
Appendix G

Preliminary Aboriginal Cultural Heritage Assessment

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Hunter Transmission Project

Prepared for Energy Corporation of NSW

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Energy Corporation of NSW

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1 Introduction

1.1 Project overview

The Hunter Transmission Project (HTP) involves the construction and operation of a new overhead 500 kilovolt (kV) double circuit transmission line between two new substations, one at Bayswater and the other in Olney State Forest. The nominal distance of the new transmission line would be approximately 100 kilometres (km). The HTP also includes developing associated infrastructure, such as upgrades to the existing Bayswater and Eraring substations, road upgrades, access roads, laydown and temporary construction facilities.

An overview of the regional context of the proposed HTP corridor is shown in Figure 1.1. The transmission line can be generally separated into three sections: HTP North – Bayswater to Broke, HTP Central – Pokolbin to Corrabare, and HTP South – Olney to Eraring.

The transmission line corridor has been selected to avoid and minimise impacts on people and the environment. This corridor will be refined during detailed design to further reduce the impacts of the project.

This preliminary Aboriginal cultural heritage assessment identifies key cultural heritage-related constraints for the project and its potential impacts.

1.2 Aboriginal consultation and early engagement

The Energy Corporation of NSW (EnergyCo) has developed a project-specific Aboriginal engagement strategy and has been undertaking early engagement with some 24 key Wonnarua, Awabakal and Darkinjung traditional owners since October 2023. This included providing introductory briefings and a general overview of the project, and exploring cultural and intangible values in the vicinity of the project. Notably, at these initial meetings, the proposed approach to consultation was discussed with the Aboriginal participants, and a co-design approach was developed.¹

This resulted in three cultural values workshops in November 2023 and January 2024 organised by the Wonnarua, Mindaribba and Biraban Local Aboriginal Land Councils, including some 20 Elders and/or key knowledge-holders. In addition, several of the Awabakal traditional owners preferred on-Country discussions, and a small field visit with these participants was facilitated in December 2023. These activities identified several important cultural values for consideration in project design and future investigations, including in the vicinity of Martinsville, Corrabare State Forest, and discrete locales in the Watagan and Pokolbin State forests. Given the sensitivity of this information, it is only cursorily outlined in this report. Ongoing discussion is being undertaken on its use in any assessment of the project impacts.

In February 2024, EnergyCo started Aboriginal consultation in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents in NSW* guideline. This process has resulted in 47 registered Aboriginal parties, and encompasses Wonnarua, Awabakal, Darkinjung individuals and/or organisations, as well as others from Gomerai, Wiradjuri and Anaiwan Country.

Overall, since October 2023, there have been over 400 interactions with the local Aboriginal community; and this consultation will continue during the environmental approvals process.

¹ Co-design is a participatory approach in which Aboriginal organisations and individuals are treated as equal collaborators in the design process to achieve eventual project goals.

1.3 Existing environment

1.3.1 Landscape characteristics

The HTP corridor can be divided into two main geomorphological divisions:

- Between Bayswater and Pokolbin (HTP North), the corridor is encompassed by the central lowlands of the Hunter Valley. These consist of gentle undulating hills and slopes intersected by floodplains encompassing a range of creeks and tributaries, including the Hunter River and Wollombi Brook. Soil profiles are typically texture contrast soils. While these areas would have historically been dominated by open woodland, they are now subject to pastoralism and coal mining activities that have resulted in modified ecological communities.
- Between Pokolbin and Martinsville (HTP Central and HTP South), the corridor is encompassed by increasingly steep and dissected sandstone plateaus intersected with steep ravines and gorges. River systems are typically found in the base of these gorges and ravines and prone to rapid flooding and elevational changes, which can result in scouring and erosion. These areas are currently flora reserves and/or State forests and include a range of dense Eucalypt dominated forests. These areas have been used for forestry and will have been subject to localised impacts and recreational use in the past.

In relation to HTP North, the majority of the soil landscapes present, including Lidell, Bayswater, Hunter, Dartbrook, Branxton and Jerrys Plains, are characterised as texture contrast soils. The two major groups of texture contrast soils include solonetzic and podzolic soils, which retain a very shallow topsoil over older clay subsoils (B2 horizon) (Dean-Jones and Mitchell 1993; HEH 1999; Hughes et al. 2014). Typically, cultural material in the form of stone artefacts is limited to the topsoil unit, which is commonly <50 centimetres (cm) thick. Various studies have suggested that such soils are between 200 and 3,000 years in age (Hughes et al. 2014), although older cultural material is considered probably present within these soil profiles. The B2 horizon of duplex soils are identified as having very low archaeological potential as they were formed prior to human occupation of the region. Based on this, areas that have been subject to development activities >50 cm are highly likely to have impacted and/or destroyed cultural materials if present. The excavation of dams and roads, as well as the extensive coal mining activities, will all typically have impacted the soil profile to such depths.

The notable exception to these broader soil characteristics is the identification of sand dunes and sand sheets that fringe the Hunter River and Wollombi Brook (Galloway 1963; Hughes 1984, Hughes et al. 2014). Hughes, et al. (2014) reference the work of Dean-Jones and Mitchell (1993) who note that surfaces covered by sand dunes or sheets of the Warkworth sand system (also known as source bordering dunes) are one of several geomorphic contexts across the Hunter Valley with potential to contain older cultural materials. At a general level, these deposits appear to extend patchily across the Hunter River and Wollombi Brook confluence and align fairly closely with Warkworth Sands Woodland. Hughes et al. (2014) identified a number of landforms within the Hunter Valley Operations (HVO), which they considered to reflect the Warkworth sand system, including the Cheshunt sand dune at Malabar Burnham Wood Site 1 (#37-6-0166). EMM (2023) similarly highlighted several discrete locations as likely part of the sand system as part of the HVO Continuation project, including Hunter Valley 1/Malabar Site 0 (#37-5-0063), Malabar Burnham Wood Site I (Site I) (#37-6-0166), HVS38 (#37-7-0167), and HVOCP TR213-AS1 (#37-3-1626) and HVOCP TR47-AS3 (#37-2-6514). More recently, archaeological excavation of the Singleton bypass just south of the main township has also encountered a ~2-metre (m) portion of the sand unit (Andrew McLaren, AECOM, pers comm.)

In addition to the Warkworth sand system, Hughes et al. (2014) also identified the potential for Pleistocene colluvial deposits off the Hunter River in Lemington. These were initially identified as part of the proposed Carrington Mine in the 1990s (now part of Hunter Valley Operations). EMM (2023) undertook additional investigation of these deposits as part of the HVO Continuation Project and demonstrated their age to be

between 9,000 to 13,000 years old. The deposit was shown to be constrained to a narrow ~500 m x 20 m landform adjacent a minor tributary and is some 400 m from the HTP corridor.

HTP Central and HTP South are dominated by steep sandstone relief. Soil landscapes are also commonly shallow and residual having formed through the diagenesis of the underlying geological substrate. A typical soil profile within the Watagan soil landscape that covers much of the site, includes a shallow organic loam (A1 horizon) some 10 to 30 cm overlying sandy clay loam (B2 horizon). Deeper deposits may be found in gorges and close depressions within the landscape. In this location the geology has greater influence of cultural materials, with the natural formation of overhangs and caves often used by Aboriginal people in the past. Equally, large flat areas of sandstone found on ridgelines and/or in creek bases are known to be used for engravings and/or grinding grooves, respectively.

1.3.2 Archaeological background

i Local overview

In HTP North, there have been numerous Aboriginal heritage investigations associated with the mining activities (e.g. Australian Museum Business Services [AMBS], 2002; Brayshaw, 1981, 1990; Brayshaw and Haglund, 1981, 1983; Central Queensland Cultural Heritage Management [CQCHM], 2014, 2016; EMM, 2022; ERM, 1995, 1997, 1998, 1999a, 1999b; Haglund, 1982, 1993; Hiscock et al. 2000; Hughes, 1999, 2000a, 2000b, 2003; Hughes and Hiscock, 2000; Jacobs, 2019, 2021; OzArk Environment and Heritage, 2013, 2016; Rich, 1990, 1993; Scarp Archaeology, 2009). A detailed review of these investigations will be undertaken for the broader project. However, in summary, these studies all develop a similar model of past occupation and use.

Specifically, past studies and previously documented sites indicate that cultural materials within the regional context are generally dominated by stone artefact sites, most frequently isolated stone artefacts or low density (<20) artefact scatters. Relatively few sites feature deep, stratified subsurface deposits, and this reflects the nature of shallow duplex soils throughout the Hunter Valley as well as high susceptibility to erosional impacts due to natural and historical disturbances. Archaeological material is scattered almost continuously across the Hunter in all contexts, disturbed and undisturbed, across all landforms. These sites have generally been attributed low scientific significance due to their prevalence in the landscape. Distribution of higher density artefact sites shows a strong correlation with elevated landforms such as ridgelines, spurs or terraces in proximity to water with cultural materials in the Hunter Valley prevalent within a corridor approximately 100 m wide on either side of watercourses. While these types of sites can demonstrate higher densities of artefacts, they still usually reflect disturbed contexts or lack discernible stratification and, therefore, are usually assigned moderate scientific significance.

Stone artefact scatters demonstrating higher densities, stratification and potential to be of greater age (i.e. Pleistocene [>10,000 years old]) are more likely to be identified within aeolian or colluvial sand dune/sheets contexts as they are characterised by deeper deposits with better preservation contexts. These are commonly found associated with the Warkworth sand system. One of the most extensive studies of the Warkworth sand system was adjacent to Sandy Hollow Creek by Scarp Archaeology (2009). Scarp Archaeology investigated the Warkworth sand system area by completing large open area excavations. From the results of the excavation and these subsequent studies, it was found that there was an upper and lower stone artefact concentration across the sand sheet area which extended to depths of ~1.5 m below current ground surface. Despite the substantial movement of sand, sand deposition was reconstructed and spanned over 30,000 years, with the cultural materials constrained to the last ~14,000 years. Such site types have generally been assessed as having high scientific significance as they are limited in number, represent stratified deposits (which is rare across the region), and can be of significant antiquity.

In HTP Central and HTP South, there has been limited investigations to date. Previously documented sites within the State forests appear to be almost exclusively characterised as rockshelters, often with art and/or potential subsurface deposit, which is reflective of the steep, rugged terrain which comprises much of this portion of the project. Grinding grooves and culturally modified trees are also considered probable in these environments, though these are more frequently recorded closer to watercourses.

ii Previous studies encompassing portions of the HTP corridor

There have been a number of previous studies that have encompassed parts of HTP North within the last decade. These locations, therefore, have up to date and readily available information on cultural materials that will be used to supplement additional assessment for the project. These include (Figure 1.2):

- between Bayswater Power Station and Plashett Reservoir investigated by Jacobs (2021) as part of the Bayswater Water and Other Associated Operational Works Project (SSD-9697) and Liddell Battery and Bayswater Ancillary Works Project (SSD-8889679)
- HVO Mining Complex investigated as part of the HVO Continuation Project (SSD-11826681; SSD-11826621) by EMM (2022, 2023)
- Warkworth Coal Mine Continuation (SSD-6464) that extended along Wallaby Scrub Road and east and west of Mount Thorley, encompassing portions of the Loder Creek catchment by CQCHM (2014)
- Bulga Coal Mine investigated as part of the Bulga Optimisation Project (SSD-4960) by OzArk Environmental and Heritage Management (2013, 2019)
- United Wambo Open Cut Project (SSD-7142), which is not intersected by the project but is located in proximity to the west of the Golden Highway, investigated by Tocomwall (2015), Australian Cultural Heritage Management (2016), and OzArk Environmental and Heritage Management (2016)
- Singleton Military Area is being investigated as part of a heritage management plan (HMP) recently prepared by Umwelt in 2023.

Of note are two of these studies that extensively intersect HTP North, EMM (2022, 2023) encompassing HVO, and various studies for the Bulga Optimisation project primarily undertaken by OzArk Environment and Heritage (2013, 2016, 2019):

- EMM (2022) undertook extensive desktop review and field investigations (both survey and test excavations) for the HVO Continuation project. These investigations identified some 1,786 previously recorded objects and sites within the site, dominated by isolated or low-density stone artefacts. These sites were found to be strongly correlated with proximity to water including the Hunter River and a number of smaller tributaries across the site; and with landforms such as ridgelines, spurs and terraces. Field investigations found a further 78 sites, including several culturally modified trees. Twelve of these locations were considered to contain subsurface cultural deposits and were subject to test excavation. Of note was the identification of one area of the Warkworth sand system, identified in the report as 'Area 12', situated in the vicinity of the Hunter River and Wollombi Brook confluence. A subsequent addendum to this document was developed as part of the EIS process (EMM, 2023). This re-iterated the earlier findings and highlighted 31 sites as being of moderate or high value, and which were typically related to the Warkworth sand system, contained high densities of stone artefacts (typically in the thousands), or represented culturally modified trees, which are becoming increasingly rare as the area is developed and/or subject to resource extraction.

- OzArk Environment and Heritage (2016) undertook an investigation of the Bulga coal mine, which was proposing to expand eastwards from its established operation into areas around Broke Road and the Golden Highway. The report, which included field survey and test excavations, ultimately identified 14 previously unidentified site ‘complexes’ encompassing ~200 hectares (ha), and some 45 other previously documented sites including grinding grooves and culturally modified trees. The new complexes consisted of low to moderate densities of stone artefacts often found in association with creeks, such as Loder Creek, Swan Lake, Moorlands Creek, and Nine Mile Creek. In most cases, these sites were found either on the surface or in shallowly buried duplex soils. Of note were previous investigations by Margrit Koettig of Loder Creek and Moorland Creek in the late 1990s, during which some 13,000 artefacts were documented (Koettig 1990).

For HTP Central and HTP South, there has been limited investigations to date. Previously documented sites within the State forests appear to be a mixture of amateur bushwalkers and/or hobby groups, and by NSW State forests personnel when encountered. There is a recent formal assessment of Corrabare North Flora Reserve, although the report is still under development. Discussions with the consultant undertaking the assessment indicate all data was submitted to the Heritage NSW AHIMS database (see Section 1.3.2iii). Further south near Eraring, additional assessments are expected to have been undertaken in relation to the power station and immediate environs (e.g. HLA-Envirosciences, 2007), and detailed review of this assessments will be undertaken as part of the future assessment.

More recently, as a precursor to the EIS and related assessments, Umwelt (2023) was engaged by EnergyCo to prepare a desktop and high-level heritage risk assessment for the project. This assessment included a review of landscape and geomorphology, a targeted literature research, and the development of landscape analysis and predictive modelling. It identified a range of sites, places and values of the HTP corridor. It also provided overarching guiding principles for the project, including avoiding sites of high value, minimising vegetation clearance, and the need to undertake extensive Aboriginal engagement. The findings of this report have been integrated into the predictive model outlined in Section 2.1.

iii Previously documented cultural materials (AHIMS)

EMM undertook a search of the Heritage NSW AHIMS database for the HTP corridor and surrounds in September 2023. Some 2,511 previously documented Aboriginal objects, sites and places are found within or in proximity (<3 km) of the HTP corridor (Figure 1.3 to Figure 1.5). Some 611 sites have been ‘destroyed’, with 1,895 sites listed as ‘partially destroyed’ and/or ‘valid’. Of the 2,511 previously documented sites identified in the AHIMS searches, 561 are located within the proposed HTP corridor (Table 1.1).

Of the total sites recorded in the search area 1,955 (77%) of these listings relate to surface and/or buried stone artefacts. Most of these (n=1,323, 52%) are undefined within the dataset, and could reflect either a simple isolated stone artefact or extend to a more complicated and important high-density artefact scatter. However, of these, some 632 could be further defined, with the majority indeed reflecting isolated objects (n=308, 49%). Only 40 were suggestive of high density (>50) artefact scatters, which would typically be more scientifically significant. Of the remaining 23% of the cultural assemblage in the database, rockshelters (n=252), culturally modified trees (n=32) and grinding grooves (n=68) are the most prevalent. Some spatial patterning of the cultural assemblage can be discerned, with rockshelters exclusively found in the State forests and flora reserves in HTP Central and HTP South. Sites are found loosely within steep relief but can occur both in the valley floors and/or close to the ridgelines within these environments. Within HTP North, sites are dominated by stone artefactual material, with culturally modified trees and grinding grooves also frequent. These sites are commonly found in close proximity to moderate and large water courses.

Of the 561 sites within the HTP corridor, 116 reflect isolated Aboriginal objects (21%), followed by low density artefact scatters (n=113, 20%) and moderate density artefact scatters (n=22, 4%). The majority of artefactual sites located within the project corridor are associated with mining operations in HTP North primarily within or near HVO and Bulga Coal Mine. Some 131 (23%) of these sites have been listed as 'destroyed', likely a result of mining and development activities in HTP North.

Of note are 26 sites that may be considered to have higher significance than the broader cultural assemblage outlined above, and these 26 sites are described in Table 1.2. Notably, #45-3-3378 and #45-3-3381 are duplicate recordings, reducing the total sites to 25. These 25 sites comprise: nine high density artefact scatters (defined as >50 artefacts recorded in a single location), two with associated subsurface archaeological potential; seven culturally modified trees, one with associated stone artefacts; five rockshelter sites with art; one art site; two grinding groove sites; and one hearth site. All sites are currently listed as valid within the AHIMS database, aside from #37-6-3039, #37-6-3044 and #37-6-1968 which have been destroyed by authorised impacts, and #37-2-0189 which appears to have been collected and deposited with the Australian Museum. All of these sites, aside from those collected or destroyed, will be subject to further investigation and consideration as part of subsequent stages of the assessment.

Table 1.1 AHIMS sites within the HTP corridor

AHIMS site type	Number of sites		% of Total	
	Category total	Subcategory total	Category total	Subcategory total
HTP North				
Culturally modified tree (carved or scarred)	4	-	0.71	-
– with undefined artefact site	-	1	-	0.17
High density artefact scatter (>50 artefacts)	9	-	1.60	-
– with potential archaeological deposit	-	2	-	0.35
Isolated find	115	-	20.50	-
– with potential archaeological deposit	-	14	-	2.50
Low density artefact scatter (<20 artefacts)	111	-	19.79	-
– with potential archaeological deposit	-	8	-	1.43
Moderate density artefact scatter (20–50 artefacts)	22	-	3.92	-
– with potential archaeological deposit	-	5	-	0.89
Undefined artefact site	281	-	50.01	-
– with potential archaeological deposit	-	72	-	12.83
Sub-total	542	-	96.6	-
HTP Central				
Art site	1	-	0.17	-
Culturally modified tree (carved or scarred)	1	-	0.17	-
Grinding groove	1	-	0.17	-
Hearth	1	-	0.17	-

Table 1.1 AHIMS sites within the HTP corridor

AHIMS site type	Number of sites		% of Total	
	Category total	Subcategory total	Category total	Subcategory total
Low density artefact scatter (<20 artefacts)	1	-	0.17	-
Rockshelter with art	5	-	0.89	-
Undefined artefact site	2	-	0.35	-
Waterhole	1	-	0.17	-
Sub-total	13	-	2.30	-
HTP South				
Culturally modified tree (carved or scarred)	3	-	0.53	-
Grinding groove	1	-	0.17	-
Isolated find	1	-	0.17	-
Low density artefact scatter (<20 artefacts)	1	-	0.17	-
Sub-total	6	-	1.1	-
Grand total	561	-	100	-

Table 1.2 Potentially significant sites previously documented within the HTP corridor

AHIMS site ID	Site name	Site type	Site description	Project location
45-3-3583	CORROBARE STATE FOREST WESTERN SIDE OF LANDONS RD	Art (pigment or engraved)	No site card available.	HTP Central
45-3-4562	Watagan/Olney ST	Culturally modified tree (carved or scarred)	A single straight, elongated scar (85 cm x 15 cm) identified on an unspecified box tree, located at the intersection of Watagan Forest Road and Wollombi Forest Road.	HTP South
45-3-3381	Scar Tree (Morisset)	Culturally modified tree (carved or scarred)	A single elongated scar (98 cm x 88 cm) with sizable regrowth identified on an unspecified tree, located west of Watagan Forest Road at the intersection of Wollombi Forest Road. Duplicate of 45-3-3378.	HTP South
45-3-3378	Scar Tree (Morisset)	Culturally modified tree (carved or scarred)	A single elongated scar (98 cm x 88 cm) with sizable regrowth identified on an unspecified tree, located west of Watagan Forest Road at the intersection of Wollombi Forest Road. Duplicate of 45-3-3381.	HTP South
37-6-4062	HVO-1145	Culturally modified tree (carved or scarred)	A single south facing elongated scar (265 cm x 30 cm) on a dead ironbark tree, located west of Archerfield Road within the HVO tenement.	HTP North

Table 1.2 Potentially significant sites previously documented within the HTP corridor

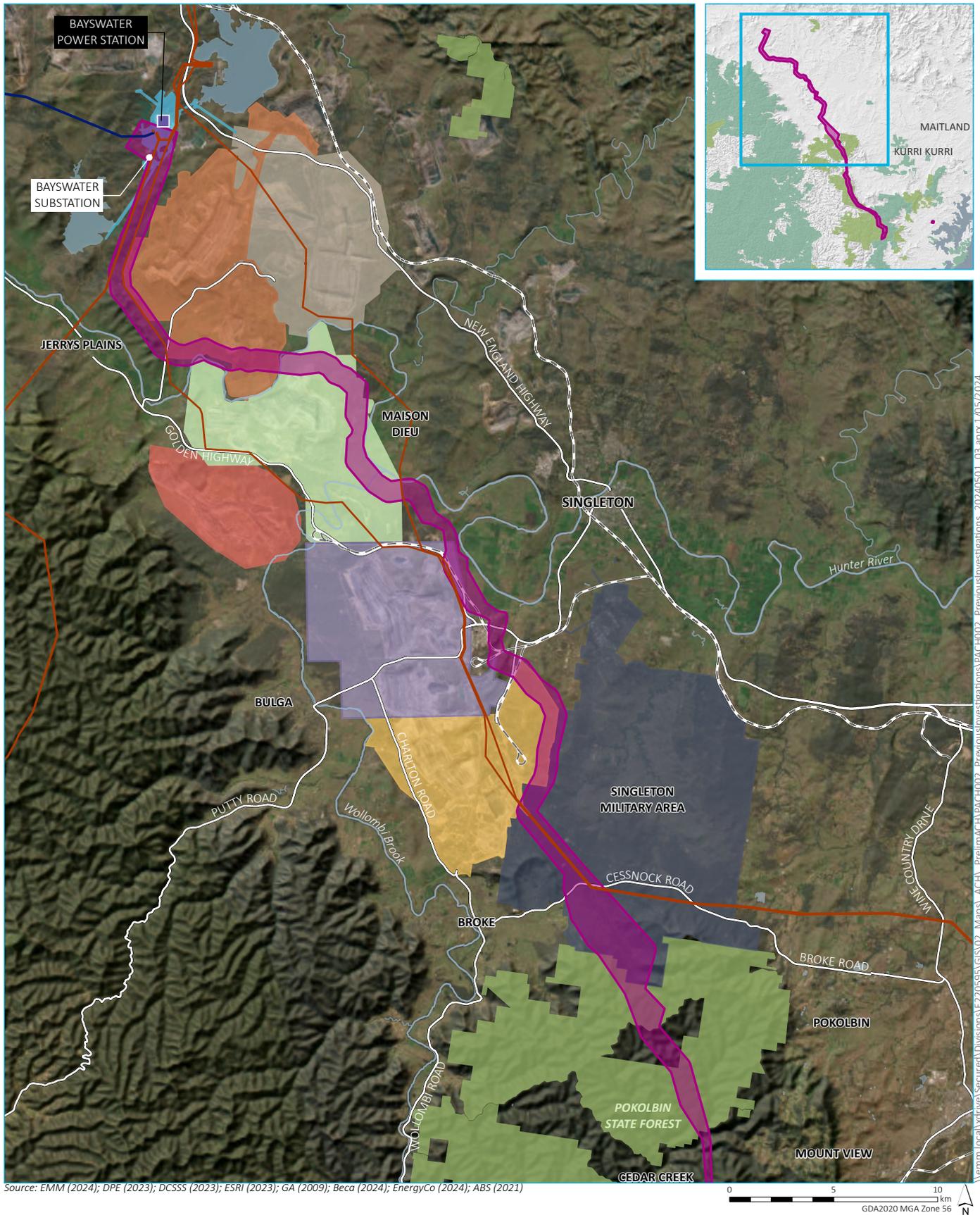
AHIMS site ID	Site name	Site type	Site description	Project location
37-6-3024	HVO-1656	Culturally modified tree (carved or scarred)	A single scar (98 cm x 88 cm) identified on a dead standing gum tree, located 90 m north of the main access track of HVO south.	HTP North
37-6-0553	Campbells Spring Track	Culturally modified tree (carved or scarred)	A single scar (c. 180 cm x 50 cm) identified on an unspecified tree with 10 cm of regrowth, located 180 m west of Campbell Springs Trail at the end of a drainage channel associated with Baldy Creek.	HTP Central
37-2-5269	HVO-930	Culturally modified tree (carved or scarred)	A single elongated scar (100 cm x 14 cm) identified on a dead standing hollow gum tree, located west of Lemington Road in the Mitchell Pit area. The scar was identified as cultural by specialist assessment in 2010.	HTP North
37-2-2363	C3 Old Lemington Road	Culturally modified tree (carved or scarred), undefined artefact site	A single elongated scar (30 cm x 15 cm) identified on a dead eucalypt, located in a cleared paddock ~300 m from a minor unnamed creek, and ~800 m north of the Hunter River. One of four remnant trees in this area, though the others appear unmodified.	HTP North
45-3-3619	Corrobare State Forest, cnr of Langdans Road	Grinding groove	No site card available.	HTP Central
45-3-2449	WST 3	Grinding groove	The site contains eight axe grinding grooves at the base of a waterfall that feeds into a drainage channel, although more may be present. The site is surrounded by wet sclerophyll forest and is situated in Olney State Forest.	HTP South
45-3-3581	CORROBARE STATE FOREST CNR OF LANGDAN'S & CABANS RD	Hearth	No site card available.	HTP Central
37-6-3376	HVO-1258	High density artefact scatter (>50)	A high-density artefact scatter comprising 30 mudstone flakes and 25 silcrete flakes situated on a flat plain, approximately 450 m east of Wollombi Brook.	HTP North
37-6-3039	HVO-1502	High density artefact scatter (>50)	The site was initially recorded as a low-density artefact scatter comprising six mudstone flakes, one multi platform silcrete core and two flakes of a volcanic material. The artefacts are located across a 10 m x 5 m area on the south side of the track. The area is extensively disturbed from cattle and track usage and had been previously cleared of vegetation. It is considered these artefacts are unlikely to remain in their depositional context. Salvage activities recovered a total of 108 mudstone flakes, 21 silcrete flakes, two tuff flakes, five chert flakes, a single mudstone platform core and two re-touched flakes of mudstone. The site has since been destroyed due to approved mining activities.	HTP North

Table 1.2 Potentially significant sites previously documented within the HTP corridor

AHIMS site ID	Site name	Site type	Site description	Project location
37-6-1968	BDS26	High density artefact scatter (>50)	The site was initially recorded as a moderate density artefact scatter comprising 49 artefacts recorded in five loci across an area measuring 250 m (l) x 6 m (w) of an unused vehicle access track. Artefacts comprised flakes, broken flakes, retouched flakes and cores of silcrete and mudstone material. A hammerstone of unknown material was also identified. The site underwent salvage activities resulting in the finding of 83 surface artefacts deeming it a high-density artefact scatter (>50). The site has since been destroyed due to approved mining activities.	HTP North
37-2-5122	MP-001	High density artefact scatter (>50), potential archaeological deposit	A high-density artefact scatter comprising >260 artefacts identified on the undulating plain >3.8 km west of the Hunter River. The recorded site size is 390 m x 300 m. The site is located off Lemington Road via internal Coal & Allied access tracks within the Mitchell Pit area.	HTP North
37-2-0189	Ponds Creek	High density artefact scatter (>50)	A high-density stone artefact scatter extending over both banks of Ponds Creek, with over 250 artefacts recorded within an unspecified area. The site card indicates that this site may have been collected and deposited at the Australian Museum, and therefore would be considered destroyed for the purposes of this assessment.	HTP North
37-2-5109	MP-008	High density artefact scatter (>50)	A high-density artefact scatter comprising >70 artefacts identified on the undulating plain >3.5 km west of the Hunter River. The recorded site size is 140 m x 60 m. The site is located off Lemington Road via internal Coal & Allied access tracks within the Mitchell Pit area.	HTP North
37-2-5104	MP-003	High density artefact scatter (>50)	A high-density artefact scatter comprising >60 artefacts identified on the undulating plain >3.8 km west of the Hunter River. The recorded site size is 120 m x 75 m. The site is located off Lemington Road via internal Coal & Allied access tracks within the Mitchell Pit area.	HTP North
37-6-3044	HVO-1497	High density artefact scatter (>50), potential archaeological deposit	The site was initially recorded as a low-density artefact scatter comprising one re-touched flake of mudstone, one silcrete flake and one mudstone flake. The artefacts were found as a result of drill sump excavation, identifying the site as heavily disturbed. Salvage activities recovered a total of 107 mudstone flakes, 151 flakes of silcrete, one mudstone blade, 13 flakes of petrified wood, one flake of quartzite, five flakes of chert, two single platform cores of chert and a single platform core of mudstone. The site has since been destroyed due to mining activities.	HTP North

Table 1.2 Potentially significant sites previously documented within the HTP corridor

AHIMS site ID	Site name	Site type	Site description	Project location
37-2-5053	HVO-986	High density artefact scatter (>50), potential archaeological deposit	An extensive artefact scatter situated on a mid to lower slope overlooking the Plashett Reservoir, with a visible site extent of 100 m x 100 m. At least 50 artefacts were identified in this area, with subsurface potential identified.	HTP North
45-3-2140	CORRABARE	Rockshelter, art (pigment or engraved)	A rockshelter with charcoal and four ochre panels consisting of at least 61 individual drawings. These include kangaroos (n=7), anthropogenic figures (n=21), male anthropogenic figures (n=2), emu (n=3), weapons (n=8), snakes (n=3), shields (n=3) and approximately fourteen indeterminate shapes were identified on the scalloped vertical surface. This site is located 240 m south-west off Langans Road within the Watagan State Forest.	HTP Central
37-6-3746	MONKEY PLACE CK THE RES SWA	Rockshelter, art (pigment or engraved)	A rockshelter with a yellow conglomerate featuring two art motifs. Both panels have been weathered by charcoal. The site is located on a spur 400 m north-east of a dirt track running north off Broken Back Trail within Pokolbin State Forest.	HTP Central
37-6-3714	DEEP CK MOTHER SWA	Rockshelter, art (pigment or engraved)	A rockshelter with over 148 individual art pieces identified within the shelter. This includes yellow (n=13) and white (n=26) hand stencils, yellow (n=1) and white (n=2) boomerangs, white axes (n=2), lizards (n=4), and a single snake and bird. A number of tally marks and indeterminate art was also identified. The site is located off Campbells Springs Trail Drive, across the head of a small gully.	HTP Central
37-6-3710	MONKEY PLACE CK ONE LIZARD SWA	Rockshelter, art (pigment or engraved)	A rockshelter with ochre drawing resembling a bird track. The site is located 600 m past Bees Nest Trail, in a gully to the north.	HTP Central
37-6-3708	MONKEY PLACE CK ONE ROO SWA	Rockshelter, art (pigment or engraved)	A rockshelter with four art features including a charcoal kangaroo, a profile possibly holding an axe, and two indeterminate charcoal drawings. The site is located 600 m past Bees Nest Trail, in a gully on the east side. At the time of recording, the site was experiencing surface wash damage.	HTP Central



Source: EMM (2024); DPE (2023); DCSSS (2023); ESRI (2023); GA (2009); Beca (2024); EnergyCo (2024); ABS (2021)

KEY

- HTP corridor
- Power station
- Previous archaeological investigation
- Bayswater Water and Other Associated Operational Works Project (Jacobs 2021)
- Warkworth Continuation (CQCHM 2014)
- Bulga Optimisation Project (OzArk 2013)
- Singleton Military Area (Umwelt 2023)
- HVO Continuation North (EMM 2023)
- Ravensworth Operations Project (Umwelt 2010)
- HVO Continuation South (EMM 2023)
- United Wambo Project (OzArk 2016)
- 500 kV transmission line
- 330 kV transmission line
- Rail line
- Major road
- Named waterbody
- NPWS reserve
- State conservation area
- State forest

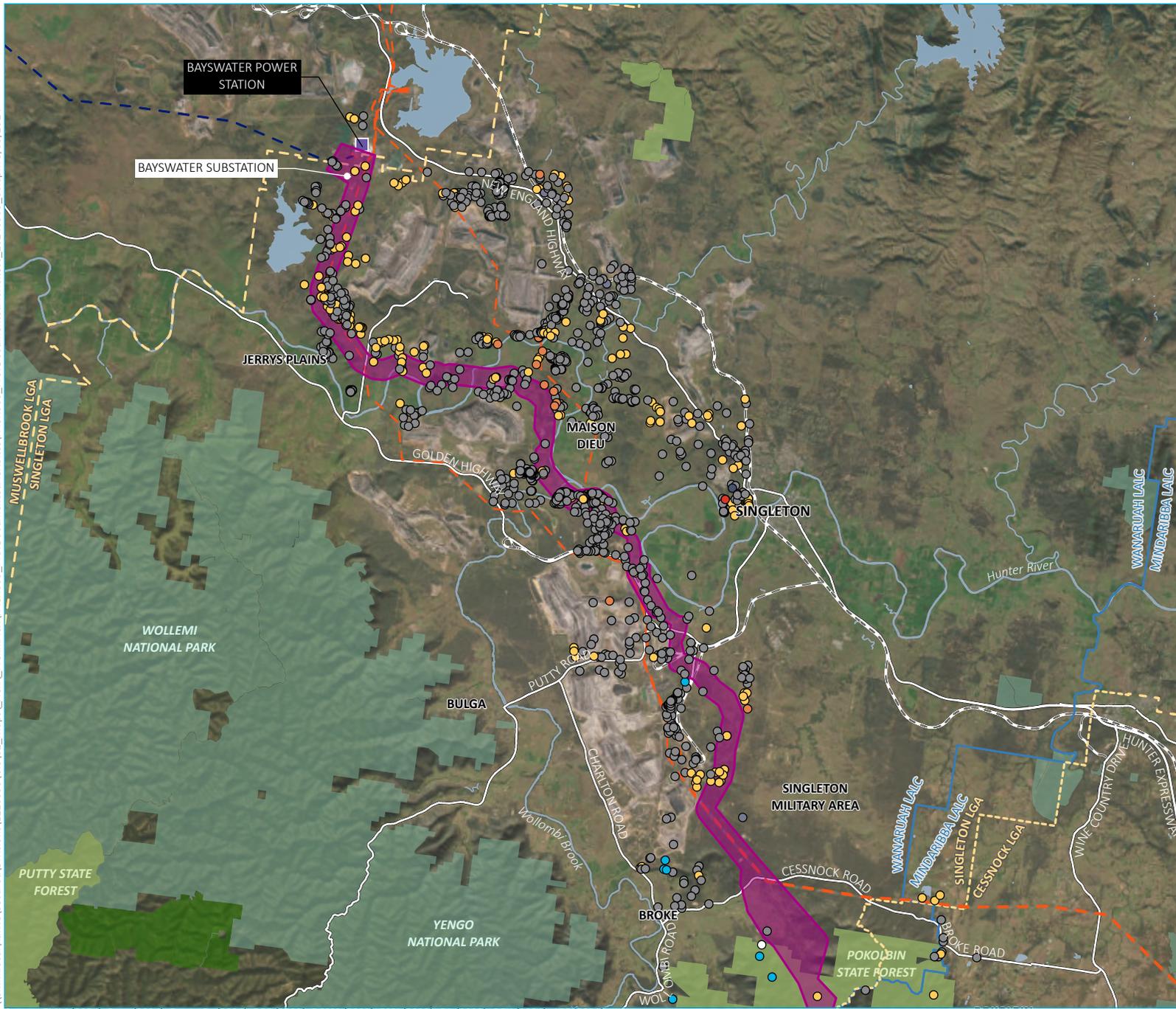
Previous investigations within the proposed HTP corridor

Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 1.2



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- KEY**
- HTP corridor
 - AHIMS site**
 - Aboriginal ceremony and dreaming
 - Aboriginal resource and gathering
 - Art (pigment or engraved)
 - Artefact scatter
 - Culturally modified tree (carved or scarred)
 - Grinding groove
 - Undefined artefact site
 - Water hole
 - Power station
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area
 - Local Aboriginal Land Council

Previously documented Aboriginal objects and sites- HTP North

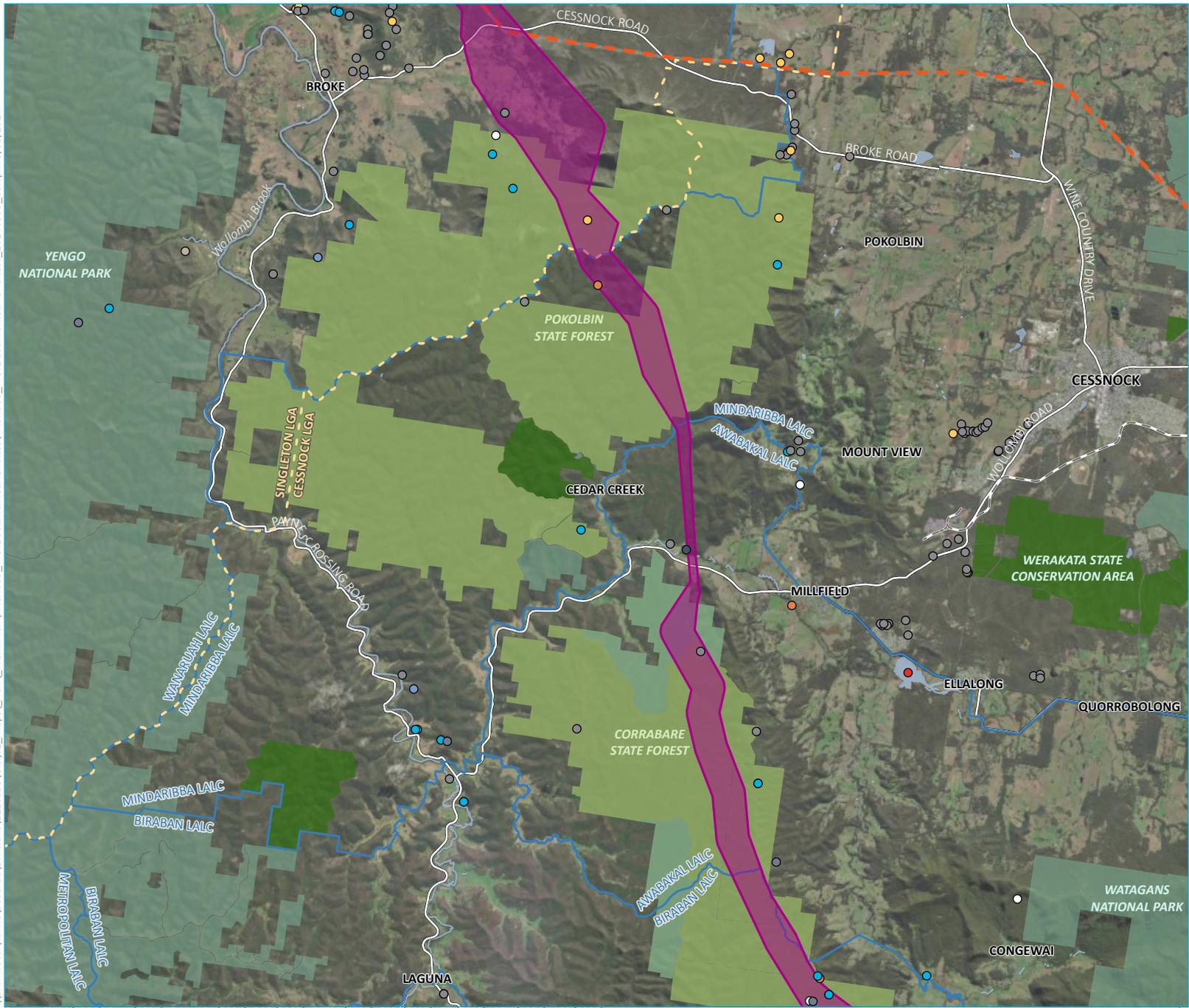
Hunter Transmission Project
 Preliminary Aboriginal Cultural Assessment
 Figure 1.3



Source: EMM (2024); Beca (2024); EnergyCo (2024); DPE (2023); DCSSS (2023); ESRI (2023); GA (2009); OEH (2024); ABS (2021)



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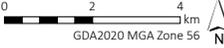
- KEY**
- HTP corridor
 - AHIMS site**
 - Aboriginal ceremony and dreaming
 - Aboriginal resource and gathering
 - Art (pigment or engraved)
 - Artefact scatter
 - Culturally modified tree (carved or scarred)
 - Grinding groove
 - Hearth
 - Midden
 - Stone arrangement
 - Undefined artefact site
 - Water hole
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area
 - Local Aboriginal Land Council

Previously documented Aboriginal objects and sites- HTP Central

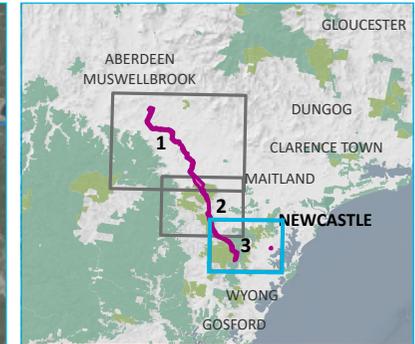
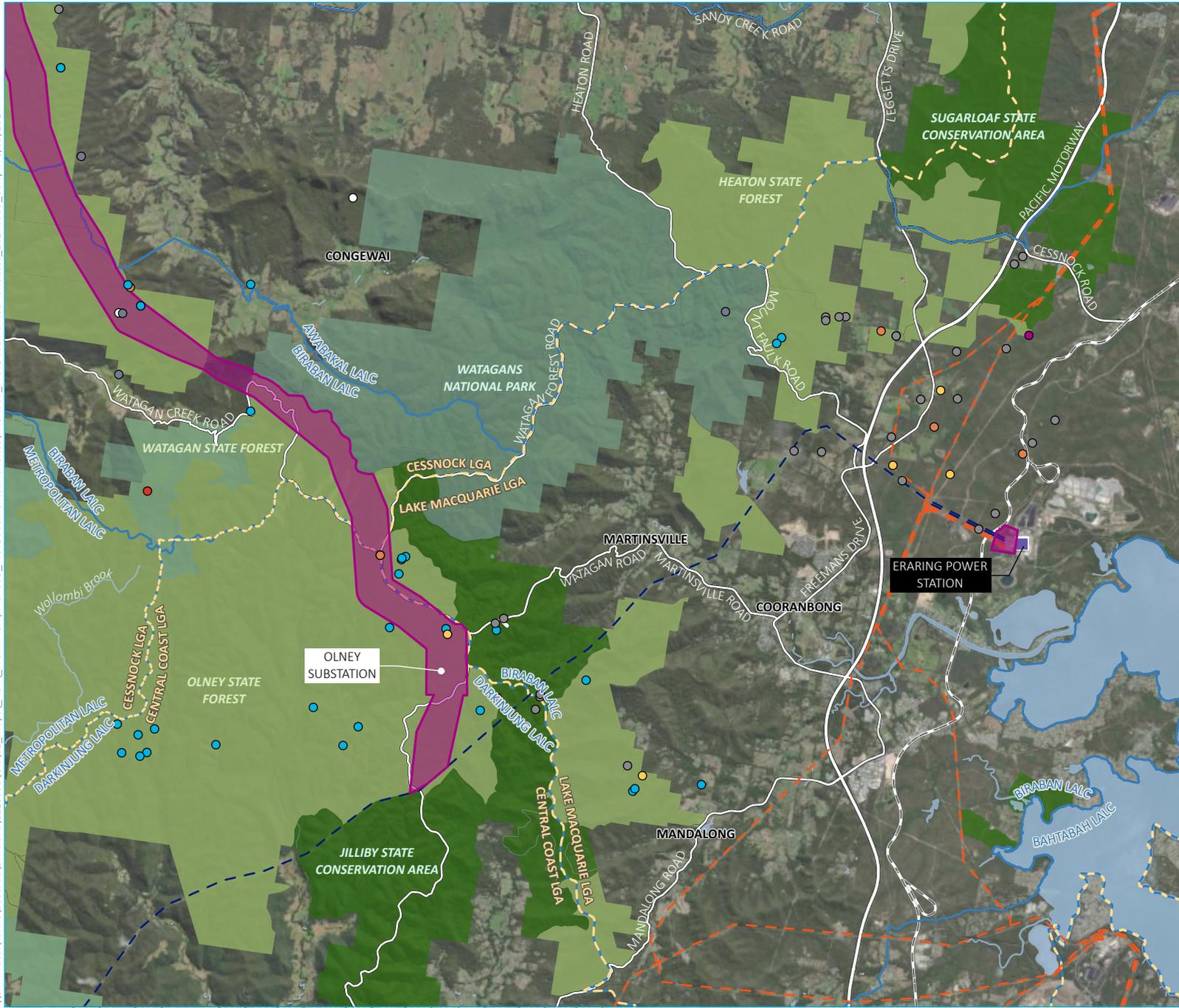
Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 1.4



Source: EMM (2024); Beca (2024); EnergyCo (2024); DPE (2023); DCSSS (2023); ESRI (2023); GA (2009); OEH (2024); ABS (2021)



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- KEY**
- HTP corridor
 - AHIMS site**
 - Aboriginal ceremony and dreaming
 - Art (pigment or engraved)
 - Artifact scatter
 - Culturally modified tree (carved or scarred)
 - Grinding groove
 - Habitation structure
 - Hearth
 - Undefined artefact site
 - Water hole
 - Power station
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area
 - Local Aboriginal Land Council

Previously documented Aboriginal objects and sites- HTP South

Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 1.5



Source: EMM (2024); Beca (2024); EnergyCo (2024); DPE (2023); DCSSS (2023); ESRI (2023); GA (2009); OEH (2024); ABS (2021)



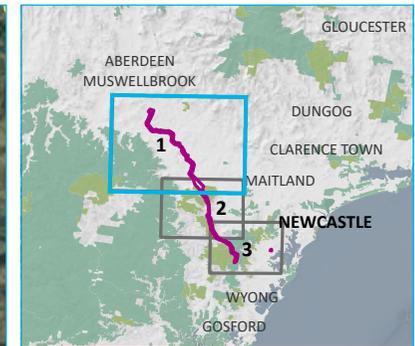
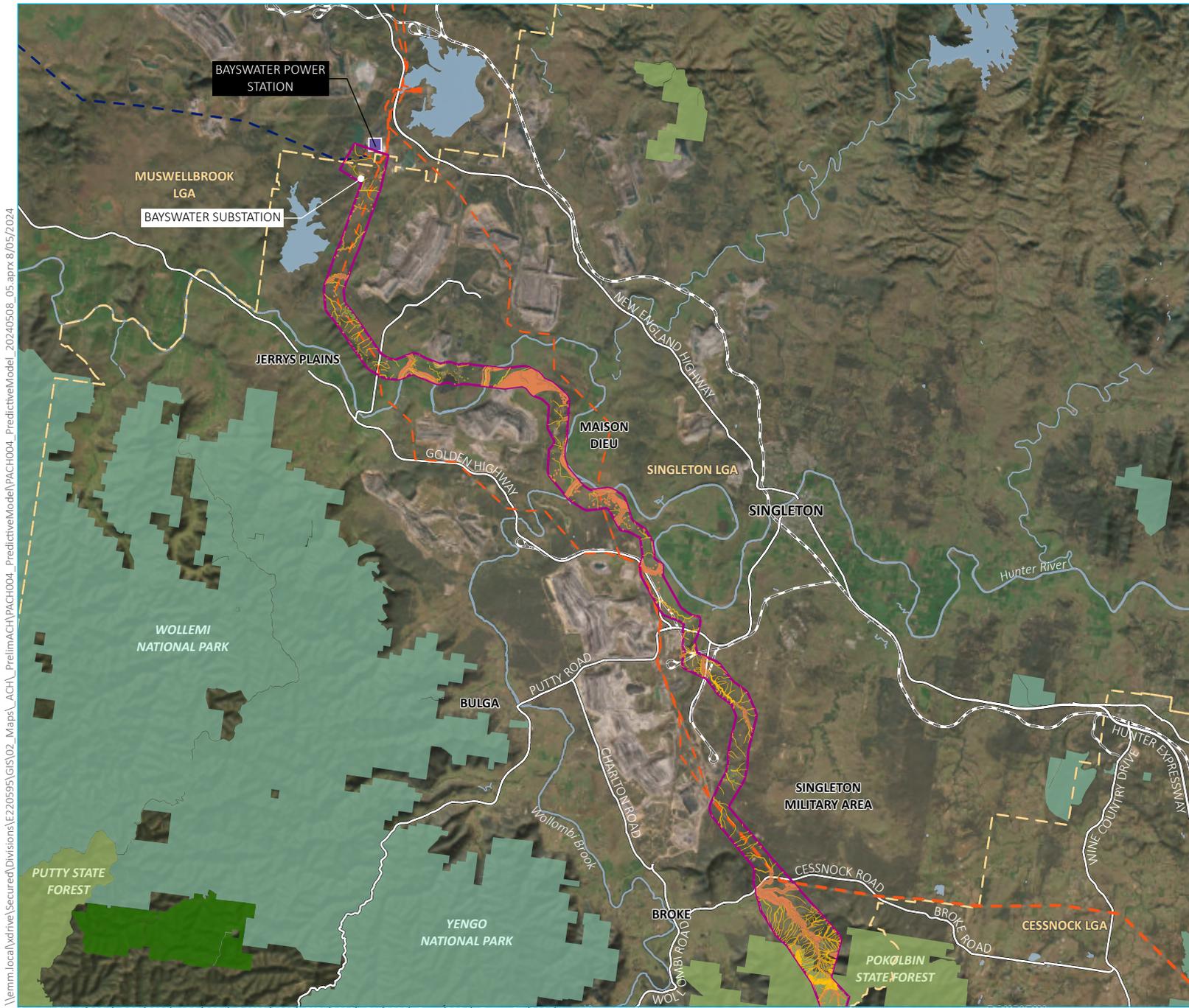
2 Key constraints to project design

2.1 Predictive model

The information outlined in Section 1.3 has been used to develop a predictive model for the HTP corridor to both inform design and subsequent assessment activity. The predictive model is provided in Figure 2.1 to Figure 2.3 and highlights areas of high and moderate potential where cultural materials are either known or expected to occur. Overall, some 1,602 ha of the project area is considered of high potential, and 1,177 ha of moderate value.

The model has used the following criteria in its formation to identify areas where cultural materials would be expected:

- Level to gently inclined landforms near reliable water. This applies to land with 5% slope gradient or less within: 200 m of 4th order and above streams (Strahler) and 100 m of 3rd order streams (Strahler). These landforms are further rated according to the following disturbance factors within the project area: i) high sensitivity = undisturbed land; ii) moderate sensitivity = pastoral and existing alignment, and iii) low sensitivity = heavy impacts evidence, such as dams, open cut mining, rehabilitation stockpiles, etc.
- Pleistocene terraces and dunes. Pleistocene alluvial terraces and nearby source bordering dunes are rated to be of high archaeological sensitivity in both undisturbed and cleared landscapes, acknowledging that these landforms have the potential to be deeper archaeological deposits (undisturbed by clearing activities and superficial development). These have been defined by geological units (Cza and Czb), by the distribution of Warkworth Sands Woodland (known to occur on these types of deposits) and from local information such as obtained through previous excavations as part of the HVO Continuation Project. There are also older (pre-human occupation) Pleistocene gravel terraces that may feature raw materials (e.g. indurated mudstone and silcrete Czas), and which have been considered of moderate potential if outcropping occurs. These are known to occur in the Warkworth sand system deposits in HTP North.
- Prominent ridgelines and peaks. These landforms are likely to have only low-moderate archaeological sensitivity but potentially very high Aboriginal cultural significance. The mapped ridgelines do not represent every 'ridgeline' as per their landform definition. Instead, only *prominent* ridgelines have been mapped, and which may have been used as pathways/travelling routes by Aboriginal people. As such, the mapped ridgelines generally have accessible gradients from valley floors up to ridgelines.
- Steep scarps, cliffs, vertical faces on sandstone country. These features have been identified through slope analysis (60% and greater) and review of geological and soil information. These landforms have the potential to feature rockshelters and associated features, which are typically rated as having high archaeological significance.
- Watercourse channels with exposed sandstone bedrock. These are areas where grinding grooves are expected to be more prevalent. These features have been identified through identifying stream alignments on suitable sandstone geology. Given that there are varying lithologies of sandstone across the region, not all sandstone is suitable for grinding. Accordingly, a moderate sensitivity rating has been applied to cover the broader region.
- A number of specific landform features and/or places are identified based on detailed review of previous assessments presented in Section 1.3, and which highlighted creeks such as Loder Creek and Wollombi Brook as documented to contain significant cultural assemblages.



- KEY**
- HTP corridor
 - Predictive model**
 - High
 - Moderate
 - Low
 - Power station
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area

Predictive model for the proposed HTP corridor- HTP North

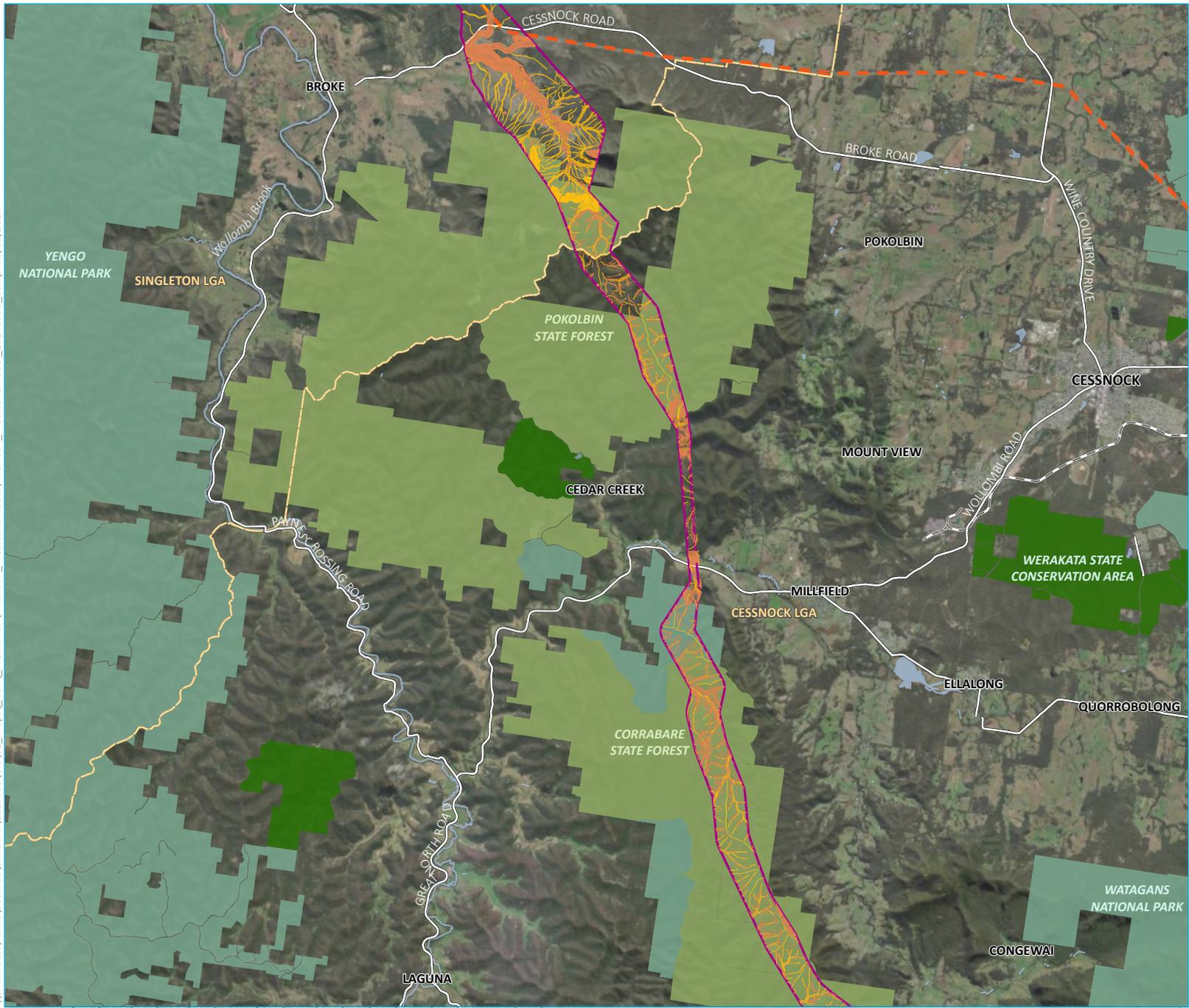
Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 2.1



Source: EMM (2024); DPE (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009); Beca (2024); EnergyCo (2024)



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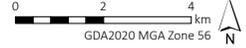


- KEY**
- HTP corridor
 - Predictive model**
 - High
 - Moderate
 - Low
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area

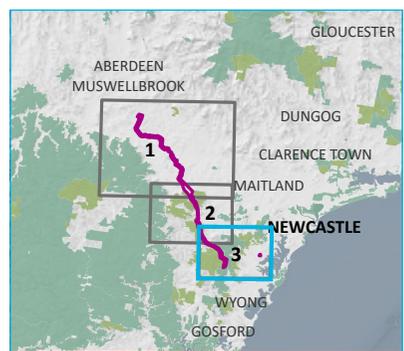
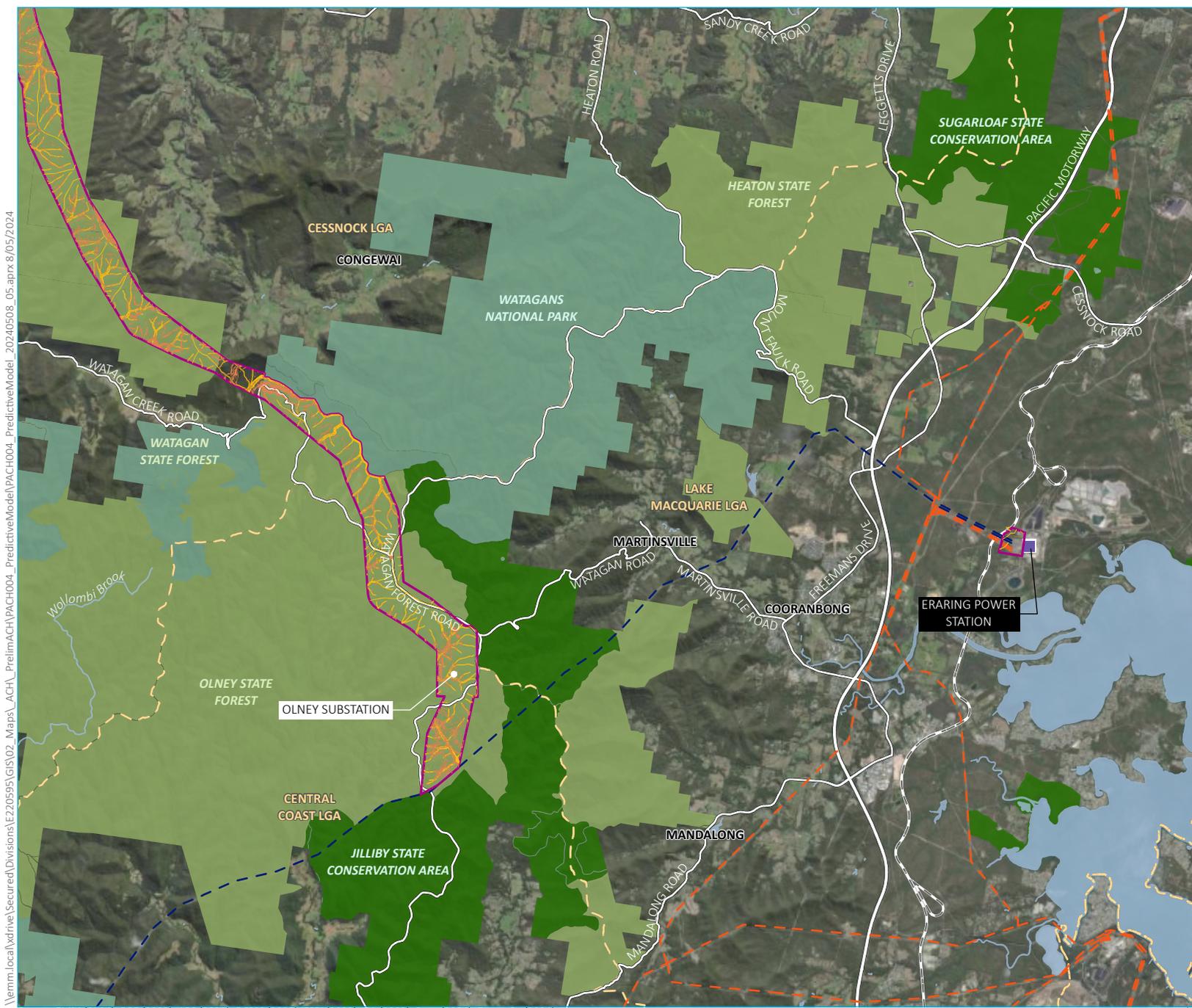
Predictive model for the proposed HTP corridor- HTP Central

Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 2.2

Source: EMM (2024); DPE (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009); Beca (2024); EnergyCo (2024)



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- KEY**
- HTP corridor
 - Predictive model**
 - High
 - Moderate
 - Low
 - Power station
 - 500 kV transmission line
 - 330 kV transmission line
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest
 - Local government area

Predictive model for the proposed HTP corridor- HTP South

Hunter Transmission Project
Preliminary Aboriginal Cultural Assessment
Figure 2.3



Source: EMM (2024); DPE (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009); Beca (2024); EnergyCo (2024)



2.2 Key cultural heritage sites, places and issues

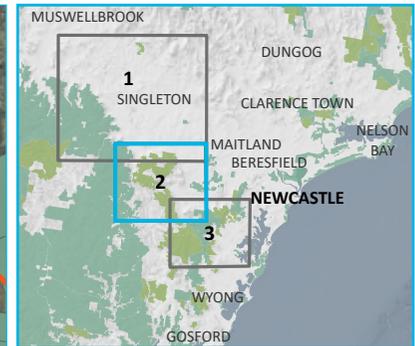
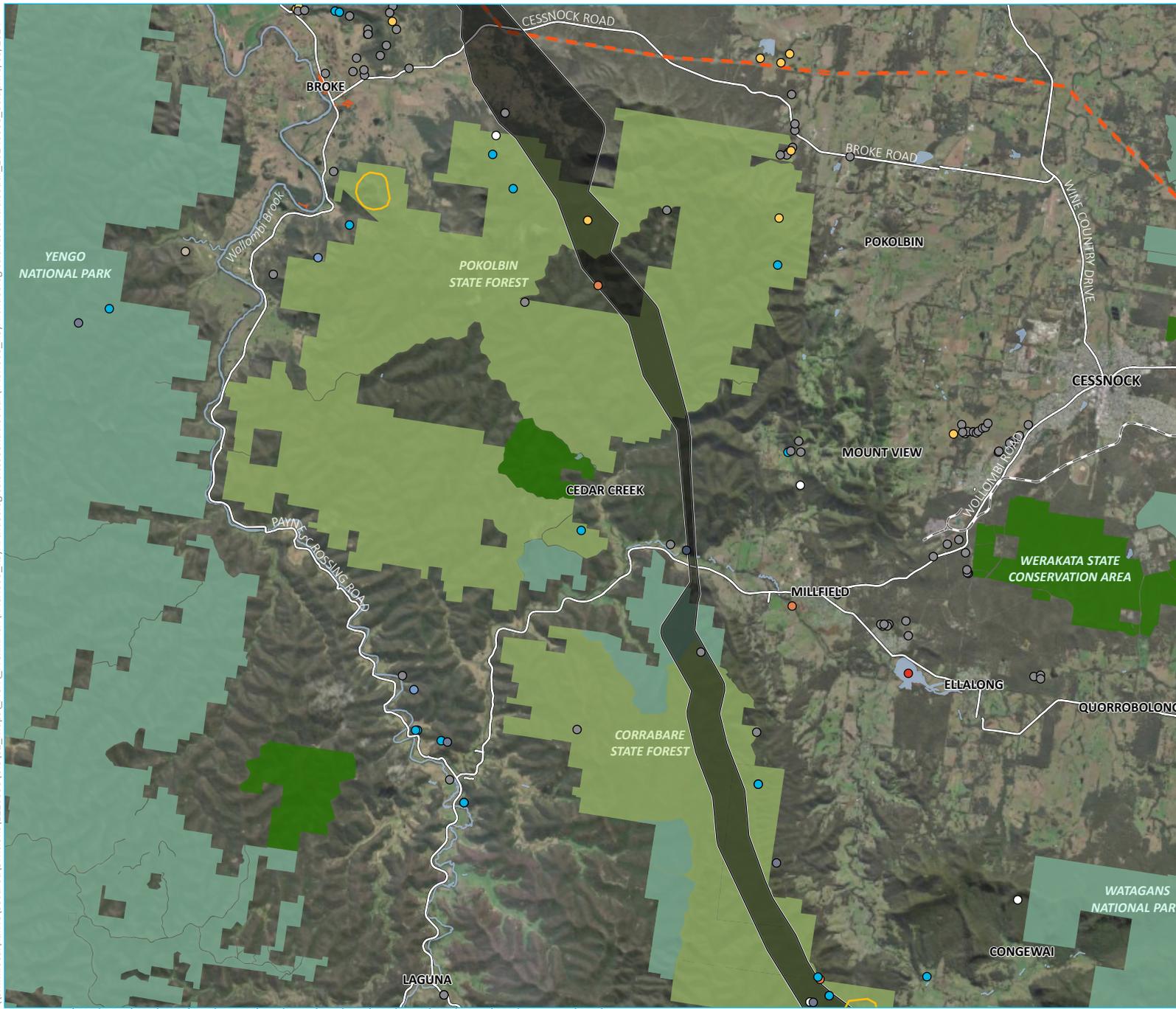
Based on information in Section 1.3 and the predictive model in Section 2.1, the following key cultural heritage sites, places and/or issues have been identified within or near the HTP corridor and will be subject to investigation and consideration during the assessment process (Figure 2.4 to Figure 2.7):

- Previously documented Aboriginal objects and sites – currently some 164 discrete site listings are documented within the HTP corridor. Of these, only three were highlighted as having characteristics that may indicate a local (moderate) or regional (high) significance, although a detailed review of all sites will be undertaken. Suitable investigation and characterisation of these sites and others will be required to maximise the project’s ability to avoid or minimise impacts to the cultural assemblage. There are also several thousand previously documented sites and places within a few kilometres of the HTP corridor, some of which may be subject to indirect impacts.
- Warkworth sand system and other related aeolian deposits – there is extensive documentation that significant cultural materials of substantive age are commonly found in deep sand deposits in the Hunter Valley. These are primarily found in the vicinity of Wollombi Brook and the Hunter River, but are increasingly found elsewhere within the region. Where found, the alignment would be designed to avoid or minimise impact. It will be critical to ensure their robust identification along the alignment through the assessment *and* ensure suitable characterisation of any cultural deposits encountered. (It should be noted that to date the cultural assemblage within the Warkworth sand sheet is often of Holocene <10,000 years age and typically less significant than the older Pleistocene assemblages that may also be identified).
- CM-CD1 (#37-2-1877) – a largely unique colluvial deposit within HVO in close proximity, but outside the HTP corridor. Based on EMM (2023), this is a highly significant site, containing cultural materials of potential antiquity. The HTP corridor is located ~400 m south of the cultural deposit, but further investigation of whether other comparable geological units in the region will be needed and whether the deposit could be affected by indirect impacts. It is understood from EMM (2023) that current projects that encompass the cultural deposit have been designed to maintain its cultural landscape, and especially connections to the Hunter River. Such issues will similarly be explored for this project.
- Significant sites in sandstone Country – Aboriginal sites such as rockshelters, engravings and grinding grooves, typically of high scientific and cultural significance, are prevalent in HTP Central and HTP South. While only one grinding groove site is currently documented within the HTP corridor, it is considered probable that additional sites are likely to be present throughout the State forests. Both predictive modelling, LiDAR data, and proposed field investigations will focus on improving the current understanding of the cultural assemblage in these locales. It will be critical as part of the assessment to ensure methods enabling suitable characterisation of these sites are adopted. Notably, this will involve undertaking test excavations within caves and overhangs with potential cultural materials that are not observable such as stone artefacts, engraving or art motifs, that may indicate a past human use. Where encountered, and validated, the project would seek to avoid direct impacts to these site types. Further numerous rockshelters are documented in the general vicinity of the HTP corridor, and consideration of indirect impacts (e.g. interruption of view-lines, vibration, etc) will also be considered.
- Cultural and intangible places, values and stories – the HTP corridor extends through a cultural landscape, within which places and stories are known to the local traditional owners. These include both traditional values associated with the Dreaming, as well as contemporary places that relate to post-Contact use and habitation of the landscape potentially up to the present day. Some of these places and values are known through recent consultation (Section 1.2), while others are fairly well-documented, such as the association of Mount Yengo and Mount Sugarloaf with a number of Dreaming stories. While initial discussions do not indicate the project would result in direct impact to such values, it is probable that indirect interactions

may occur, notably in relation to view-lines between major landforms across the region. Further exploration of these cultural values with the local Aboriginal community and discussion in relation to any impacts is proposed as part of the project.

- Singelton Military Area (SMA) – as part of the HMP (Umwelt 2023) a number of grinding groove sites were recorded within/adjacent to the HTP corridor, and assessed to be of moderate (local) and high (regional) significance. Multiple low-moderate density artefact scatters are also recorded at SMA, the most significant of which are located on elevated banks and plains associated with Muddies Creek and Emigrant Creek, neither of which intersect with the HTP corridor. However, a site complex of lesser (low) significance was noted on a tributary of Monkey Place Creek, which does intersect with the HTP corridor in several locations. Additionally, a single rockshelter with art, likely of high (regional significance) is also documented within SMA, however the site could not be relocated and information associated with the site suggests the recorded location may be in error (Umwelt 2023, p. D-49). All sites will be subject to management under the HMP.

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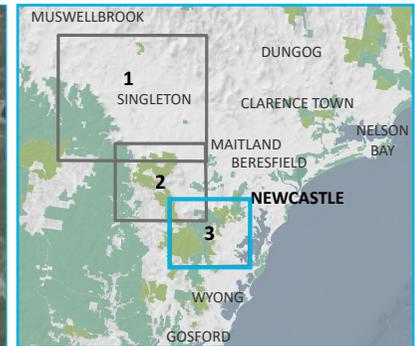
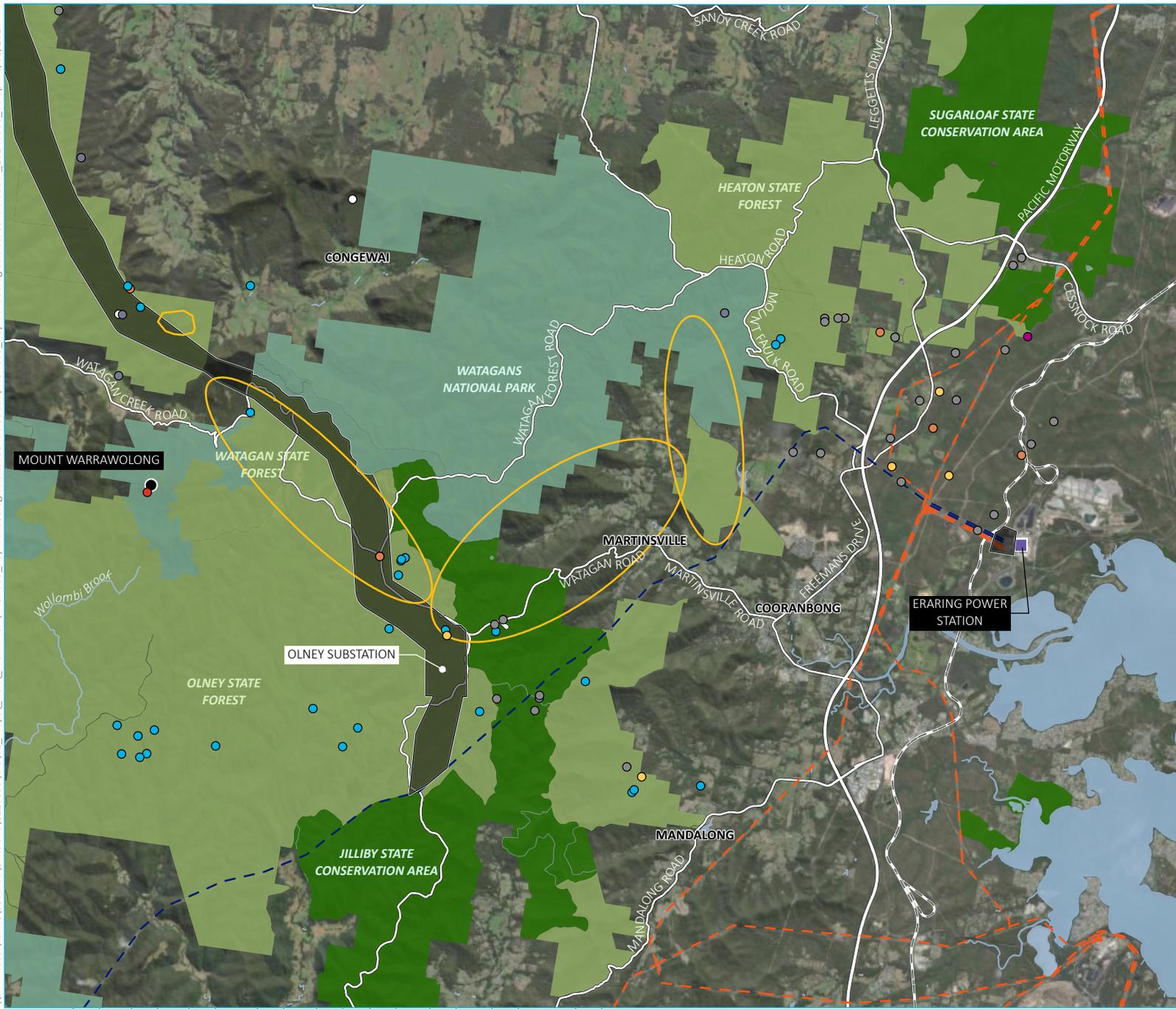
- KEY**
- █ HTP corridor
 - ▭ Culturally significant area
 - ▭ Warkworth sand system
- AHIMS site**
- Aboriginal ceremony and dreaming
 - Aboriginal resource and gathering
 - Art (pigment or engraved)
 - Artifact scatter
 - Culturally modified tree (carved or scarred)
 - Grinding groove
 - Hearth
 - Midden
 - Stone arrangement
 - Undefined artefact site
 - Water hole
- 330 kV transmission line
- - - Rail line
- == Major road
- Named watercourse
- ▭ Named waterbody
- ▭ NPWS reserve
- ▭ State conservation area
- ▭ State forest

Summary of key archaeological and cultural sites and places within the proposed HTP corridor
 HTP Central
 Hunter Transmission Project
 Preliminary Aboriginal Cultural Assessment
 Figure 2.6

Source: EMM (2024); DPE (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009); OEH (2024); Beca (2024); EnergyCo (2024)



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- KEY**
- █ HTP corridor
 - Major landform
 - ▭ Culturally significant area
- AHIMS site**
- Aboriginal ceremony and dreaming
 - Art (pigment or engraved)
 - Artefact scatter
 - Culturally modified tree (carved or scarred)
 - Grinding groove
 - Habitation structure
 - Hearth
 - Undefined artefact site
 - Water hole
 - Power station
- - 500 kV transmission line
 - - 330 kV transmission line
 - - Rail line
 - Major road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State conservation area
 - State forest

Summary of key archaeological and cultural sites and places within the proposed HTP corridor
 HTP South
 Hunter Transmission Project
 Preliminary Aboriginal Cultural Assessment
 Figure 2.7

Source: EMM (2024); DPE (2023); ABS (2021); DCSSS (2023); ESRI (2023); GA (2009); OEH (2024); Beca (2024); EnergyCo (2024)



3 Potential impacts to Aboriginal cultural heritage

3.1 Direct impacts

The project is expected to result in ground disturbance during construction and operation. The level of ground disturbance would be variable, with greater impacts expected at tower footprint locations. It is likely that such ground disturbance would exceed 150 cm in most instances, which is the general depth of where buried cultural materials were encountered. Activities such as roads and temporary construction facilities may also result in ground disturbance.

Localised vegetation clearance along the HTP corridor is also proposed, and would be variable dependent on the nature of the vegetation and topography. In HTP Central and HTP South, for instance, it will be possible to span across steep ravines and avoid clearing the valley floor, and in other areas only part of the easement will be cleared.

Based on the proposed development activities, the following potential direct impacts to cultural materials may occur:

- Surface and shallowly buried stone artefactual material prevalent within HTP North and documented elsewhere along the HTP corridor could be adversely affected by ground disturbance, earthworks and/or excavation that exceed >50 cm below current surface.
- Culturally modified trees could be adversely affected by vegetation clearance and removal.
- Rockshelters, grinding grooves and/or engravings prevalent in HTP Central and HTP South could be adversely affected where significant rock removal and/or excavation is required in their vicinity.

The proposed assessment process (Section 4) would seek to identify and characterise cultural materials to determine their spatial location, composition and significance to identify and manage any proposed impacts. The project is seeking to avoid impacts to cultural materials wherever feasible through design refinement and suitable micro-siting during on-Country activities. It is envisaged that sites of high scientific and/or cultural value would be avoided through this process.

3.2 Indirect impacts

The project may have indirect impacts to cultural materials both within and/or outside of the HTP corridor. Indirect impacts include activities such as vibration that may result in de-stabilisation or harm to cultural materials, and dust generated from the project that may adversely affect any nearby rock art. The clearance of vegetation along parts of the HTP corridor may allow improved informal access to cultural materials that are currently inaccessible or hidden from current view. Initial discussions with the local Aboriginal community also indicated that visual impacts of the project may impact both specific cultural sites or places and the broader cultural landscape.

Based on the proposed development activities, the following potential indirect impacts to cultural materials may occur:

- Destabilisation, cracking and/or collapse of rockshelters, grinding grooves and/or engravings in HTP Central and HTP South from nearby construction activities through vibration, etc.
- Deterioration of rock art in close proximity to the project from dust, dirt and/or aerosol products created during construction.

- Harm or loss to cultural materials from improved access to such sites via a the HTP corridor by tourists, bushwalkers, four-wheel drivers, pedestrians, etc.
- Visual impacts to significant view-lines to/from key tangible sites (e.g. rockshelters, lookouts, etc.) and intangible places (e.g. Dreaming places and stories).

The proposed assessment process (Section 4) would seek to identify and characterise any indirect impacts and their potential to interact with tangible and intangible cultural sites and places. This will include a cultural values mapping exercise with traditional owners and/or key knowledge holders, focussing, but not limited to, areas where which the project intersects with the State forests in HTP Central and HTP South. As outlined in Section 1.2, discussions in relation to traditional and contemporary places of cultural value have already been initiated and are being integrated into project design. Further activities to explore, identify and minimise adverse impacts where encountered are proposed throughout the assessment process.

4 Suggested environmental assessment requirements

The suggested Secretary's environmental assessment requirements (SEARs) for HTP in relation to Aboriginal cultural heritage are to:

- avoid and minimise Aboriginal cultural heritage impacts
- assess the project's impacts on Aboriginal cultural heritage, including any cumulative impacts in HTP North, having regard to the Guide to Investigating, Assessment and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011), Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010a) and the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010b)
- include targeted test excavations with the approval of Heritage NSW
- include a cultural values mapping study of the State forests and surrounds that has been prepared by an anthropologist in consultation with key Aboriginal Elders and knowledge-holders
- include a draft Aboriginal cultural heritage management plan.

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