Thursday, 2 June 2022

Mr Mick Cassel
Secretary
Department of Planning, Industry and Environment
Locked Bag 5022
PARRAMATTA NSW 2124

Dear Mr Cassel,

Re: SSI-8583 Powering Sydney's Future (PSF) – Condition D2 – EMS substitute for OEMP

Provision of additional information

We thank you for your response to Transgrid's request to use our Environmental Management System (EMS) in place of an Operational Environmental Plan (OEMP), dated 15 March 2022. This letter will provide information on how Transgrid actively manages the cables and associated infrastructure already under operation. We provide further detail about how our EMS guides the operational activities, including how it operates and who is responsible, and the procedures employed to ensure ongoing compliance.

This letter summarises conditions of operation and how these will be managed by Transgrid (Appendix D). It highlights risks and mitigation strategies occurring during operation, as noted in the EIS and Response to Submissions. Specific references have been supplied to our EMS' documents, policies and procedures that will be used to ensure ongoing compliance.

Transgrid has held an accredited Environmental Management System since 1996. As part of our license conditions [under section 93A of the *Electricity Supply Act 1995* (NSW)], Transgrid is required to operate and maintain an EMS. Our operating license extends for a further 95 years – guaranteeing the ongoing environmental protections that are already in place. The operating systems and procedures arising from our EMS are well established in the business, and continue to be refined and improved.

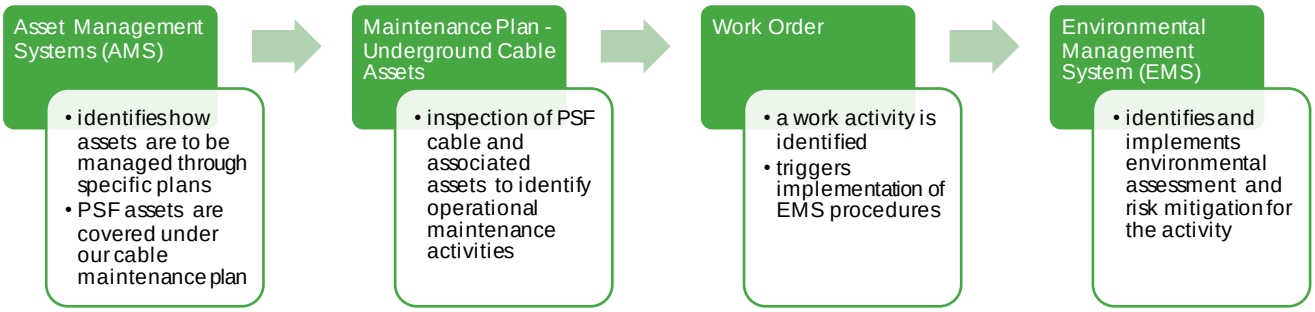

Figure 1: Overview of the connection between Asset Management System and Environmental Management System.

1. Our Asset Management System

Transgrid also maintains an accredited Asset Management System (AMS). In relation to cables, Transgrid successfully manages six major assets spanning over 100 km in length, all of which are located within the Sydney Metropolitan area. Our AMS and EMS work together to provide network reliability and environmental protections (Figure 1).

1.1. Maintenance of underground and associated assets

Our ***Maintenance Plan – Underground Cable Assets*** is a regularly updated document for the preventative maintenance of high voltage underground power cables and associated plant, and includes PSF assets (see Figure 2). Maintenance includes not only the direct assets, but also associated infrastructure such as tunnels, bridges and roadways (see Figure 3). The implementation of the inspection and maintenance practices specified in this plan fulfils Transgrid's regulatory obligations, and promotes the attainment of reliability and safety objectives.

Our regular inspection of cable assets ensures early identification of any preventative or maintenance requirements. Any issues identified through inspections go into our Asset Inspection Manager tool, with automated defects being raised for rectification. At this stage, our EMS is triggered to ensure that an appropriate level of environmental assessment is undertaken. In such a way, all ongoing PSF cable operation activities are subject to the requirements of our Environmental Management System.

Asset Section	Description	Frequency
	End of Defects liability checks	Prior to end of defects liability
Cable 46 and Tie (Placeholder only)	**Cable route patrol and inspections**	
	Route Patrol	Weekly
	Cable maintenance and tests	
	Outer sheath test	End of DLP tests then 3 yearly
	Pit Maintenance	End of DLP tests then 3 yearly
	Sealing End Minor Maintenance	Annually
	Sealing End Major Maintenance	End of DLP tests then 3 yearly
	End of Defects liability checks	Prior to end of defects liability
	Bedwin Rd Rail bridge survey	End of DLP
	Bedwin Road and Muir Road Level 2 Bridge inspections	End of DLP then 5 Yearly
SYS 26F Tie Cable (Placeholder only)	Outer sheath test	End of DLP tests then 4 yearly
	Sealing End Minor Maintenance	Annually
	Sealing End Major Maintenance	End of DLP tests then 4 yearly
	End of Defects liability checks	Prior to end of defects liability

Figure 2: Excerpt from Maintenance Plan demonstrating types of checks and frequency

Transgrid

Contents

Figure 3: Table of Contents, taken from Maintenance Plan - Underground Cable Assets (rev 26/11/21).

2. Background of the EMS

Transgrid's EMS is certified under the international standard, ISO 14001:2016. The EMS has been designed to meet the commitments of its environment policy by identifying and assessing environmental risks, and where reasonable and practicable, implementing controls to avoid or limit these risks. Our re-accreditation was awarded in March 2021 and the certificate is provided as Appendix A.

Transgrid's approach to improved environmental management rests significantly with its staff members. A focus on staff training and authorisation that provides staff with skills in the areas of environmental assessment and environmental protection have resulted in a range of checks and balances aimed at protecting the environment in which we operate.

TransGrid has adopted the 'Three Lines model' to ensure there are clearly defined risk ownership responsibilities within functionally independent levels of advice, oversight and independent assurance. Each of these lines has a distinct role in Transgrid's governance and oversight.

1. *First Line – Risk Owners.* The first line comprises those roles which are directly aligned with the delivery of projects, products and services as well as those providing support functions. These roles are responsible for managing risks in accordance with the Environmental Assessment Framework (EAF). A key responsibility of the first line is to direct the implementation of and ensure compliance with, the policies and procedures set out by Transgrid.
2. *Second Line – Advise, Review and Challenge*. The second line comprises of numerous specialist functions within Transgrid who perform risk management. The Risk and Insurance function's second line role is to ensure the implementation of the EAF and Project Risk Management Procedure throughout Transgrid and to provide assurance to Executive Management regarding the effectiveness of risk management activities.
3. *Third Line - Independent Assurance.* The third line is set by the Executive / Board to satisfy themselves, from a fully independent perspective, that the organisation will deliver against corporate / project objectives. The third line of defence is achieved through regular internal and external audits.

3. Implementation of the EMS

The EMS identifies the key steps of plan, do, check and act; and our procedures to maintain our network support this.

3.1. Planning and undertaking works

Transgrid recognizes that the failure of an employee or a contractor to adhere to the conditions of approval, legislative requirements or environmental assessment requirements (e.g. CEMP and associated sub-plans) during network maintenance activities is a significant environmental risk to us.

To support the EMS, Transgrid has developed an Environmental Assessment Framework (EAF) to streamline the way we assess our activities. The EAF is designed to ensure that Transgrid actions go through a risk review process prior to carrying out any work, and that the assessment is undertaken in line

with current legislation and best practice. A snapshot of our procedure is provided as Figure 5 (also see Appendix B).

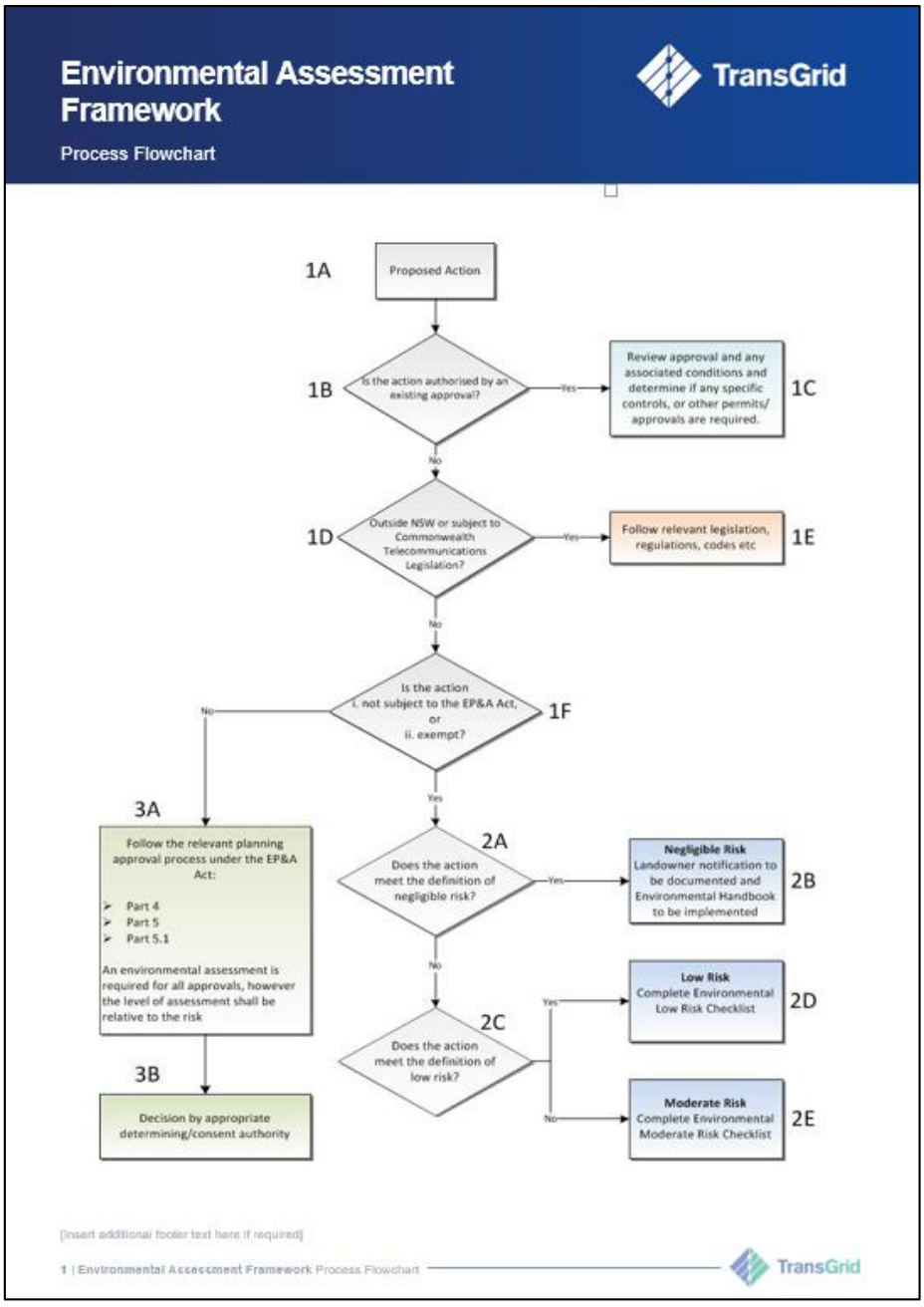

Figure 4: Our Environmental Assessment Framework identifies the correct level of assessment.

Under the EAF:

- All construction and operational activities are appropriately assessed to identify environmental risks; and
- Mitigation measures to eliminate or minimize risks are put in place *before* works are started.
- Work teams are provided with clear instruction on environmental constraints.

Our environmental practises on site are set out in an Environmental Handbook – an easily accessible and informative document that includes mitigation measures (Figure 5). This Handbook applies to Transgrid workers and contractors involved in the construction and maintenance of our network. It specifies the minimum environmental controls for all construction and maintenance work on Transgrid's network (Figure 6), although additional project specific controls may be identified during the assessment phase. This Handbook applies to all construction and maintenance work and must be available on site.

Figure 5: Table of Contents from our Environmental Handbook (attached separately).

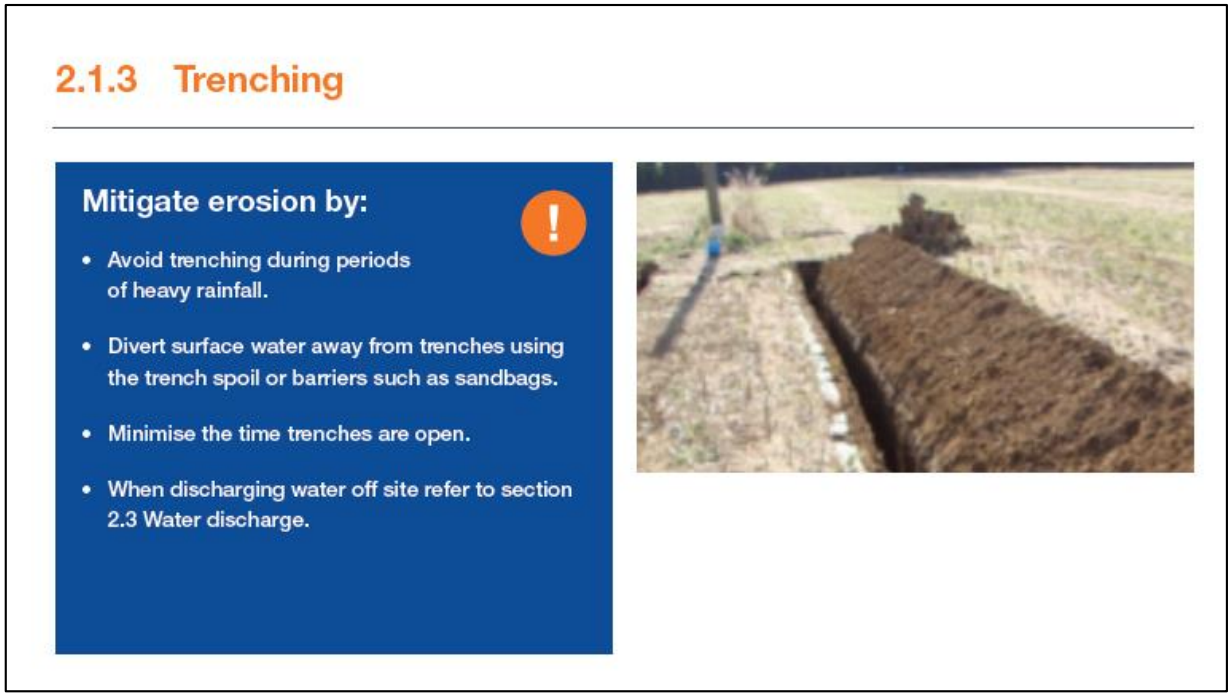

Figure 6: The Environmental Handbook includes specific environmental controls and procedures that cover our routine activities.

3.2. Checking and auditing of controls

Our Three Lines Model assigns our *Line One* staff the responsibility for ensuring compliance with required environmental controls. Review of documentation and on-site activities are undertaken by our specialist staff within Transgrid (an example of substation excavation works audit provided below as Figure 7). Where specialist advice is required we work with specialist third parties, such as in noise and vibration management, or erosion and sediment control.

Our *Line One* staff are empowered to stop works and issue work directions. Audit results are recorded and any resulting actions required are communicated through the business and to the work teams. Where a corrective action is required, this is formally notified to the work crew and follow-up by Line One staff is undertaken until successful resolution.

1 Environmental Management

1.1 Are Environmental Plans current and on site?	Yes

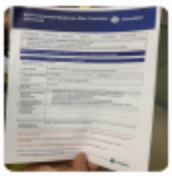

Photo 1

1.2 Are workers and visitors inducted into site environmental conditions and sensitivities?	Yes

Evidence of inclusion of relevant environment conditions in pre-start documents.

Photo 2

1.3 Are there any hot works and are relevant procedures being adhered to?	Not Applicable
1.4 Are the project Environmental Inspections up to date?	Yes
1.5 Have environmental incidents been managed appropriately?	Not Applicable
1.6 Have any outstanding action items from last inspection been resolved?	Not Applicable

2 Soil and Water Management

2.1 Are there any ground disturbing activities that require erosion and sediment control measures as per relevant plans/documents or the "Blue Book" Vol 2C - Unsealed Roads? This includes construction pads, tracks, crossings, etc.	Yes
2.1.1 Are there endorsed site plans for access tracks, benches or crossings on site?	Not Applicable

Minor excavations only.

2.1.2 Is clean water being diverted around disturbed areas?	Yes
2.1.3 Is dirty water adequately captured/filtered before leaving site?	Yes
2.1.4 Has dewatering been undertaken in accordance with relevant plans and legislation?	Yes
2.1.5 Is soil being stockpiled appropriately?	Yes

Stockpile area visually inspected, plastic-covered and sediment fence installed.

2.1.6 Are disturbed areas stable with relevant controls in place?	Not Applicable

Figure 7: Auditing of worksites is undertaken by our Line One staff.

3.3. Revision of controls and continual improvement

Our EMS is a live document that undergoes continual improvement based on our actual activities. Audit results are shared within Transgrid to (i) share both positive lessons learned and areas for improvement (refer Figure 8); and (ii) determine trends. This information is used to ensure the on-going effectiveness of our EMS and whether improvements or changes to our processes and procedures are required. Trend analysis and changes to our EMS are carried out by our *Line Two* and then *Line Three* staff.

Positive HSE Notice

Date: 10 March 2022

Exemplary wet weather controls - Powering Sydney Future Project

On the weekend of 5-6 March 2022, the Powering Sydney Future Project (PSF) team undertook a complex installation operation to connect a new 132kV bay at Sydney South Substation. This required 2 transformers to be placed out of service.

Consistent with the ongoing extreme weather conditions impacting eastern parts of NSW, Metropolitan Sydney has experienced unprecedented rainfall and flooding, making working conditions incredibly challenging.

The project team met with their Delivery Partner (Zinfra) and carefully planned the job, discussing the many risks, including the weather and multiple plant and vehicle movements on site.

Being proactive and learning from past events involving mobile plant in wet conditions, the team did a thorough and coordinated review of their work methods and critical risk controls around mobile plant.

Thinking outside the box, the team implemented additional wet weather controls by installing anti-slip mats for the full access path of the Elevating Work Platforms (EWP) and Franna Crane.

Good planning, positive communication and great collaboration between Transgrid and Zinfra ensured the work was completed safely.

Congratulations to all involved!

This is a great example of 'Citizenship' culture mindset, where we take ownership for safety and learn from past experiences to ensure future safe outcomes.

What do you need to do?

> Share this positive message with our people and delivery partners and reflect on the safety excellence that has been delivered by this team.

Stay safe for your most important people things or future plans.

1 | **Positive HSE Notice** | Exemplary wet weather controls

Figure 8: HSE Notices are distributed to continually improve our work practises.

4. Conclusion

Transgrid operates an accredited Environmental Management System that covers all activities related to the ongoing operation of the PSF cable and associated infrastructure. Transgrid is obliged to maintain an EMS while operating the network, ensuring ongoing accreditation. Any activities arising from the ongoing operation of the PSF cable must necessarily be in accordance with our EMS.

Our EMS includes a robust plan, do, check and act model that identifies risks, mitigates against these, and monitors and adapts to results. It has clear lines of responsibility and is adopted top-to-bottom by Transgrid staff and contractors.

Transgrid has successfully managed and operated cables across Sydney and NSW and is confident in its ability to manage the PSF cable under its EMS. We thank you for your continued consideration of our request in this regard.

Should you require any further information please don't hesitate to call or email.

Sincerely,

Luke Fania

Environment Manager | People Culture and Safety

Transgrid | 200 Old Wallgrove Road, Wallgrove, NSW, 2766

T: (02) 9620 0196 **M:** 0400 370 140

E: Luke.Fania@transgrid.com.au **W:** www.transgrid.com.au

Appendix A: External accreditation of Transgrid's EMS

global-mark®

Certificate of Approval

This certificate confirms that the company below complies with the following standard:

Company Name	**TransGrid**
Company Other Name	**The Trustee for the NSW Electricity Networks Operations Trust**
Client ID	**104848**
Scheme	**Environmental Management Systems Scheme**
Certification Standard	**AS/NZS ISO 14001-2016: Environmental management systems - Requirements with guidance for use**
Scope of Certification	**Engineering services, planning, design, specification, construction, procurement, contract administration, and project management associated with management development, commissioning, operations and security, and maintenance of interconnected high voltage transmission systems having a maximum nominal supply of 500kV.**
Type of Certification	**Management System**

CERTIFICATE DATES:

Original / Initial	16/11/2017	*Last Certificate update*	3/03/2021
Certification / Re Certification	13/01/2021	*Expiry*	12/02/2024
Last Certification Decision	3/01/2021		

Please refer to Page 2 for Approved Sites

The use of the Accreditation Mark indicates accreditation by the Joint Accreditation System of Australia and New Zealand in respect to those activities covered by JAS-ANZ accreditation. Refer to www.jas-anz.org/register for verification. This certification remains valid until the above mentioned expiry date and subject to the organisation's continued compliance with the certification standard, and Global-Mark's Terms and Conditions. This Certificate of Approval remains the property of Global-Mark Pty Ltd, Company Number: ACN 108-087-654

Certification Manager

Unique Certificate Code: 974B670CBD07E851CA25868C005D60D4

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JAS-ANZ

IAF

- continued from Page 1

APPROVED COMPANY / SITE ADDRESS (ES):

180 Thomas Street Sydney NSW 2000 Australia
Old Wallgrove Road Horsley Park NSW 2164 Australia
McLachlan Street Orange NSW 2800 Australia
Goonoo Goonoo Road South Tamworth NSW 2340 Australia
Copeland Street Wagga Wagga NSW 2650 Australia
Wirra Crescent Waratah West NSW 2298 Australia
Perry Street Yass NSW 2582 Australia

Certification Manager

Appendix B: Environmental Assessment Framework Process

9: Table of Contents – taken from Environmental Assessment Framework Procedure (rev 4/6/20)

Appendix C: Environmental Controlled Documents

2. Environmental Controlled Documents

Procedure	Work Instruction	Form/Guidance Notes
Aboriginal Heritage Due Diligence Assessment		
Authorisation to Work		
Biosecurity		Biosecurity Form Environmental Guidance Note - Biosecurity Environmental Guidance Note - Biosecurity - Alligator Weed Environmental Guidance Note - Biosecurity - Bitou Bush Environmental Guidance Note - Biosecurity - Tropical Soda Apple Environmental Guidance Note - Biosecurity - Water Hyacinth
Contaminated Land Management		
Ecological Due Diligence Assessment		
Environmental Assessment Framework	Preparation and Approval of Environmental Checklists Access to Transmission Line Easements and Special Areas – Work Instruction MMS-TLC-WIN-111	**Forms** Environmental Low Risk Checklist Environmental Moderate Risk Checklist (General) Environmental Moderate Risk Checklist (Vegetation Maintenance) Environmental Moderate Risk Checklist (Water Crossing) Oil PCB Management Form Out of Hours (OOH) Work Request Environmental Geotechnical Investigation Checklist **Environmental Guidance Notes** Environmental Guidance Note - Access and Work Mandatory Environmental Controls

		Environmental_Guidance_Note_-_Acid_Sulphate_Soils Environmental_Guidance_Note_-_Biosecurity_-_Alligator_Weed Environmental_Guidance_Note_-_Biosecurity_-_Bitou_Bush Environmental_Guidance_Note_-_Biosecurity_-_Tropical_Soda_Apple Environmental_Guidance_Note_-_Biosecurity_-_Water_Hyacinth Environmental_Guidance_Note_-_Biosecurity Environmental_Guidance_Note_-_Bird_Nest_Removal Environmental_Guidance_Note_-_Construction_Noise Environmental_Guidance_Note_-_Easement_Environmental_Aspects Environmental_Guidance_Note_-_Excavation_and_Machine_Work Environmental_Guidance_Note_-_Flora_Fauna,_Ecological_Communities_and_Sensitive_Habitats Environmental_Guidance_Note_-_Habitat_Trees Environmental_Guidance_Note_-_Heritage Environmental_Guidance_Note_-_LiDAR_Processes Environmental_Guidance_Note_-_Minor_Civil_Works_-_Dewatering Environmental_Guidance_Note_-_Minor_Civil_Works_-_Erosion_and_Sediment_Control Environmental_Guidance_Note_-_Mulching_and_Slashing Environmental_Guidance_Note_-_Naturally_Occurring_Asbestos Environmental_Guidance_Note_-_Protected_Land Environmental_Guidance_Note_-_Regulated_Land Environmental_Guidance_Note_-_Working_near_Watercourses
HSE_Objectives		
HSE_Risks_and_Opportunities		

Hot Work and Fire Risk Work		Hot Work Permit Hot Work - Fire Risk Assessment and Control Measures
HSE Audit Strategy and Schedule		Premobilisation Project Audit Checklist Construction Site Health Check
HSE External Notification of Incidents		
HSE Hazard and Incident Management		Witness Statement ICAM Investigation Form 5 Whys Incident Investigation Form
HSE Inspection Procedure		Site HSE Inspection Form
Health Safety and Environment Legal and Other Requirements		Health and Safety Legal and Other Requirements Register.pdf Environmental Compliance Requirements Register
HSE Monitoring Measurement Analysis and Performance Evaluation		
Identification of Significant Environmental Aspects		
NGER Reporting Procedure		
Oil Management		
Pollution Incident Response Management Plan – Sydney West 330kV Substation		
Pollution Incident Response Management Plan - Transportation of Waste		
Preparation of a Construction Environmental Management Plan (CEMP)		Guidelines for the Construction Environmental Management Plan CEMP Summary Template Contractor's CEMP Requirements Checklist
Preparation and Approval of Environmental Checklists		
Site Management Plans		
Use of Pesticides	TransGrid Schedule of Approved Pesticides	Pesticide Application Record (General)
Waste Management	Work Instruction - Disposal of Asbestos	Notice to Landholder - Gifting of Timber Poles
	Waste Management of Timber Poles Waste Management of Oil and Oil-Filled Assets Waste Management of Spoil	

Appendix D: Table of Risks and Mitigation Measures within Operation Phase

Impact	ID	Measure	Timing	Achievement
General				
General	GE1	TransGrid will carry out the construction and operation of the project in accordance with the EIS, Response to Submissions Report and the approval conditions.	Detailed design, construction and operation	Captured and addressed within Transgrid's Asset Management System (AMS) and Environmental Management System (EMS)
CEMP	GE2	A CEMP will be prepared prior to the commencement of construction. The CEMP will demonstrate an understanding of the environmental objectives and outcomes described within the EIS and the requirements set out in the conditions of approval for the project and any other legislative requirements. It will also document mechanisms for demonstrating compliance with the commitments made in this EIS and the Response to Submissions report (yet to be prepared).	Construction	Completed and verified through the Independent Environmental Audit process.
Environmental Management Representative	GE3	TransGrid will appoint a suitably qualitied, independent Environmental Management Representative to periodically audit the construction work activities to ensure that all mitigation measures are being effectively applied and that the work is being carried out in accordance with the CEMP and the environmental approval and legislative requirements.	Construction	Completed and verified through the Independent Environmental Audit process.
Training	GE4	Construction personnel will undergo inductions in accordance with the CEMP and any other training commitments agreed as part of the project approval.	Construction	Completed and verified through the Independent Environmental Audit process.

Approval and permits	GE5	All necessary approvals, licences and permits will be obtained for the project from the relevant approval authorities.	Detailed design, construction and operation	Identified and gained through Environmental Assessment Framework. Refer to Environmental Handbook 1.3.1 Refer to Maintenance Plan – Underground Cable Assets Section 17
Traffic and Transport				
General traffic impacts	TT1	Alternative construction methodologies and traffic management approaches will be considered to identify additional measures that may reduce potential impacts.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
General traffic impacts	TT2	A CTMP will be produced for the project that will outline the proposed methodology for managing traffic flow around the work sites, traffic assessment, traffic counts, modelling and/or mid-block capacity assessments to confirm measures to be put in place to manage network performance from lane closures and proposed diversion routes. The CTMP will include effective traffic management measures for the proposed work sites to ensure the construction activities can be undertaken in a safe manner. The CTMP will also consider worker parking requirements and the temporary loss of on-road parking. The CTMP will be supported by TCPs.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.

General traffic impacts	TT3	TCPs will be prepared for each work site. The TCP will graphically show the required traffic control at the work site, which will include, for example, lengths of merge/diverge tapers, location of traffic cones, traffic controllers, warning signage and speed limit sign locations, as required. Each TCP will be prepared by a suitably qualified technician in accordance with the *Traffic control at work sites manual* (Roads and Maritime, 2018) and will comply with the requirements of AS1743.3 *Roads Signs - Specifications*.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Road closures	TT4	In the event of road closures, diversion routes will be provided along with an assessment of the likely network performance of the proposed diversion. Where required, demand management measures will be considered in consultation with the relevant roads authorities to reduce traffic on key corridors affected by construction activities for the project by directing traffic to other appropriate roads. Diversion routes and demand management measures will be documented in the CTMP.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Active travel impacts	TT5	Where feasible, reasonable and safe, impacts on active transport (walking and cycling) modes and routes will be minimised by maintaining access around work sites or providing diversion routes.	Construction	Completed and verified through the Independent Environmental Audit process.
Vehicle access	TT6	Vehicle access to residential and business properties will be maintained at all times, where possible. Where restricting access to properties is required to enable construction works, vehicle access will be restored as soon as possible. Where access to a property cannot be maintained, affected owners/occupants will be informed and feasible and reasonable solutions for access to their specific location discussed.	Construction	Completed and verified through the Independent Environmental Audit process.
Emergency access	TT7	Access for emergency services vehicles will be maintained at all times.	Construction	Completed and verified through the Independent Environmental Audit process.

Community and stakeholder consultation	TT8	TransGrid will engage with relevant stakeholders including Roads and Maritime, Transport for NSW (TfNSW), Transport Management Centre (TMC), public transport service providers (e.g. Sydney Trains, Transdev, State Transit Authority), waste collection agencies, local councils and local residents and businesses regarding potential traffic and access impacts and management options, in accordance with the CCF. TransGrid will work with TfNSW and bus operators to ensure that sufficient lead time and comprehensive public notification is provided, regarding changes to bus stops and services and that alternative arrangements are in place to minimise disruption during road changes. Consultation regarding the potential overlap of construction works for the project and other adjacent projects will be undertaken during detailed design to ensure that the works are coordinated, where possible.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Impacts to bus routes	TT9	All diversions of bus routes will be agreed with TfNSW and bus operators prior to the traffic management approach being finalised; and will consider acceptable routes based on the turning paths of these vehicles.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Construction laydown areas	TT10	The construction laydown areas will undergo a detailed design to ensure that access/egress is possible for the nominated construction design vehicle, and to ensure that impacts to the road network are mitigated and managed. This design will be presented within the CTMP for the project.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Parking	TT11	Workers will be encouraged to travel to the work sites using public/active transport where possible. However, some on-road parking may be required at work sites. The CTMP will detail measures to minimise parking impacts to surrounding receivers as far as possible (e.g. not parking near schools/child care centres during drop off and pick up times or not parking close to sensitive land uses with high on-road parking demand, such as hospitals).	Construction	Completed and verified through the Independent Environmental Audit process.

Noise and vibration				
CNVMP	NV1	A CNVMP will be developed as part of the CEMP for the project and will include reasonable and feasible safeguards to manage the noise emissions from construction and manage any complaints which may be received. The CNVMP will include the following: identification of nearby residences and other sensitive land uses; description of approved hours of work; description and identification of all construction activities, including construction work sites, equipment and duration; description of work practices (generic and specific) which will be applied to minimise noise and vibration; a complaints handling process; noise and vibration monitoring procedures; overview of community consultation/notification required (see NV2); and the Out-of-hours Protocol developed for the project.	Construction	Completed and verified through the Independent Environmental Audit process.
Community consultation/ notification	NV2	Residents and other sensitive receivers impacted by noise and/or vibration from the proposed works which is expected to exceed the NML (as defined in Table 5-2 and Table 5-3 of Appendix E of the EIS) and/or vibration criteria (as summarised in Table 5-6 and Table 5-7 of Appendix E of the EIS) will be notified at least seven days prior to the commencement of the particular activity. The information provided to the residents and other sensitive receivers impacted will include: programmed times and locations of construction work; the hours of proposed works; construction noise and vibration impact predictions; and construction noise and vibration mitigation measures to be implemented. Community consultation regarding construction noise and vibration is further detailed in the CCF in Appendix C of the EIS.	Construction	Completed and verified through the Independent Environmental Audit process.

Site inductions	NV3	All project personnel, contractors and subcontractors will undergo an environmental induction. The induction will at least include: all project specific and relevant standard noise and vibration mitigation measures; relevant licence and approval conditions; permissible hours of work; any limitations on high noise generating activities (e.g. use of jack hammering, rock breaking, piling rigs and diamond saws); locations of nearest sensitive receivers; construction employee parking areas; designated loading/unloading areas and procedures; site opening/closing times (including deliveries); behavioural practices such as limiting the use of loud stereos/radios on-site and not dropping materials from height or metal items; public complaints handling procedures; and environmental incident management procedures.	Construction	Completed and verified through the Independent Environmental Audit process.
Out-of-hours protocol	NV4	Where feasible and reasonable, construction will be carried out during standard construction hours. However, given that some works will be required to be undertaken outside of standard construction hours, an 'Out-of-hours Protocol' will be prepared as part of the CNVMP. This will evaluate the potential noise impacts of specific out-of-hours works and recommend appropriate mitigations measures such as: community consultation with highly noise affected receivers; procedures to determine negotiated outcomes in consultation with affected receivers (e.g. construction scheduling during sensitive periods such as exams where construction is in the vicinity of schools); specific mitigation measures such as respite periods; and a monitoring program.	Construction	Completed and verified through the Independent Environmental Audit process.

Respite periods for works during standard construction hours	NV5	Respite periods during standard construction hours, will be identified in consultation with affected receivers. Respite options will be considered when sensitive receivers are within the minimum working distances for vibration intensive works or are highly noise affected receivers (experiencing noise levels above 75 dB(A)). Respite options will include consideration of amendments to work schedules. Vibration intensive or high noise generating equipment will be used in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block.	Construction	Completed and verified through the Independent Environmental Audit process.
Respite periods for works outside of standard construction hours	NV6	The need to consider respite periods will be triggered where the $L_{Aeq(15min)}$ noise levels exceed 75 dB(A) at the same receiver after midnight for more than three consecutive nights. Where this level is exceeded, respite periods will be considered in accordance with the Out-of-hours Protocol (refer to NV4).	Construction	Completed and verified through the Independent Environmental Audit process.
Construction hours and scheduling	NV7	Where feasible and reasonable, construction will be carried out during standard construction hours. Where required to be completed outside of standard construction hours, in proximity to sensitive receivers, works generating high noise and/or vibration levels (including the use of rock breakers and diamond saws) will be scheduled during less sensitive time periods.	Construction	Completed and verified through the Independent Environmental Audit process.
Noise monitoring	NV8	A noise monitoring program will be implemented for the duration of the works in accordance with the CNVMP and will focus on the use of high noise generating plant (e.g. jack hammering, rock breaking, piling rigs and diamond saws) and works outside of standard construction hours.	Construction	Completed and verified through the Independent Environmental Audit process.

Equipment selection and placement	NV9	Equipment selection will consider potential noise and vibration impacts and quieter equipment and/or construction methods will be used where feasible and reasonable. Plant and equipment will: have an operating sound power level of no more than those listed in the Construction Noise and Vibration Impact Assessment in Appendix E of the EIS; be maintained and operated in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse noise and vibration impacts; be fitted with non-tonal reversing beepers (or an equivalent mechanism); be throttled down or shut down when not in use; minimise noise through: use of residential grade mufflers; use of damped hammers such as "City" Model Rammer Hammers; and silencing air parking brakes. High noise generating plant will: be located so that the offset distance between the plant and adjacent sensitive receivers is maximised as far as possible; and be directed away from sensitive receivers, where possible to do so.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.

Construction traffic	NV10	Potential noise impacts from construction vehicles will be minimised through the following: traffic flow, parking and loading/unloading areas will be planned to minimise reversing movements within the work sites and at construction laydown areas; loading and unloading of materials/deliveries will occur as far as possible from sensitive receivers; shielding loading/unloading areas if close to sensitive receivers, where feasible (i.e. breaking the line of site between the area and the receiver); fitting delivery vehicles with straps rather than chains for unloading, wherever possible; selecting construction laydown area access points and roads as far away as possible from sensitive receivers; locating delivery and haulage routes away from sensitive receivers, where possible; scheduling deliveries during less sensitive times, where possible; limiting the speed of vehicles; restricting the use of engine compression brakes; and maximising the storage capacity of construction laydown areas to reduce the need for truck movements during sensitive times (between midnight and 7:00 am).	Construction	Completed and verified through the Independent Environmental Audit process.
Steel road plates	NV11	The use of road plates will be minimised, where possible. Where required to be used, the plates will be installed in a manner that minimises the potential for displacement by traffic loading and minimises any height difference with the adjacent road surface in order to reduce the potential for impact noise generation from tyres traversing the plates.	Construction	Completed and verified through the Independent Environmental Audit process.
Stationary noise sources	NV12	Low noise emitting plant and equipment (such as those with built-in shielding and mufflers) will be used wherever possible. Noise generating plant at work sites (such as compressors and generators) will be directed away from and situated furthest away from sensitive receivers, where practicable. Machinery that is not in use will be switched off.	Construction	Completed and verified through the Independent Environmental Audit process.

Shield sensitive receivers	NV13	Structures will be used to shield residential receivers from noise such as use of hoarding/noise curtains, where practicable, at construction laydown areas and special crossing work sites.	Construction	Completed and verified through the Independent Environmental Audit process.
Building condition surveys and vibration monitoring	NV14	If vibration intensive equipment is to be used within the minimum working distances for cosmetic damage, then it is recommended that a different construction method with lower source vibration levels is used where feasible and reasonable. Where work within the minimum working distances for cosmetic damage is planned to occur: attended vibration measurements will be undertaken at the work site when work commences, to determine site specific minimum working distances. As a precaution, where practicable, these measurements will be made at distances outside the minimum working distances to ensure no structural damage occurs and will provide detailed information regarding the transmission of vibration to allow site specific safe working distances to be determined; and for listed heritage items and houses within Heritage Conservation Areas (HCAs), building conditions surveys will be undertaken. The survey will document the structural condition of these buildings/structures before construction commences and after construction is complete to identify any impacts on historical buildings/structures as a result of the project construction. Building condition surveys will be scheduled in consultation with property owners. Vibration intensive work will not proceed within the minimum working distances (recommended or site specific) unless a permanent vibration monitoring system is installed to warn operators when vibration levels are approaching the peak particle velocity objectives as outlined in DIN 4150. For work scheduled to occur near a building, within the minimum working distance for human comfort but outside the minimum working distance for cosmetic damage, the affected receivers will be notified.	Construction	Completed and verified through the Independent Environmental Audit process.

Air quality				
General dust and odour impacts	AQ1	An Air Quality Management Plan (AQMP) will be prepared for the project as part of the project's CEMP. The AQMP will identify the measures to be undertaken during construction of the project and document the complaints management process.	Construction	Completed and verified through the Independent Environmental Audit process.
Dry surfaces	AQ2	Regularly water all exposed surfaces at construction laydown areas (excluding stockpiles) or special crossing work sites when conditions are dry and dusty, through the use of water sprays, sprinkler systems, a water cart or other suitable methods. Frequency would be determined by how quickly the surface dries out again, with higher frequency watering required on hot, dry, windy days.	Construction	Completed and verified through the Independent Environmental Audit process.
Adverse weather	AQ3	On days where forecast weather conditions (e.g. high winds) may result in high dust emissions, dust generating work activities may need to be rescheduled or modified. The forecast weather conditions will be included in daily tool box talks and construction planning.	Construction	Completed and verified through the Independent Environmental Audit process.
Stockpiles	AQ4	Spoil stockpiles will be covered.	Construction	Completed and verified through the Independent Environmental Audit process.
Drop heights	AQ5	Minimise drop heights from excavators when placing spoil into trucks or onto stockpiles to reduce the potential for dust generation.	Construction	Completed and verified through the Independent Environmental Audit process.
Exposed surfaces	AQ6	Progressively rehabilitate exposed areas at work sites to limit dust generation.	Construction	Completed and verified through the Independent Environmental Audit process.

Generation of dust from vehicles and plant	AQ7	Ensure that all vehicles transporting soils, rock or other materials are covered when entering or exiting the work site.	Construction	Completed and verified through the Independent Environmental Audit process.
Generation of dust from vehicles and plant	AQ8	Vehicles and plant will be free of excessive soil, where required, to reduce soil tracking onto public roadways.	Construction	Completed and verified through the Independent Environmental Audit process.
Generation of dust from vehicles and plant	AQ9	Provide stabilised site access (where existing site is unsealed), and access points as required.	Construction	Completed and verified through the Independent Environmental Audit process.
Generation of dust from vehicles and plant	AQ10	Construction vehicles and mobile plant will use designated haulage and access routes, where practicable, and traffic speeds at work sites will be restricted to limit the generation of dust from vehicle movements.	Construction	Completed and verified through the Independent Environmental Audit process.
Migration of dust off-site	AQ11	If dust is seen to be migrating off-site, the source of the dust will be identified. Additional management and mitigation measures implemented (such as rescheduling the works or water spraying), where required.	Construction	Completed and verified through the Independent Environmental Audit process.

Landfill gas	AQ12	Site-specific landfill gas management plans will be prepared for works at locations with landfill gas (including Camdenville Park and Sydney Park) prior to any trenching and excavation. Further site investigations will be undertaken within the project area closest to Arlington Oval and Marrickville Park and where the project traverses Henson Park, in accordance with the *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (NSW EPA, 2012), to assess the presence and risk of landfill gas. If landfill gas is detected, a site-specific landfill gas management plan will be developed for any excavation works in these areas (also refer to CT9). The plans will be prepared by a suitably qualified landfill gas management specialist. The management plans will include mitigation measures to prevent human health exposure and explosive risks posed by landfill gas and nuisance odours from exposed leachate or landfill wastes. The plans will detail the type and frequency of monitoring required during the works and will outline the triggers that could stop works or require a step up in controls. Controls may include the use of odour suppressant mists and foams and other measures deemed suitable for the local conditions of the site.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Plant exhaust emissions	AQ13	Construction vehicles and mobile plant will be maintained in good working condition. Engines will be switched off when not in use.	Construction	Completed and verified through the Independent Environmental Audit process.
Electric and Magnetic Fields				
Generation of magnetic fields	EMF1	A revised EMF calculation will be undertaken once the final cable details are known to ensure consistency with the initial assessment undertaken and to confirm that magnetic field levels for the project are still below the ICNIRP reference levels for human exposure.	Detailed design	Complete.
Generation of magnetic fields	EMF2	The project will operate within the limits set in the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to EMF (ICNIRP, 2010).	Operation	Refer to Maintenance Plan – Underground

				Cable Assets Section 6.2
Verification of magnetic fields	EMF3	Within six months of operations commencing, magnetic field levels will be measured at selected locations near receptors along the transmission cable route to verify that levels are below the ICNIRP reference levels.	Operation	This is currently being completed by Aurecon and will be completed by June 2022. Refer to Maintenance Plan – Underground Cable Assets Section 6.2
Hazards and risks				
General	HR1	General hazard and risk management measures for construction of different project components (such as underground cables, special crossings and construction laydown areas) will be included within the CEMP, including: details of the environmental hazards and risks associated with different construction activities; procedures to comply with legislative and industry standard requirements; Work Method Statements; emergency procedures for unplanned events; and training for relevant personnel (including subcontractors) and site inductions.	Construction	Completed and verified through the Independent Environmental Audit process.
Traffic hazards during construction	HR2	Traffic hazards will be managed through the preparation and implementation of a CTMP. The CTMP will manage access to residences/businesses, the closure of lanes and roads and detours for pedestrians and cyclists. The CTMP will also include measures to make the public aware of changes in road conditions such as erecting warning signs and having traffic controllers on-site. Refer to additional measures in TT1 to TT10.	Construction	Completed and verified through the Independent Environmental Audit process.
Disruption of rail network	HR3	Construction and maintenance of the cable bridges within heavy rail and light rail corridors will be undertaken during rail	Construction and operation	Identified in project planning and “safety-in-design” workshop.

		possessions planned by the relevant rail network authority or as otherwise agreed with the rail authority.		Refer to Maintenance Plan – Underground Cable Assets Sections 8.1.1, 17
Transportation of hazardous materials	HR4	Hazardous materials will be transported, stored and used in accordance with: Work Health and Safety Act 2011 (NSW); Dangerous Goods (Road and Rail Transport) Act 2008 (NSW); Australian Code for the Transport of Dangerous Goods by Road and Rail (National Transport Commission, 2017); and relevant Australian Standards. Safety Data Sheets will accompany all dangerous goods transported to work sites.	Construction and operation	Completed and verified through the Independent Environmental Audit process. Refer to Environmental Handbook Sections 1.2, 1.3, 3 Hazardous Chemicals Handling Storage and Transport procedure.
Spills and leaks of hazardous materials	HR5	Hazardous material procedures (including procedures for storage, transport and disposal of hazardous materials, spill prevention and management, and the refuelling and maintenance of vehicles/equipment) will be developed and implemented as part of the CEMP, to minimise potential for impacts associated with chemical spills and leaks. Any captured water which is not of a suitable quality for discharge will be disposed of at an appropriately licenced waste facility.	Construction and operation	Completed and verified through the Independent Environmental Audit process. Refer to Environmental Handbook Sections 1.2, 1.3, 2.3, 3 Refer to Environmental Guidance Notes – Erosion and Sediment Control; Excavation and Machine Work
Unauthorised access	HR6	All work sites and construction laydown areas will include some form of delineation, barrier/perimeter fencing and signage	Construction	Completed and verified through the

		notifying unauthorised persons not to enter and of the potential hazards at the site.		Independent Environmental Audit process.
Underground utilities	HR7	Minimise public safety risks such as flooding and fire/explosions from damaging underground utilities by: undertaking Dial-Before-You-Dig (DBYD) enquiries and consulting with relevant service infrastructure providers, prior to commencement of construction; undertaking service and utility identification works; employing non-destructive excavation methods to expose buried services prior to excavation where works are required in close proximity to the utility and there is a high risk of striking that utility; and protecting utilities prior to any excavation works being undertaken in proximity to the utility where required.	Construction	Completed and verified through the Independent Environmental Audit process.
Bushfire risks	HR8	Restrict hot works (such as welding or other activities generating heat or sparks) on days of declared catastrophic fire danger **or Total Fire Ban** at the Sydney South substation. **The CEMP for the project will include measures to identify any hot work or fire risk work and controls would be put in place to manage any risks.**	Construction	Completed and verified through the Independent Environmental Audit process.
Electrical safety	HR9	During construction, appropriate warning in the form of surface markers and subsurface tape will be installed along the transmission cable route to warn third parties conducting excavations in the area of the presence of the cable circuit. The cable circuit will also be registered on DBYD prior to construction commencing.	Construction	Completed and verified through the Independent Environmental Audit process.

Emergency response	HR10	If required, the site-specific Emergency Response Manual for the Rookwood Road, Beaconsfield West and Sydney South substations will be updated to reflect the changed conditions and additional requirements that may arise as a result of the project.	Operation	Refer to Rookwood Road 220 kV Substation – Emergency Response Manual MNA-SUB-ERM-344; Beaconsfield 330 kV Substation – Emergency Response Manual MNA-SUB-ERM-321; Beaconsfield 330 kV Substation – Emergency Response Manual MNA-SUB-ERM-349.
Hazards during operation	HR11	Maintenance crews will undertake maintenance and repair work in accordance with the requirements of TransGrid's existing Environmental Management System.	Operation	Refer to Environmental Handbook Section 1.2 Refer to Maintenance Plan – Underground Cable Assets Section 8
Subsidence and/or frac-out during underboring	HR12	The risk of subsidence and/or frac-out will be minimised during underboring by: designing the depth of the underbore around local geotechnical conditions; appointing a suitably qualified and experienced drilling contractor; and ensuring contingency plans are in place to deal with drilling fluid in the event of a frac-out.	Detailed design	Complete.
Frac-out during underboring	HR13	Modelling of underbores would be undertaken to determine the risk of frac-out. This would include a geotechnical evaluation and construction risk assessment. Proposed construction methods would be evaluated to determine the lowest risk method.	Detailed design	Complete.

Subsidence during underboring	HR14	For all rail underbores, a geotechnical settlement analysis is required by the rail authority. This analysis determines the risk of settlement based on the depth of cover of the underbore and the cross sectional area.	Detailed design	Complete.
Visual amenity				
Design of construction laydown areas and work sites	LV1	Fencing around construction laydown areas and work sites and hoardings (where required) will take into consideration the landscape character of the local environment and proximity of sensitive receptors in selecting suitable materials and designs. Fencing around laydown areas within HCAs and public open space will prevent visibility of the internal works area.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Night lighting at construction laydown areas	LV2	Night lighting at construction laydown areas will be minimised adjacent to residential properties. Where lighting is required, and a construction laydown area is positioned close to residences, lighting will be directed away from residential properties to avoid light spill into adjacent properties at night.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Cable bridge design	LV3	Design principles for the final cable bridge designs will include integration of the structures into the surrounding landscape while meeting safety, technical and operational requirements. Bridges will be designed to reduce visual prominence, including surface treatment which avoids reflective materials.	Detailed design	Complete.

Landscaping and rehabilitation	LV4	Ground stabilisation, landscaping and rehabilitation at cable bridge crossings will be undertaken once installation of the cable bridge is complete and will be monitored for a period of at least six months.	Construction and operation	Completed and verified through the Independent Environmental Audit process. Refer to Maintenance Plan – Underground Cable Assets Section 6.5 Refer to Environmental Guidance Notes – Erosion and Sediment Control; Excavation and Machine Work
Tree removal and replanting	LV5	The project will avoid the removal of trees wherever feasible and reasonable. Where avoidance is not possible, a tree replanting strategy/landscape plan will be developed in consultation with the relevant council. To mitigate the visual impact of tree removal, similar species of trees will be replanted, where feasible. Where this is not possible, suitable trees for specific local conditions will be determined. The suitability of the replacement trees will be confirmed by a qualified arborist, in consultation with TransGrid's cable specialists. Trees will be removed at the time of construction if trenching activities impact tree roots to a point where the tree is no longer viable (as determined by the project arborist). No trees will be removed within the parklands of Sydney Park in Alexandria, along Constitution Road in Dulwich Hill and at the Johnson Park Bushcare site in Dulwich Hill (this is consistent with BD10).	Construction and operation	Completed and verified through the Independent Environmental Audit process. Refer to Environmental Handbook Sections 1.2, 1.3, 2.3, 3 Refer to Environmental Guidance Notes – Habitat Trees

Sydney Park impacts	LV6	The final transmission cable circuit will follow Barwon Park Road and existing stormwater infrastructure wherever possible to avoid impacting established trees within or adjacent to Sydney Park.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Biodiversity				
Relocation of resident fauna	BD1	Pre-clearance survey of trees to be removed will be undertaken by a suitably qualified ecologist to identify/locate active nests in use by native animals. The removal of nest trees will be supervised by a qualified ecologist/licensed wildlife handler. Any fauna that will not disperse independently will be captured and relocated to a suitable location nearby. Prior to any disturbance by construction works, pre-clearance surveys of stormwater culverts and pipes that may be suitable habitat for roosting bats will be undertaken to identify bats for relocation.	Construction	Completed and verified through the Independent Environmental Audit process.
Critical life-cycle events (e.g. breeding or nursing)	BD2	If active bird nests are identified during the pre-clearance survey, avoidance of vegetation clearing works during late winter/early spring breeding/nesting period will be considered.	Construction	Completed and verified through the Independent Environmental Audit process.
Grey-headed Flying-fox habitat	BD3	Replanting with potential Grey-headed Flying-fox habitat vegetation will be undertaken within the project area where feasible, and in consultation with local councils.	Construction	Completed and verified through the Independent Environmental Audit process.
Construction footprint	BD4	No temporary facilities i.e. site offices/toilets/equipment storage will be placed outside of the designated construction laydown areas or work sites. Access tracks to work sites outside of a road reserve will be clearly demarcated.	Construction	Completed and verified through the Independent Environmental Audit process.

Temporary fencing	BD5	Work sites outside of the road reserve will be delineated with temporary fencing/barriers along the perimeter to avoid encroachment into vegetated areas.	Construction	Completed and verified through the Independent Environmental Audit process.
Sedimentation of waterways	BD6	Appropriate controls will be utilised to manage exposed soil surfaces and stockpiles to reduce sediment discharge into waterways, in accordance with the Blue Book (Landcom, 2004). All works within proximity to drainage lines will have adequate sediment and erosion controls. Revegetation of disturbed areas will commence as soon as practicable to reduce the risk of erosion.	Construction	Completed and verified through the Independent Environmental Audit process.
Dust generation	BD7	Dust suppression measures, as outlined in an AQMP, will be implemented during construction works to limit dust at work sites. Revegetation of disturbed areas will commence as soon as practicable to reduce areas likely to create dust.	Construction	Completed and verified through the Independent Environmental Audit process.
Spread of weeds and pathogens	BD8	Vehicles, machinery and waste associated with construction will remain within work sites and laydown areas and will not impinge on areas of retained vegetation. Weeds (listed under the NSW *Biosecurity Act 2015*) present within construction laydown areas or work sites will be managed in accordance with the regional priority objectives of the Greater Sydney Regional Strategic Management Plan 2017 – 2022.	Construction	Completed and verified through the Independent Environmental Audit process.
Construction staff training	BD9	All construction personnel will undertake an environmental induction that will include items such as: potential or actual presence of threatened species or habitats; site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and the prevention of the spread of weeds); response to environmental emergencies (chemical spills, fire, and injured fauna); and key environmental project personnel.	Construction	Completed and verified through the Independent Environmental Audit process.

Tree removal and replanting	BD10	The project will avoid the removal of trees[1] wherever feasible and reasonable. Where avoidance is not possible, a tree replanting strategy/landscape plan will be developed in consultation with the relevant council. Similar species of trees will be replanted, where feasible. Where this is not possible, suitable trees for specific local conditions will be determined. The suitability of the replacement trees will be confirmed by a qualified arborist, in consultation with TransGrid's cable specialists. Trees will be removed at the time of construction if trenching activities impact tree roots to a point where the tree is no longer viable (as determined by the project arborist). No trees will be removed within the parklands of Sydney Park in Alexandria, along Constitution Road in Dulwich Hill and at the Johnson Park Bushcare site in Dulwich Hill.	Construction and operation	Completed and verified through the Independent Environmental Audit process. Refer to Environmental Handbook Sections 5.1, 5.2 Refer to Environmental Guidance Notes – Erosion and Sediment Control; Excavation and Machine Work; Habitat Trees Refer to Maintenance Plan – Underground Cable Assets Section 6.5.2
Cable monitoring for tree impacts	BD11	Where cable monitoring systems identify a potential impact of tree roots on the operating transmission cable, a qualified arborist will be called on to investigate further. If there is potential for damage to the cables, the tree will need to be removed. Removal will be limited only to trees that are affecting the transmission cable.	Operation	Refer to Environmental Handbook Sections 5.1, 5.2 Refer to Environmental Guidance Note – Habitat Trees. Refer to Maintenance Plan – Underground Cable Assets Section 6.5.2

Tree retention	BD12	The following will be considered during the detailed design phase to retain trees wherever possible: review the alignment of the transmission cable circuit to avoid impacting the structural root zone (SRZ) or more than 10% of the tree protection zone (TPZ) where possible, with priority consideration given to heritage areas and high retention value trees; and locate construction facilities and infrastructure (e.g. site offices, plant/equipment storage) outside of tree protection zones.	Detailed design	Complete.
Tree protection	BD13	The following tree protection measures will be implemented: all tree pruning must be in accordance with the AS 4373-2007 Pruning of Amenity Trees (Standards Australia 2007) and the Code of Practice for the Amenity Tree Industry (NSW WorkCover, 1998); all tree work on retained trees is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture; trunk, branch and/ or ground protection measures for high retention value trees that extend into or are located in the roadway, will comply with AS 4970-2009 Protection of trees on development sites (Standards Australia, 2009a); and ground protection will be used within the TPZ and SRZ, where possible, to prevent root damage caused by compaction of the soil and the loss of water infiltration and oxygen to the trees root system. Ground protection may include a permeable membrane such as geotextile fabric beneath a layer of mulch, crushed rock or rumble boards. The location and distribution of roots of trees to be retained will be determined through low or non-destructive excavation methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation, where required, immediately prior to excavation works commencing.	Construction	Completed and verified through the Independent Environmental Audit process.

Tree monitoring	BD14	A qualified arborist will be consulted in the event there is a change to the condition of high retention value trees in the project area due to construction activity. A qualified arborist will inspect high retention value trees within the project area for any damage once construction is completed and tree protection measures have been removed.	Construction and operation	Refer to Environmental Handbook Sections 5.1, 5.2 Refer to Environmental Guidance Note – Habitat Trees. Refer to Maintenance Plan – Underground Cable Assets Section 6.5.2
Cable installation in key fish habitat	BD15	DPI Water's Controlled activities on waterfront land – Guidelines for laying pipes and cables in watercourses on waterfront land (DPI, 2012) will be used to inform the cable installation at the Cooks River.	Detailed design	Complete.
Protection of water quality in the Cooks River	BD16	The following water quality measures will be implemented: water collected during construction (e.g. during dewatering or surface water inflows to the trench or pits) will be discharged or disposed of in accordance with the *Protection of the Environment Operations Act 1997 and the ANZECC Water Quality Guidelines (2000) for 95% protection level for marine ecosystems;* the water discharge point will be at a stable point on the bank or across riparian vegetation to allow slowing of water before travelling further downstream. Where feasible, the velocity of downstream flows will not exceed natural seasonal flow velocities. Sediment and erosion mitigation measures will be implemented in accordance with ESCPs; and contaminated water captured during construction will be disposed of at an appropriately licensed facility.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.

Weed control at the Cooks River	BD17	Weed control will be implemented within the project area at the Cooks River, where required, to maintain restored areas as weed free.	Construction	Completed and verified through the Independent Environmental Audit process.
Light spill impacts on fauna	BD18	In the event that construction works within or adjacent to the Johnson Park bushcare site, Cooks River and Sydney Park are required to be undertaken at night, project lighting will be directed towards work sites and away from stands of vegetation.	Construction	Completed and verified through the Independent Environmental Audit process.
Aboriginal heritage				
Impacts to areas of Aboriginal archaeological sensitivity and/or impacts to Aboriginal sites	AH1	If impacts to the area of potential Aboriginal archaeological sensitivity at Mildura Reserve, Campsie cannot be avoided, a program of archaeological test excavation will be required to determine the presence or absence of subsurface Aboriginal objects. The methodology for investigating and managing areas of Aboriginal archaeological sensitivity and known Aboriginal sites/objects will be detailed in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the project. The ACHMP will be prepared in consultation with Registered Aboriginal Parties (RAPs) and Department of Planning, Industry and Environment (DPIE). Subject to ACHMP approval by DPIE, this document will guide the management of Aboriginal cultural heritage within the project area throughout the life of the project.	Construction	Completed and verified through the Independent Environmental Audit process.
Site inductions	AH2	Prior to the commencement of works, all construction personnel will undergo an Aboriginal heritage induction which identifies the general nature of Aboriginal sites and objects, the location of areas of archaeological sensitivity, requirements of the ACHMP (if relevant), procedure for unexpected finds, personnel responsibilities, and safeguards to be implemented to protect and avoid impacts to Aboriginal sites, if discovered.	Construction	Completed and verified through the Independent Environmental Audit process.

Unexpected Aboriginal objects or human remains	AH3	If unexpected Aboriginal objects or human remains are uncovered in the project area during construction, TransGrid's Unexpected Finds Protocol will be initiated. This includes[2]: All ground surface disturbance in the area of finds should cease immediately when the finds are uncovered and relevant personnel will be notified; If the find is suspected to be human skeletal material, the NSW Police will be contact immediately; If there is substantial doubt regarding an Aboriginal origin for the finds, then a qualified opinion from an archaeologist will be sought as soon as possible; If a qualified opinion cannot be gained or the identification is positive, immediately notify the following authorities or personnel of the discovery: OEH (Environment Line: 131 555); Relevant Aboriginal Community Representatives Immediately notify the following authorities or personnel of the discovery: OEH (Environment Line: 131 555); Relevant Aboriginal Community Representatives. Facilitate, in co-operation with the appropriate authorities and relevant Aboriginal community representatives: the recording and assessment of the finds; fulfilling any legal constraints arising from the find(s). This will include complying with OEH directions; and the development and conduct of appropriate management strategies. Strategies will depend on consultation with stakeholders and the assessment of the significance of the find(s). Where the find(s) are determined to be Aboriginal Objects, any re-commencement of construction related ground surface disturbance will only resume in the area of the find(s) following	Construction	Completed and verified through the Independent Environmental Audit process.

[2] Unexpected Finds Protocol, TransGrid Aboriginal Heritage Due Diligence Assessment (Document ref: D2018/05672)

		the preparation of an ACHMP for the project, if one does not already exist.		
Non-Aboriginal Heritage				
Impact on Alexandra Canal and Potts Hill Reservoirs 1 and 2	NAH1	Works in the vicinity of Alexandra Canal at Beaconsfield West substation and the Potts Hill Reservoirs 1 and 2 will be managed by the Cultural Heritage Management Plan (CHMP) (refer to NAH6) to ensure that there are no direct impacts on the canal walls or the reservoirs.	Construction	Completed and verified through the Independent Environmental Audit process.
Removal of street trees/plantings at the intersection of Seventh Avenue and Fifth Avenue (Canterbury LEP 2012 Item 55)	NAH2	The project will avoid impacts to heritage listed street plantings on Fifth Avenue wherever feasible and reasonable. During construction, manual excavation and monitoring by an arborist, with exclusion fencing used to protect trees from indirect impacts if there are works in their immediate vicinity will be considered. If tree removal cannot be avoided, a tree replanting strategy will be discussed and agreed with the relevant local council, in consideration of the Canterbury Bankstown Tree Management Manual (~~Canterbury~~ Bankstown Council, 2015).	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Impacts on the Brick Paving (Marrickville LEP 2011 Item 98)	NAH3	The design of the final transmission cable route will avoid the footpath that includes the brick paving that is immediately adjacent to the transmission cable route.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Impact on heritage values of the HCAs from tree removal	NAH4	Removal of street trees identified as providing contributory heritage values within HCAs will be avoided where possible. If tree removal cannot be avoided, a tree replanting strategy will be developed in consultation with the relevant local council.	Construction	Completed and verified through the Independent Environmental Audit process.
Damage to heritage structures from vibration	NAH5	Minimum working distances will be enforced when working in proximity to heritage structures. This includes: hand held jack hammers will be used, if needed, at least one metre away from the location of a heritage item; hydraulic hammers up to 300 kilograms only be used if greater than four metres away from the location of a heritage item;	Construction	Completed and verified through the Independent Environmental Audit process.

		hydraulic hammers up to 900 kilograms will only be used if greater than 12 metres away from the location of a heritage item; and hydraulic hammers up to 1,600 kilograms will only be used if greater than 34 metres away from the location of a heritage item. If minimum working distances cannot be maintained during construction, a CHMP will be developed that includes building condition surveys and/or vibration monitoring as per environmental management measure NV14.		
General construction impacts	NAH6	A CHMP will be produced for the project as part of the CEMP, to manage any impacts on identified heritage items. The CHMP will: guide appropriate responses to identified heritage constraints during construction; define limits to machinery use and construction activity in proximity to heritage structures to avoid vibration impacts; detail where and when monitoring will be undertaken to ensure no vibration or other indirect impacts on identified heritage items; define any protectionary fencing required to delineate safe working areas and/or no-go areas in relation to heritage protection; and include maps showing the location and curtilage of heritage items. A toolbox presentation or project induction will be held with all staff and contractors prior to the commencement of works to make them aware of their responsibilities with regard to avoiding heritage impacts. Once the final design is known, the relevant local councils within the project area will be informed of any anticipated impacts to heritage items.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Unexpected finds	NAH7	In the event that unexpected historic finds are identified during construction, all works will immediately cease at that area. Unexpected finds may include artefact scatters (including glass, animal bone, ceramic, brick and metal), building foundations and earthworks of unknown origin. The following procedure guides the	Construction	Completed and verified through the Independent Environmental Audit process.

		management of unexpected and previously unidentified finds during the course of project works: all work in the area will cease immediately; alert the Environmental Specialist to the find; if necessary, protect the area with fencing; engage a suitably qualified archaeologist to undertake an assessment of the find/s; if it is determined the relic is likely to be significant, a Section 146 notification form will be sent with a short letter report to the Heritage Council notifying them of the discovery; an assessment will be undertaken using the guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'* (NSW Heritage Branch, 2009); on the advice of the archaeologist, if necessary, prepare an Impact Assessment with Research Design and Methodology to submit to the Heritage Division along with a Section 140 excavation permit to undertake archaeological works; undertake the archaeological mitigation in accordance with the prepared documents and any permit/exception issued by the Heritage Division; and once the site has been mitigated to the satisfaction of the archaeologist and the Heritage Division, works may resume in the area.		
Soils and contamination				
Assessment of excavation areas	CT1	Soil investigations will be undertaken prior to construction along the project area to: assess the presence of contamination and risks posed to project workers and the environment, so that appropriate controls can be implemented during construction; chemically classify the soil *in-situ,* for potential re-use or off-site disposal to licensed landfill or re-use facility in accordance with	Construction	Completed and verified through the Independent Environmental Audit process.

		the applicable land use criteria, Waste Classification Guidelines (NSW EPA, 2014a) or applicable Resource Recovery exemption and order; and assess for the presence of acid sulfate soils and liming rates, so Acid Sulfate Soils Management Plans (ASSMPs) can be prepared and waste classified in accordance with Waste Classification Guidelines (NSW EPA, 2014a). A Sampling Analysis Quality Plan (SAQP) will be prepared for soil investigation in accordance with the NEPM (ASC NEPM, 2013). The SAQP will detail: data quality objectives (DQOs) and data quality indicators (DQIs); justification of the number, density and location of sampling locations based on the potential for contamination, excavation extent and quantities requiring off-site disposal; analytical suite and schedule, including contaminants of concern identified; assessment criteria for on-site reuse or off-site disposal (waste classification); and sampling and laboratory methodologies, field and laboratory quality assurance and control. Following the completion of the soil investigations a report will be prepared for each construction precinct providing conclusions on waste classification and recommendations for health and environmental controls during construction. The reports will provide clear commentary on the classification of the waste in accordance with the Waste Classification Guidelines (NSW EPA, 2014a).		
Assessment of imported Virgin Excavated Natural Material (VENM)	CT2	Prior to the backfilling of trenches during construction with VENM, the VENM source(s) will be identified and assessed against the definition of VENM in the Waste Classification Guidelines (NSW EPA, 2014a) and *Protection of the Environment Operations Act 1997* (POEO Act). The VENM source(s) will be assessed by an appropriately qualified contaminated land consultant, which will entail: identifying whether the current and past activities at the source site that had potential to contaminate the land, whether actual	Construction	Completed and verified through the Independent Environmental Audit process.

		acid sulfate soils (AASS) or potential acid sulfate soils (PASS) is present and that the site is not within an area mapped as containing naturally occurring asbestos; and undertaking chemical assessment to ascertain that the material is not contaminated. The NSW EPA VENM certificate will be completed and signed by the consultant (or supplier) and provided to TransGrid prior to importation and use of the VENM. The VENM will also be inspected at the work site to check the imported VENM is from the same source assessed.		
Construction laydown areas	CT3	Limited baseline soil investigations and site inspections will be undertaken for each construction laydown area to manage identified risks during construction. The investigations will include limited sampling to identify and assess contamination in surface soil. A baseline report will be prepared for each construction laydown area. Where contamination is identified, a site-specific management plan will be implemented prior to construction to inform the management of asbestos or chemical contamination in soil while the construction laydown area is in use. Following demobilisation of the construction laydown area a post–construction report will be prepared for each construction laydown area. The post-construction report will compare to the baseline report and confirm whether or not conditions are the same and if remedial works are required to clean up contamination from the project works within the construction laydown areas.	Construction	Completed and verified through the Independent Environmental Audit process.
Contaminated soil management during construction	CT4	Protocols for the management of contaminated soil during construction will be included in the CEMP for all construction works and will: detail requirements for safety controls including the following where required: air monitoring; exclusion zones and decontamination; excavation ventilation; dust suppression and containment; odour suppression and monitoring;	Construction	Completed and verified through the Independent Environmental Audit process.

		personnel protective equipment; training and supervision; detail requirements for environmental controls including the following: sediment and erosion control; management of surface water runoff around the excavation areas and prevention of surface water entering excavations; stockpile management and separation; and materials tracking and records. Sediment and erosion mitigation measures will be implemented in accordance with ESCPs.		
Spoil waste management and transport	CT5	Spoil which has been assessed as not suitable for reuse or cannot be reused will be classified in accordance with the Waste Classification Guidelines (NSW EPA, 2014a). The spoil will be transported to an appropriate waste disposal facility licensed to receive such waste. Approval will be obtained from the respective landfill facility prior to transport and will require an estimate of the likely volume of waste to be disposed. The following material handling requirements will be implemented for trucks transporting materials off-site: a licensed transporter will be used to transport material to an appropriately licensed NSW EPA waste facility; all truck loads will be filled to the correct level and not over filled; trucks carrying waste materials will be covered prior to exiting the work site and will remain covered until authorised to unload at the destination (NSW EPA licensed waste facility); trucks will be fitted with seals to ensure that the movement of potentially saturated materials is undertaken appropriately. The integrity of the seals will be inspected and tested prior to commencement of each day's haulage works; in the event that materials are tracked or spilt outside of the construction zone, soil will be immediately cleaned up in a way that prevents contamination of land, the stormwater or waterways; and	Construction	Completed and verified through the Independent Environmental Audit process.

		all truckloads and landfill waste tickets/dockets will be tracked and a register completed to reconcile and check spoil has been lawfully disposed. Temporary spoil stockpiles may be stored at select construction laydown areas. As all spoil will be classified in-situ prior to excavation, the stockpiled material will already be classified in accordance with the NSW EPA guidelines. Stockpiles will be kept separate based on their classification. All stockpiles will be tracked in accordance with protocols within the CEMP for material tracking. Stockpiles will be managed with appropriate sediment and erosion controls as outlined in an ESCP.		
Asbestos management	CT6	An Asbestos Management Plan (AMP) will be developed for areas identified during pre-construction investigations as containing Asbestos Containing Materials (ACM), areas suspected of containing ACM and to address unexpected finds of ACM during construction. Specifically, protocols will be stipulated for separation, monitoring, validation and clearance of asbestos. The AMP and associated Standard Work Procedures will satisfy the requirements of: Work Health and Safety Regulation 2011; the Safe Work Australia Asbestos Codes of Practice and Guidance Notes: Code of Practice: How to Manage and Control Asbestos in the Workplace; Code of Practice: How to Safely Remove Asbestos; and Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibre, 2nd Edition [NOHSC: 3003 (2005)]. An Occupational Hygienist (Hygienist) will be on-site for the duration of the excavation works where ACM has been identified from pre-construction or where unexpected finds of ACM are encountered. The Hygienist will: undertake air monitoring for asbestos during excavation; provide on-site visual inspection, identification of asbestos impacted material and clearance of non-asbestos impacted surfaces; and	Construction	Completed and verified through the Independent Environmental Audit process.

		supervise works to ensure compliance with the AMP and NSW regulatory requirements for asbestos containing material management and disposal. In the event that friable asbestos is detected, a suitably licensed Asbestos Removal Contractor (licensed to undertake friable asbestos (Class A) removal) will be required to undertake and oversee all the asbestos removal and disposal works outlined in the AMP. All persons performing the works will be required to undertake a suitable risk assessment and develop a Safe Work Method Statement (SWMS) for all of their work activities prior to commencing work in ACM impacted areas. Identified ACM will be segregated, managed and disposed of as Special Waste and transported and disposed in accordance with Protection of the Environment Operations (Waste) Regulation (2014). Where more than 100 kg of asbestos waste or more than 10 square metres of asbestos sheeting is transported the NSW EPA online tool WasteLocate will be used. The handling and disposal of asbestos waste will be tracked and recorded.		
Acid sulfate soils	CT7	ASSMPs will be prepared in accordance with the ASSMAC (1998) guidelines based on the results of the pre-construction investigations for locations within Precinct 2, 3, 4 and 5. The ASSMPs will incorporate the following procedures: soil will be treated with lime in accordance with the ASSMP where PASS is not able to be loaded and transported to a landfill licensed to receive untreated PASS within 24 hours of excavation or if AASS are identified and excavated; exposure of PASS material within an excavated trench or excavation site will be minimised to reduce the potential for oxidation and acid leachate generation; excavation will be done under dry conditions, where possible using a truck and shovel (tracked excavator) operation and the water table will be lowered within excavation areas, as part of excavation dewatering; excavated fill will be monitored for colour and leachate quality; no PASS material will be placed and left at the surface untreated;	Construction	Completed and verified through the Independent Environmental Audit process.

		soil will be placed into an appropriately bunded treatment area (pads) and treated with a neutralising agent (e.g. lime). Leachate water from the PASS material will be managed and treated to ensure no acid is released to the environment; leachate generated during the ASS treatment operations will be captured. Any water potentially affected by leachate collecting within the excavation will be treated with hydrated lime or equivalent prior to discharge. Water potentially affected by leachate accumulating within the work site will not be discharged until it meets acceptable water quality standards or collected and disposed at a licensed liquid waste treatment facility; and PASS materials will be kept separate from non-PASS materials at all times to reduce the volume of material requiring treatment. Acid is transported by water; therefore, excavation works in PASS will be conducted during dry periods (where practical) to minimise the risk of overflow associated with sudden or heavy rain and to allow better control of treated waters for discharge.		
Unexpected finds	CT8	An unexpected finds procedure will be included in the CEMP. An unexpected find is potential contamination that was not previously identified during this PSI or pre-construction investigations. Project workers will be trained in identifying the following: soil that appears to be contaminated based on visual and olfactory (odour) observations; ACM (i.e. either bonded or friable asbestos); groundwater that appears to be contaminated based on visual and olfactory (odour) observations (including potential hydrocarbon sheens on the water surface, free phase liquids such as petroleum fuel, discolouration etc.); drums or underground storage tanks (USTs); and	Construction	Completed and verified through the Independent Environmental Audit process.

		fill containing wastes (e.g. slag, refuse, demolition materials). In the event of an unexpected find: excavation works will temporarily be suspended at the location of the unexpected find, the environment manager contacted and the area of concern appropriately isolated; the area will be inspected by a contaminated land consultant and if required, appropriate sampling and analysis will be undertaken, the sampling works will be documented in a report; the requirement for additional controls will be assessed by the consultant and implemented by the proponent; and workplace health and safety and environmental protection requirements will be reviewed, depending on the type of unexpected finds encountered.		
Former landfill management	CT9	Site-specific management plans for former landfill sites will be required for excavation works in Sydney Park and Camdenville Park. A plan may also be required for Henson Park following the outcome of investigations (see CT1). The development of the plans will include consultation with the relevant councils. Approval will be sought from the NSW EPA in all areas where exhumation of landfill waste is required in accordance with Clause 110A of the *Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018 (Amendment Regulation).* Where there are existing environmental management plans, such as for Camdenville Park, site-specific mitigation measures outlined in these plans will be reviewed and implemented as required. The plan will be prepared by a contaminated land consultant and occupational hygienist. The plan will specify: an excavation plan specifying areas classified as per in-situ waste classification and suitability for reuse; trench ventilation during excavation to prevent the accumulation of landfill gases within the trench (also refer to AQ12);	Construction	Completed and verified through the Independent Environmental Audit process.

		ambient and in-trench monitoring for landfill gases (methane, carbon dioxide, hydrogen sulfide and carbon dioxide), ammonia and volatile organic compounds; action levels for evacuation of the work zone where health and lower explosive limit (LEL) levels are exceeded and additional controls to allow work to re-commence once implemented; exclusion zone around the work area on either side of the trench, including fully fenced security chain mesh fences with bracing, where required; geotechnical considerations for the base of the trench to mitigate the risk of subsidence of the installed cable; final capping layer above the concrete cable conduit casing as per the Environmental Guidelines Solid Waste Landfills (NSW EPA, 2016), unless otherwise specified or agreed with City of Sydney ~~Council~~ and Inner West Council: compacted clay layer at least 600 mm thick, with an in situ saturated hydraulic conductivity of less than 1 x 10–9 metres/s (where subsurface waste either side of the trench is less than; a revegetating layer from the top of the capping layer to the surface comprising clean soils with 200 mm of topsoil (in landscaped areas); and the construction of joint bays, link boxes and sensor pits within former landfill areas will be designed to prevent the accumulation of landfill gases. Inner West Council and City of Sydney ~~Council~~ will be consulted on the design, monitoring and location of the pits within Sydney Park, Camdenville Park, and Henson Park (if required).		
Sydney Park	CT10	TransGrid will undertake additional investigations at Sydney Park on leachate and methane risks prior to or during construction and will report these findings to the City of Sydney.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Drilling slurry	CT11	TransGrid will investigate and adopt good practice measures for the management of drilling slurry during horizontal directional drilling, where used, taking into consideration the volume of slurry that will be generated.	Detailed design and construction	Completed and verified through the Independent

				Environmental Audit process.
Surface water and flooding				
Water quality, soil erosion and sediment control (CSWMP)	WQ1	A CSWMP will be prepared as part of the overall CEMP to document the measures required to mitigate and manage potential impacts on soils, surface water and groundwater during construction. The CSWMP will include the following sub-plans and measures: ESCPs (see WQ2); where wheel washing is required, wheel wash wastewater will be collected (e.g. through temporary containment and directing to sediment basins or tanks) and disposed of appropriately; water collected during construction (e.g. during dewatering or surface water inflows to the trench or pits) would be discharged or disposed of in accordance with the *Protection of the Environment Operations Act, 1997 and the ANZECC Water Quality Guidelines (2000) for 95% protection level for marine ecosystems.* Contaminated water captured during construction would be disposed of at an appropriately licensed facility; and where works are within the riparian zone (40 metres from the top of the watercourse bank) the *Controlled Activities on Waterfront Land Guidelines* (DPI, 2012) would be reviewed and relevant measure included into the CSWMP where appropriate. Procedures and protocols to manage potentially contaminated fill, soil, bedrock, acid sulfate soils and extracted groundwater will be detailed in the CEMP in accordance with conditions outlined in the Preliminary Site Investigation report (refer to Appendix K of the EIS) and the *NSW Acid Sulfate Soils Manual* (Stone *et al*, 1998).	Construction	Completed and verified through the Independent Environmental Audit process.
Water quality, soil erosion and sedimentation (ESCP)	WQ2	ESCPs will be prepared as part of the CEMP for transmission cable route work sites, substations and construction laydown areas, in accordance with the Blue Book (Landcom, 2004). ESCPs will be implemented in advance of site disturbance and updated as required as the construction progresses and the work site locations change.	Construction	Completed and verified through the Independent Environmental Audit process.

		Measures in the ESCPs will include: construction traffic to be restricted to access tracks, where existing roads cannot be utilised (e.g. through Sydney Park). These access tracks will be clearly delineated and maintained until construction is complete; where possible, clean water will be prevented from entering excavations by diverting runoff away from earthworks activities; the extent of ground disturbance and exposed soil will be minimised to the greatest extent practicable to minimise the potential for erosion; disturbed ground and exposed soils, such as inside trenches or at construction laydown areas, will be temporarily stabilised (e.g. with geotextile) prior to extended periods of site inactivity and permanently stabilised as soon as possible to minimise the potential for erosion; stormwater flows will be managed to avoid flow over exposed soils which may result in erosion and impacts to water quality. Inside the excavation this may require the use of trench stops; and rainfall forecasts will be monitored daily during construction and works rescheduled if necessary and as determined by the contractor, to reduce risk of erosion and sedimentation and to minimise the impact of heavy rainfall and flood events.		
Water quality – spills and leaks	WQ3	The following measures will be documented in the CSWMP and implemented to mitigate and manage spills and leaks: areas will be allocated for the storage of fuels, chemicals and other hazardous materials. These areas will be as far away as feasible and reasonable from watercourses, located where flooding during a 20 year Average Recurrence Interval (ARI) event is unlikely, and on an impervious bunded area; the storage and handling of dangerous goods will be in accordance with relevant guidelines and standards such as the	Construction	Completed and verified through the Independent Environmental Audit process.

		Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005); fuel and liquid storage at construction laydown areas will be secured and stored in accordance with the NSW EPA guidelines (Department of Environment and Climate Change NSW, 2007b); appropriate spill containment and prevention measures will be applied to fuel and liquid storage, where feasible and reasonable; accidental spills or leaks will be managed through the use of spill containment measures including spill kits. Any contaminated material will be disposed of to an appropriately licenced facility; re-fuelling of construction plant and equipment will be undertaken using appropriate spill containment measures to mitigate pollution risks from accidental spills or leaks; refuelling activities will be undertaken at least 100 metres from the nearest watercourse; a spill response kit will be available on-site at all work sites at all times; where bulk fuel or other liquid substances are to be brought to a work site, a container specifically designed for that purpose will be used; underboring sites will have appropriate stormwater diversions, as well as downstream pollution and sediment control measures to both prevent stormwater entering the excavation as well as to assist with containing any loss of drilling fluid; and flows of drilling fluid will be visually monitored in accordance with the CSWMP.		
Flooding and water flows (FMS)	FF1	A Flood Mitigation Strategy (FMS) will be prepared in accordance with the *Floodplain Development Manual* (DIPNR, 2005) for work within flood prone or flood affected land within the project area to demonstrate that the existing flooding characteristics will not be exacerbated. The FMS will be prepared by a suitably qualified and experienced person in consultation with directly affected landowners, DPI-Water, DPIE, Sydney Water and relevant councils. The FMS will be prepared during detailed design and prior to construction.	Detail design	Complete.

		The FMS will identify design and mitigation measures that will: be considered by the contractor in the development of site-specific flood management plans, including the need to protect plant, staff, materials and earthworks activities from flooding (also refer to FF**2**); avoid or reduce impacts at adjacent properties; and not significantly alter surface water flows during construction and operation. The FMS will limit flooding characteristics to the following levels, or else provide alternative flood mitigation solutions consistent with the intent of these limits: a maximum increase in inundation time of one hour in a 100 year ARI rainfall event; a maximum increase of 10 millimetres in inundation at properties where floor levels are currently exceeded in a 100 year ARI rainfall event; a maximum increase of 50 millimetres in inundation at properties where floor levels would not be exceeded in a 100 year ARI rainfall event; and no inundation of floor levels which are currently not inundated in a 100 year ARI rainfall event.		
Flooding and water flows during construction	FF2	Flood Management Plans (FMPs) will be developed as part of the CSWMP for works within flood prone or flood affected land within the project area. Measures to be detailed in the FMPs to manage potential flood and water flow impacts would include: the construction of the project will be staged to limit the extent and duration of temporary works in a floodplain; work inside ephemeral watercourses including, but not limited to the Coxs Creek and other urban drainage network assets, will not be undertaken during or immediately following runoff generating rainfall events when stormwater flows in these watercourses are expected; and	Construction	Completed and verified through the Independent Environmental Audit process.

		flood emergency response procedures will be documented within the FMPs to make sure construction equipment and materials are removed from floodplain areas at the completion of each work activity or in the event a weather warning is issued for impending flood producing rain.		
Camdenville Park flood detention basin	FF3	Design of the transmission cable route through Camdenville Park will consider the integrity and functionality of the existing flood detention basin.	Detail design	Complete.
Groundwater				
Groundwater interception	GW1	A Groundwater Management Strategy will be prepared that will outline the requirement for drilling and installation of monitoring wells and baseline groundwater level and quality monitoring. This additional information will be collected prior to or during detailed design in locations where it is likely that the water table may be intersected. This data will be used to confirm whether groundwater control measures or dewatering will be required. Where it is likely that groundwater will be intersected, estimates of groundwater inflows will be predicted to assess if a groundwater extraction license would be required (that is if 3 ML/year of groundwater discharge was to be exceeded). Outcomes from the GMS will inform the Construction Environmental Management Plan (CEMP). The CEMP, where necessary: measures to stabilise the excavation, such as installation of temporary shoring in trenches (e.g. sheet piling); localised temporary dewatering measures to maintain dry working conditions; measures to maintain groundwater flow conditions to minimise disruption to down-gradient receptors; and measures to minimise groundwater drawdown to reduce any ground settlement impacts.	Detailed design	Complete.
Aquifer interference	GW2	Detailed hydrogeological information (e.g. bore data) will be used to inform the most suitable underboring construction method at select special crossings that will minimise the need for dewatering.	Detailed design	Complete.

		Where an aquifer is to be completely penetrated at the underboring special crossings, appropriate controls (such as drainage blankets) will be installed beneath the infrastructure to ensure groundwater flow is maintained to minimise disruption to groundwater flow paths.		
Intersection of contaminated groundwater	GW3	In areas where contaminated groundwater is identified, measures will be implemented to ensure that the backfill within the excavation does not create a more permeable pathway for migration of contamination.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Dewatering	GW4	A CSWMP will be prepared as part of the CEMP to document the measures required to mitigate and manage potential impacts on groundwater during construction. The CSWMP would include the following measures: water collected during dewatering of excavations would be discharged or disposed of in accordance with the *Protection of the Environment Operations Act 1997* and the *ANZECC Water Quality Guidelines* (2000) for 95% protection level for marine ecosystems; and contaminated groundwater captured during construction will be disposed of at an appropriately licenced facility.	Construction	Completed and verified through the Independent Environmental Audit process.
Waste management				
Waste minimisation	WM1	The following waste minimisation strategies will be implemented: use of recycled materials (i.e. recycled content for asphalt and concrete including the use of fly ash) wherever feasible; use of wastewater or recycled water to reduce potable water demand for construction activities; and use of modular, precast/prefabricated structures, where feasible.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
General	WM2	Waste will be managed in accordance with the waste hierarchy established in the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act). This will include the: classification of waste during construction in accordance with the current guidelines;	Construction and operation	Identified using Environmental Assessment Framework. Refer Transgrid's Waste Management procedure

		segregation of waste at construction laydown areas and substations (within appropriate bins) for ease of recycling/reuse; procurement of materials on an as needed basis to avoid waste due to over-ordering; and investigating opportunities to reuse materials where feasible.		Refer to Environmental Handbook Sections 1.2, 1.3, 1.4, 4.3, 4.4
Construction waste	WM3	Waste will be managed (classified, handled and stored) in accordance with relevant state legislation and government policies (including the NSW EPA *Waste Classification Guidelines*). All waste to be disposed off-site will be directed to a waste management facility that is lawfully permitted to accept that type of waste. Records of waste tracking and disposal will be maintained.	Construction and operation	Identified using Environmental Assessment Framework. Refer Transgrid's Waste Management procedure Refer to Environmental Handbook Sections 1.2, 1.3, 1.4, 4.3, 4.4
Spoil management	WM4	The Waste Management Plan developed for the project as part of the CEMP will outline the requirements for spoil management. The plan will identify: spoil generation activities; spoil generation location; spoil management hierarchy; on-site management, including stockpile sites; spoil reuse options spoil disposal locations; spoil transport modes and routes; and material tracking requirements.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Asbestos waste	WM5	The disturbance, movement and disposal of asbestos containing materials will be carried out in accordance with the Work Health and Safety Regulation 2011 and other relevant guidelines. The handling and disposal of asbestos waste will be tracked in accordance with the Asbestos Management Plan (refer to CT6).	Construction	Completed and verified through the Independent Environmental Audit process.

Construction wastewater	WM6	Wastewater not used on-site will be disposed off-site or discharged into the local stormwater system in accordance with the requirements of the POEO Act.	Construction	Completed and verified through the Independent Environmental Audit process.
Spoil reuse	WM7	Reasonable and feasible options will be investigated to reuse spoil (where it can be achieved safely) in accordance with the POEO Act and WARR Act.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Concrete recycling	WM8	Opportunities to recycle concrete (i.e. from excavation of concrete roads) will be investigated.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Land use and property				
Property use	LP1	Agreements will be negotiated with relevant landowners for the temporary use of property during construction and permanent easements over private property during operation.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Traffic and access disruptions	LP2	Affected landowners/occupants will be provided with advance notification of project construction schedules and changes to access arrangements or traffic disruptions.	Construction	Completed and verified through the Independent Environmental Audit process.
Vehicle access	LP3	Vehicle access to residential and business properties will be maintained at all times, where possible. Where restricting access to properties is required to enable construction works, vehicle access will be restored as soon as possible. Where access to a property cannot be maintained, affected owners/occupants will be informed and feasible and reasonable solutions for access to their specific location discussed.	Construction	Completed and verified through the Independent Environmental Audit process.

Temporary land use change	LP4	Construction laydown areas will be reinstated to their pre-existing condition as soon as practicable following the completion of construction, in consultation with the relevant landowner.	Construction and operation	Refer to Environmental Handbook Section 2.1 Refer to Environmental Guidance Note – Erosion and Sediment Control
Identification of utilities	LP5	Further surveys (including pot holing) will be undertaken to confirm the locations of major utilities identified in DBYD. Thermal resistivity assessments will be undertaken to determine the potential for reduced trench widths in order to minimise the need for utility relocation or support/protection measures.	Detailed design	Complete.
Disruption of services or relocation of utilities	LP6	Where services need to be disrupted or utilities relocated, relevant stakeholders will be consulted and affected communities notified.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Utility damage	LP7	Where works are to be carried out in close proximity to utilities, consultation will be undertaken with the relevant utility provider to determine safety and network integrity requirements.	Construction	Completed and verified through the Independent Environmental Audit process.
Social and economic				
Community consultation	SE1	Implementation of the project CCF (refer to Appendix C of the EIS) as part of the project Community and Stakeholder Engagement Strategy and Plan.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Social infrastructure	SE2	Construction laydown areas within private and public reserves and parks will be planned to minimise impacts on existing recreational and sporting infrastructure, including playground equipment, with construction laydown areas located in areas of open space, where possible.	Construction	Completed and verified through the Independent Environmental Audit process.

		Establishment and use of the laydown areas will consider public safety and maintain safe access to recreational areas. Private and public reserves and parks proposed for the construction laydown areas will be returned to their original or improved condition following construction (or as otherwise agreed with the relevant authority). Access to community facilities along the transmission cable route and in proximity to construction laydown areas will be maintained at all times unless an alternative solution has been negotiated with the landowner/occupier. Access to areas of reserves and parks not utilised for construction laydown areas will be maintained throughout construction.		
Access and transport	SE3	Opportunities to enhance pedestrian and cyclist connectivity within the local study area, including design of cable bridges to accommodate pedestrian and cyclist movements will be investigated during detailed design, in consultation with relevant stakeholders. The construction workforce will be encouraged to travel to and from work sites via public transport or use car-pooling to reduce impacts on local parking. Temporary relocation of bus stop facilities will be undertaken in consultation with the relevant road authority, bus operators and TfNSW. The relocated bus stops will be reinstated at their original location as construction works are completed in each location. Vehicle access to residential and business properties will be maintained at all times, where possible. Where restricting access to properties is required to enable construction works, vehicle access will be restored as soon as possible. Where access to a property cannot be maintained, affected owners/occupants will be informed and feasible and reasonable solutions for access to their specific location discussed.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
Business impacts	SE4	Vehicle access to business properties will be maintained at all times, where possible. Where restricting access to properties is required to enable construction works, vehicle access will be restored as soon as possible. Where access to a property cannot be maintained, consultation will be undertaken with affected	Construction	Completed and verified through the Independent Environmental Audit process.

		landowners/occupants, in accordance with the CCF, to identify appropriate timeframes for restricting access, or to negotiate alternative solutions. Construction activities undertaken in proximity to businesses will maintain visibility of business frontage, associated signage and access points, where possible. Business impacts resulting from changes to amenity or access will be managed in line with mitigation measures identified for other relevant environmental issues.		
Utilities impacts	SE5	Consultation and construction planning with relevant utility/service providers (including councils, TfNSW, Sydney Trains, ARTC and Roads and Maritime) and measures such as searches of DBYD will be undertaken to minimise the potential for damage or disruption to utilities and services.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
EMF impacts	SE6	Information about potential EMF levels and the relevant health guidelines will continue to be provided to stakeholders in proximity to the cable route as part of community consultation undertaken for the project.	Construction	Completed and verified through the Independent Environmental Audit process.
Sydney Park impacts	SE7	Construction works within Sydney Park will be undertaken in stages and appropriate diversions for access provided to minimise disruption to park users and the City of Sydney.	Construction	Completed and verified through the Independent Environmental Audit process.
Cumulative impacts				
General	CE1	TransGrid explore project refinements and opportunities (including construction scheduling) to further minimise impacts on the environment and communities.	Detailed design	Complete.
General	CE2	Key stakeholders, including relevant government agencies, councils and developers (including project proponents), will be kept informed of construction progress and scheduling in an effort to minimise community impacts. The frequency and method of this communication will be outlined in the project CEMP and CCF.	Construction	Completed and verified through the Independent Environmental Audit process.

General	CE3	TransGrid will review the environmental impacts of the project before the start of construction and periodically during construction to identify further opportunities to reduce cumulative impacts. Any potential changes to impacts or mitigation measures will be captured in the CEMP.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.
General	CE4	Consultation and construction planning will be undertaken with relevant stakeholders, particularly proponents for other developments within proximity to the project.	Detailed design and construction	Completed and verified through the Independent Environmental Audit process.