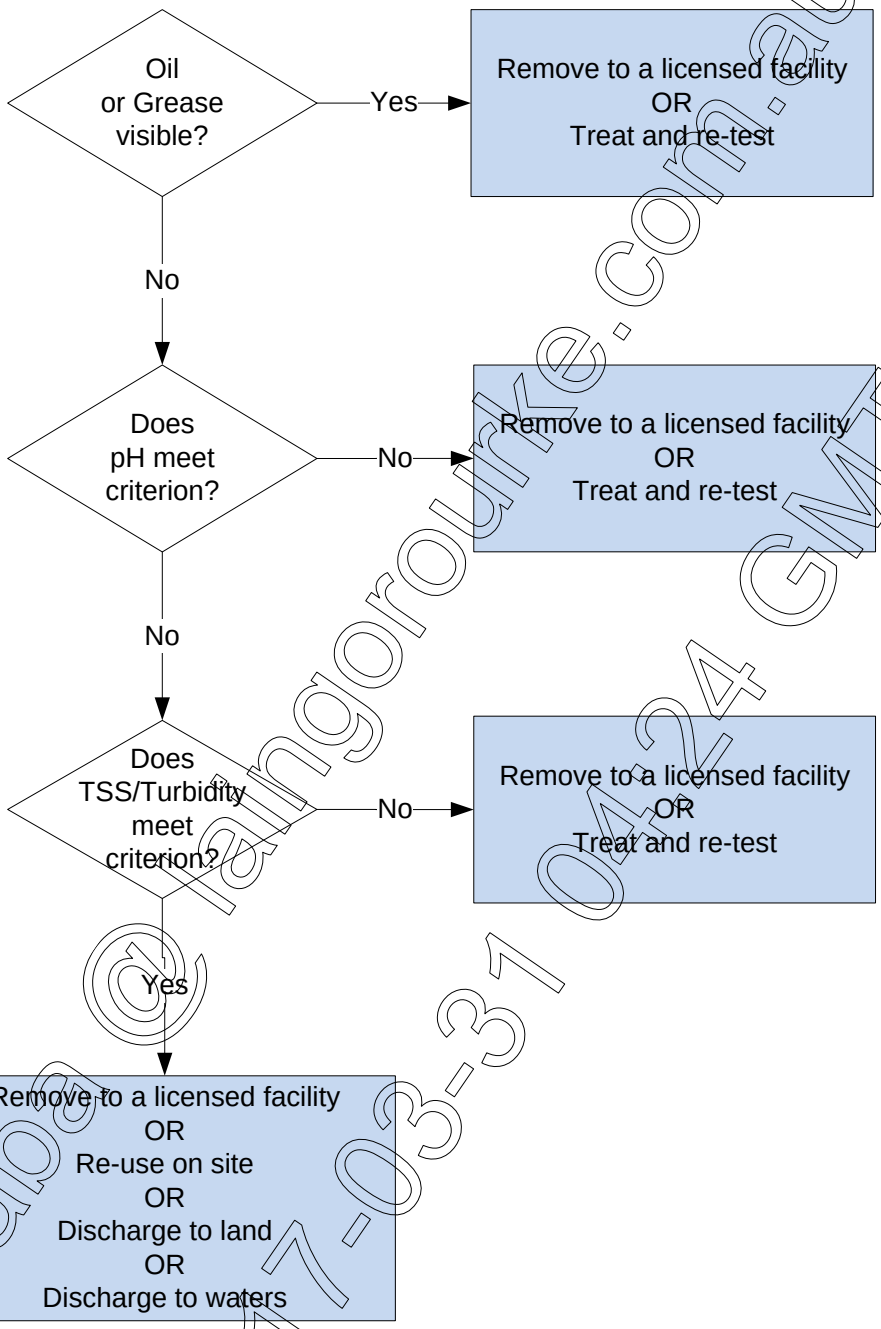

Figure 1: Process for testing water to determine options for removal, reuse, treatment or discharge

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4.6.1. Monitoring and Maintenance

All sediment controls or areas that store water must be inspected to assess their integrity and capacity, as a minimum at the following times:

- Weekly during dry weather.
- Prior to forecast rainfall events.
- During rainfall events (as often as possible), within 24 hours or as soon as possible following a rainfall event when the site is unattended (e.g. on weekends).

During any offsite or onsite discharge, regular monitoring must occur to ensure compliance with the requirements specified in this Procedure.

All rain event data shall be recorded for the site, including rainfall quantities from each rain event.

4.6.2. Record Keeping

Records of all water discharges must be documented using the SM ES-FT-412 Approval to Discharge or Reuse Water Form or site-specific equivalent. Records of all monitoring and maintenance measures must also be kept, on the site-specific environmental inspection checklist and other relevant document(s) (e.g. Site Foreman's diary).

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5. Related Documents and References

Related Documents and References
• SM ES-MM-101 Environmental and Sustainability Management Manual: http://intranet.transport.nsw.gov.au/guides/nwrl-environmental-sustainability-management-manual.pdf • SM ES-FT-412 Approval to Discharge or Reuse Water Form: http://intranet.transport.nsw.gov.au/guides/sm-es-ft-412-approval-to-discharge-or-reuse-water-form.docx • SM QM-FT-435 Integrated Management System (IMS) Glossary: http://intranet.transport.nsw.gov.au/guides/nwrl-ims-glossary.pdf

6. Superseded Documents

Superseded Documents
There are no documents superseded as a result of this document.

7. Document History

Version	Date of approval	Summary of change
1.0	31/03/2015	New document
2.0	7/7/2016	IMS Review

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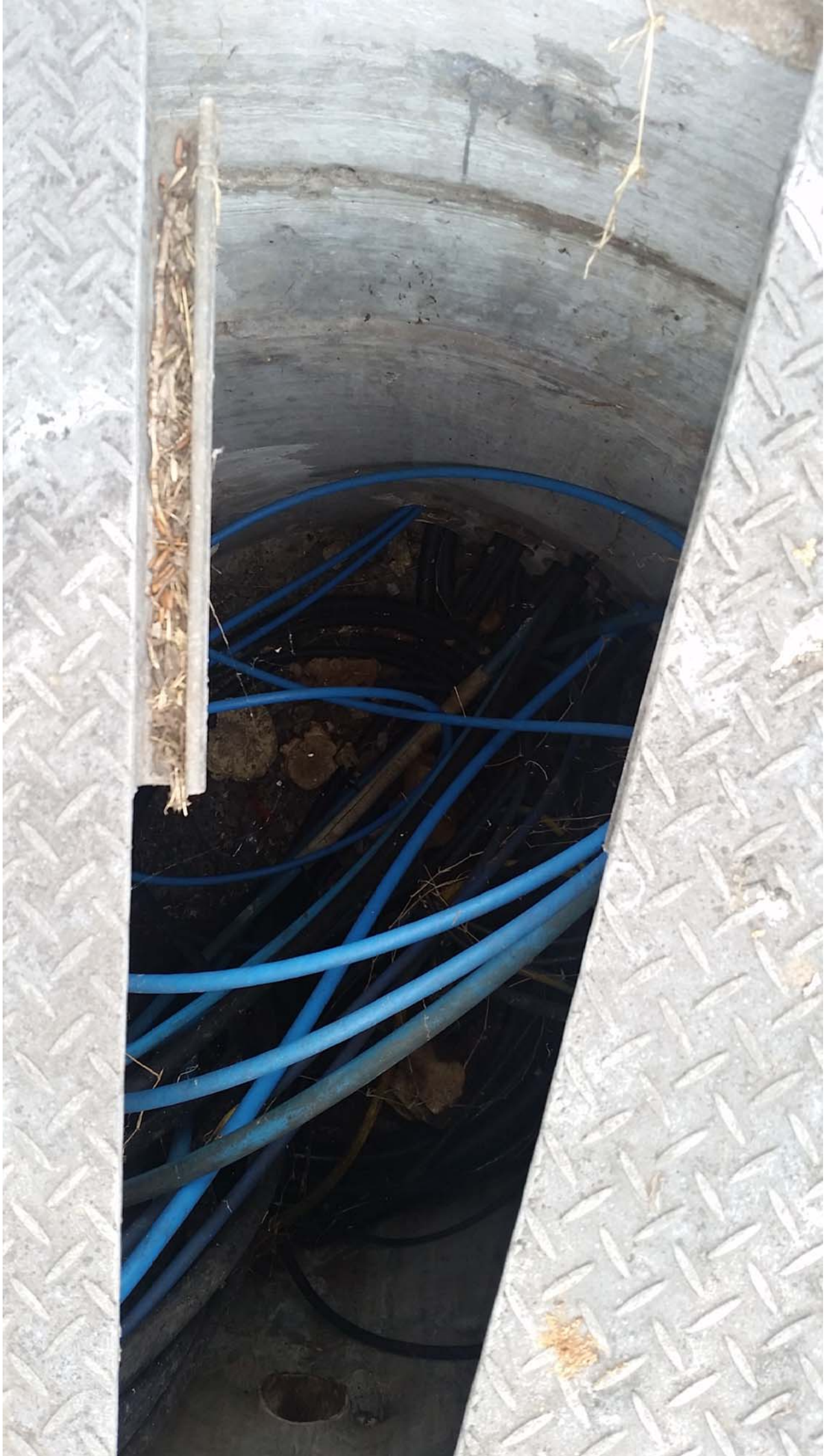

Sydney Metro Unexpected Heritage Finds Procedure

Supporting Document – Applicable to:

Quality Management System

Status:

Division:

Version: 1.2

Date of issue:

Effective date:

Review date:

Document owner:

Security classification:

Document History

Version	Date of approval	Doc. Control no.	Notes
1.1			Incorporates ER comments 21/06/17
1.2			Amends p13 step 8 reference to s146 added

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1. Purpose

This procedure has been developed in response to the Sydney Metro Critical State Significant Infrastructure Planning (CSSI 15_7400) Condition of Approval (CoA) E19, that requires Sydney Metro City & Southwest Program to provide a method for managing unexpected heritage items (both Aboriginal and non-Aboriginal) that are discovered during construction.

An 'unexpected heritage find' can be defined as any unanticipated archaeological discovery, that has not been previously assessed or is not covered by an existing approval under the *Heritage Act 1977* (Heritage Act) or *National Parks and Wildlife Act 1974* (NPW Act).

In NSW, there are strict laws to protect and manage heritage objects and relics. As a result, appropriate heritage management measures need to be implemented to minimise impacts on heritage values; ensure compliance with relevant heritage notification and other obligations; and to minimise the risk of penalties to individuals, TfNSW and its contractors. This procedure includes TfNSW's heritage notification obligations under the Heritage Act, NPW Act and the Coroner's Act 2009 and the specific requirements of the conditions of approval(CoA) issued by NSW Department of Planning and Environment for CSSI 15-7400.

Note that a Contractor may create their own Unexpected Finds Procedure or modify this document, however its use will be subject to compliance with the following:-

- CSSI CoA E17 requires consultation with the Heritage Council of NSW (or its delegate)
- CSSI CoA E19
- Prior approval from the nominated Excavation Director, as required under CSSI CoA E18
- Prior approval from the Environmental Representative, CSSI CoA A24
- Prior approval from Sydney Metro.

It should be noted that this procedure must be read in conjunction with the relevant CCSI conditionals of approval, the contract documents and other plans and procedures developed by contractor during the delivery of the works.

Legislation that does not apply

The following authorisations are not required for Sydney Metro approved Critical State significant infrastructure (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):

- Division 8 of Part 6 of the *Heritage Act 1977* does not apply to prevent or interfere with the carrying out of approved State significant infrastructure.

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- An approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,
- An Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,

This document provides relevant background information in Section 3, followed by the technical procedure in Sections 6 and 7. Associated guidance referred to in the procedure can be found in Appendices A-H.

2. Scope

Despite appropriate and adequate investigation, unexpected heritage items may still be discovered during maintenance and construction works on a Sydney Metro site. When this happens, this procedure must be followed. This procedure provides direction on when to stop work, where to seek technical advice and how to notify the regulator, if required.

This procedure applies to construction activities for the Sydney Metro Program as approved under Section 115ZB of the Environmental Planning and Assessment Act 1979 for Critical State Significant Infrastructure, Application No. SSI 15-7400.

This procedure **applies to**:

- the discovery of any unexpected heritage item, relic or object, where the find is not anticipated in the Archaeological Assessment Design Report (AARD)

This procedure must be followed by all Sydney Metro staff, contractors, subcontractors or any person undertaking works for Sydney Metro . It includes references to some of the relevant legislative and regulatory requirements, but is not intended to replace them with the exception S139 of the NSW Heritage Act 1977

This procedure **does not apply** to:

- The discovery and disturbance of heritage items as a result of investigations being undertaken in accordance with the Office of Environment and Heritage's (OEH) *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW 2010*[1]; an Aboriginal Heritage Impact Permit (AHIP) issued under the NPW Act; or an approval issued under the Heritage Act.

[1] An act carried out in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* as published by the Department in the Gazette on 24 September 2010 is excluded from the definition of ***harm*** an object or place in section 5 (1) of the NPW Act.

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- the discovery and disturbance of heritage items as a result of construction related activities, where the disturbance is permissible in accordance with an AHIP; or an approval issued under the Heritage Act; All new Construction Environment Management Plans (CEMPs) must make reference to and/or include this procedure (included as a heritage sub-plan, refer to CSSI CoA C6(g)).

Note that this procedure does not supersede the requirements of CSSI CoA CSSI CoA E10 and E26:

- E10The Proponent must not destroy, modify or otherwise physically affect any Heritage item not identified in documents referred to in CoA A 1.
- E26 This approval does not allow the Proponent to harm, modify, or otherwise impact human remains uncovered during the construction and operation of the CSSI, except in accordance with the Exhumation Management Plan (CoA E27).

3. Definitions

All terminology in this procedure is taken to mean the generally accepted or dictionary definition with the exception of the following terms which have a specifically defined meaning:

Term	Meaning
AHIP	Aboriginal Heritage Impact Permit
Aboriginal object	An Aboriginal object is any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains. An Aboriginal object may include a shell midden, stone tools, bones, rock art, Aboriginal-built fences and stockyards, scarred trees and the remains of fringe camps.
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CSSI	Critical State Significant Infrastructure
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
Heritage Act	NSW *Heritage Act 1977*
NPW Act	NSW *National Parks and Wildlife Act 1974*
OEH	Office of Environment and Heritage

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Term	Meaning
Relic (non-Aboriginal heritage)	A relic means any deposit, artefact, object or material evidence that: a) relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and b) is of State or local heritage significance. A relic may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse.
TfNSW	Transport for New South Wales – Infrastructure and Services Division
Work (non-Aboriginal heritage)	Archaeological features such as historic utilities or buried infrastructure that provide evidence of prior occupations such as former rail or tram tracks, timber sleepers, kerbing, historic road pavement, fences, culverts, historic pavement, buried retaining walls, cisterns, conduits, sheds or building foundations, but are subject to specific assessment by the Excavation Director

4. Accountabilities

The Principal Manager Sustainability Environment & Planning (Program) is accountable for this procedure including authorising the document, monitoring its effectiveness and performing a formal document review.

5. Types of unexpected heritage items and corresponding statutory protections

The roles of project, field and environmental personnel (including construction contractors) are critical to the early identification and protection of unexpected heritage items. **Appendix A** illustrates the wide range of heritage discoveries found on transport infrastructure projects and provides a useful photographic guide. Subsequent to confirmation of a heritage discovery it must then be identified and assessed by Excavation Director as required under CSSI CoA E20. An 'unexpected heritage item' means any unanticipated discovery of an actual or potential heritage item, for which Sydney Metro (refer to CSSI CoA E10 and E26) does not have approval to disturb[2] and/or have an existing management process in place.

These discoveries are categorised as either:

[2] Disturbance is considered to be any physical interference with the item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).

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(a) Aboriginal objects

(b) historic (non-Aboriginal) heritage items

(c) human skeletal remains.

The relevant legislation that applies to each of these categories is described below and is also addressed in the Sydney Metro Exhumation Management Plan (refer to CSSI CoA E26 and E27).

5.1. Aboriginal objects

The NPW Act protects Aboriginal objects which are defined as:

> *"any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non Aboriginal extraction, and includes Aboriginal remains"*[3].

Examples of Aboriginal objects include stone tool artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

IMPORTANT!

<u>All</u> Aboriginal objects, regardless of significance, are protected under law.

If any impact is expected to an Aboriginal object, an AHIP is usually required from OEH[4]. Also, when a person becomes aware of an Aboriginal object they must notify the Director-General of OEH about its location[5]. Assistance on how to do this is provided in Section 7 (Step 5).

CSSI CoA E23, E24 and E25 for management of Aboriginal Heritage Applies to the Sydney Metro Chatswood to Sydenham Project

5.2. Historic heritage items

Historic (non-Aboriginal) heritage items may include:

- archaeological 'relics'
- other historic items (i.e. works, structures, buildings or movable objects).

[3] Section 5(1) NPW Act.

[4] Refer to CSSI CoA E23 & E25.

[5] This is required under section 89(A) of the NPW Act and applies to all TfNSW projects.

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5.2.1. Archaeological relics

The Heritage Act protects *relics* which are defined as:

> "*any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance*"[6].

Relics are archaeological items of local or state significance which may relate to past domestic, industrial or agricultural activities in NSW, and can include bottles, remnants of clothing, pottery, building materials and general refuse.

Construction in the vicinity of a relic, of State significance, must not recommence until the requirements of the ARMP have been implemented, in consultation with the Excavation Director**.** The Sydney Metro must notify the Secretary of the Department of Environment & Planning in writing of the outcome of consultation with the Heritage Council of NSW, refer to CSSI CoA E20.

IMPORTANT!

<u>All</u> relics are subject to statutory controls and protections.

If a relic is likely to be disturbed, a heritage approval is usually required from the NSW Heritage Council[7]. Also, when a person discovers a relic they must notify the NSW Heritage Council of its location[8]. Advice on how to do this for works under CSSI 15_7400 is provided in Section 7 (Step 5).

5.2.2. Other historic items

Some historic heritage items are not considered to be 'relics'; but are instead referred to as works, buildings, structures or movable objects. Examples of these items that may be encountered include culverts, historic pavements, retaining walls, tramlines, rail tracks, timber sleepers, cisterns, fences, sheds, buildings and conduits. Although an approval under the Heritage Act may not be required to disturb these items, their discovery must be managed in accordance with this procedure.

[6] Section 4(1) Heritage Act.

[7] Refer to CSSI CoA E20,

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[8] This is required under section 146 of the Heritage Act and applies to all TfNSW projects however also refer to foot note 8.

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As a general rule, an archaeological relic requires discovery or examination through the act of excavation. An archaeological excavation permit under section 140 of the Heritage Act is required to do this. In contrast, 'other historic items' either exist above the ground surface (e.g. a shed), or they are designed to operate and exist beneath the ground surface (e.g. a culvert).

Despite this difference, it should be remembered that relics can often be associated with 'other heritage items', such as archaeological deposits within cisterns and underfloor deposits beneath buildings.

5.3. Human skeletal remains

Refer to Sydney Metro Project Exhumation Management Plan

Human skeletal remains can be identified as either an Aboriginal object or non-Aboriginal relic depending on ancestry of the individual (Aboriginal or non-Aboriginal) and burial context (archaeological or non-archaeological). Remains are considered to be archaeological when the time elapsed since death is suspected of being 100 years or more. Depending on ancestry and context, different legislation applies.

As a simple example, a pre-European settlement archaeological Aboriginal burial would be protected under the NPW Act, while a historic (non-Aboriginal) archaeological burial within a cemetery would be protected under the Heritage Act. For a non-Aboriginal archaeological burial, the relevant heritage approval and notification requirement described in Section 3.1 would apply. In addition to the NPW Act, finding Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under section 20(1) of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth).

IMPORTANT!

All human skeletal remains are subject to statutory controls and protections.

All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

However, where it is suspected that less than 100 years has elapsed since death, the human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Such a case would be considered a 'reportable death' and under legal notification obligations set out in section 35(2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less

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than 100 years old[9] regardless of ancestry (i.e. both Aboriginal and non-Aboriginal remains). Public health controls may also apply.

Guidance on what to do when suspected human remains are found is provided in **Appendix E**.

6. Legislative Requirements

Table 1 identifies some of the relevant legislation/regulations for the protection of heritage and the management of unexpected heritage finds in NSW. It should be noted that significant penalties exist for breaches of the listed legislation as a result of actions that relate to unauthorised impacts on heritage items. Further, it is noted that heritage that has been assessed and is being managed in accordance with relevant statutory approvals(s) is exempt from these offences.

To avoid breaches of legislation, it is important that Sydney Metro and its contractors are aware of their statutory obligations under relevant legislation and that appropriate control measures are in place to ensure that unexpected heritage items are appropriately managed during construction. Contractors/Alliances will need to ensure that they undertake their own due diligence to identify any other legislative requirements that may apply for a given project.

CSSI CoA E10 applies to unexpected finds, so that all relevant legislation will apply to heritage items not identified in documents referred to CoA A1.

Table 1 Legislation and guidelines for management of unexpected heritage finds

Relevant Requirement	Objectives and offences
Environmental Planning and Assessment Act 1979 (EP&A Act)	Section 115ZB Giving of approval by Minister to carry out a project.
Environmental Planning and Assessment Act 1979 (EP&A Act)	Requires heritage to be considered within the environmental impact assessment of projects. This guideline is based on the premise that an appropriate level of Aboriginal and non-Aboriginal cultural heritage assessment and investigations and mitigation have already been undertaken under the relevant legislation, including the EP&A Act, during the assessment and determination process. It also assumes that appropriate mitigation measures have been included in the conditions of any approval.

[9] Under section 19 of the *Coroners Act 2009*, the coroner has no jurisdiction to conduct an inquest into reportable death unless it appears to the coroner that (or that there is reasonable cause to suspect that) the death or suspected death occurred within the last 100 years.

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Relevant Requirement	Objectives and offences
Heritage Act 1977 **(Heritage Act)**	The Heritage Act provides for the care, protection and management of heritage items in NSW. Under section 139, it is an offence to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed, unless the disturbance or excavation is carried out in accordance with an excavation permit issued by the Heritage Division of the OEH. Under the Act, a relic is defined as: *'any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and (b) is of State or local heritage significance.'* A person must notify the Heritage Division of OEH, if a person is aware or believes that they have discovered or located a relic (section 146). Penalties for offences under the Heritage Act can include six months imprisonment and/or a fine of up to $1.1million.
National Parks and Wildlife Act 1974 **(NPW Act)**	The NPW Act provides the basis for the care, protection and management of Aboriginal objects and places in NSW. An Aboriginal object is defined as: *'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'*. An 'Aboriginal place' is an area declared by the Minister administering the Act to be of special significance with respect to Aboriginal culture. An Aboriginal place does not have to contain physical evidence of occupation (such as Aboriginal objects). Under section 87 of the Act, it is an offence to harm or desecrate an Aboriginal object or place. There are strict liability offences. An offence cannot be upheld where the harm or desecration was authorised by an AHIP and the permit's conditions were not contravened. Defences and exemptions to the offence of harming an Aboriginal object or Aboriginal place are provided in section 87, 87A and 87B of the Act. A person must notify OEH if a person is aware of the location of an Aboriginal object. Penalties for some of the offences can include two years imprisonment and/or up to $550,000 (for individuals), and a maximum penalty of $1.1 million (for corporations).

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7. Unexpected heritage finds protocol

7.1. What is an unexpected heritage find?

An ‘unexpected heritage find’ can be defined as any unanticipated archaeological discovery that has not been identified during a previous assessment or is not covered by an existing permit under the Heritage Act. The find may have potential cultural heritage value, which may require some type of statutory cultural heritage permit or notification if any interference of the heritage item is proposed or anticipated.

The range of potential archaeological discoveries can include but are not limited to:

- remains of rail infrastructure including buildings, footings, stations, signal boxes, rail lines, bridges and culverts
- remains of other infrastructure including sandstone or brick buildings, wells, cisterns, drainage services, conduits, old kerbing and pavement, former road surfaces, timber and stone culverts, bridge footings and retaining walls
- artefact scatters including clustering of broken and complete bottles, glass, ceramics, animal bones and clay pipes
- Archaeological human skeletal remains.

7.2. Managing unexpected heritage finds

In the event that an unexpected heritage find (the find) is encountered on a Sydney Metro site, the flowchart in Figure 1 must be followed. There are eight steps in the procedure. These steps are summarised in Figure 1 and explained in detail in Table 2

.

Figure 1 Overview of steps to be undertaken on the discovery of an unexpected heritage item

IMPORTANT!

Sydney Metro may have approval to impact on certain heritage items during construction. If you think that you may have discovered a heritage item and you are unsure whether an approval is in place or not, **STOP** works and follow this procedure.

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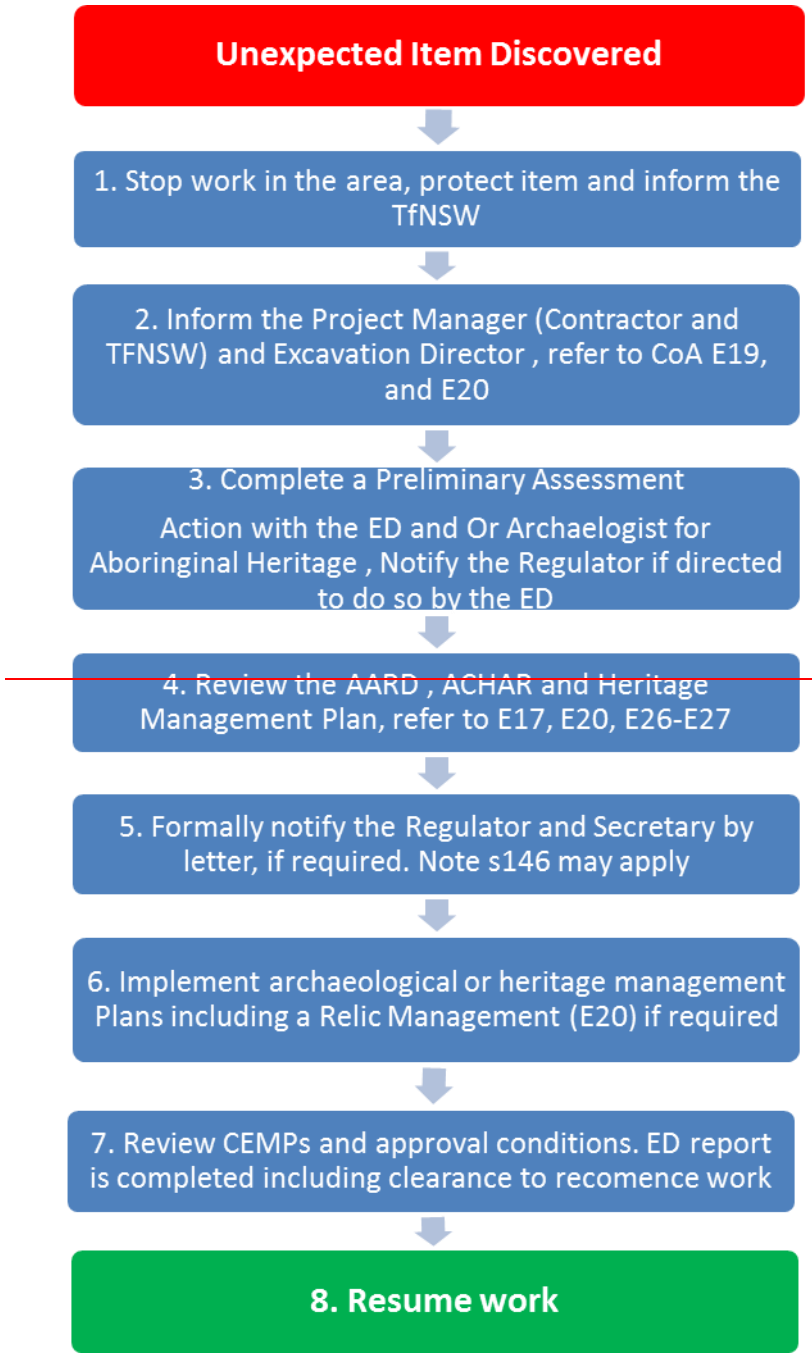
Unexpected Item Discovered
1. Stop work in the area, protect item and inform the TfNSW
2. Inform the Project Manager (Contractor and TFNSW) and Excavation Director , refer to CoA E19, and E20
3. Complete a Preliminary Assessment
Action with the ED and Or Archaelogist for Aboringinal Heritage , Notify the Regulator if directed to do so by the ED
4. Review the AARD , ACHAR and Heritage Management Plan, refer to E17, E20, E26-E27
5. Formally notify the Regulator and Secretary by letter, if required. Note s146 may apply
6. Implement archaeological or heritage management Plans including a Relic Management (E20) if required
7. Review CEMPs and approval conditions. ED report is completed including clearance to recomence work
8. Resume work

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Table 2 Specific tasks to be implemented following the discovery of an unexpected heritage item

Step	Task	Responsibility	Guidance and tools
1	**Stop work, protect item and inform the Excavation Director**		
1.1	Stop all work in the immediate area of the item and notify the Project Manager	Contractor/ Supervisor	**Appendix A** (Identifying Unexpected Heritage items)
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical. No work is to be undertaken within this zone until further investigations are completed and, if required, appropriate approvals are obtained. Inform all site personnel about the no-go zone.	Project Manager/ Contractor/ Supervisor	
1.3	Inspect, document and photograph the item.	Excavation Director	**Appendix B** (Unexpected Heritage Item Recording Form) **Appendix C** (Photographing Unexpected Heritage items)
1.4	Is the item likely to be bone? If **yes**, follow the steps in Appendix D – 'Uncovering bones'. Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately. They may take command of all or part of the site. If **no**, proceed to next step.	Excavation Director	**Appendix D** (Uncovering Bones)

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Step	Task	Responsibility	Guidance and tools
1.5	Inform the Excavation Director of the item and provide as much information as possible, including photos and completed form (**Appendix B**). Where the project has an Environmental Representative (ER), the ER should be involved in the tasks/process as appropriate.	Contractors Project Manager	
1.6	Can the works avoid further disturbance to the item? Project Manager to confirm with TfNSW Environment and Planning Manager. Complete the remaining tasks in Step 1.	Contractors Project Manager	
1.7	Excavation Director to advise the Project Manager whether TfNSW has approval to impact on the 'item'. Does Metro have an approval or permit to impact on the item? If **yes**, work may recommence in accordance with that approval or permit. There is no further requirement to follow this procedure. If **no**, continue to next step.	Contractors Project Manager	
1.8	Has the 'find' been damaged or harmed? If **yes**, record the incident in the Incident Management System Implement any additional reporting requirements related to the planning approval and CEMP, where relevant. Contract Sydney Metro Manager, Environment Safety, Environment and Business Systems	Contractors Project Manager, Excavation Director	
2	**Contact and engage an archaeologist and/or an Aboriginal heritage consultant**		

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Step	Task	Responsibility	Guidance and tools
2.1	If an archaeologist and/or Aboriginal heritage consultant has been previously appointed for the project, contact them to discuss the location and extent of the item and arrange a site inspection, if required. The project CEMP may contain contact details of the archaeologist/Aboriginal heritage consultant. Where there is no project archaeologist engaged for the works engage a suitably qualified consultant to assess the find: if the find is a non-Aboriginal deposit, engage a suitably qualified and experienced archaeological consultant if the find is likely to be an Aboriginal object, engage an Aboriginal heritage consultant to assess the find.	Contractors Project Manager, Excavation Director	
2.2	If requested, provide photographs of the item taken during Step 1.3 to the archaeologist or Aboriginal heritage consultant.	TfNSW Project Manager	**Appendix C** (Photographing Unexpected Heritage items)
3	**Preliminary assessment and recording of the find**		
3.1	In a minority of cases, the archaeologist/Aboriginal heritage consultant may determine from the photographs that no site inspection is required because no heritage constraint exists for the project (*e.g. the item is not a 'relic', a 'heritage item' or an 'Aboriginal object*'). Any such advice should be provided in writing (e.g. via email or letter with the consultant's name and company details clearly identifiable) to the TfNSW Project Manager.	Archaeologist/ Aboriginal heritage consultant/ Contractors Project Manager, Excavation Director	Proceed to Step 8

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Step	Task	Responsibility	Guidance and tools
3.2	Arrange site access for the archaeologist/Aboriginal heritage consultant to inspect the item as soon as practicable. In the majority of cases a site inspection is required to conduct a preliminary assessment.	Contractors Project Manager, Excavation Director	
3.3	Subject to the archaeologist/Aboriginal heritage consultant's assessment, work may recommence at a set distance from the item. This is to protect any other archaeological material that may exist in the vicinity, which may have not yet been uncovered. Existing protective fencing established in Step 1.2 may need to be adjusted to reflect the extent of the newly assessed protective area. No works are to take place within this area once established.	Archaeologist/ Aboriginal heritage consultant Contractors Project Manager, Excavation Director	
3.4	The archaeologist/Aboriginal heritage consultant may provide advice after the site inspection and preliminary assessment that no heritage constraint exists for the project (e.g. the item is not a '*relic*' or a '*heritage item'* or an '*aboriginal item'*. Any such advice should be provided in writing (e.g. via email or letter with the consultant's name and company details clearly identifiable) to the Metro Project Manager. Note that : a relic is evidence of past human activity which has local or State heritage significance. It may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse an Aboriginal object may include a shell midden, stone tools, bones, rock art or a scarred tree a "work", building or standing structure may include tram or train tracks, kerbing, historic road pavement, fences, sheds or building foundations.	Archaeologist/ Aboriginal heritage consultant/ Contractors Project Manager, Excavation Director	Proceed to Step 8 Refer to **Appendix A** (Identifying heritage items)

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Step	Task	Responsibility	Guidance and tools
3.5	Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains). The archaeologist/Aboriginal heritage consultant can provide contacts for such specialist consultants.	Contractors Project Manager, Excavation Director	
3.6	Where the item has been identified as a 'relic' or 'heritage item' or an 'Aboriginal object' the archaeologist should formally record the item.	Archaeologist/ Aboriginal heritage consultant	
3.7	OEH (Heritage Division for non-Aboriginal relics and Planning and Aboriginal Heritage Section for Aboriginal objects) can be notified informally by telephone at this stage by the Sydney Metro Principal Manager Sustainability Environment and Planning (Program). Any verbal conversations with regulators must be noted on the project file for future reference.	Contractors Project Manager, Excavation Director	
4	**Section 4 not used**		

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Step	Task	Responsibility	Guidance and tools
5	**Notify the regulator, if required.**		
5.1	Based on the findings of the archaeological or heritage management plan and corresponding legislative requirements, is the find required to be notified to OEH and the Secretary? If **no**, proceed directly to Step 6 If **yes**, proceed to next step.	Contractors Project Manager, Excavation Director	
5.2	If notification is required, complete the template notification letter, including the archaeological/heritage management plan and other relevant supporting information and forward to the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) for signature.	Contractors Project Manager, Excavation Director	**Appendix F** (Template Notification Letter)
5.3	Forward the signed notification letter to OEH and the Secretary. Informal notification (via a phone call or email) to OEH prior to sending the letter is appropriate. The archaeological or heritage management plan and the completed site recording form (Appendix B) must be submitted with the notification letter (for both Aboriginal objects and non-Aboriginal relics). For Part 5.1 projects, the Department of Planning and Environment must also be notified.	Contractors Project Manager, Excavation Director	
5.4	A copy of the final signed notification letter, archaeological or heritage management plan and the site recording form is to be kept on file and a copy sent to the Sydney Metro Project Manager.	Contractors Project Manager, Excavation Director	
6	**Implement archaeological or heritage management plan**		

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Step	Task	Responsibility	Guidance and tools
6.1	Modify the archaeological or heritage management plan to take into account any additional advice resulting from notification and discussions with OEH.	Contractors Project Manager, Excavation Director	
6.2	Implement the archaeological or heritage management plan. Where impact is expected, this may include a formal assessment of significance and heritage impact assessment, preparation of excavation or recording methodologies, consultation with Registered Aboriginal Parties, obtaining heritage approvals etc., if required.	Contractors Project Manager, Excavation Director	
6.3	Where heritage approval is required contact the Environment and Planning Manager for further advice and support material. Please note there are time constraints associated with heritage approval preparation and processing.	Contractors Project Manager, Excavation Director	
6.4	Assess whether heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning and Environment.	Contractors Project Manager, Excavation Director	
6.5	Where statutory approvals (or project approval modification) are required, impact upon relics and/or Aboriginal objects must not occur until heritage approvals are issued by the appropriate regulator.	Contractors Project Manager, Excavation Director	
6.6	Where statutory approval is not required but where recording is recommended by the archaeologist/Aboriginal heritage consultant, sufficient time must be allowed for this to occur.	Contractors Project Manager, Excavation Director	

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Step	Task	Responsibility	Guidance and tools
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material removed from site, where required. Interested third parties (e.g. museums, local Aboriginal land councils, or local councils) should be consulted on this issue. Contact the archaeologist or Aboriginal heritage consultant for advice on this matter, if required.	Contractors Project Manager, Excavation Director	
7	**Section 7 Not Used**		
8	**Resume work**		
8.1	Seek written clearance to resume project work from the Environment and Planning Manager and the Archaeologist/Aboriginal heritage consultant. Clearance would only be given once all archaeological excavation and/or heritage recommendations and approvals (where required) are complete. Resumption of project work must be in accordance with the all relevant project/heritage approvals/determinations.	Contractors Project Manager, Excavation Director	
8.2	If required, ensure archaeological excavation/heritage reporting and other heritage approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.	Contractors Project Manager, Excavation Director	
8.3	Deleted		
8.4	If additional unexpected items are discovered this procedure must begin again from Step 1.	All	

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8. Responsibilities

Roles and Responsibilities

Role	Responsibility or role under this guideline
Contractor / Supervisor	Stop work immediately when an unexpected heritage find is encountered. Cordon off area until Environmental Manager advises that work can recommence.
Contractor or Environment Manager	Manage the process of identifying, protecting and mitigating impacts on the 'find'. Liaise with Sydney Metro Project Manager and Environment and Planning Manager and assist the archaeologist/Aboriginal heritage consultant with mitigation and regulatory requirements. Complete Incident Report and review CEMP for any changes required. Propose amendments to the CEMP if any changes are required.
Contractor's or Project Heritage Advisor or Consultant	Provide expert advice to the Sydney Metro Environment and Planning Manager on 'find' identification, significance, mitigation, legislative procedures and regulatory requirements.
Environmental Representative	Independent environmental advisor engaged by Sydney Metro Review and provides advice on heritage management plan and changes to the CEMP. Ensures compliance with relevant approvals (new and existing).
Heritage Division of OEH	Regulate the care, protection and management of relics (non-Aboriginal heritage). Delegated authority for Heritage Council Issue excavation permits.
Registered Aboriginal Parties (RAPs)	Aboriginal people who have registered with Sydney Metro to be consulted about a proposed project or activity in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.
Sydney Metro Environment and Planning Manager	Notify the TfNSW Principal Manager, Environmental Management of 'find' and manage Incident Reporting once completed by Environmental Manager.
Contractors Project Manager	Ensures all aspects of this procedure are implemented. Advise Contractor / Supervisor to recommence work when all applicable requirements have been satisfied.

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9. Seeking advice

Advice on this procedure should be sought from the Sydney Metro Environment and Planning Manager in the first instance. Contractors and alliance partners should ensure their own project environment managers are aware of and understand this procedure.

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from a suitably qualified and experienced archaeologist/Aboriginal heritage consultant.

10. Related documents and references

Related Documents
Environmental Incident Classification and Reporting – 9TP-PR-105
Guide to Environmental Control Map – 3TP-SD-015
NSW Heritage Office (1998), *Skeletal remains: guidelines for the management of human skeletal remains*.
Roads and Maritime Services (2015), *Standard Management Procedure Unexpected Heritage Items.*
Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal remains.*

11. List of appendices

The following appendices are included to support this procedure:

Appendix A: Examples of finds encountered during construction works
Appendix B: Unexpected Heritage Item Recording Form
Appendix C: Photographing Unexpected Heritage Items
Appendix D: Uncovering Bones
Appendix E: Archaeological Advice Checklist
Appendix F: Template Notification Letter

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Appendix A - Examples of finds encountered during construction works

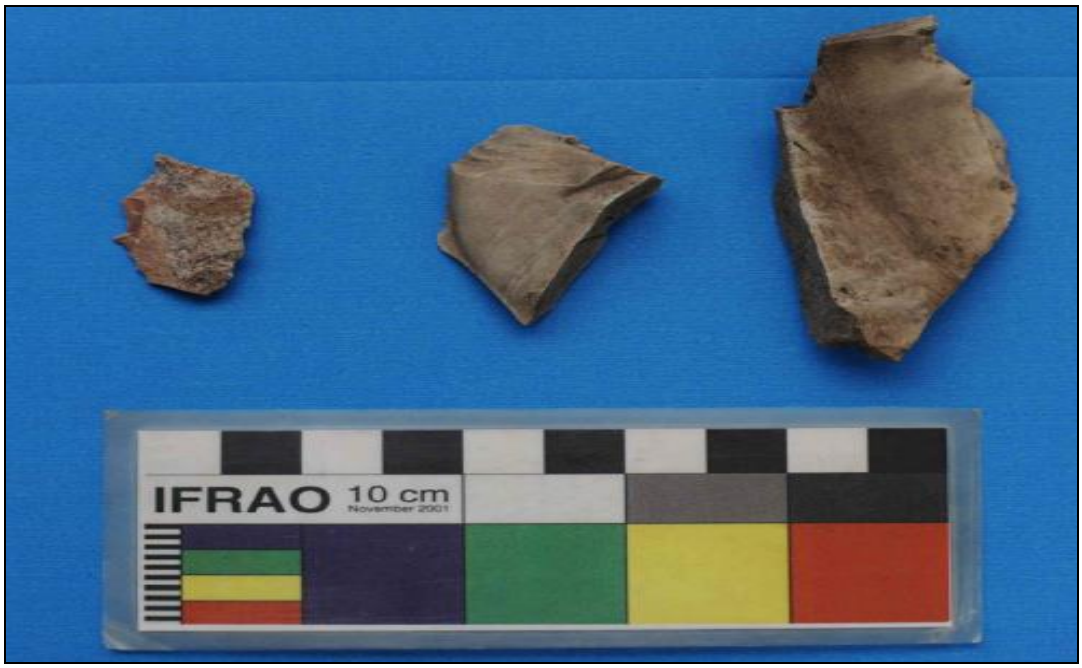

Photo 1 - Aboriginal artefacts found at the Wickham Transport Interchange, 2015

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Photo 2 – Aboriginal artefacts (shell material) found at the Wickham Transport Interchange, 2015

Photo 3 1840s seawall and 1880s retaining wall uncovered at Balmain East, 2016

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Photo 4 Sandstone pavers uncovered at Balmain East, 2016

Photo 5 - Platform structure at Hamilton Railway Station classified as a 'work' by the project archaeologist - Wickham Transport Interchange project, 2015

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Photo 6 - Platform structure at Hamilton Railway Station classified as a 'work' by the project archaeologist - Wickham Transport Interchange project, 2015

Photo 7 - Sandstone flagging and cesspit - Wynyard Walk project, 2014

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Photo 8 - Chinese Ming Dynasty pottery and English porcelain/pottery dating back to early 19th century -Wynyard Walk project, 2014

Photo 9 - Pottery made by convict potter Thomas Ball during the early settlement - Wynyard Walk project, 2014

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The following images, obtained from the Roads and Maritime Services' *Standard Management Procedure for Unexpected Heritage items 2015,* can be used to assist in the preliminary identification of potential unexpected items during construction and maintenance works.

Photo 10 - Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at

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Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area) (RMS, 2015).

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Photo 11 - Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at

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Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area) (RMS, 2015).

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Appendix B- Unexpected heritage item recording form

©

Example of **unexpected heritage item recording form**

This form is to be completed Excavation Director on the discovery of an archaeological heritage item during construction or maintenance works

Date:		**Recorded by:** (include name and position)	
Project name:			
Description of works being undertaken:			
Description of exact location of item			
Description of item found (What type of item is it likely to be? Tick the relevant boxes).			
A. A relic	☐	A 'relic' is evidence of a past human activity relating to the settlement of NSW with local or state heritage significance. A relic might include bottle, utensils, plates, cups, household items, tools, implements, and similar items	
B. A 'work', building or structure'	☐	A 'work' can generally be defined as a form infrastructure such as track or rail tracks, timber sleepers, a culvert, road base, a bridge pier, kerbing, and similar items	
C. An Aboriginal object	☐	An 'Aboriginal object' may include stone tools, stone flakes, shell middens, rock art, scarred trees and human bones	
D. Bone	☐	Bones can either be human or animal remains. **Remember that you must contact the local police immediately by**	

©

		telephone if you are certain that the bone(s) are human remains.	
E. Other	☐		
Provide a short description of the item *(eg metal rail tracks running parallel to the rail corridor. Good condition. Tracks set in concrete, approximately 10 cm below the current ground surface).*			
Sketch *(provide a sketch of the item's general location in relation to other road features so its approximate location can be mapped without having to re-excavate it. In addition, please include details of the location and direction of any photographs of the item taken)*			
Action taken (Tick either A *or* B)			
A. Unexpected item **would not** be further impacts on by the works	☐	**Describe how works would avoid impact on the item.** *(eg the rail tracks would be left in situ and recovered with paving).*	

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B. Unexpected item would be further impacted by the works	☐	**Describe how works would impact on the item**. *(eg milling is required to be continued to a depth of 200 mm depth to ensure the pavement requirements are met. Rail tracks would need to be removed.)*	
Excavation Director		Signature	
		Signature	

Important

It is a statutory offence to disturb Aboriginal objects and historic relics (including human remains) without an approval. All works affecting objects and relics must cease until an approval is sought.

Approvals may also be required to impact on certain works.

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Appendix C- Photographing unexpected heritage items

Photographs of unexpected items in their current context (*in situ*) may assist archaeologists/Aboriginal heritage consultants to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin etc) and a note describing the direction of the photograph.

Context and detailed photographs

It is important to take a general photograph (Figure 1) to convey the location and setting of the item. This will add value to the subsequent detailed photographs also required (Figure 2).

Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.

Figure 2: Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

Figure 1: Telford road uncovered on the Great Western Highway (Leura) in 2008 (RMS, 2015).

Photographing distinguishing features

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of these features, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See Figures 3 and 4 for examples.

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Figure 3: Ceramic bottle artefact with stamp.

Figure 4: Detail of the stamp allows '*Tooth & Co Limited*' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

Photographing bones

The majority of bones found on site will those of be recently deceased animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, the police must be contacted immediately (see Appendix F for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. The project archaeologist can confirm if bones are human or non-human if provided with appropriate photographs.

Ensure that photographs of bones are not concealed by foliage (Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed.

Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.

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Figure 5: Bone concealed by foliage.

Figure 6: Bone covered in sediment

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). Figures 7 and 8 are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.

Figure 7: Photograph showing complete bone.

Figure 8: Close up of a long bone's epiphysis.

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Appendix D - Uncovering bones

This appendix provides advice regarding:

- what to do on first discovering bones
- the range of human skeletal notification pathways
- additional considerations and requirements when managing the discovery of human remains.

1. First uncovering bones

Refer to the Sydney Metro Exhumation Management Plan

Stop all work in the vicinity of the find. All bones uncovered during project works should be **treated with care and urgency** as they have the potential to be human remains. The bones must be identified as either human or non-human as soon as possible by a qualified forensic or physical anthropologist..

On the very rare occasion where it is immediately obvious from the remains that they are human, the Project Manager (or a delegate) should **inform the police by telephone** prior to seeking specialist advice. It will be obvious that it is human skeletal remains where there is no doubt, as demonstrated by the example in Figure 1[10]. Often skeletal elements in isolation (such as a skull) can also clearly be identified as human. Note it may also be obvious that human remains have been uncovered when soft tissue and/or clothing are present.

[10] After Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal Remains: 17*

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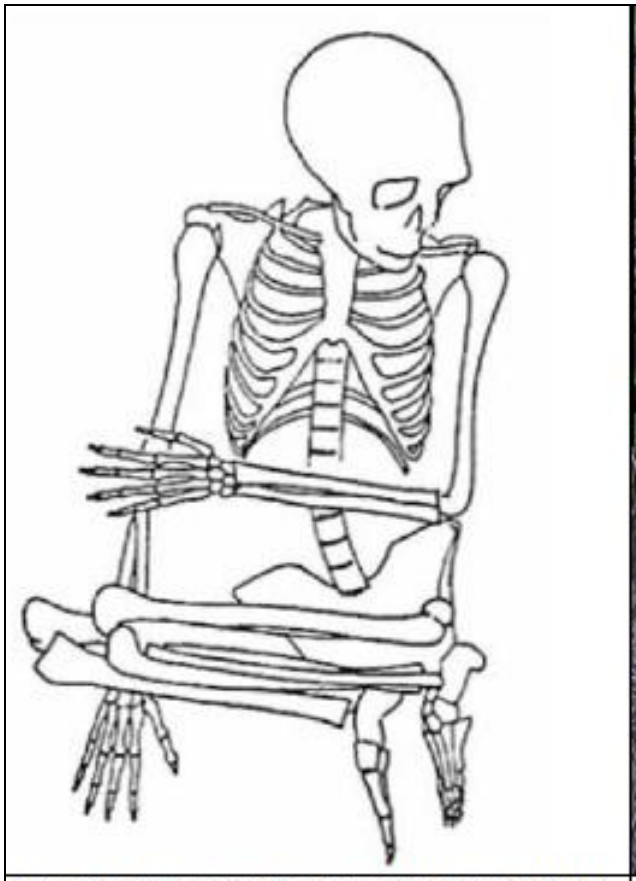

Figure 1: Schematic of a complete skeleton that is 'obviously' human[12].

Figure 2: Disarticulated bones that require assessment to determine species.

This preliminary phone call is to let the police know that a specialist skeletal assessment to determine the approximate date of death which will inform legal jurisdiction. The police may wish to take control of the site at this stage. If not, a forensic or physical anthropologist must be requested to make an on-site assessment of the skeletal remains.

Where it is not immediately obvious that the bones are human (in the majority of cases, illustrated by Figure 2), specialist assessment is required to establish the species of the bones. Photographs of the bones can assist this assessment if they are clear and taken in accordance with guidance provided in Appendix C. Good photographs often result in the bones being identified by a specialist without requiring a site visit; noting they are nearly always non-human. In these cases, non-human skeletal remains must be treated like any other unexpected archaeological find.

If the bones are identified as human (either by photographs or an on-site inspection) a technical specialist must determine the likely ancestry (Aboriginal or non-Aboriginal) and burial context (archaeological or forensic). This assessment is required to identify the legal regulator of the human remains so **urgent notification** (as below) can occur.

Preliminary telephone or verbal notification by the archaeologist to the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) appropriate. This

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must be followed up later by a formal letter notification to the relevant regulator (as per Appendix G) when a management plan has been developed and agreed to by the relevant parties.

2. Range of human skeletal notification pathways

The following is a summary of the different notification pathways required for human skeletal remains depending on the preliminary skeletal assessment of ancestry and burial context.

A. Human bones are from a recently deceased person (*less than* 100 years old).

Action
A police officer must be notified immediately as per the obligations to report a death or suspected death under s35 of the *Coroners Act 2009* (NSW). It should be assumed the police will then take command of the site until otherwise directed.

B. Human bones are archaeological in nature (*more than* 100 years old) and are likely to be *Aboriginal* remains.

Action
The OEH (Planning and Aboriginal Heritage Section) must be notified immediately. The Aboriginal Cultural Heritage Advisor must contact and inform the relevant Aboriginal community stakeholders who may request to be present on site.

C. Human bones are archaeological in nature (more than 100 years old) and likely to be non-Aboriginal remains.

Action
The OEH (Heritage Division) must be notified immediately

Figure 3 summarises the notification pathways on finding bones.

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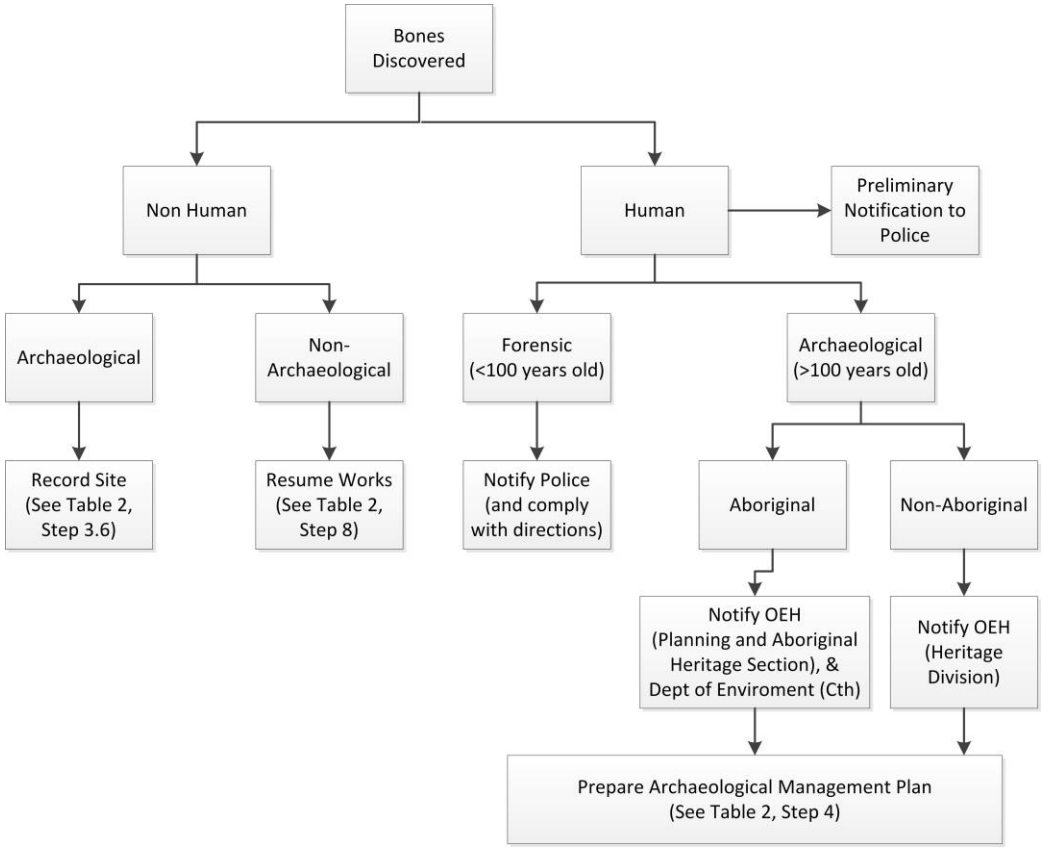

Figure 3 Overview of steps to be undertaken on the discovery of bones

After the appropriate verbal notifications (as described in 2B and 2C above), the Project Manager must proceed through the *Unexpected Heritage Items Exhumation Management Plan* (Step 4). It is noted that no *Exhumation Management Plan* is required for forensic cases (2A), as all future management is a police matter. Non-human skeletal remains must be treated like any other unexpected archaeological find and so must proceed to record the find as per Step 3.6.

3. Additional considerations and requirements

Uncovering archaeological human remains must be managed intensively and needs to consider a number of additional specific issues. These issues might include facilitating culturally appropriate processes when dealing with Aboriginal remains (such as repatriation and cultural ceremonies). Project Managers may need to consider overnight site security of any exposed remains and may need to manage the onsite attendance of a number of different external stakeholders during assessment and/or investigation of remains.

Project Managers may also be advised to liaise with local church/religious groups and the media to manage community issues arising from the find. Additional investigations may be required to identify living descendants, particularly if the remains are to be removed and relocated.

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If exhumation of the remains (from a formal burial or a vault) is required, Project Managers should also be aware of additional approval requirements under the *Public Health Act 1991* (NSW). Specifically, TfNSW is required to apply to the Director General of NSW Department of Health for approval to exhume human remains as per Clause 26 of the *Public Health (Disposal of Bodies) Regulation 2002* (NSW)[11].

Further, the exhumation of such remains needs to consider health risks such as infectious disease control, exhumation procedures and reburial approval and registration. Further guidance on this matter can be found at the NSW Department of Health website.

In addition, due to the potential significant statutory and common law controls and prohibitions associated with interfering with a public cemetery, project teams are advised, when works uncover human remains adjacent to cemeteries, to confirm the cemetery's exact boundaries.

[11] This requirement is in addition to heritage approvals under the *Heritage Act 1977.*

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Appendix E - Archaeological/heritage advice checklist

The archaeologist/Aboriginal heritage consultant must advise the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) of an appropriate archaeological or heritage management plan as soon as possible after an inspection of the site has been completed (see Step 4). An archaeological or heritage management plan can include a range of activities and processes, which differ depending on the find and its significance.

In discussions with the archaeologist/Aboriginal heritage consultant the following checklist can be used as a prompt to ensure all relevant heritage issues are considered when developing this plan. This will allow the project team to receive clear and full advice to move forward quickly. Archaeological and/or heritage advice on how to proceed can be received in a letter or email outlining all relevant archaeological and/or heritage issues.

	Required	Outcome/notes
Assessment and investigation		
• Assessment of significance	Yes/No	
• Assessment of heritage impact	Yes/No	
• Archaeological excavation	Yes/No	
• Archival photographic recording	Yes/No	
Heritage approvals and notifications		
• AHIP, section 140, section 139 exceptions etc.	Yes/No	
• Regulator relics/objects notification	Yes/No	
• Notification to Sydney Trains for s170 heritage conservation register	Yes/No	
• Compliance with CEMP or other project heritage approvals	Yes/No	
Stakeholder consultation		
• Aboriginal stakeholder consultation	Yes/No	
Artefact/heritage item management		
• Retention or conservation strategy (e.g. items may be subject to long conservation and interpretation)	Yes/No	
• Disposal strategy	Yes/No	
• Short term and permanent storage locations (interested third parties should be consulted on this issue).	Yes/No	
• Control Agreement for Aboriginal objects	Yes/No	

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Appendix F- Template notification letter

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Insert on TfNSW letterhead
Select and type date]
[Select and type reference number]

XXX
Manager, Conservation
Heritage Division, Office of Environment and Heritage
Locked Bag 5020
Parramatta NSW 2124

[Select and type salutation and name],

Re: Unexpected heritage item discovered during Transport for NSW –Sydney Metro activities.

I write to inform you of an unexpected [select: relic, heritage item or Aboriginal object] found during TfNSW Infrastructure and Services construction works at [insert location] on [insert date] in accordance with the notification requirement under select: section 146 of the *Heritage Act 1977* (NSW). [Where the regulator has been informally notified at an earlier date by telephone, this should be referred to here].

NB: On finding Aboriginal human skeletal remains this letter must also be sent to the Commonwealth Minister for the Environment in accordance with notification requirements under section 20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Commonwealth).

[Provide a brief overview of the project background and project area. Provide a summary of the description and location of the item, including a map and image where possible. Also include how the project was assessed under the *Environmental Planning and Assessment Act 1979* (NSW) (e.g. Part 5). Also include any project approval number, if available].

Sydney Metro [*or contractor*] has sought professional archaeological advice regarding the item. A preliminary assessment indicates [provide a summary description and likely significance of the item]. Please find additional information on the site recording form attached.

Based on the preliminary findings, Sydney Metro *[or contractor]* is proposing [provide a summary of the proposed archaeological/heritage approach (e.g. develop archaeological research design (where relevant), seek heritage approvals, undertake archaeological investigation or conservation/interpretation strategy). Also include preliminary justification of such heritage impact with regard to project design constraints and delivery program].

The proposed approach will be further developed in consultation with a nominated Office of Environment and Heritage staff member.

Should you have any feedback on the proposed approach, or if you require any further information, please do not hesitate to contact [Environment and Planning Project Manager] on (02) XXXX XXXX.

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Yours sincerely

[Sender name]

Sydney Metro Principal Manager Sustainability Environment and Planning (Program) [Attach the archaeological/heritage management plan and site recording form].

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Web: www.hbi.com.au

Mr Stuart Hodgson

30 August 2017

Principal Manager,
Program Sustainability Environment & Planning
Sydney Metro
Transport for NSW
PO Box 588
NORTH RYDE BC NSW 1670

Ref: 170108_UHFP

Dear Stuart

RE: Endorsement of Sydney Metro Unexpected Heritage Finds Procedure

Thank you for providing the following document for Environmental Representative (ER) review and endorsement as required by the Condition of Approval A24 (d) of the Sydney Metro City & Southwest project (SSI – 15_7400 January 9 2017).

- Sydney Metro *Unexpected Heritage Finds Procedure* V1.2 (undated)

As an approved ER for the Sydney Metro City & Southwest project, I have reviewed and provided comment on this document and now consider it appropriate for implementation for managing unexpected heritage finds on the Sydney Metro City & Southwest project.

Yours sincerely

Jo Robertson
Environmental Representative – Sydney Metro – City and South West

SYDENHAM STATION AND SYDNEY METRO TRAINS FACILITY SOUTH

Addendum to the Sydney Metro City & Southwest – Chatswood to Sydenham Historical Archaeological Assessment and Research Design

Report to Jacobs/Arcadis/RPS

January 2018

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CONTENTS

FIGURES

TABLES

1.0 INTRODUCTION

This addendum report constitutes an Archaeological Research Design (ARD) for the Sydenham Station and Sydney Metro Trains Facility South (the project as modified), a modification to Sydney Metro City & Southwest Chatswood to Sydenham project (the project as approved). This report has been prepared as an addendum to the ARD for the project as approved (Artefact 2016b).

1.1 Project Background

Planning approval for the project as approved was granted by the Minister for Planning under Part 5.1 of the *Environmental Planning and Assessment Act* (EP&A Act) on 9 January 2017. The modification area (study area) is located at the southern end of the Chatswood to Sydenham section of the approved project and includes:

- The southern services facility (for traction power supply and an operational water treatment plant) adjacent to the southern dive structure
- Sydenham Station and precinct works
- Track and rail system facilities
- Adjustments to the Sydenham Pit and Drainage Pumping Station
- Ancillary infrastructure and works.

Table 1-1: Key features of the modification

Component	Description of activities
Sydenham Station and precinct works	Demolition and reconstruction of platforms 1 and 2 for metro rail operations and a new aerial concourse connecting to new station entries at Railway Parade and Burrows Avenue. Upgrades to transport interchange facilities and provision for active transport would be delivered as part of the station works
Sydney Metro Trains Facility South	Construction and operation of train stabling and maintenance facilities for the overall metro network. The scope includes earthworks, retaining walls, track and rail systems, construction of new buildings, enabling works to support future rail corridor development above the facility, plus operation of trains and maintenance activities within the stabling yard
Track and rail system facilities	Reconfiguration of existing track and rail systems to segregate the T3 Bankstown Line and the Goods Line, installation of metro tracks and rail systems including crossover and turnback facilities
Adjustments to the Sydenham Pit and Drainage Pumping Station	Including a new aqueduct over the pit, new pumping station and new maintenance access ramp
Ancillary infrastructure and works	Including fencing, maintenance access, utilities works, drainage, noise barriers, road and transport network works, bridge works, and temporary facilities to support construction

DRAFT

1.2 Previous heritage assessments

This ARD is informed by previous heritage assessments prepared for the Metro project, which have assessed the archaeological potential and significance within the portions of the project as modified. These assessments are:

- Arcadis, 2017, *Chatswood to Sydenham: Sydenham Station and Sydney Metro Trains Facility South Modification Report*
- Artefact Heritage 2017, *Sydney Metro City & Southwest Sydenham to Bankstown Technical Paper 3 Non-Aboriginal Heritage Impact Assessment*
- Artefact Heritage, 2016a, *Sydney Metro City & Southwest – Chatswood to Sydenham Technical Paper 4 Non-Aboriginal Heritage Impact Assessment*
- Artefact Heritage 2016b, *Sydney Metro City & Southwest Chatswood to Sydenham – Historical Archaeological Assessment and Research Design*

Works within the eastern portion of the study area of the project as modified are included in the project as approved. The Southern Dive Site and adjacent works site were assessed in the project as approved Non-Aboriginal Heritage Impact Assessment (NAHIA) (Artefact 2016a). The NAHIA found that there was unlikely to be impacts to significant archaeology as a result of the project and management under an Unexpected Finds Procedure was recommended as appropriate mitigation.

> *Any potential archaeological resources within the study area would be impacted by substantial excavation works associated with the dive structure and tunnel portal. Although any impacts to potential archaeological resources within the study area would be substantial, the archaeological assessment did not identify any significant archaeological resources within the study area. (Artefact 2016a:247)*

The ARD for the project as approved included a management map for the Southern Dive Site and adjacent works site which showed the entire are as covered under the Unexpected Finds Procedure (Artefact 2016b: Figure 13-11).

1.3 Study area

The study area of the project as modified is illustrated in Figure 1-1 to Figure 1-4. This addendum ARD provides management measures for potential archaeological resources within the study area, as shown in Figure 1-2. The study area is located in the Inner West Local Government Area.

1.4 Statutory context

There are no statutory listed heritage items with identified archaeological values located within the study area. The following listed items are located within the study area and are significant for their built heritage values (Table 2). Built heritage is assessed in the modification report (Arcadis 2017).

Table 1-2: Listed items in the modification area

Listing	Suburb	Number	Significance
Sydenham pit and drainage pumping station 1	Sydenham	State SHR (01644) Sydney Water S. 170 Heritage and Conservation Register (4571743) Marrickville LEP 2011 (I81)	State
Sydenham Railway Station Group	Sydenham	SHR (No. 01254) RailCorp S.170 Heritage and Conservation Register (4801154) Marrickville LEP 2011 (I286)	State
Sydenham (Illawarra Line) underbridge	Sydenham	RailCorp S.170 Heritage and Conservation Register (4805746)	Local
Marrickville (Meek's Road) Railway Substation	Marrickville	RailCorp S.170 Heritage and Conservation Register (4801123)	Local

All four listed items within the study area are identified in their listing information or relevant Conservation Management Plans (CMPs) as having no, or low, non-Aboriginal archaeological potential.

1.5 Report Authorship

This report was prepared by Jenny Winnett (Senior Heritage Consultant) and Dr Sandra Wallace (Director).

Figure 1-1: Study area of the project as modified

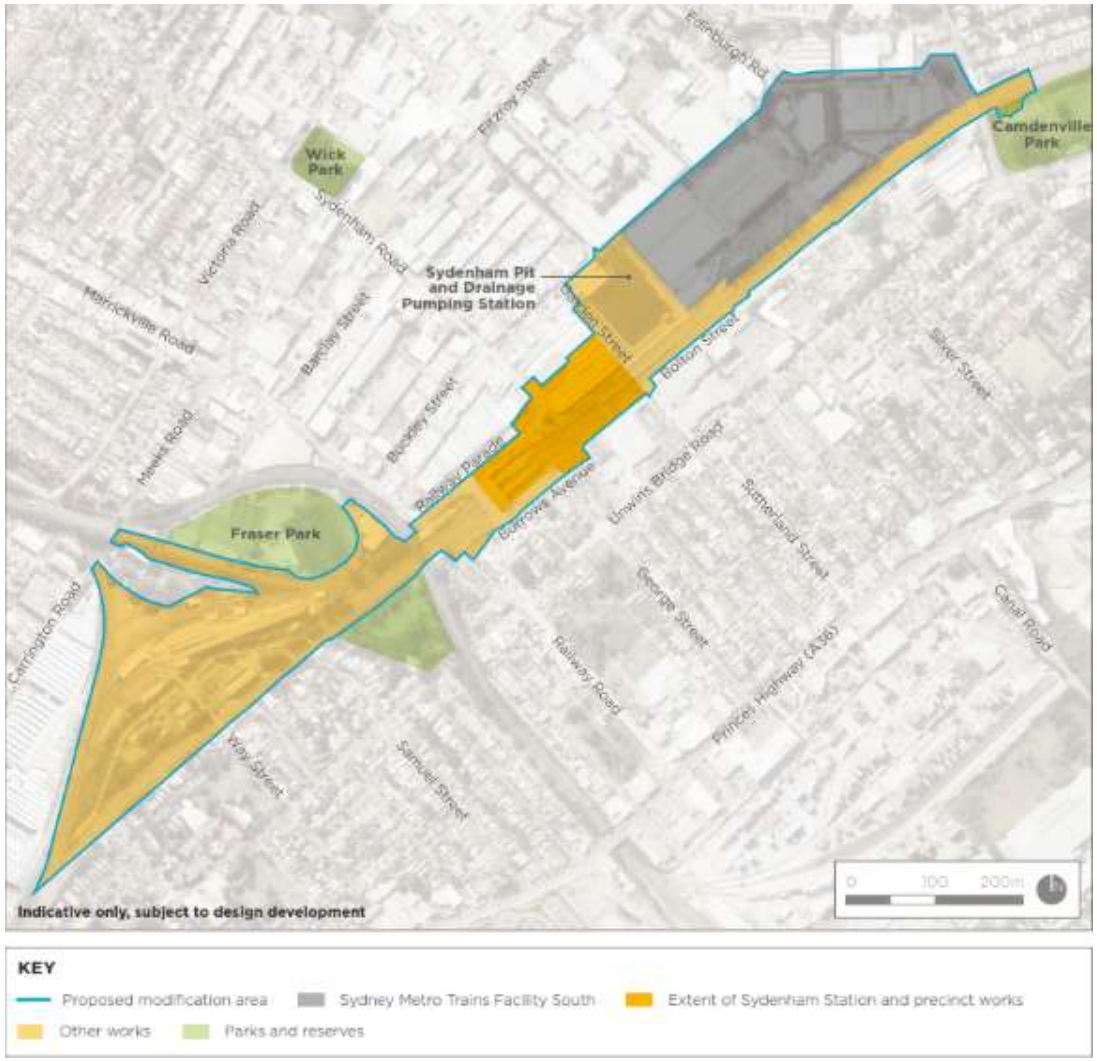
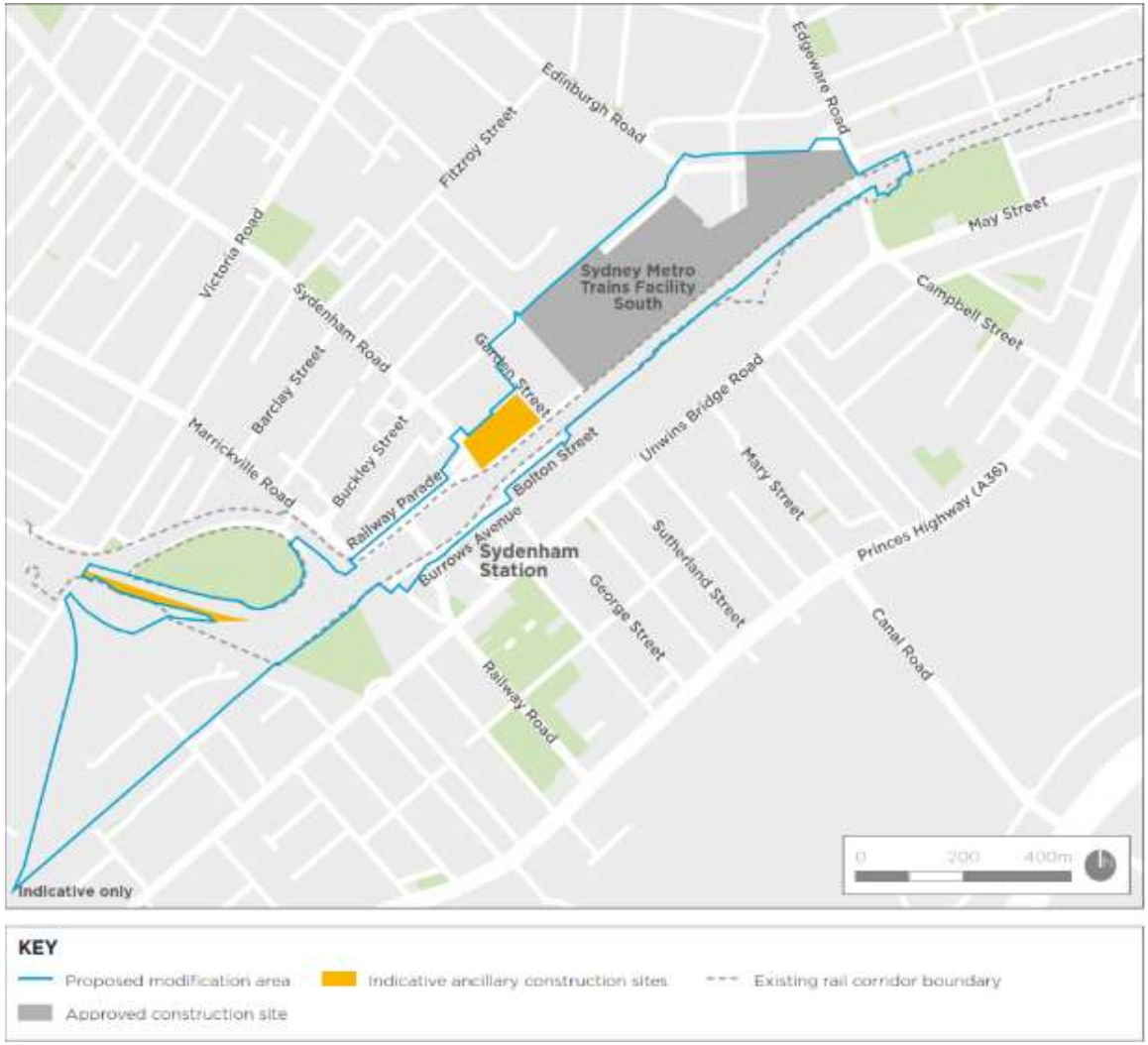


Figure 1-2: Key features of the Marrickville Dive Site and Southern Support Facility

Figure 1-3: Key features of the Sydenham station and precinct works

Figure 1-4: Construction sites



2.0 HISTORICAL CONTEXT

2.1 Introduction

Land in the Marrickville area was first granted to European settlers in the 1790s. Initially used for low intensity timber getting and agricultural activities, subdivision and establishment of various manufacturing industries, such as brickmaking, began in the 1830s. By the 1860s Marrickville had grown as a suburb with both residential and industrial development areas. Marginal swampy land, such as the study area, was slow to develop. During the early to mid-1900s the study area developed primarily as a location for industry and manufacturing, rather than residential subdivision (with some exceptions). The topography and development history influenced the subdivision pattern and land use throughout the twentieth century. The study area today remains predominately industrial in character surrounded by both residential and other industrial pockets.

2.1.1 Early land grants

Land grants were first issued in 1793 for farms and crop growing in the Marrickville area. By 1810 all the land in Marrickville was granted to settlers. In 1799, Thomas Moore received a grant of 470 acres adjoining the swamp and in 1803, a further grant of 700 acres. Moore also purchased adjoining land and by 1807 held 1,920 acres, making him one of the largest landowners in the area (Figure 8). His holdings incorporated much of present day Marrickville, Petersham, and Dulwich Hill. Douglas Farm, as Moore's holdings were named, was utilised for the growing of maize and wheat and for its valuable stands of timber. Moore was appointed Master Boat Builder in the dockyard at Port Jackson, and it is likely that some of the timber from the property went to his shipbuilding yard.

Moore sold his land holdings to Dr Robert Wardell on the 21st of July, 1830. At this time, the estate extended from Parramatta Road to Cooks River. Wardell was a flamboyant figure, hosting lavish parties at his home, Sara Dell (originally located on Parramatta Road in the vicinity of the Fort Street High School), and stocking his property with imported English deer for hunting. In September 1834, Wardell stumbled across the camp of three escaped convicts whilst riding along the Cooks River and was murdered. Wardell's estate was divided amongst his sisters, Anne Fisher, Margaret Fraser, and Jane Isabella Priddle. Wardell's death opened the way for the first era of subdivision in the area, and parts of his land began to be sold off soon after his death, creating small farms for orchards and dairy cattle, and new industries such as brickmaking. Most of the remaining land was scrub earning the name of 'Wardell's Bush'.

The western half of present-day Sydenham, including the area now occupied by Sydenham Station, was part of the Gumbramorra Swamp. During the 1830s and 1840s, the outer lying suburbs of Newtown, St Peters, Tempe, and Petersham became desirable locations for the construction of rural retreats, due to increasing land prices in the city.

By the 1840s, a track known as Swamp Road was established, now Sydenham Road. Unwin's Bridge Road was constructed by convict labour in 1836 for Frederick Wright Unwin, a prominent landowner south of the study area. During this phase, the area was occupied primarily by brickmakers, farms and stockmen utilised the swamp to water livestock.

The area to the north of the railway line was originally part of the extensive Petersham Estate, also referred to as the Sydenham Farms. This was subdivided, primarily into large agricultural lots, from the mid-19th century. A portion of the study area (including, and east, of Sydenham Railway Station) was included in Section No.1 of the subdivision c. 1850. The subdivision plan from the time indicates that much of the study area was low-lying at this time, and is shown as being marsh-land (Figure 2-2). The area today known as Fraser Park formed part of the area labelled as 'King's Garden' (Figure 2-2;

Figure 2-6). The areas was obviously suited to this use, as 'Meek's Garden' was also located to the north of the study area.

Figure 2-1: Undated plan of the Parish of Petersham, showing Thomas Moore's grant of 470 acres. The study area was located within this grant and also crossed into the small holdings of John Fincham and James Wain.

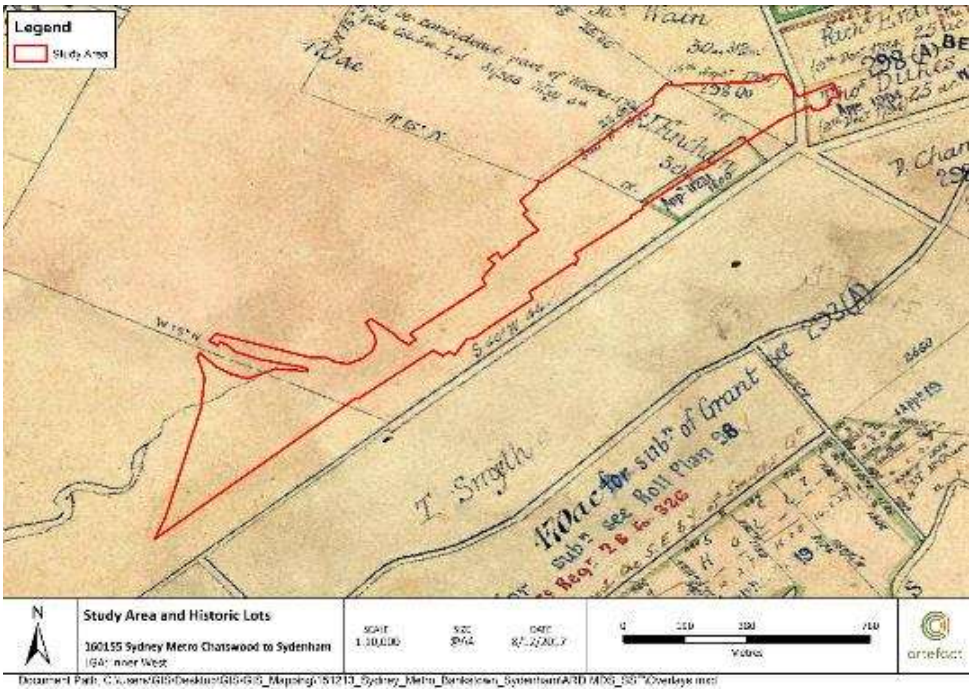


Figure 2-2: Detail of John Allan's plan showing the subdivision of the Petersham Estate, c. 1850. King's Garden is labelled. Source: NLA MAP F 178.

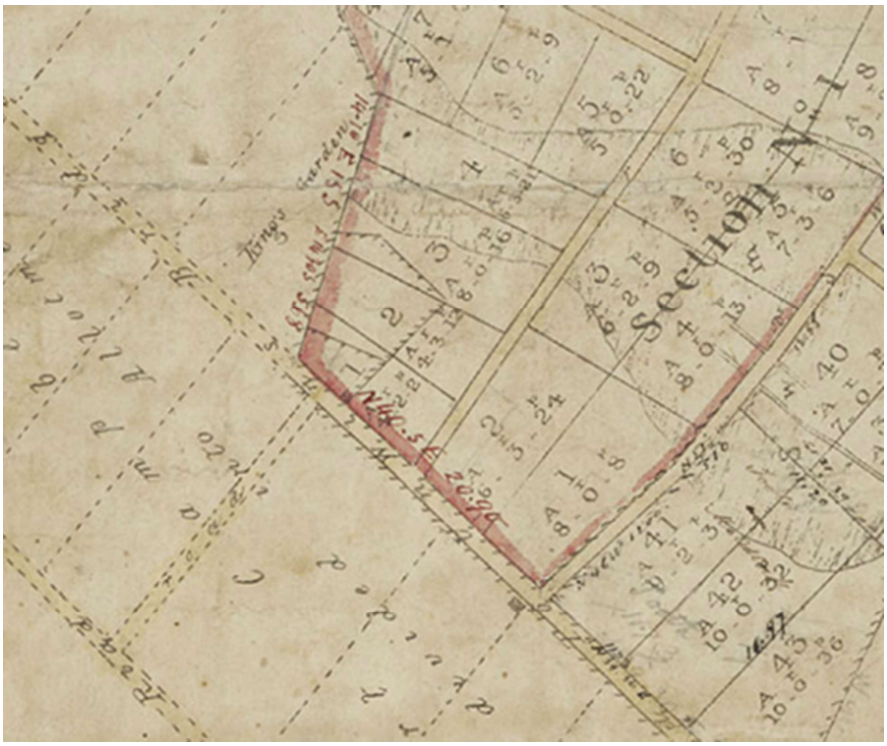
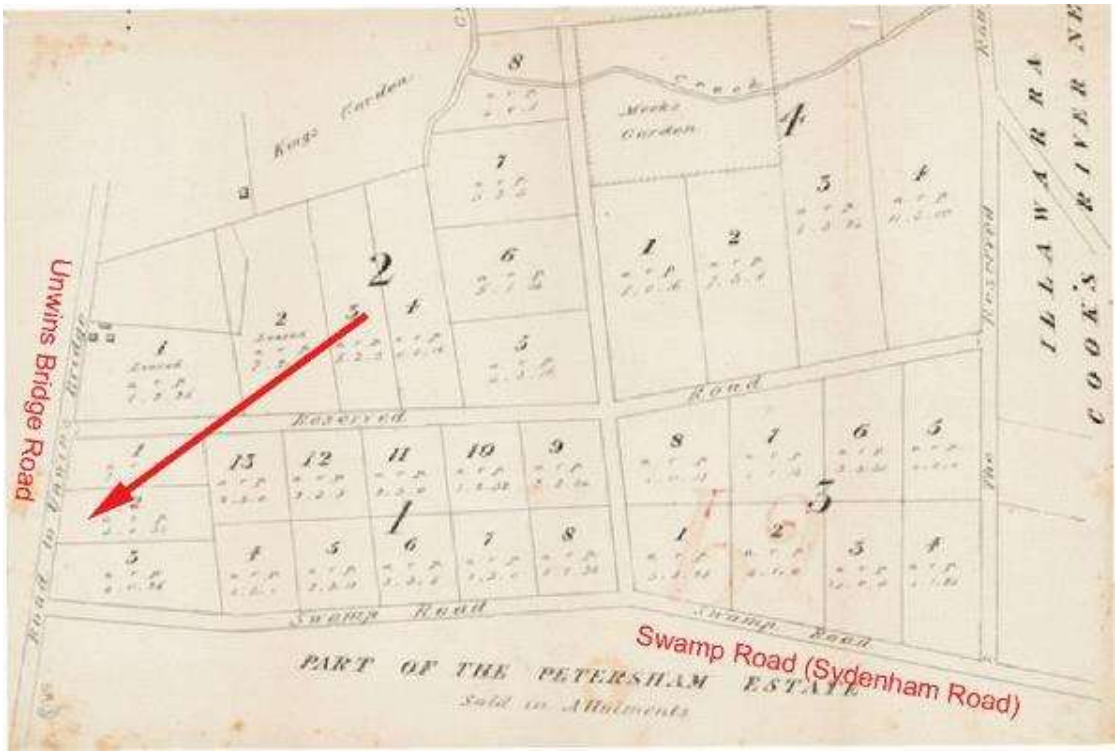


Figure 2-3: Detail from J. Allans plan of Sydenham Farms. Swam Road and Unwin's Bridge Road. The approximate location of Sydenham Station is arrowed. Plan no. 1 / J. Dating between 1840 and 1850. SLNSW M2 811.1826/1840/1.

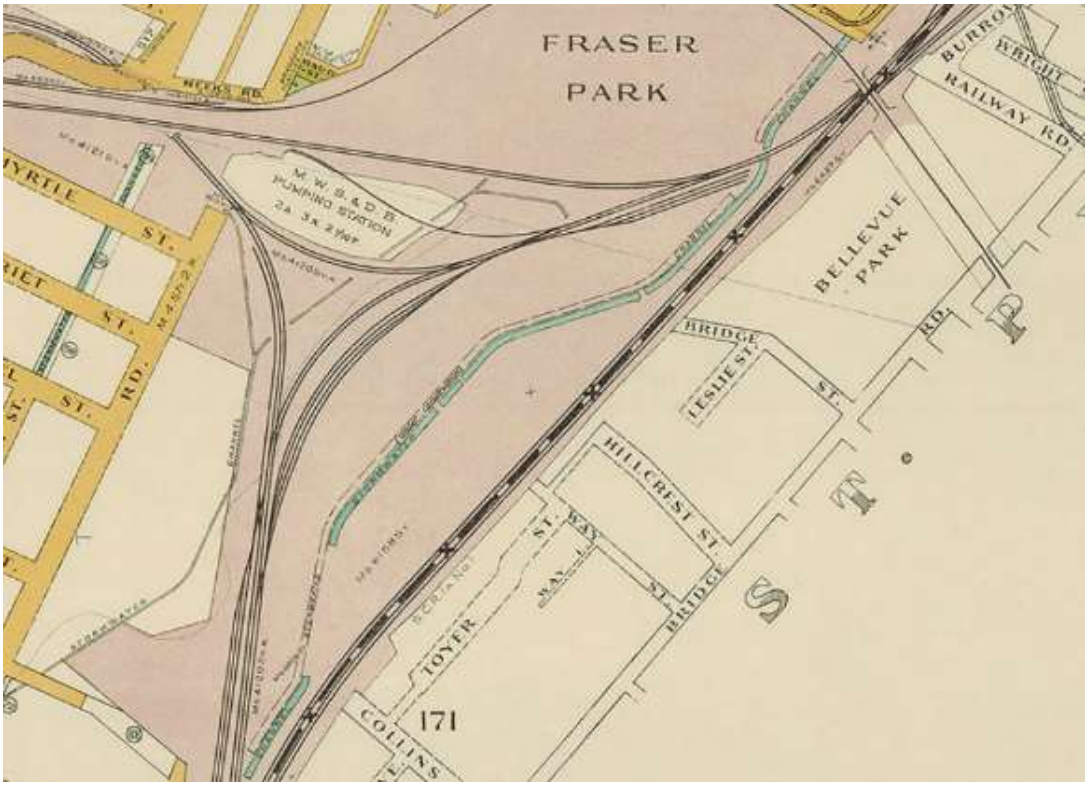


2.1.2 Subdivision and early industry

In the 1880s there was a Sydney wide population boom, resulting in mass residential and commercial development for the area. Steam trams were introduced and in 1881 a line ran from Newtown Bridge to Marrickville. This was designed to stimulate residential development within the area. The Tramvale subdivision in the western portion of Sydenham was offered for sale soon after, targeting working class families and offering close proximity to factories and employment opportunities. The estate was affected by regular flooding and poor drainage, and lacked basic sewerage facilities. Mosquitos were rampant in summer and its inhabitants suffered badly from a range of diseases. In May 1889, after several days of heavy rain, the Cooks River flooded and the areas surrounding Gumbramorra Swamp were soon inundated with water, including the Tramvale estate. Residents were rescued as their homes were severely flooded. The Tramvale estate was consequently abandoned, although the area continued to be used, primarily for industrial and agricultural purposes.

The Gumbramorra Swamp, and other low-lying areas within the district, were systematically drained from the late 1890s. This work was part of a broader scheme for waste water management for Sydney, creating useable land in out-lying districts for residential and industrial purposes. The Sewage Pumping Station 271 (described below) located in the south-west of the study area, and within the former swamp, was designed and built by the Public Works Department in 1889 as part of this broader program. This scheme included the construction of a number of brick and concrete drains, as well as a series of low level sewage pumping stations constructed to transport waste against gravity by means of a series of rising mains. During the early 20th century an open stormwater channel, and later a below-ground stormwater drain ('under construction' in 1917), passed though the Sydenham Triangle (Figure 2-4). In the 1930s the Sydenham Pit (described below) was constructed to deal with overflow from the system, discharging it into the Cooks River.

Figure 2-4: Detail from the c.1917 Municipality Maps Series. SLNSW.



The draining of the Swamp allowed for industrial businesses to utilise the land that was deemed unsuitable for residential development.[1] Industries included potteries, metal work, quarries, and food manufacturing. Brickmaking was still prominent in the area, with many of the former market farms converting their land to brick pits.[2] The proliferation of the brick business also witnessed the demolition of grand homes, and subdivision of the estates for cheap worker's accommodation was made.

Residential lots from the Smidmore subdivision, in the north-east of the study area, were auctioned in 1906 (Figure 2-7). It is likely that the majority of occupants were employed at the nearby factories and warehouses. The residences associated with the Smidmore subdivision are still present in 1943, prior to demolition in the late 20th century to make way for the present-day warehouses (Figure 2-5).

With the exception of the Smidmore Estate, the study area remained largely industrial in character throughout the early 20th century. By 1910 Marrickville and Sydenham were dominated by iron and woollen works, with residential development continuing in the remaining suitable open areas of land subdivision, mostly for the working class. Dairies were prominent along Edinburgh Road in 1911. Woollen mills, such as Vicars Woollen Mills which was founded in 1893, were located along Victoria Road.[3] James Steel Engineering was established in 1915 on Victoria Road. Malco Industries (formerly Malleable Castings Ltd), started in 1915 on Rich Street. The industry was so important to the people of Marrickville that they held annual exhibitions in the town hall.[4]

[1] Fox 1986, 29; Whitaker 2006, 6.
[2] Meader 2008
[3] Cashman & Meader 1990, 168.
[4] Meader 2008

Figure 2-5: The houses associated with the 1906 Smidmore estate are located between Edinburgh and Murray Streets. NSW Lands and Property Information, SIX Maps.

Figure 2-6: Fraser Park, Sydenham, c. 1947. Source: Marrickville Library & History Services.

Figure 2-7: The Smidmore subdivision, south of Edinburgh Road, is within the study area. NLA image 230293982.

2.1.3 Industrial consolidation

The 1929 Wall Street crash led to many of the industries within Australia, including Marrickville, being affected, with many workers left jobless.[5] Prior to World War Two the industrial area was consolidated in the low lying areas, but new growth began after the founding of new raw materials for iron and steel works.[6] Immigration increased after World War Two with the factories and warehouses providing jobs for unskilled workers with little English and cheaper accommodation.[7]

With increased road transport, industries were not relying as heavily on rail transport, resulting in many of the industries in the Marrickville area moving out cheaper sites. In the 1943s aerial, the study area was a mix of residential and light industry (Figure 2-5). By 1970s many of the larger industries within Marrickville had moved out of the Marrickville area, although smaller industries still continue to the present day.

2.1.3.1 Sydney Steel Company

In 1910, the Sydney Steel Company was established on a 22-acre site to the north of the rail line (within the Sydney Metro Trains Facility South Precinct boundary). This was a vast area of vacant land on the fringe of the city, adjacent to the main rail line and located between Sydenham and St Peters stations. Founded by Scottish migrant Alexander Stuart, the former Premier of NSW and Mayor of the former St Peters Council, the large factory was established on Edinburgh Road in Marrickville and supplied steel fabrication and distribution services to Sydney's expanding construction industry in the decades that followed (Figure 2-8).[8]

Figure 2-8: The main workshop at the Edinburgh Road Marrickville Sydney Steel Company factory, 1911. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

With merchandising of steel having been an important part of the company's business for several decades, the stockyard was originally laid out at the rear of the main Edinburgh Road workshop in 1913 (Figure 2-9 and Figure 2-10). A steam operated crane was installed in this location to move the stock.

[5] Whitaker 2006, 13.
[6] Fox 1986, 30.
[7] Whitaker 2006, 13.
[8] Stuart, W. 2012. *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979*

Figure 2-9: Photograph of the stockyard at the rear of the Sydney Steel Company workshop, taken from the roof of the workshop looking south towards Sydenham Station, c1913. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

Figure 2-10: Photograph of the stockyard at the rear of the Sydney Steel Company workshop, showing steam operated crane, c1913. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

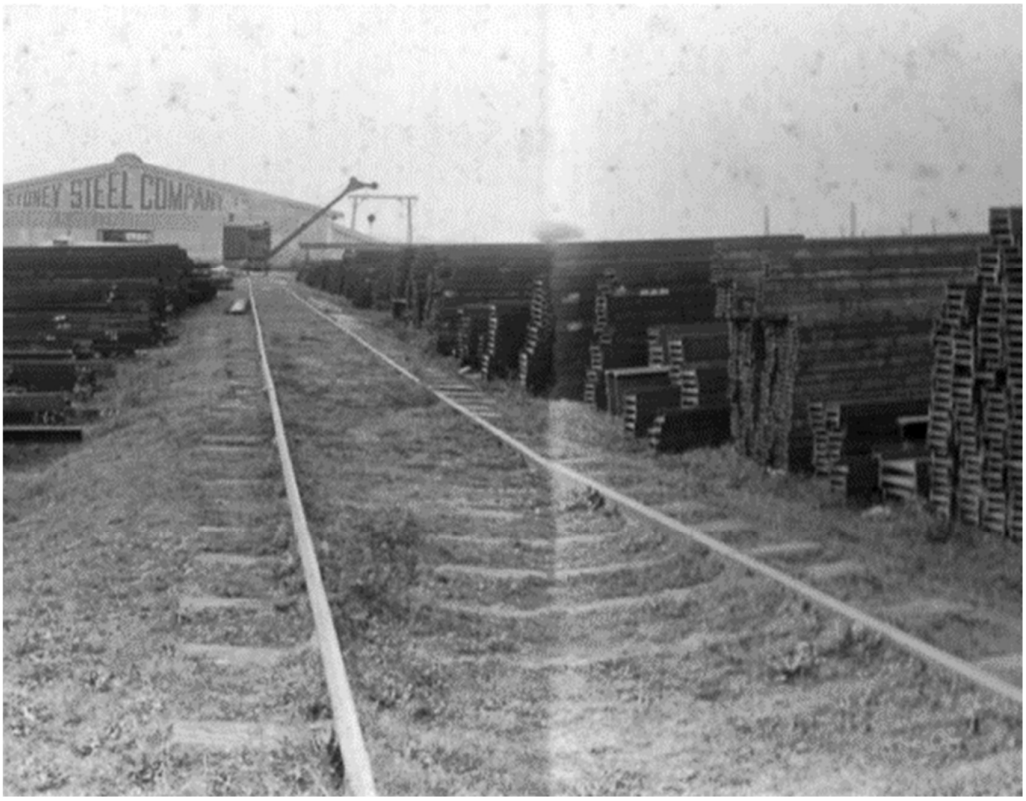


Figure 2-11: View of the Sydney Steel Company, Marrickville in 1919. A 44-tonne girder is seen being transported on a custom-made horse drawn limber to a rail siding near Sydenham Station. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

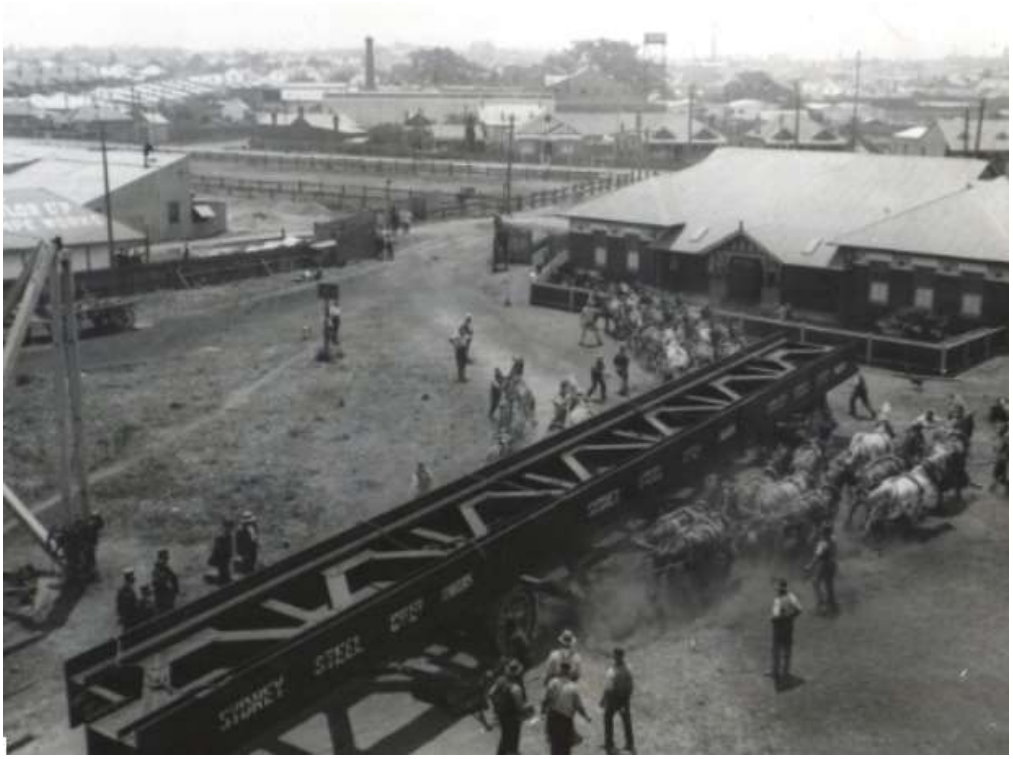


Figure 2-12: Employees at work outside Sydney Steel Company, Marrickville in 1922. The train line can be seen in the background. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

The post-World War II building boom resulted in significant expansion of the fabrication area at Edinburg Road during the 1950s. The stockyard was relocated adjacent to the rail line, where a giant crane was assembled, and additional buildings were constructed on the vacant land. By 1960, half of the 22-acre site had been developed as covered fabrication area. Sydney Steel Company had, by this time, become one of the largest employers in the suburb of Marrickville.

The factory was responsible for producing steel used in the construction of landmark city structures including the Farmers (now Myer) and David Jones department stores, the AWA Building in York Street, the AMP Building at Circular Quay and the Wentworth Hotel in Phillip Street, Sydney Harbour Bridge, and iconic structures like the MA Noble Stand at the Sydney Cricket Ground and the 250 tonne Hammerhead Crane at Garden Island. [9]

Between 1973 and 1975, Sydney Steel Company relocated to the site of a smaller fabricator and reinforcing supplier located at Revesby. Following closure of the Sydney Steel Company at Marrickville, the site was redeveloped. In 1975, the rear of the site (approximately eight acres) was sold, and the remaining portion of the site was subsequently sold in 1976.

Figure 2-13: Photograph of the Sydney Steel Company in Marrickville in 1948. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

[9] Stuart 2012

Figure 2-14: Photograph of the Sydney Steel Company in Marrickville in 1962, showing crane and buildings on land adjacent to railway line. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

2.1.3.2 Sydenham Pit and Drainage Pumping Station

The Sydenham Storage Pit and Pumping Station was designed and built by the New South Wales Public Works Department between 1935 and 1941. The Sydenham Pit and Drainage Pumping Station 1 was constructed during the Great Depression immediately west of the steelworks and east of Garden Street. It remains at the site today and consists of a brick lined drainage pit designed to collect the overflow from stormwater drains in the area. The Eastern Canal is associated with the pit and extends into the study area.

2.1.3.3 Sewage Pumping Station 271

The Sewage Pumping Station 271 was designed and built by the Public Works Department in 1889 as part of a larger program of waste water management within Sydney. The complex consists of a combined boiler house and engine room, a large chimney stack and a residence. The pumping station/boiler house is designed in classic Federation Romanesque style. The residence is an unadorned two storey brick building designed in Federation Queen Anne style and the stack is a local landmark. The station and residence building are in good condition and the fabric is substantially intact. A series of low level sewage pumping stations were constructed to transport waste against gravity by means of a series of rising mains. The low-level portions of Marrickville, Newtown, Erskineville, Alexandria and St Peters are still serviced by a low level sewer which discharges into the wells of Marrickville Pumping Station. The sewage is then pumped to the high level of the Eastern Branch of the Southern and Western Suburbs Ocean Outfall Scheme (SWOOS). Marrickville SPS also receives stormwater discharge from the Central stormwater channel during certain high tides in the Cooks River.

2.1.3.4 Meeks Road substation

Marrickville Railway Substation was designed and built by NSW Government Railways in 1926. It is located facing south on to the Illawarra Line within the Sydenham Triangle. The site is accessed via

an overbridge via Way St to the south. The site includes the substation building, the switch house, transformers and surrounding electrical equipment.

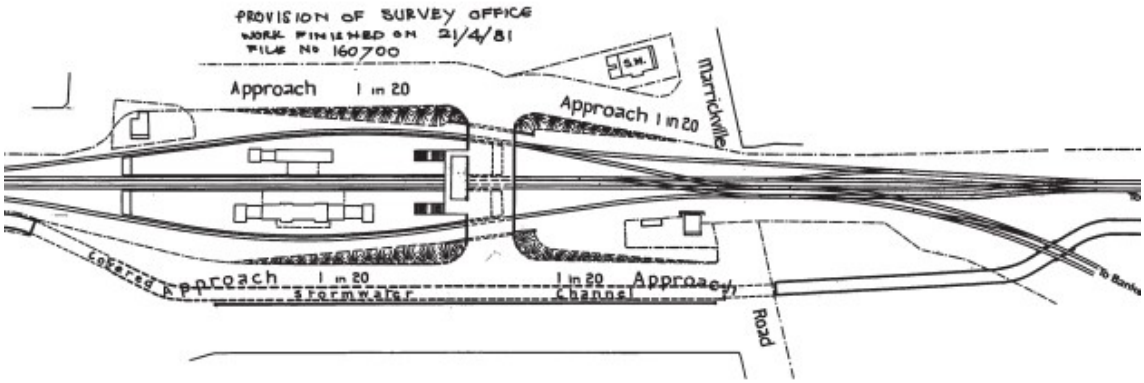
2.1.3.5 Sydenham Railway Station

Sydenham Station, originally named 'Marrickville Station', was constructed on the first section of the Illawarra Railway line in 1884 (Figure 2-16).[10] The station and associated buildings, including the station masters residence, were designed by the NSW Railways Department. The contract for the construction of the station was awarded to William Robinson in 1883.[11]

In 1895, following the construction of the present-day Marrickville Station on Illawarra Road, the station was renamed 'Sydenham'. The station originally comprised of two platforms with impressive and detailed platform buildings (Figure 2-15). The station was originally intended to serve the Marrickville township, but it was distant and surrounded by industrial and rural estates.[12] Consequently, whilst a number of small businesses were established in the area surrounding the station to serve local residents, Sydenham remained relatively underdeveloped in comparison to neighbouring Marrickville.

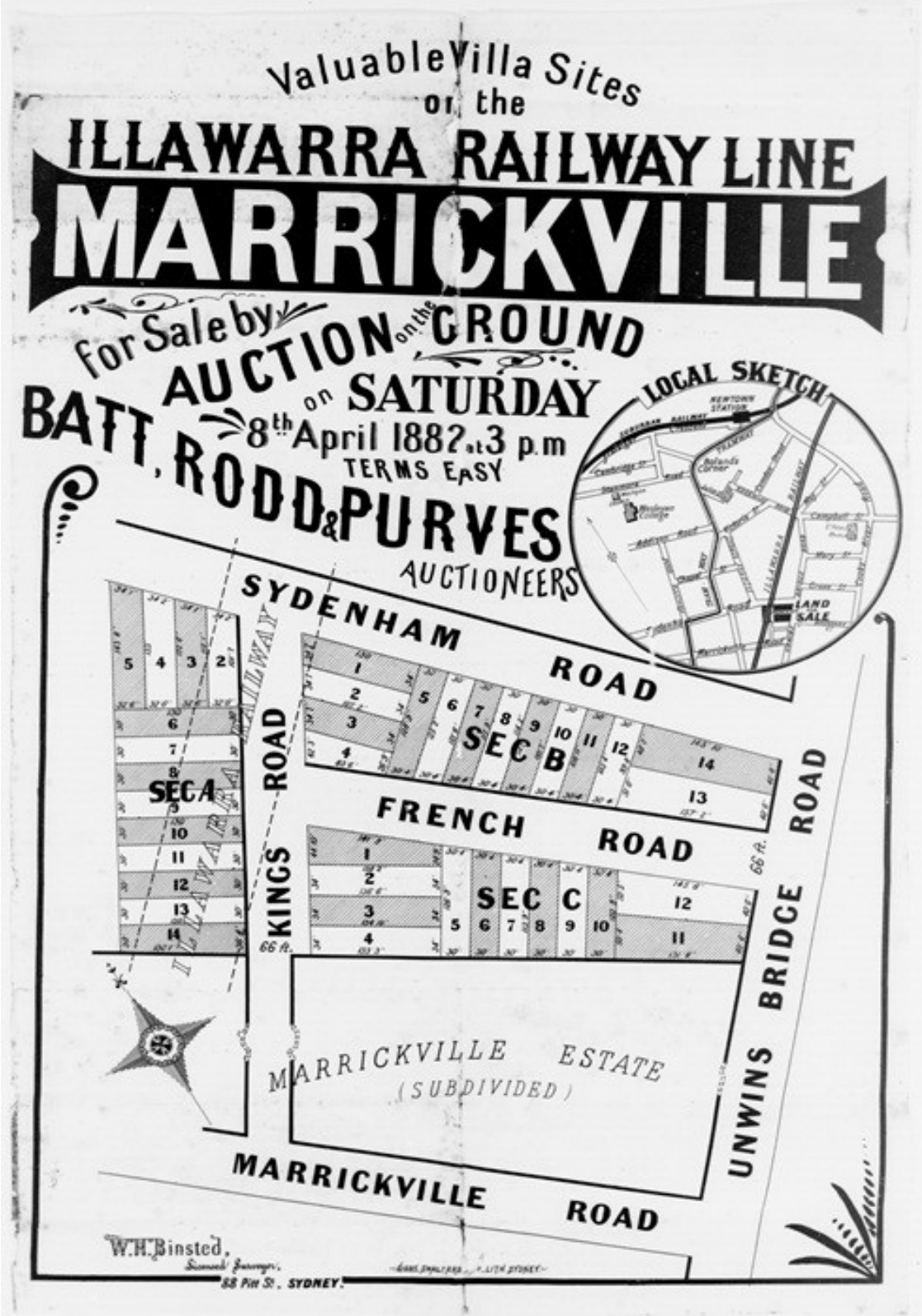
In 1909 the railway line was extended to Bankstown, and the line from Edgeware Road to Sydenham was quadruplicated. This required the extension of the platforms at Sydenham Station. The railway cutting was widened and the original platforms were transformed into island platforms, requiring the construction of an extended footbridge to allow access. The footbridge was constructed by Dorman Long & Co Ltd., the same company that would engineer the Sydney Harbour Bridge.[13] The lines were electrified in 1926.

Figure 2-15: 1881 Plan of Marrickville (Sydenham) Station, showing the platform configuration prior to the construction of the Bankstown line. Source: State Records NSW, images 17420_a014_a014_a014000815.



[10] State Heritage Inventory 'Sydenham Railway Station Group', NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 19 June 2016.
[11] Australian Town and Country Journal, 15 September 1883. Accessed via TROVE, 29 June 2016.
[12] State Heritage Inventory 'Sydenham Railway Station Group', NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 19 June 2016.
[13] *Ibid*.

Figure 2-16: Subdivision plan from 1882 indicating the location of the proposed Illawarra Railway corridor. Source: Marrickville Library & History Services.



3.0 ARCHAEOLOGICAL ASSESSMENT

3.1 Previous studies

David Scobie Architects Pty Ltd 2012. *Sydenham Railway Station. Heritage Impact Statement.* Prepared for Arenco (NSW) Pty Ltd.

A TAP upgrade of the station was conducted in 2012 with the removal of the 1980s overhead booking office and footbridge and provision of a new concourse, new lifts and stairs; new canopy structure; and new station building at overbridge level.

Sydney Water 2004. *Sydenham Pit & Drainage Pumping Station 1. Draft Conservation Management Plan.* Prepared for Sydney Water.

The CMP was commissioned by Sydney Water to provide a conservation and management framework for Sydenham Pit and DPS No.1. The report provides a contextual history of Sydney Water and the legislative background to the management of heritage assets, as well as an assessment of significance and conservation policies specific to the site. The CMP was consulted to understand the elements that constitute the significance of the site and how these would be affected by the project. The project was assessed against the relevant conservation policies of the CMP. The CMP is a draft report which was not endorsed by the Heritage Council.

The CMP did not identify archaeological potential for the item.

> *Historical evidence suggests that the site was probably once used for crop growing or livestock grazing purposes. The land was resumed from Sydney Steel Co. to make way for the construction of the pit. As the land was excavated, to make way for Sydenham Pit, it is unlikely that the area would contain potential historical archaeology. There is a potential that the site contains evidence of the construction activities for the pit; i.e. tools, materials, but if this existed it would be most likely contained beneath the Pit base and walls. (Page 77)*

Sydney Water 2005. Sewage Pumping Station SP0271. Conservation Management Plan. Prepared for Sydney Water.

The CMP was commissioned by Sydney Water to provide a conservation and management framework for the Sewage Pumping Station SP0271. The CMP outlines the history of the site and identifies the item as having historical and aesthetic significance as a landmark item with important architectural values. No archaeological values are identified. The CMP was endorsed by the Heritage Council in 2005 with an expiry of 2010.

The CMP did not identify archaeological potential for the item.

> *There is no evidence to suggest the likelihood of any physical remains of any other activity than these typical uses of the item and the site. There is thus only a limited potential for the survival of historical archaeological remains ('relics', under the NSW Heritage Act 1977). Any surviving remains are likely to be fragmentary and disturbed by later uses and services in this area of the site. Their potential to provide additional information regarding the history of the site is likely to be limited. (Page 82)*

3.2 Land use summary

The historical development of the study area can be divided into the following phases of activity:

- Phase 1 (1799 – 1840s) early land grants: Gumbramorra Swamp, large residential estates, farms and rural retreats.
- Phase 2 (1840s – 1880) scattered residential and industrial settlement: Swamp Road (now Sydenham Road) established, farms, brickmakers and stockmen utilise swamp.
- Phase 3 (1880 – 1909) arrival of the tramway, railway, residential subdivisions and scattered industrial settlement: Establishment of the Smidmore Estate, Gumbramorra Swamp systematically drained, railway arrives in 1895.
- Phase 4 (1909 – present) rail line extension, Sydenham Pit and Pumping Station and associated drainage channels, Meeks Road substation, Sewage Pumping Station SP0271 and Sydney Steel Company established, line from Edgeware Road to Sydenham quadruplicated, railway cutting widened.

Construction of the railway station and rail line in the late nineteenth and early twentieth century would have included a considerable amount of ground disturbance and excavation. Rail corridor upgrades throughout the twentieth century and the construction of the Sydenham Pit and Pumping Station and surrounding warehouses would have resulted in high levels of subsurface impacts throughout the area.

3.3 Potential archaeological remains

3.3.1 Phase 1 (1788 – 1840s)

There is no evidence of structures located within the study area during this phase. Archaeological remains associated with early agricultural land use near marginal swamp land may include tree boles, field drains, fence line postholes, imported garden soils and isolated refuse deposits/rubbish pits. The likelihood of remains from this period surviving is low.

3.3.2 Phase 2 (1840s – 1880s)

There is no documentary evidence of specific industrial activities taking place within the study area during this phase. Structures associated with King's Garden, in the south-west of the study area, were located further south, on Unwin's Bridge Road. Archaeological remains associated with grazing and land drainage, such as fence line postholes, drainage channels, land fill, and isolated artefacts from this phase, if present, are likely to have been disturbed by later construction works. The likelihood of remains from this period surviving is low.

3.3.3 Phase 3 (1880s – 1909)

There is low to moderate potential for archaeological remains associated with the early phase of railway infrastructure such as ceramic and wooden service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track to be located within the rail corridor on the south eastern side of the study area.

The study area has low-moderate potential to contain archaeological remains associated with the draining of the swampland commencing in the late 19th century. Evidence of this drainage scheme may include subsurface brick, concrete and terracotta drains and former land-drains (likely concrete or similar). As these drains continued to be used into the 20th century (and may possible still be in use), they are unlikely to contain intact soil deposits with research potential. There is low potential that artefactual remains associated with the construction of the drainage system remain within the drain cuts and backfilled soils.

3.3.4 Phase 4 (1909 – present)

Archaeological remains associated with rail line upgrades such as utilities and drainage may be present but as the rail line has undergone maintenance and upgrades, any remains are likely to be fragmentary and no longer in situ.

The location of the Sydney Steel Company and yards have been subject to development of warehouses and infrastructure since its decommissioning. Manufacturing would have largely occurred in the factory itself which was constructed on a slab. It is therefore unlikely evidence of the manufacturing process or workers would remain. Archaeological remains in the yard section of the factory are likely to have been impacted by previous development, and would largely have consisted of incidental remains such as offcuts which may not have survived. There is a low potential that remains of crane footings, the steam crane tracks in the rear yard, or footings of other structures may remain beneath the existing warehouse slabs. The steam crane track was elevated on fill therefore it is probable it was removed during levelling in preparation for the construction of existing warehouses.. Any remains are more likely to be in the northern section of the Sydney Steel Company site as the southern section vacant until around 1950 and was not the focus of the operation.

There is moderate evidence that remains associated with the former Smidmore Estate may remain in the north-eastern portion of the study area, below the present-day warehouses. Remains are likely to be typical of those associated with early to mid-20th century residential development, including brick and concrete footings and remnant floor treatments. Artefacts and occupation deposits are rarely found in structures of this date. There is some potential for rubbish pits and other domestic refuse deposits (yard scatters, outhouses) to be located in the rear yards of the properties. This potential, however, is low, due to the introduction of municipal rubbish collection and sewage services in the 1880s.

3.4 Summary of archaeological potential

Previous assessments have provided historic context and a description of archaeological potential in the study area. A summary of the archaeological potential and significance of those remains is provided in Table 3-1.

Table 3-1: Summary of potential archaeological resources and significance

Phase	Likely archaeological remains	Potential
1 (1788 – 1840s)	• No documentary evidence of specific activities or development with the site • Archaeological remains associated with low intensity land use associated with early agricultural use may include tree boles, field drains, fence line postholes, imported garden soils and isolated artefact scatters.	Nil-low

Phase	Likely archaeological remains	Potential
2 (1840s – 1880s)	• No documentary evidence of specific industrial activities within the site • Archaeological remains associated with low intensity land use associated with early agricultural use may include tree boles, field drains, fence line postholes, imported garden soils and isolated artefact scatters.	Nil-low
3 (1880s – 1909)	• Archaeological remains associated with the early phase of railway infrastructure and the development of Sydenham Station, such as ceramic and wooden service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track • Archaeological remains associated with the late 1890s drainage program including drainage associated with the SWOSS and Marrickville Sewerage Pumping Station may include subsurface brick, concrete and terracotta drains and former land-drains. Low potential for artefactual remains.	Low-moderate
4 (1909 – present)	• Archaeological remains associated with rail line upgrades such as utilities and drainage and structural remains associated with former warehouses • Low potential for remains associated with the Sydney Steel Company, such as building and/or crane footings, steam crane and line, offcuts, refuse from manufacturing processes. These would most likely be present on the northern section of the former Sydney Steel Company site. • Remains associated with the Smidmore Estate residential subdivision may include footings. Low potential for artefactual remains. These remains are unlikely to reach the threshold of local significance.	Low-Moderate

3.5 Archaeological significance

The previous reporting provided the following assessment of significance for the archaeology of the study area:

Table 3-2: Assessment of archaeological significance for Sydney Metro Trains Facility South Precinct

Criteria	Discussion
Research potential	• It is highly unlikely that archaeological remains associated with Phase 1 and Phase 2 would be present within the site and they are unlikely to have research potential • Potential archaeological remains associated with the Sydney Steel Company site may give insight into early 20th century industrial development, manufacturing techniques and structural layouts. Archaeological remains associated with Phase 4 may have local significance under this criterion.
Association with individuals, events or groups of historical importance	• The development of the rail network facilitated economic development and suburban growth in Sydney in the latter half of the nineteenth and early twentieth centuries. The Illawarra line was constructed in 1881 and was extended to accommodate the Bankstown line between (1895-1939). The potential Phase 3 archaeological remains are associated with the historical development of the Illawarra and Bankstown rail lines • The potential archaeological Phase 4 remains associated with the Sydney Steel Company site are associated with Alexander Stuart, who was a Scottish-born merchant and politician who became Premier of New South Wales in 1883. The factory produced steel for the Sydney Harbour Bridge, numerous landmark buildings in Sydney and iconic structures including the Garden Island

Criteria	Discussion
	Hammerhead Crane. It was also one of the first major factories constructed after the Gumbramorra Swamp was drained. Archaeological remains associated with Phases 3 and 4 may have local significance under this criterion.
Aesthetic or technical significance	• The potential archaeological remains from Phase 1 and 2 are not likely to have aesthetic value • The remains of Phase 3 former rail infrastructure may demonstrate changes in technology and rail engineering over time. However, they are not expected to demonstrate technical significance • Evidence of the Phase 3 swamp drainage, and associated works, would have technical significance • Any remains of Phase 4 steel works structures and rail infrastructure may demonstrate changes in technology and rail engineering over time. Archaeological remains associated with Phases 3 and 4 may have local significance under this criterion.
Ability to demonstrate the past through archaeological remains	• The potential archaeological remains are not considered to have the ability to illustrate the historical development of the surrounding area.

4.0 ARCHAEOLOGICAL MANAGEMENT

4.1 Summary of Archaeological Impacts and Management

A summary of impacts and the recommended archaeological management strategies are show in Table 4-1.

Table 4-1: Archaeological impacts and management strategies in the study area

Potential archaeological resource	Significance	Archaeological potential	Proposed impact	Archaeological Management
Phase 1 (1788 – 1840s)	Unlikely to reach threshold of local significance	Nil-Low	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 2 (1840s – 1880s)	Unlikely to reach threshold of local significance	Nil-Low	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 3 (1880s – 1909)	Local (Development of the railway and swamp drainage)	Low- Moderate	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 4 (1909 – present)	Local (Sydney Steel Company)	Low – moderate for rail line and Smidmore Estate, low for Sydney Steel Company	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure

4.2 Research Design

4.2.1 Historic themes

Historical themes are a way of describing important processes or activities which have significantly contributed to Australian history. Historical themes are described at a national and state level. The Heritage Council of NSW has prepared a list of state historic themes relevant to the demographic, economic and cultural development of the state (Heritage Council 2006). The use of these themes provides historical context in order to allow archaeological items to be understood in a wider historical context.

Table 4-2: Historic themes for study area

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Agriculture	Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes, can include aquaculture	The acquisition and use of the land by Thomas Moore and later Dr Robert Wardell was notable in the early history of Sydney for its size.
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	The Sydney Steel company was associated with Alexander Stuart, the former Premier of NSW and Mayor of the former St Peters Council. The company was responsible for producing steel used in the construction of the Sydney Dental Hospital, the Sydney Morning Herald building, Qantas building, Sydney harbour Bridge, and Sydney Cricket Ground.
3. Developing local, regional and national economies	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	The corridor which the study area partially encroaches into has been a rail corridor since 1881 and undergone periodic improvements.
4. Building settlements, towns and cities	Utilities	Activities associated with the provision of services, especially on a communal basis	The study are contains Sydenham Pit, which is an item of State significance with high technical values.
9. Marking the phases of life	Persons	Activities of, and associations with, identifiable individuals, families and communal groups	The study area sits partly on land owned and exploited by Thomas Moore, Dr Robert Wardell, and Alexander Stuart.

4.2.2 Research questions

Archaeological resources within the study area have the potential to answer a number of research questions. Additional research questions may be added if the archaeological resource allows for further, or more in-depth, investigation. The following research questions have been provided to guide the archaeological investigative program.

- Is there remaining evidence of land use practices associated with early 18th century farming on the edges of marginal swamps and if so, how is this expressed in the archaeological record?
- Are any expressions of early rural use similar to, or noticeably different from other similar sites near Sydney?
- Were the smaller rural holdings on the edges of Moore's land occupied by their owners, such as John Fincham or James Waine?
- Are the industrial process of the Sydney Steel Company interpretable within the archaeological record?

- Can the spatial layout of the Sydney Steel Company's operations be discerned within the archaeological record?
- Are successive phases of railway development present within the archaeological record?
- If successive phases of railway development are present in the archaeological record, are they able to provide insight into changing rail technology or utilisation of utilities associated with rail corridors in Sydney?

4.3 Archaeological Management

The study area would be managed under the Metro Unexpected Finds Procedure.

There is a nil-low potential for remains associated with Phases 1 and 2 (low intensity land use and development) to be impacted. If remains exist their location is not predictable, therefore the unexpected finds procedure is appropriate and in adherence to the archaeological management framework outlined in the project ARD (Artefact 2016b).

There is a low-moderate potential for remains associated with the infill of the Gumbramorra Swamp and construction of the early rail line to be impacted by the project. As the location of any intact deposits from Phase 3 is difficult to predict, and remains are likely to be dispersed the unexpected finds procedure is appropriate and in adherence to the archaeological management framework outlined in the project ARD (Artefact 2016b).

There is a low-moderate potential that Phase 4 remains associated with the development of the rail line and Smidmore Estate would be located within the modification area. It is unlikely these remains would reach the threshold of local significance. There is a low potential that locally significant remains of the Sydney Steel Company would be present. The archaeological management framework outlined in the project ARD states that areas with low potential for locally significant archaeology would be managed under the unexpected finds procedure.

4.3.1 Unexpected Finds Procedure

Unexpected archaeological finds would be managed under the Sydney Metro Unexpected Heritage Finds Procedure.

4.3.2 Heritage induction

Archaeological heritage would be included in the general project induction for all personnel. At a minimum, this would include an overview of the projects obligations and archaeological management requirements, the role of the archaeological team and the unexpected finds procedure.

4.3.3 Further archaeological investigation

If significant archaeological remains are identified as an unexpected find, an Archaeological Work Method Statement (AMS) would be prepared and recommendations would be made on appropriate archaeological management.

The project ARD (Artefact 2016b) outlines the appropriate methodology for archaeological investigation and reporting. This methodology would be followed under the modification.

4.3.4 Excavation director

Archaeological investigations would be managed by a suitably qualified Excavation Director with experience in the historical archaeology of Sydney and identification. The Excavation Director should meet the NSW Heritage Division criteria for locally significant archaeological sites.

5.0 REFERENCES

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Appendix 3: Cover Page

Community Notification.

Appendix 4: Cover Page

Environmental Representative Supporting Letter.