

Molonglo 3- Major Electrical Infrastructure Relocation Dismantling of the Overhead 132kV

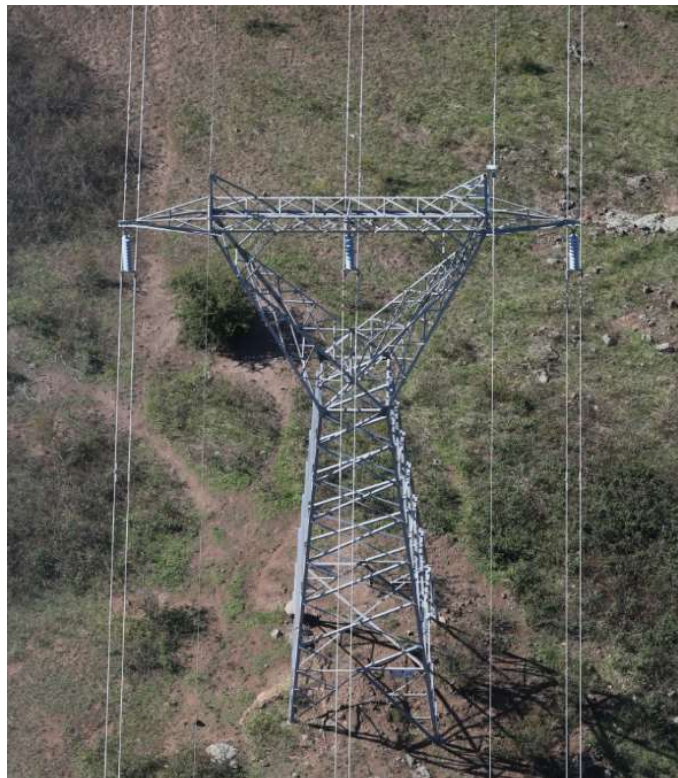


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1 INTRODUCTION

1.1 Purpose

This brief is a supporting document to DA 201936352 submission for Molonglo 3 Major Electrical Infrastructure Relocation Project. It provides information for works to dismantle a redundant section of Evoenergy 132kV overhead line after the new 132kV underground cable is energised.

The application is submitted by Calibre Consulting on behalf of the Suburban Land Agency (SLA) and Evoenergy who are seeking the necessary approvals to conduct the proposed works.

Upon energisation of the new underground 132kV cable, the overhead section from Kama Nature Reserve Buffer to the Molonglo River and over the Tuggeranong Parkway will be redundant. Approximately 5.1km and 18 lattice towers will be removed.

This report is discussing the methodology of the proposed works to dismantle the line and the towers.

This is not a specification document to engage a contractor to perform the dismantling work.

1.2 Location

Figure 1 shows the location of the proposed project in the ACT. The route has an approximate length of 5.1km extending from the Kama Reserve buffer (B1 S39 Molonglo Valley) to the Molonglo River over the Tuggeranong Parkway (Molonglo Valley RB27).

For the purpose of this report, the route has been divided into 3 segments as shown in Figure 1. The segments are as follows:

- A. **Segment A** – Kama Nature Reserve buffer to the edge of future Whitlam Development stage 4 (tower 1 and 2)
- B. **Segment B** – Whitlam Development stage 4 to Coppins Crossing Road (tower 2, 3 and 4)
- C. **Segment C** – Coppins Crossing Road to over Tuggeranong Parkway (tower 5 to 18).

The subject sites, for the purpose of this document, are considered to be:

- The location of each pole, including any surrounding area needed for work purposes related to the proposed dismantling works. All transmission towers are within the power easement.
- Formal tracks that will be used by work crews to reach workpoints.

The geospatial coordinates, specificities of the towers and specific districts, blocks and sections are identified in Table 1.1.

Figure 1: Route Alignment



Source: ACTmapi (2020)

Table 1 Towers to be dismantled from Kama Reserve Buffer to Molonglo River

	Tower No.	Asset No	Conductor Configuration	Height	Spatial coordinates	Tower Type	Span in meters to next structure	District Block	Environmental consideration (as per ACTmap)	Evoenergy Comments
A	1	STP95820	Suspension (towers only)	24.5m	Easting 201716 Northing 604826	S-20	Not applicable	S39 B1 Molonglo development area	Pink-tailed Work-lizard ACT Grassland Communities Potentially contaminated soil (UXOs)	Figure 2
A	2	STP95821	Suspension (towers only)	24.5m	Easting 201910 Northing 604560	S-10	329.65	S39 B1 Molonglo development area	Pink-tailed Work-lizard Potential threatened Woodland ACT Grassland Communities Potentially contaminated soil (UXOs)	Slope and water features Figure 2
B	3	STP95822	Suspension (towers only)	24.5m	Easting 202197 Northing 604167	S+/- 0	483.86	S39 B1 Molonglo development area	None – area under development Pink-tailed Work-lizard Potentially contaminated soil (UXOs)	Figure 2
B	4	STP95823	Suspension (towers only)	24.5m	Easting 202374 Northing 603924	S-20	299.72	S39 B2 Molonglo development area	None – area under development Pink-tailed Work-lizard Potentially contaminated soil (UXOs)	Figure 2
Under crossing 11kV Feeder CIVIC_8+NB_BLACKMTM										
B	5	STP95824	Suspension (towers only)	24.5m	Easting 202374 Northing 603924	S-20	309.52	S39 B2 Molonglo development area	None – area under development Pink-tailed Work-lizard	Figure 2
Under crossing Coppins crossing road										
C	6	STP95825	Suspension (towers only)	24.5m	Easting 202736 Northing 603426	S-10	304.35	Molonglo Valley Rural B72	Environmental offsets Potential threatened woodland Pink-tailed Work-lizard ACT Grassland Communities Potentially contaminated soil (UXOs)	Figure 3
Under crossing 11kV Feeder CIVIC_8+NB_BLACKMTN										

	Tower No.	Asset No	Conductor Configuration	Height	Spatial coordinates	Tower Type	Span in meters to next structure	District Block	Environmental consideration (as per ACTmap)	Evoenergy Comments
C	7	STP95826	Suspension (towers only)	24.5m	Easting 202943, Northing 603143	S+/-0	351.19	Molonglo Valley Rural B72	Not Applicable ACT Grassland Communities Potentially contaminated soil (UXOs)	Figure 3 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
C	8	STP95827	Suspension (towers only)	24.5m	Easting 203146, Northing 602864	S+/-0	344.36	Molonglo Valley Rural B72	Potentially contaminated soil (UXOs)	Figure 3 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN Potentially contaminated soil
C	9	STP95828	Suspension (towers only)	24.5m	Easting 203297, Northing 602657	S+/-0	355.58	Molonglo Valley Rural B72	Potentially contaminated soil (UXOs)	Figure 3 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
C	10	STP95829	Suspension (towers only)	24.5m	Easting 203563, Northing 602292	S-20	446.53	Molonglo Valley Rural B71	Potentially contaminated soil (UXOs)	Figure 3 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
C	11	STP95830	Suspension (towers only)	24.5m	Easting 203657, Northing 602164	S-10	158.23	Molonglo Valley Rural B71	Potentially contaminated soil (Heavy metals)	Figure 3 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
C	12	STP95831	Suspension (towers only)	24.5m	Easting 203837, Northing 601916	S-20	305.78	Molonglo Valley Rural B71	Environmental Offsets	Figure 4 Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
Under crossing 11kV Feeder CIVIC_8+NB_BLACKMTN										
C	13	STP95832	Suspension (towers only)	24.5m	Easting 204097, Northing 601560	S-20	436.59	Molonglo Valley Rural B71	Environmental Offsets Potentially contaminated soil (Heavy metals)	Figure 4 Parallel to Civic to Woden 132kV OH line

	Tower No.	Asset No	Conductor Configuration	Height	Spatial coordinates	Tower Type	Span in meters to next structure	District Block	Environmental consideration (as per ACTmap)	Evoenergy Comments
C	14	STP95833	Suspension (towers only)	24.5m	Easting 204227, Northing 601382	S+10	224.28	Molonglo Valley Rural B71		Figure 4 Parallel to Civic to Woden 132kV OH line
Under crossing Boundary Road										
C	15	STP95835	Suspension (towers only)	24.5m	Easting 204420 Northing 601117	S-20	353.49	Molonglo Valley Rural B71	Potentially contaminated soil (Heavy metals)	Figure 4 Parallel to Civic to Woden 132kV OH line Parallel to 11kV feeder CIVIC_8+NB_BLACKMTN
Under crossing River Road										
C	16	STP95837	Suspension (towers only)	24.5m	Easting 204579 Northing 600899	S-10	267.74	Molonglo Valley Rural B71	Potentially contaminated soil (Heavy metals)	Figure 4 Parallel to Civic to Woden 132kV OH line
Under crossing Tuggeranong Parkway										
C	17	STP95839	Light Tension (towers only)	24.5m	Easting 204717 Northing 600709	S+/-0 Or A-10	236.18	Molonglo Valley Rural B27	Potentially contaminated soil (Heavy metals)	Figure 4 Parallel to Civic to Woden 132kV OH line Heritage
C	18	STP95841	Suspension (towers only)	24.5m	Easting 204768 Northing 600444	S-10	Approx. 200m to new UGOH	Molonglo Valley Rural B27	Potentially contaminated soil (Heavy metals)	Figure 4 Parallel to Civic to Woden 132kV OH line

2 PROPOSED DISMANTLING WORKS

2.1 Summary

The works involve:

- Preparation work (non-exhaustive list)
 - o Access to site via existing tracks outside or within electrical easement
 - o Site set up
 - o Installation of working earths/construction earths
 - o Protection at road crossing and exclusion zones near towers
 - o Earthworks: level construction benches approx. 10m x 10m (pending on ground conditions) for plant and equipment (crane, bulldozer, elevated work platforms, winches and excavators)
 - o Traffic management as required
 - o Isolation of Evoenergy lines running parallel as required
- Removal of the conductors, optic fibre and earthwire between tower 1 and tower 18
- Dismantling 18 lattice steel towers and dispose/recycle steel metal
- Excavate and remove the concrete footings and tower earthing
- Reinstatement of site to previous condition including revegetation if required.

2.2 Asbestos paint removal

The paint coating samples taken from the main legs of Transmission Towers 3,6,11 and 18 (Asset numbers STP95822, STP92825, STP95830 and STP95841) were found to contain chrysotile asbestos

Photo 1: Tower 11 (STP 95830) - surface coating to lower section of main support leg – Fibrous contain Chrysotile Asbestos



The ACM paint coating to all Transmission Towers were found to be in a good and stable condition and remained in-situ provided it is not disturbed.

Although the Transmission Tower STP 95837 (sample number E2191) was found to be non-asbestos it

is recommended that it be treated as containing chrysotile asbestos as the paint coating may have some inconsistencies in the material. Additionally, the paint coating to all of the Transmission Towers were all visually consistent.

It is proposed to encapsulate the ACM paint, then proceed with the dismantling of the tower and leave the footing steel member for licensed asbestos removalist to cut and dispose once the top members of the steel tower are dismantled.

In any cases, removal of ACM or handling of the steel member with ACM paint must be undertaken by a licensed asbestos removalist as per current legislation. The removal/remediation of friable ACM must be undertaken by a licensed Class A asbestos removalist. Removal or remediation of non-friable asbestos may be undertaken by either an A or B Class asbestos removalist.

Prior to the commencement of any removal or remediation works associated with any amount or type of asbestos, a Building Certifier must be engaged, and Building Approval sought from WorkSafe ACT a minimum of 5 working days prior to the commencement of the works. An asbestos removal contractor must supply an Asbestos Removal Control Plan (ARCP) and a Safe Work Method Statement (SWMS). An independent licensed Asbestos Assessor should be engaged to ensure that the ARCP addresses all safety issues relating to the planned asbestos works.

Air monitoring is mandatory during the removal or remediation of friable asbestos and should be considered during the removal or remediation of non-friable asbestos. Air sampling is to be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC: 3003(2005)] and test certificates must be National Association of Testing Authorities (NATA) endorsed.

An independent licensed Asbestos Assessor must also be employed to undertake a Clearance Inspection of both friable and non-friable asbestos removal or remediation works. A satisfactory clearance certificate for the remediated areas must ensure that no visible asbestos or presumed asbestos remains, or that the ACM has been satisfactorily sealed or remediated. Additionally no asbestos fibres should be detected by laboratory analysis in any validation samples. All surfaces within the remediated area must be free of general dust and debris.

2.3 Removal of conductors, OPGW (optic fibre) and earth wire

The work will involve cranes, elevated platforms and tesmec winches. Conductors, OPGW and earth wire will be removed from the transmission tower and pulleys and rollers will be installed to allow controlled cable recovery over roads and public spaces.

Line workers will transit from one tower to another to prepare and to install the pulleys.

Waste:

	Estimated Quantity	Disposal
Aluminium Conductor steel reinforced 54/6/0.139 inch + 1/0.146 inch ACSR/GZ "Moose"	Total length: approx. 30.6 km (= 5.1km x 3 phases x 2 circuits) Weight: 1,998kg/km Total weight: 61 tonnes	Removed conductors will be recovered onto cable drums and disposed to suitable recycling facility.
Optic Fibre ZTT OPGW 16-67274 (95kN-72F).	Approx 5.5km (= 5.1km + service coil)	Landfill
Earth wire (OHEW) 7/0.128 (i.e. 1 x 7/3.25mm) galvanised steel	Approx 5.1km	Removed conductors will be recovered onto cable drums and disposed to suitable recycling facility.
Insulators and other fixtures	3 x 17 suspension tower 6 x 1 light tension tower	Removed insulators will be assessed for recycling suitability and disposed of in accordance with best practice waste management strategies.

2.3 Staged disassembly of the towers

Evoenergy's Contractor will sequentially dismantle tower sections (super structure, body, legs..) and lower to the ground with a crane (refer to Attachment 1 for tower drawings). This will require earthwork preparation to level the ground and ensure site stability.

Waste material:

	Estimated Quantity in kg	Proposed disposal
18 Steel Towers	Approximately 18,000kg per tower x 18	Unbolt members and cut to appropriate length if necessary, to suit disposal in a 9 cubic meter Morrell bin.

2.4 Scrap metal handling from site

Morrell bins will be placed in the vicinity of the steel towers for disposal of the dismantled parts. Each bin will take up to 8 tonnes of steel per transport.

2.5 Foundations and earthing arrangement

Evoenergy towers have 4 footings per tower with a depth up to 3m (refer to Attachment 2).

To avoid increasing the footprint of the foundation removal within the easement it is proposed to remove:

- Entire footings for towers 1, 2, 3, 4 and 5 (within Whitlam Development).
- Footings up to 1000mm deep in all other areas.

All towers except tower 12 and 14 are within potentially contaminated sites. Excavated material should remain on site and Evoenergy will aim at reducing the amount of waste generated. The backfilling will be done with the excavated material. In any cases disposal will be subject to testing and EPA approval.

Waste:

	Estimated Quantity	Proposed disposal
Concrete footings for towers in segment A and B (DIA estimated 460mm, average base estimated 1524mm x 1524mm x 300mm)	24 cubic meters (5 towers x 4 footings x average 1.2 cubic meters per footing excluding base)	Commercial Waste landfill
Concrete footings for towers in segment C	11 cubic meters (13 towers x 4 x 0.2 cubic meter per footing – estimated length 1200mm)	Commercial Waste landfill
bare copper conductor and copper clad electrodes from tower earthing	Not estimated (pending on earthing arrangements per tower)	will be assessed for recycling suitability and disposed of in accordance with best practice waste management strategies.

2.6 Construction Environmental Management Plan (CEMP)

The Contractor engaged by Evoenergy will prepare a CEMP prior to the commencement of the proposed dismantling works.

The CEMP will outline avoidance and mitigation measures required to be implemented during the dismantling works. The contractor will be required to implement the CEMP for the duration of the project.

The detailed removal and installation method will be finalized and incorporated into the CEMP with avoidance and mitigation measures provided in this context.

3 THE SITE

This section provides a summary of each block within the path of the transmission lines. Some blocks do not contain a transmission tower and will not need to be accessed. The transmission line passes through blocks which contains heritage items, environmental offset areas and threatened species. However, the majority of these areas and sites are not impacted by the works since the access track, transmission line and towers are generally not within area of concern or access tracks are well established. One location is at risk with Heritage artefacts and advice will be sought from the Heritage Unit in the DA process.

Each block that the transmission line traverses is outlined below and includes an explanation of the zoning; custodianship; topography; size and dimensions; threatened species; heritage; and means of access for the maintenance works.

S39 Block 2 Molonglo Valley

S39 B2 Molonglo Valley is an irregular shaped parcel of land with an area of 123.5ha. The site is in planning development for Whitlam suburb.

There are several different species and heritage items identified on the site, however the location of the transmission line does not interfere with all of these elements.

- Tower 1 (refer to figure 2) is located approximately 115m from the north western boundary of the block. The 132kV relocation construction project will provide an access track to the UGOH (underground to overhead termination) located within meters of the tower.
- Tower 2 (refer to figure 2) is directly adjacent a water course and is beside an area of potential habitat for Pink-Tailed Worm Lizards. This tower will be accessed by the service vehicle driving across the paddock to the western edge of the water course and then walking to the site of the tower. The access to tower 2 will be facilitated by Whitlam development stage 4.
- Tower 3, 4 and 5 (refer figure 2) are located further south east of the block. There are no threatened species, offset areas or heritage items identified near towers 3 and 4. Tower 5 is close to an area of potential habitat suitable for Pink-Tailed Work Lizards. Whitlam development stage 3 will provide an access through Coppins Crossing Road for this Tower.

Block 72 Molonglo Valley

Block 72 Molonglo Valley is under the custodianship of EPSDD. The block area is 130.6ha and has mixed zoning. The west of the block is zoned NUZ4, is part of the Molonglo River corridor and is identified as a nature reserve. The rest of the block that the transmission line passes is zoned RZ1. The topography of the block falls from a height of 592m at the south east to 520m at the west. There are 4 transmission towers on the block, each of which require different access and are proximate to different threatened species.

- Tower 6 (refer Figure 3) is located near the north western boundary of the block. There is no direct access to this tower, however the most efficient access would be via the dirt road north east of the tower which connects with Coppins Crossing Road. The service vehicle would need to cross 85m of grass to get to the tower. There is an environmental offset area but no heritage items or threatened species near this tower. Refer to Figure 5 for access tracks.
- Tower 7 (Figure 3) is similar to tower 6 in that there are no heritage items or environmental offset areas. There is no direct access to the tower, therefore the service vehicle would need to travel 91m between the tower and the dirt trail (same as above, however access to the east). Refer to Figure 5 for access tracks.

- Tower 8 (Figure 3) and tower 9 (refer Figure 3) can both be accessed via a service track that connect to the National Arboretum. There are no heritage items, threatened species or environmental offset areas near both towers. The plantings surrounding these towers are clear of the transmission line and would not be impacted by the works. Refer to Figure 6 for access tracks.

Block 34 Molonglo Valley

Block 34 Molonglo Valley is an un-named road reserve that stretches 1,254m and is 30m wide. The block is under the custodianship of EPSDD and is currently used as a service track that connects Boundary Road and Quarry Road. There are no threatened species, heritage items or environmental offset areas on this block. The transmission line crosses the block and there are no towers, meaning no access is required.

Block 71 Molonglo Valley

Block 71 Molonglo Valley is a large irregularly shaped block adjacent to the Tuggeranong Parkway, National Arboretum and Molonglo River. The block area is 355.8ha and has been identified for future development and urban areas, therefore has been zoned for several uses under the Territory Plan. The southern part of the block is under NCA jurisdiction as it is within a designated area under the NCP. There are seven towers on the block which are aligned from the north west to the south east. No heritage items on the block are within a 20m radius of the transmission line and no threatened species are close enough to the towers, line or tracks to be impacted in any way. Tower 13 is adjacent to an environmental offset area.

Tower 10 (Figure 4), tower 11 (Figure 4), tower 12 (Figure 4), tower 13 (Figure 4), tower 14 (Figure 4), tower 15 (4) and tower 16 (figure 4) can all be accessed via the same track as the previous towers.

Block 27 Molonglo Valley

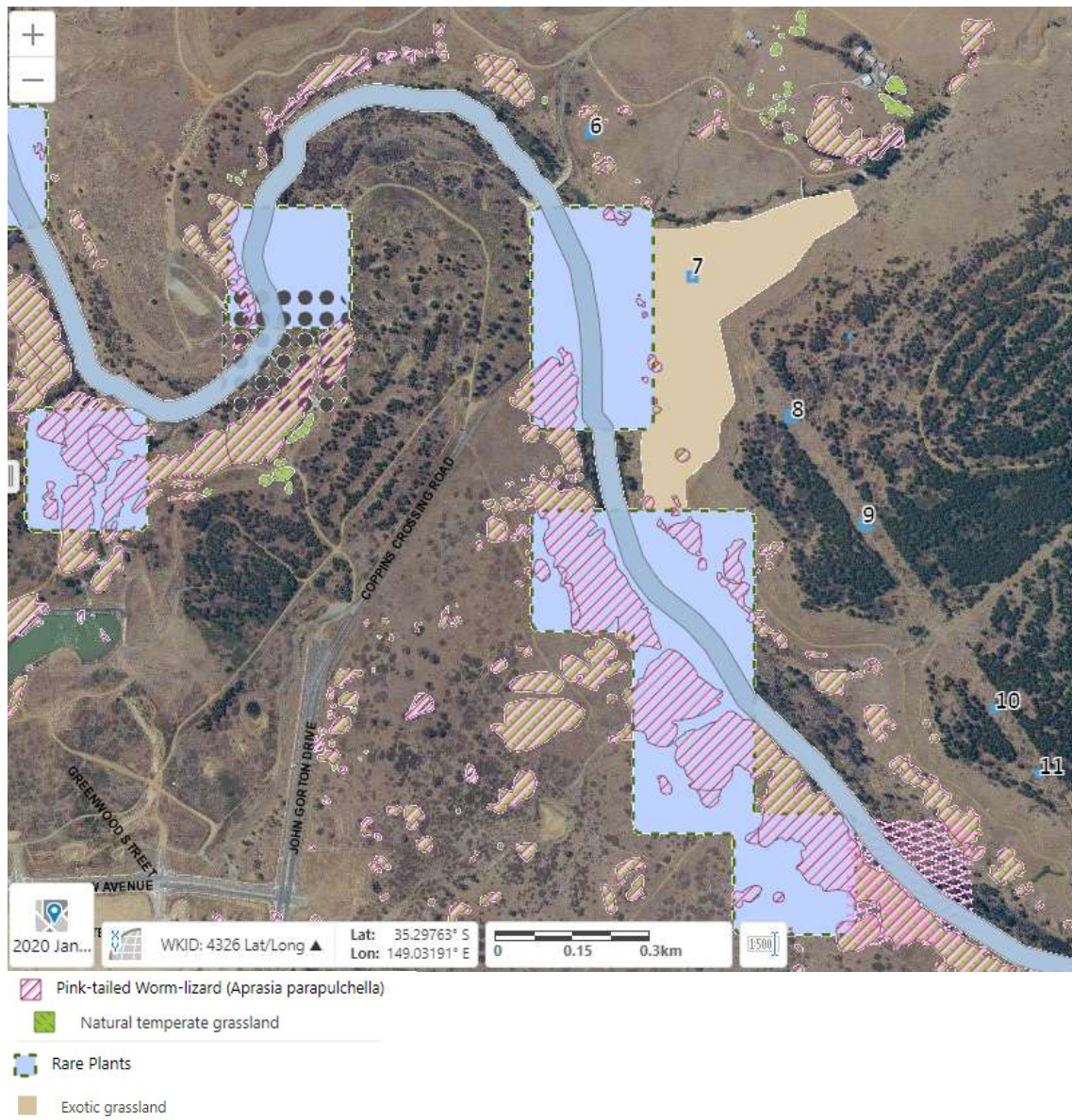
Tower 17 (Figure 4) and tower 18(Figure 4) can also be accessed via the same track as the previous towers or via the access from the Tuggeranong Parkway southbound carriage road. Refer to Figure 7.

Figure 2: Segment A and B - Tower 1 to 5 -



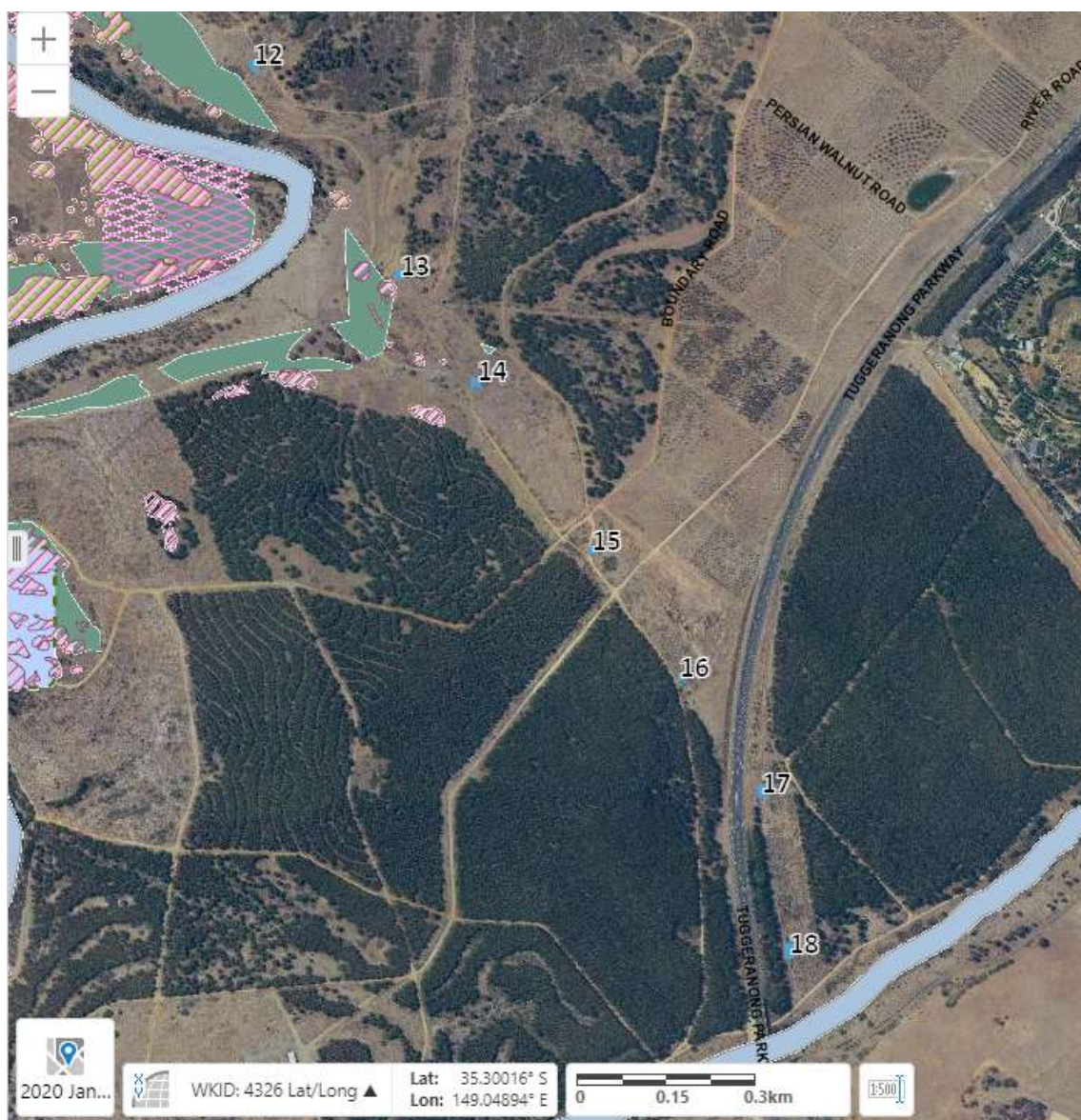
Source: ACTmapi (2020)

Figure 3: Segment C- Tower 6 to 11



Source: ACTmapi (2020)

Figure 4: Segment C – Tower 12 to 18



-  Pink-tailed Worm-lizard (*Aprasia parapulchella*)
-  Natural temperate grassland
-  Potential Threatened Woodland

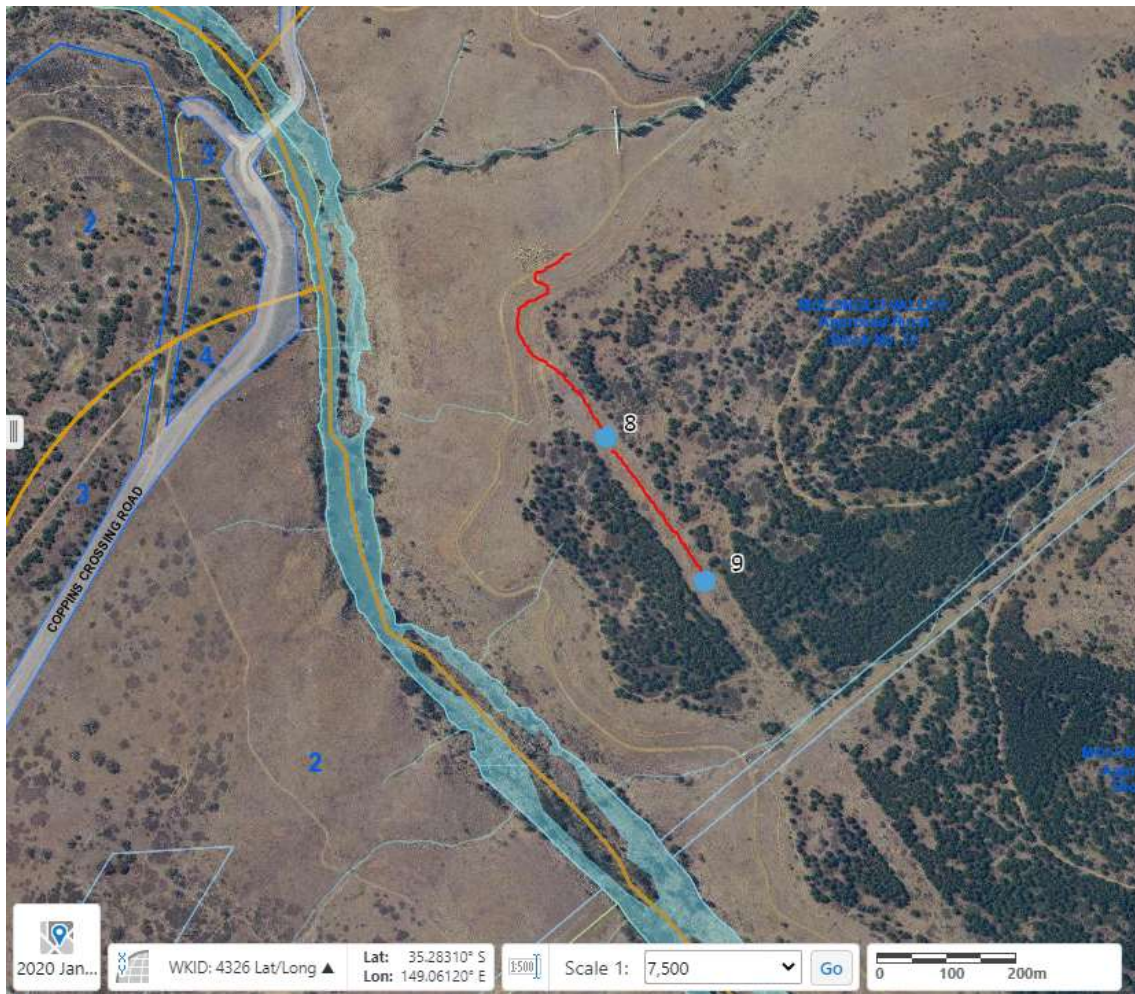
Source: ACTmapi (2020)

Figure 5: Access to tower 6 and tower 7



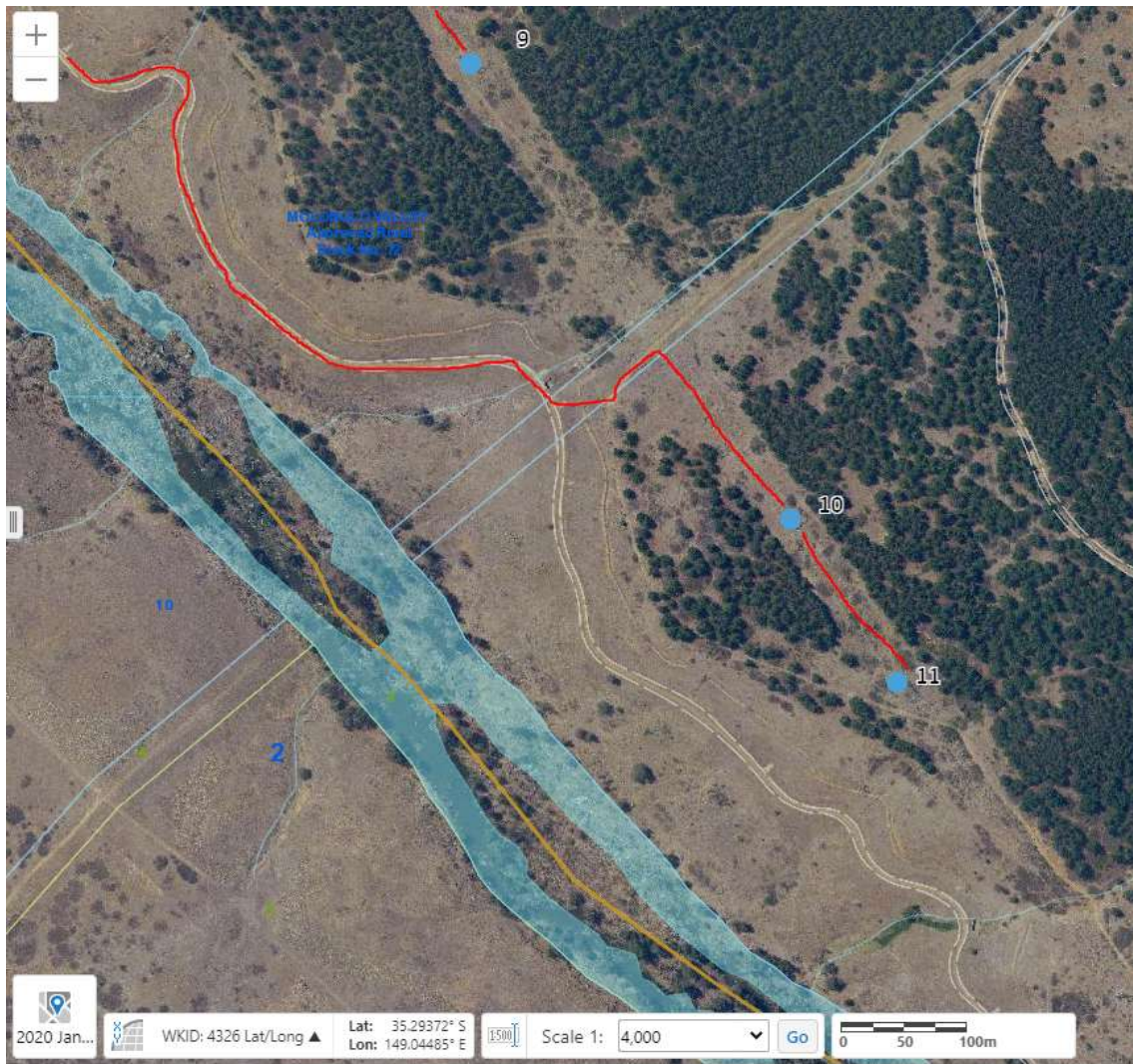
Source: ACTmapi (2020)

Figure 6: Access to tower 8 and 9 – Evoenergy access track within the overhead line easement



Source: ACTmapi (2020)

Figure 7: Access to tower 10 and 11 – Evoenergy access track within the overhead line easement



Source: ACTmap*i* (2020)

Figure 8: Access to tower 12 and 13 – Evoenergy access track to the easement



Source: ACTmapi (2020)

Figure 9: Access to tower 14, 15, 16, 17 and 18



Source: ACTmapi (2020)

4 VALUES OF THE SITE AND POTENTIAL IMPACT

This section provides an assessment of the proposed works against all relevant impact categories.

▪ Flora and Fauna

Ecological communities

The route traverses areas identified as containing the following ecological communities:

- Natural Temperate Grassland of the South Eastern Highlands – listed as critically endangered

The tower within the grasslands is:

- Tower 7

It is considered unlikely that there will be a 'significant adverse environmental impact' upon the critically endangered ecological community as this is currently within the electrical easement and future development for urban residential housing.

To reduce the potential for impacts, it is proposed that the movements are confined to access tracks along the transmission line route and near the towers. In areas of the two critically endangered ecological communities where an access track is absent, it is proposed that no direct vehicle access be permitted to the towers.

Fauna

The transmission line route traverses areas of potential habitat for the Pink-tailed Worm-lizard (*Aprasia parapulchella*). Mitigation measures, such as minimising vehicle movements outside designated access tracks, easement and tracks and preventing the spread of weeds, can reduce the risk of direct impacts to native vegetation and grassland and fauna habitat

▪ Impact on Wildlife Corridors

The transmission line is located in areas that are identified on ACTMAPi as having either local or regional habitat linkage values. There is no intention or requirement to impact any vegetation.

The duration of works for each tower is estimated to approximately a week per tower. It is not anticipated that the proposed works will have significant or negative long-term construction impacts on wildlife corridors.

Furthermore, 'no-go zones' can be proposed in locations to ensure vehicles do not progress beyond their required scope.

▪ Cultural Heritage

The ACTMAPi database indicates a number of blocks are listed as containing heritage items although we understand that only one heritage item is located on the edge of an existing track between tower 17 and tower 18 and will not be impacted by the proposed works. Exclusion zones will be established on site with para-webbing and ID flags to demarcate no go zones and avoid any potential impacts on heritage artefacts. A project specific CEMP will be developed by Evoenergy Contractor. The CEMP will include a Unexpected Finds Protocol in the event that heritage artefacts are discovered on site.

- **Water Supply Catchment**

The proposed works will not have any impact on water supply catchment areas.

- **Soil Erosion and Water Quality**

Earthworks to stabilize the ground for the crane may be required for the proposed works. As such the risk of causing soil erosion or impacting water quality through creating sediment laden runoff exist. The Evoenergy Contractor will provide a site specific erosion and sediment control plan which will be adhered to on site. The residual risks that could impact soils and cause sediment laden runoff would arise from vehicle movements in soft, wet soils. This potential impact can be mitigated to an acceptable level with a commitment to not conduct works during, or immediately after significant rain events. The commitment to vehicles only utilising existing access tracks will also mitigate this risk.

- **Cumulative impacts**

A project specific CEMP will be implemented for the project that discusses cumulative impacts and mitigation measures. Given that the project is removing an overhead transmission line and rerouting the corridor, any impacts will likely be net-benefit given that the removal of infrastructure will remove the requirement to access these areas.

5 SUMMARY OF MITIGATION MEASURES

Table 5-1 provides a summary of key potential impacts and mitigation measures that would be implemented to ensure the project does not have a significant impact on the environment.

Table 5-1: Key Potential Impacts and Mitigation Measures

Potential Impact	Measures to Reduce Impact
Flora, fauna and ecological communities	▪ Reduce earthworks to easement width ▪ Limit vehicle movement to that which is necessary. ▪ Micro-site works to existing disturbed areas where possible. ▪ Works are not to occur during significant wet weather or in water logged soils. ▪ Works will not be permitted on total fire ban days.
Aboriginal Heritage	If a previously unidentified archaeological artefact is located during the course of the dismantling works, an Unanticipated Finds Protocol (UFP) is to be implemented. The UFP will outline measure to protect the site/item until the Environment and Planning Directorate can be notified. The UFP is to be included as an attachment to the CEMP.
Weed Infestation	The contractor will prepare a CEMP prior to works commencing that will include vehicle hygiene management measures to reduce the risk of transporting weedy materials through the study area.
Disruption to public users	▪ The contractor will place signs and temporary fencing to ensure recreational users do not enter work zones. ▪ The CEMP will outline waste management measures to ensure that the proposed maintenance works do not result in waste materials being left on-site.
Soil/water contamination	The contractor will include emergency spill management measures in a CEMP.

6 SAFETY RISK REGISTER

Site hazard assessment dated 9/09/2020 (Refer to Attachment 3 for risk assessment table)

Hazards	Causes (Hazards)	Consequences	Controls	Likelihood	Consequence	Rating	Review Date	Next Review
Vehicles become bogged Vehicle rollover	Lack of vehicle access Stock dam/s Water courses Sloping ground Soft ground	Health/safety incident	- Hazard noted on Job Risk Assessment (JRA) and SWMS/Procedures implemented and monitored: - Preparation and Restoration of Sites - Movement of Mobile Plant SWMS - Use designated tracks - Create designated tracks (if required/possible) after permission has been given by the Evoenergy Senior Environmental Officer and the Evoenergy Project Manager - Use of 4WD/AWD vehicles where possible - Drive according to conditions - Use designated storage areas - Check ground condition prior to driving on it - All vehicles plant parked at appropriate angles for the terrain, hand brakes engaged, in gear	Rare	Minor	Low (6)	23/09/2020	TBA
Slips/trips/falls	Uneven/sloping ground Vegetation debris Construction debris Old/unused stays still in ground Large rocks	Health/safety incident	- Hazard noted on JRA and SWMS/Procedures implemented and monitored: - Preparation and Restoration of Sites - Remove vegetation debris from work site - Remove construction debris/rocks from work site, if not possible to move, ensure clearly identified and all persons onsite are aware of location/s - Maintain clear walk ways and paths - Maintain housekeeping while onsite - Do not climb over fences – use gates	Possible	Minor	Medium (9)	23/09/2020	TBA
Electric shock Electrical induction	Live 132kV O/H line 11Kv O/H line	Health/safety incident	- Hazard noted on JRA and SWMS/Procedures implemented: - Electrical Safety Rules – Safe Approach Distances observed and adhered to (for persons and plant) - Movement of Mobile Plant SWMS - Electrical Work SWMS - Network Switching	Rare	Severe	Medium (16)	23/09/2020	TBA

			- All persons onsite are appropriately authorised to work on or near the Evoenergy Network and Registered in Beakon - Trailing, running earths and bonding in place (as required per JRA and access permit) - Insulating mats used as required (as required per JRA and access permit) - Install approved barriers, tags and warning devices (as required per JRA and access permit)					
Worker and or plant/equipment struck by traffic	Traffic	Health/safety incident	- Hazard noted on JRA and SWMS/Procedures implemented: - Traffic Management SWMS - Temporary Traffic Management Manual - Temporary Traffic Management plans implemented as required	Rare	Major	Medium (14)	23/09/2020	TBA
Asbestos related disease (mesothelioma)	Asbestos Containing Material (ACM)	Health/safety incident	- Hazard noted on JRA and SWMS/Procedures implemented: - Asbestos Manual - Assessment of lower sections/footings of all towers requiring decommission takes place prior to works commencing – by a licensed asbestos assessor - Where ACM is found, removal to occur in line with advice from licensed asbestos removalist	Rare	Severe	Medium (16)	23/09/2020	TBA
Worker or object falls from a height	Working at heights (over 2m) Working at heights (over 2m from an EWP)	Health/safety incident	- Hazard noted on JRA and SWMS/Procedures implemented: - Risk of Falls >2m SWMS - All workers appropriately trained (Work at Heights Safely; MEWP High Risk Licence; MEWP Escape; MEWP rescue; Tower Rescue) - Rescue plan discussed, implemented and noted on JRA - All work at heights safety gear inspected and within date and inspected prior to use	Rare	Severe	Medium (16)	23/09/2020	TBA
Damage to underground assets	Unknown underground services	Health/safety incident	- Hazard noted on JRA and the following SWMS/procedures implemented: - Gas Mains and Excavations SWMS - Safe Work Around or Near the ACT Gas Network - When excavating the following must occur prior to works commencing:	Rare	Severe	Medium (16)	23/09/2020	TBA

			- Current Dial Before You Dig (DBYD) drawings must be onsite, within expiry date and referred to - Identified gas pipes must be located and marked by Zinfra and an Advice Form received and followed					
Sting or bite	Animals/wildlife	Health/safety incident	• Hazard noted on JRA and the following SWMS/procedures implemented: - Preparation and Restoration of Sites • Look for signs of animals/wildlife prior to entering work site and remain vigilant at all times • Do not approach animals if considered dangerous • Check work site for vermin/infestation and remove before commencing work if required • Insect repellent appropriately applied • Watch out for snakes and know the emergency response for snake bite • First aid kit available and within inspection dates, contents are in date	Unlikely	Moderate	Medium (12)	23/09/2020	TBA

7 CONCLUSION

This report has outlined the proposed works, site and planning context for the dismantling of the 132kV network from the Kama Buffer Nature Reserve through to the Molonglo River.

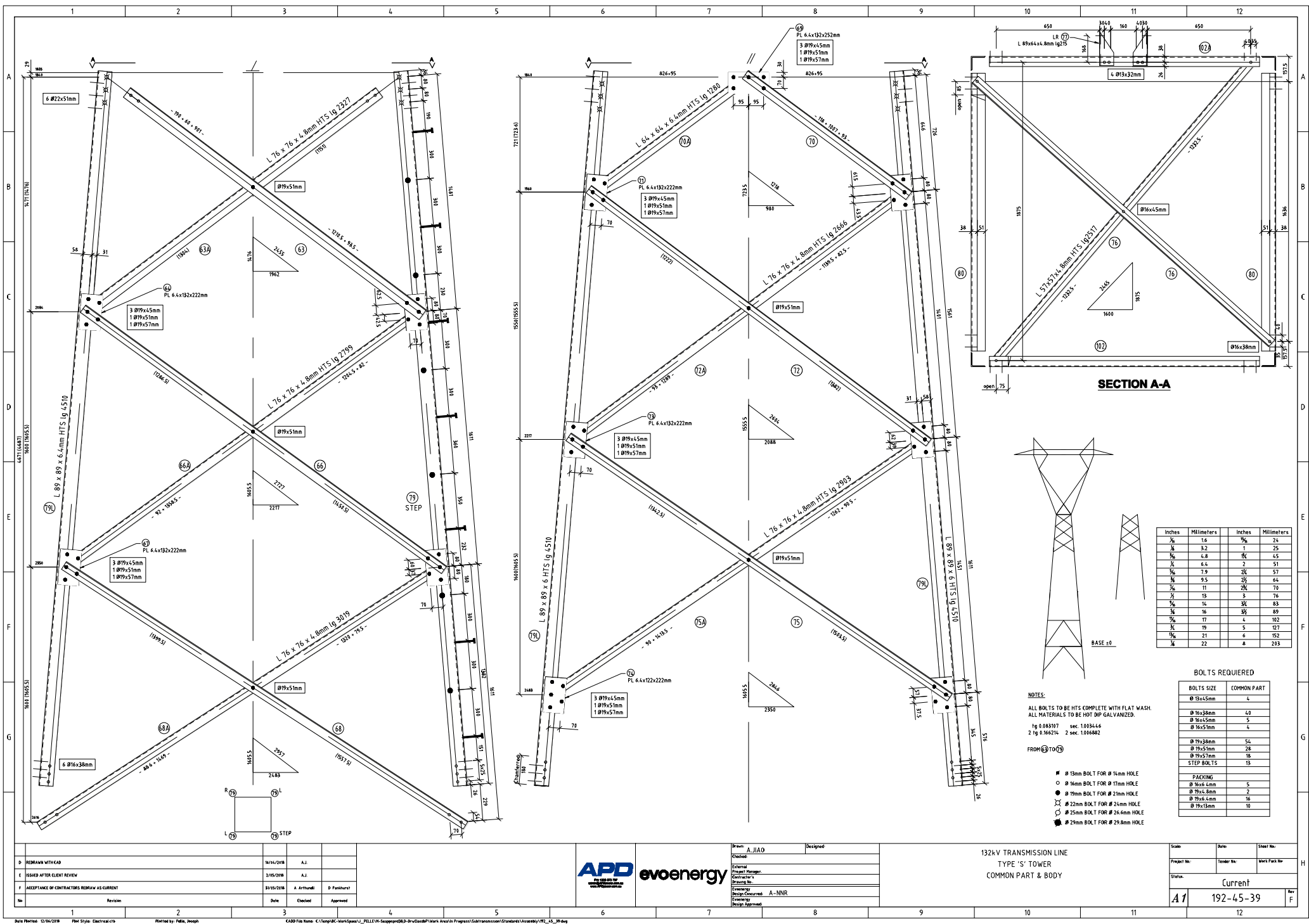
A project specific CEMP will be developed by Evoenergy Contractor and will discuss further the environmental impacts of the project and mitigation measures. This will be implemented and maintained on site by the Evoenergy Contractor.

ATTACHMENT 1- Tower (selected drawings)

ATTACHMENT 2- Tower footings

ATTACHMENT 3- Evoenergy Risk assessment tables PO0403

ATTACHMENT 1- Tower (selected drawings)





Inches	Millimeter	Inches	Millimeter
$\frac{1}{8}$	1.6	$\frac{3}{8}$	24
$\frac{3}{8}$	3.2	1	25
$\frac{1}{2}$	4.8	$\frac{5}{8}$	45
$\frac{5}{8}$	6.4	2	51
$\frac{3}{4}$	7.9	$\frac{7}{8}$	57
$\frac{7}{8}$	9.5	$\frac{1}{2}$	64
$\frac{1}{4}$	11	$\frac{1}{4}$	70
$\frac{1}{2}$	13	3	76
$\frac{3}{4}$	15	$\frac{3}{4}$	83
$\frac{1}{2}$	16	$\frac{1}{2}$	89
$\frac{1}{4}$	17	$\frac{1}{4}$	102
$\frac{1}{8}$	19	5	127
$\frac{1}{16}$	21	6	152
$\frac{1}{32}$	22	8	203

BOLTS REQUIRED

BOLTS SIZE	BODY-20	BODY-10
Ø 16x38mm	24	60
Ø 16x45mm	8	68
Ø 16x51mm	16	32
Ø 19x38mm	12	12
Ø 19x51mm	18	18
STEP BOLTS	19	19
PACKING		
Ø 16x5,4mm	8	20
Ø 16x13mm	8	12
Ø 18x5,4mm	6	6

NOTES:

ALL BOLTS TO BE HTS COMPLETE WITH FLAT WASH
ALL MATERIALS TO BE HOT DIP GALVANIZED.

tg 0.083107	sec 1.003446
2 tg 0.166214	2 sec. 1.006882

- Ø 13mm BOLT FOR Ø 14mm HOLE
- Ø 16mm BOLT FOR Ø 17mm HOLE
- Ø 19mm BOLT FOR Ø 21mm HOLE
- ⊗ Ø 22mm BOLT FOR Ø 24mm HOLE
- ⊙ Ø 25mm BOLT FOR Ø 26.6mm HOLE
- ⦿ Ø 29mm BOLT FOR Ø 29.8mm HOLE

FROM 49 TO 62

Scale:	Date:	Sheet No.:
Project No.:	Tender No.:	Work Pack No.:
Status:		
Current		
A1	192-45-48	

[illegible]

Drawn: A. JIAO	Designed:
Checked:	
External Project Manager:	
Contractor's Drawing No.:	
Evening Design Concerned:	
Evening:	

132kV TRANSMISSION LINE
TYPE 'S' TOWER
COMMON PART BODY & BODY-20

ATTACHMENT 2- Tower footings

ATTACHMENT 3- Evoenergy Risk assessment tables PO0403

PO0403- Risk Assessment Tables



CONSEQUENCE	NEGATIVE RISK					
		Negligible	Minor	Moderate	Major	Severe
	Health/safety incident	Superficial injury or ailment, self-administered first aid or no treatment required. No Lost Time Injury (LTI).	Minor injury requiring first aid, hospital/GP treatment only (no surgery required). LTI <1 week , may require modified duties <1 week.	Injury requiring surgery, LTI >1 week , modified duties >1 week to < 6 months.	Irreversible disability, impairment or extensive injuries. LTI > 6 months .	One or more fatalities, or irreversible disabilities/effects to multiple persons.
	Damage to the environment	No impacts to environment or sustainability.	Short-term (weeks) environmental impacts, effects are contained within site.	Medium-term (months) impacts, on-site environmental releases are contained with outside assistance, ecological impacts to culturally significant artefacts.	Longer-term (> 1 year) environmental effects to site and off-site, impact on ecosystem, destruction of area of cultural significance. Requiring significant remediation measures.	Severe environmental damage or long term effects (years) on ecosystem or culturally significant site.
	Damage to reputation or competitive position	Insignificant public or media attention and enquiries.	Minor stakeholder ¹ dissatisfaction and/or local media enquiries and minor reporting. Loss of <5% market share.	Moderate dissatisfaction across multiple stakeholder groups and/or adverse local media attention. Loss of 5 to 9% market share.	Major dissatisfaction across multiple stakeholder groups and/or adverse local/national media attention or public outcry across multiple media channels. Loss of 10 to 15% market share.	Severe dissatisfaction across all stakeholder groups and/or sustained (>1week) adverse local/national media attention across multiple media channels. Loss of >15% market share.
	Legal/compliance breach	Breach of law/regulation with negligible consequences. Regulatory audit outcome of observation.	Breach of law/regulation with minor consequences such as minor legal issues and/or minor fine imposed. Regulatory audit with few minor non-conformance findings.	Breach of law with moderate consequences such as investigations, threat of litigation, moderate fines (\$1,000 - \$19,999), additional reporting, and/or audit requirements imposed. Regulatory audit with minor non-conformance findings.	Breach of law with major consequences such as litigation, major fines (\$20,000 - \$499,000), extensive reporting, audit regimes imposed and/or license to operate reviewed by regulator. Regulatory audit with major non-conformance finding.	Breach of law with severe consequences such as prosecutions, severe fines (individual fine of over \$500,000), major litigation, and/or license to operate suspended. Regulatory audit outcome of major non-conformance.
	Financial Damages, losses or costs	Organisation²: <1% of profit Other: <1% unfavourable variance	Organisation: 1% to 3% of profit Other: 1% to 3% unfavourable variance	Organisation: 4% to 6% of profit Other: 4% to 6% unfavourable variance	Organisation: 7% to 9% of profit Other: 7% to 9% unfavourable variance	Organisation: >10% of profit Other: >10% unfavourable variance
	Disruption to operations, program or project	Continuity of supply: disruption to 1 residential customer, 1 small commercial customer; OR Continuity of operations: negligible and/or short term (days) effects on an element of operations; OR Negligible consequences that could be dealt with by routine project management.	Continuity of supply: disruption to <20 residential customers, small land development (less than 10 lots, single small commercial); OR Continuity of operations: minor and/or short term (days) effects on operations; OR Threatens the efficiency or effectiveness of an aspect of the project/program, but dealt with internally and/or a minor impact on project's objectives.	Continuity of supply: disruption to <15,000 customers, residential suburbs, (large subdivision, suburban shops, government facilities). Bushfire (some feeders compromised); OR Continuity of operations: moderate term (weeks/months) effects on operations; OR The program or project could be subject to significant review regarding operation and/or a moderate impact on the program or project's operational objectives.	Continuity of supply: disruption to >15,000 customers for any duration OR >100 customers for more than 72 hrs, residential suburbs, government depot/offices, large commercial development (Westfield, Multi story offices). Bushfire (load shedding); OR Continuity of operations: medium term (months) effects on operations; OR The survival or continued effective function of the program/project is threatened and/or a major impact on the project's objectives.	Continuity of supply: disruption to >10% of customers for >72 hrs OR system blackout loss of supply to CBD. Restoration >240 min. Multiple suburbs, hospitals, Parliamentary Triangle, airport, HV contract customers. Bushfire. Multiple zones substations impaired. Blackstart; OR Continuity of operations: long term (>6 months) effects on operations; OR The survival the program/project and related programs is affected; and/or a severe impact on its viability.
	Strategic impact	Failure to achieve an inconsequential part of one or more strategic imperatives.	Failure to achieve multiple inconsequential parts of one or more strategic imperatives.	Failure to achieve a consequential initiative of one or more strategic imperatives.	Failure to achieve multiple consequential initiatives of one or more strategic imperatives.	Failure to achieve one or more strategic imperatives.
LIKELIHOOD RATING		RISK RATING TABLE				
Almost Certain >90% More than 1,643 occurrences in the next five years		Low (5)	Medium (11)	High (18)	Very High (23)	Very High (25)
Likely 71 – 90% Between 1,279 - 1,642 occurrences in the next five years		Low (4)	Medium (10)	High (17)	High (20)	Very High (24)
Possible 21 – 70% Between 366 - 1,278 occurrences in the next five years		Low (3)	Medium (9)	Medium (13)	High (19)	High (22)
Unlikely 2 - 20% Between 38 - 365 occurrences in the next five years		Low (2)	Low (7)	Medium (12)	Medium (15)	High (21)
Rare <2% Up to 37 occurrences in the next five years		Low (1)	Low (6)	Low (8)	Medium (14)	Medium (16)
RISK RESPONSE TABLE						
Risk Rating	Low Mitigate or Accept	Medium Mitigate or Accept	High Avoid, Transfer or Mitigate	Very High Avoid, Transfer or Mitigate		
Risk Response	Manage by existing procedures and work practices.	Manage by specific monitoring and response procedures. Routine reporting.	Requires escalation through reporting and active management through systematic monitoring. Routine reviews of treatment strategies to determine adequacy and effectiveness. Additional controls may be required.	Requires immediate escalation and active management through continual monitoring. Systematically review treatment strategies to determine adequacy and effectiveness. Further controls are needed unless impractical or financially non-viable.		

¹ Stakeholders include owners, customers, employees, suppliers, government/regulator, media, public/community, competitors

² Organisation refers to divisional or corporate level profits, otherwise use "other"

CONSEQUENCE	POSITIVE RISK			
		Slight	Moderate	Major
	Health/safety improvement	Improvement in employee health/safety initiative through the implementation of an administrative or process adjustment control.	Improvement in employee/contractor health safety behaviour through a reduction in Lost Time Injury and/or reduction in exposure to activities that result in hospital/GP visit requiring surgical procedure.	Improvement in employee health/safety through elimination of risk of irreversible disability, impairment or extensive injuries to one or more persons.
	Environmental sustainability	Improvement in environmental management through better practices and behaviour.	Improvement in environmental management through controlled initiatives seeking improvements to the environment and/or culturally significant artefacts.	Marked improvement to the environment and/or preservation to culturally significant artefacts.
	Reputation / Brand strengthening	Stakeholder satisfaction and/or positive local media enquiries and reporting. Increased 5% to 10% market share.	Satisfaction across multiple stakeholder groups and/or positive local media attention. Increased 10% to 15% market share.	Satisfaction across multiple stakeholder groups and/or positive local/national media attention across multiple media channels. Increased 15% and above market share.
	Obligations compliance	Improvement in compliance management through better practices and behaviour.	Improved compliance management through active initiatives to meet compliance of obligations, reporting and regulatory audits.	Improved compliance to obligations with major consequences such as litigation, major fines, extensive reporting, audit regimes imposed and/or license to operate reviewed by regulator.
	Financial savings, revenue	Organisation: 1% to 3% of profit Other: 1% to 3% positive variance	Organisation: 4% to 7% of profit Other: 4% to 7% positive variance	Organisation: 7% to 10% of profit Other: 7% to 10% positive variance
	Operational/ program or project efficiency	Reliability of supply: improved reliability to up to 10% of customers; OR Improved operations: short term (days) positive effects on an element of operations; OR Improved efficiency or effectiveness of some aspect of the program or project.	Reliability of supply: improved reliability to between 10% and 30% of customers; OR Improved operations: short – medium term (weeks/months) positive effects on an element of operations; OR Improved efficiency or effectiveness of some aspect of the program or project.	Reliability of supply: improved reliability to more than 30% of customers; OR Improved operations: medium term (months) positive effects on an element of operations; OR Improved efficiency or effectiveness of some aspect of the program or project.
	Strategic impacts	Achieves an inconsequential part of one or more strategic imperatives.	Achieves a consequential initiative of one or more strategic imperatives.	Achieves multiple consequential initiatives of one or more strategic imperatives.
LIKELIHOOD RATING		RISK RATING TABLE		
Almost Certain >90%		Low (3)	Medium (7)	High (9)
Possible 6 – 90%		Low (2)	Medium (6)	High (8)
Rare <6%		Low (1)	Low (4)	Medium (5)
POSITIVE RISK RESPONSE TABLE				
Risk Rating		Low Maintain	Medium Review	High Pursue
Risk Response		Focus efforts on related risks and impacts to strategic business/program/project objectives.	Review related risks to ascertain investment requirements and impacts to strategic/business/program/project objectives.	Pursue with adherence and consideration of risk management framework.