

Tables

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Table T1: Transects Sampled and Effective Coverage

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
T1	N extent S extent	0402438 0402748	6452866 6452539	River banks, terraces, flats	Avon River; Martin's property (see also T35). This transect traversed only the eastern banks of the Avon River due to access restrictions on the western side. The banks of the river are not uniform in height (5 m on the eastern side; 3 m on the western side). There are extensive river flats (floodplain) on both sides, with the flats on the eastern side extending 200 m wide to the base of a low-lying ridge line (see T36). The flats are completely cleared with only occasional isolated eucalypts occurring. The flats have a thick cover of pasture grasses with 0% visibility, except in a long 200 mm wide cattle track along the fenced river bank (total exposure area ~. Very little lithic material was observed in this transect.	0.0027	33.33	0.0009	100	0.0009	33.33
T2	NE extent SW extent	0402746 0402204	6452140 6451955	River banks, terraces, flats	This transect consist of a short section of the Avon River from the Fairbairn Road bridge to the confluence of Waukivory Creek on Mitchell's property. Here, the river gully itself is 3-4 m deep and about 5 m wide. The bank on the north side is quite steep but levels out onto a relatively wide flat (floodplain). The south side is a little lower. Vegetation is almost completely thick pasture and weed (100% cover) with eucalypt/Melaleuca open woodland occurring in the river margins. Exposures were limited to flood-scours in the river banks (total area about 300 m ²). Visibility in these scours was about 90%. Archaeological potential is considered to be low due to heavy disturbance and previous flood events. One possible Aboriginal site (LEH3) occurs here.	3.426	0.88	0.03	100	0.03	0.88
T3	NE extent SW extent	0403414 0403303	6452458 6452264	Ridge crest	Martin's property, Gloucester area. This transect sampled a low-lying (20-30 m high) ridge to the east of the Avon River (running SE-NW). The ridge crest is about 100 m wide with gentle slopes down to creek and river flats. A deeply eroded ephemeral water course runs E-W on the south side of the ridge. Eroded banks show soils to be	1.35	3.70	0.05	100	0.05	3.70

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					thin O horizons overlying a deep B horizon of clay. Total exposed area about 500 m ² . There were no other exposures evident away from the gully. Very few lithics observed - about 10/m ² density; no suitable raw material for stone-working. Archaeological potential is considered to be low.						
T4	N extent S extent	0402746 0402743	6452140 6451290	River banks, terraces, flats, lower foot slopes	Avon River; Samson's property. The transect traversed both banks of the Avon River on Samson's property from boundary to boundary. The transect is contiguous with T4 to the north and T35 to the south. The river gully is 3-4 m deep in this section with 500-600 m wide river flats on the eastern side and 10-20 m wide flats on the western side. The western side then slopes upwards to a small ridge line where the farm buildings are located. These are highly disturbed. There are also occasional small (3 m wide) river terraces at the southern end of the transect. The property is mostly cleared with a thick cover of pasture grass offering 0% visibility, except for minor flood-scour erosion scars in the river banks (total area ~100 m ²). The river channel retains tall-stratum vegetation. Very little lithic material was observed within the transect.	5.1	0.20	0.01	100	0.01	0.20
T5	W extent E extent	0402743 0404041	6451290 6450702	4th order creek, creek flats and terraces, low ridge crests and steep side slopes, back swamps	Waukivory Creek, Gloucester area; Gary Cole's property. Waukivory Creek meanders through an extensive area of creek flats (100-300 m wide) through most of the transect, except at the eastern end where a series of low ridges and spurs lay close to the northern banks, with a series of small back swamps between. Vegetation consists mainly of thick pasture and weeds (100% cover) with a thin belt of taller vegetation in the creek line. Soils ranged from uniform brown alluvial silt at the western end to duplex soils at the eastern end consisting of alluvial silt A horizon over a bleached yellow clay B1 horizon and a coarse gravel/cobble B2 horizon. Exposures were limited to cattle tracks and pads along most fences along the creek (280 m ²), and a 20 m ² exposure on a spur at the eastern end and	8.52	0.35	0.03	100	0.03	0.35

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					flood scours in the banks sides (total exposed area about 300 m ²). Very few lithics observed except for gravel/cobbles in the creek bed and in the lower horizons of a few exposed soil profiles. A few mature eucalypts in the creek line but no scars observed. Archaeological potential along the creek flats within 100 m of the creek is considered low; potential along the low-lying spurs and ridge crests at the eastern end are considered to have moderate potential. One of these spurs is considered to be a PAD (PAD6).						
T6	N extent S extent	0402170 0401905	6451215 6448327	River banks, terraces, flats	Tiedman's Block. The transect straddles the confluence of Avon River and Dog Trap Creek. Transect incorporated a 2 km section of the eastern bank of the Avon River, and a 1.2 km section of Dog Trap Creek (both banks) as far as its confluence with an unnamed water course that rises near the Stratford Coal Mine. Vegetation on the eastern side is mainly very thick pasture grasses/weeds including plantain and fire weed; land use on this side is mainly grazing. The western side is cultivated with oats and/or lucerne to feed the dairy industry which is prevalent on that side of the Avon. Upper stratum vegetation is restricted to a narrow belt on the margins of the river and creeks. About 400 m south of the confluence, this vegetation stops abruptly and the creek banks are completely cleared and covered only in pasture grasses. There is a wide floodplain along the western side, but there is a very low ridge that comes within 50 m of the Avon on the eastern side but the distance increases to around 400-500 m south of the confluence. Ground visibility in this transect is extremely limited: 0%, except in very limited exposures formed mainly by 200 mm wide cattle pads on the river banks, flood-scours on the river banks themselves, and around contour-banks near the confluence. Total area ~500 m ² . Archaeological potential on the creek flats is considered to be low, but on low ridges within 100 m of the creek the potential is moderate.	17.46	0.29	0.05	100	0.05	0.29

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
T7	N extent S extent	0401798 0401999	6447537 6457069	Creek flats, floodplain, marshland	Avondale Creek, from Wenham Cox Road to the confluence of Dog Trap Creek. The landscape in this transect is characterised by a shallow creek gully winding through an extensive floodplain, rising to a low N-S ridge line on the western side, approximately 100 m west of the creek channel (this is where the farm buildings are located). The vegetation in the transect consists of cleared pasture/weeds throughout, with sedges and reeds occurring in the creek margins and in the marsh areas of the southern end of the transect. These southern areas also consist of large stands of paperbark low woodland. There were no exposures evident in this transect. Ground visibility in the transect was 0% and no lithic material was observed.	3.066	0.00	0	100	0	0.00
T8	E extent W extent	0403803 0401905	6446654 6448327	Creek banks, flats, terraces, lower footslopes, lower spur crest	Dog Trap Creek; Ellis (Denyer) Property. This transect traversed a long section of the creek on both sides. The eastern end consisted of undulating flats on both sides of the creek, with the topography more pronounced at the eastern end where it begins to rise towards the ranges on the eastern side of the Avon River valley. There is a long ridgeline that passes parallel to the south bank of the creek, where the transect traversed lower foot slopes. At the far western end the creek opens to wide creek flats and flood plain where it meets the confluence of Avondale Creek. The landscape in this transect consists of mostly cleared pasture with taller vegetation occurring only in the creek margins. The pasture was very thick offering 0% visibility, except in exposures caused by flood scours in the creek banks and in cattle tracks and pads (total area ~150 m ²). Soils in this area were duplex with a thick alluvial A horizon over a red clay B horizon over a bedrock of sandstone. Lithic concentrations in the exposures ranged from 1/10m ² to 100+/m ² , but there was no evidence of any material suitable for the manufacture of stone tools.	15.18	0.10	0.015	100	0.015	0.10
T9	N extent	403551	6445241	1st & 2nd order	Gloucester Coal Mine lands, off Bowens Road, Stratford. Generally low lying creek flats, inundated after rain, rising to the tall hills on the	600	1200	3	3.6	0.06%	0.0020

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
	S extent	403714	6444756	creeks, creek flats, low-lying swamp, simple slope (3-10%), hill crest	eastern side of the Vale of Gloucester. Vegetation consists of paperpark and eucalypt woodland with understory of grass, pasture and reeds in the creeklines. Creek channels are largely shallow and intermingled. Exposures were very few consisting of a few on midslopes at the southern end of the transect (total area about 20 m ²). Very few lithic examples observed anywhere in the transect, and no raw material. Archaeological potential considered to be low.						
T10	N extent S extent	0401522 0402242	6442888 6441710	1st order creek, creek banks and flats, simple slope (3-10%)	Southern end of the GFDA, Gloucester Coal lands, near Stratford. Generally low lying creek flats, inundated after rain, rising to the tall hills on the eastern side of the Vale of Gloucester. The area is generally a large, cup-shaped drainage depression, approx. 200 m wide, with a low ridge to the west and rising to lower foothills in the east. The creek channel is shallow (<0.5 m), narrow (1-2 m) but gets slightly deeper (1-2 m) and wider (<2.5 m) at far SE end near transmission easement. The area is vegetated almost wholly by open pasture to a height of 0.5 m and ground surface visibility is <1% throughout. Exposures are limited to minor streambank erosion (50 m ²) throughout. Few indications of any lithic material. Low potential for archaeological deposit.	1560	1560	3	4.68	1.28%	0.0600
T11	N extent S extent	0401245 0402215	6442454 6441528	Spur crest, ridge crest	Southern end of the GFDA, Gloucester Coal lands, near Stratford. This area lies immediately adjacent to T2 on the spur crest off the foothills to the east (south of T2) which become a ridgeline west of T2. The ridgeline is elevated approx. 10-15 m above the creek. The ridge and spur are vegetated almost completely by tall pasture grass (up to 1 m tall in places) with 100% cover; virtually no upper stratum. Exposures are completely restricted to a dam wall (10 m ² total). No evidence of cattle pads. No lithic material observed. The ridgeline has a moderate potential for subsurface deposits, higher than the adjacent creek flats due to the periodic inundation of these flats.	1700	1700	3	5.1	0.04%	0.0020

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
T12	N extent S extent	0401460 0401717	6443480 6441460	2nd order creek, creek flats	Southern end of the GFDA, Gloucester Coal lands, near Stratford. This transect follows the creek from a point just north of Glen Road and follows the creek to a point where it meets T2 adjacent to Parkers Lane. It runs west of, and adjacent to, T3. The creek is wide (5-10 m) and deep (up to 4 m) at the southern end, with moderate stream bank erosion, and narrows and shallows to insignificant levels at the northern end. Vegetation at the southern end consists of thick upper and mid stratum with grass/weed ground cover. The northern half is almost completely improved pasture with occasional woodland copses. Ground cover is near 100% throughout. The ground surface is boggy and often inundated, particularly at the northern end. Archaeological potential is considered to be low.	3440	3440	3	10.32	11.63%	1.2000
T13	W extent E extent	0399860 0400418	6443464 6443463	Simple slope (gentle); swamp; ridgeline	Between Parkers Lane and the Stratford Coal Rail Loop, Craven. This area is the proposed site of the CPF. It consists of open paddocks on a very gentle slope (<3%), with a ridge along the western and northern boundaries descending to a low-lying swampy area in the SE corner of the block. The block is mainly covered in low, thick pasture grasses (<5% visibility), with occasional small copses of eucalypt woodland regrowth, mainly in the eastern end of the block. The swampy area consists of paperbark closed woodland. Exposures were limited to isolated cattle hoof scrapes, minor exposures on a dam wall, and larger exposures on a raised artificial mound extending along the western boundary adjacent to the rail loop. Total exposure area approximately 200m ² . No lithics observed; archaeological potential in this area considered to be low.	N/A	N/A	N/A	15.5	1.29%	0.2000
T14	N extent S extent	0399705 0399780	6445477 6445021	River banks, terraces, flats, lower	Avon River; Isaac's property, near Stratford. This transect sampled an area where the proposed pipeline traversed within 100 m of the Avon River. The landscape in this sample area consisted of the meandering river channel (5 m deep x 5 m wide) with narrow river terraces, river flats and a gently incline lower slope rising to a N-S	1.86	0.16	0.003	100	0.003	0.16

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				foot slopes	ridge where the railway and Buckett's Way are located. This slope is highly disturbed by original vegetation clearance and the development of the railway and road. Near the track crossing the railway is a stockyard and a large cutting measuring approximately 5 x 4 m. The density of lithic material in this cutting is approximately 20+/m ² , but no suitable raw material for stone tool manufacture was observed. Immediately west of the cutting was a very small outcrop of sandstone, but no grinding grooves were observed. Ground cover in this area consisted of very thick pasture/weeds offering 0% visibility.						
T15	N extent S extent	0399229 0399014	6442376 6442124	1st order drainage depression	Woods Road, Craven. Property on northern side of road. This area consists of a very shallow drainage depression between two low rises; there is no watercourse channel. Improved pasture throughout with isolated woodland copses. Exposures limited to cattle pads along fence lines (approx 10 m ² in total). No lithic material observed; trees are regrowth only. Archaeological potential is low.	410	820	2	1.64	0.012	0.0033
T16	N extent S extent	0399035 0398979	6442386 6441967	1st order creek, lower slopes	Drainage line across Woods Road, Craven; Wallace / Yates properties. The landscape in this area is characterised by a shallow, ephemeral drainage line (no gully) with gently incline slopes rising to low ridgelines on either side of the water course. The northern side of Woods Rd (Wallace) is largely cleared pasture/weeds with occasional small copses of eucalypt woodland regrowth. Disturbance on this side is limited to dam construction. Exposures consist of the dam wall (150 m ² ; 40% visibility), and isolated natural exposures on the lower slopes associated with eucalypt regrowth and cattle tracks along the fence lines. The southern side of Woods Rd (Yates) is more heavily disturbed with shed, fence and driveway construction. The road and associated verges are also heavily disturbed. Exposures on this side are more extensive around the built structures and totals some 50 m ² with 60% ground surface visibility. The surrounding area	1.696	1.18	0.02	40	0.008	0.47

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					is cleared and covered in pasture offering 20-30% visibility. Site LEA4 was located in this transect.						
T17	N extent S extent	0398849 0399017	6441101 6439232	gentle slopes, steep slopes, spur crests, 2nd order creek, 4th order creek	Coal Creek and Spring Creek; Bosma / Harris properties, off Spring Creek Road, Craven. This transect followed a relatively long section of the transmission line easement where the proposed pipeline is to be placed. It follows a N-S fence line (with thick eucalypt woodland on the eastern side). The western side (with the easement) is completely cleared with thick pasture growth. Occasional small copses of eucalypt woodland occur in the paddocks and along creek margins. The transect traversed the second order Coal Creek with deep creek gully and gentle slopes either side. The south side traversed a high ridge, then a steep spur southwards to cross the creek flats of 4th order Spring Creek, then southwards up a spur line. The vegetation consisted mainly of pasture grasses/weeds with taller stratum occurring only in the creek margins and as small regrowth copses on ridge crests. Ground surface visibility ranged from 0% in the south to 10% in the north. Disturbance was largely limited to original vegetation clearance, fence construction and power line construction. Several large exposures were evident along the fence line at the northern end associated with a vehicle track and caused by sheet erosion (total 1000 m ² ; 40% ground surface visibility); the banks of Coal Creek are convoluted with many areas of exposure (~50 m ² ; 50% visibility). One Aboriginal site (LEH5) and one PAD (PAD 1) was identified in this transect.	7.52	1.46	0.11	40	0.044	0.59
T18	N extent S extent	0399422 0399488	6438224 6437903	3rd order creek, terraces, lower gentle slopes	Unnamed creek crossing, Craven area; Wolfenden property. This transect sampled a 3rd order creek that rises to the west in the steep hills of Lawlers Range. The creek gully is convoluted, 3 m deep with steep, deeply incised banks. Either side of the creek, the land rises in a gentle incline (~4%) to low spur crests to the north and south. The vegetation is mostly thick pasture and weeds with 100% ground	1.974	1.52	0.03	100	0.03	1.52

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					cover. There were no exposures on the slopes. Exposures were limited to the flood-scoured banks of the creek gully and several minor tributaries (total area 300 m ²). Soils in the creek gully were duplex with alluvial soils over a clay B horizon. soils in the tributaries were a skeletal, uniform clay soil. Density of surface lithics in exposures was ~1/10m ² . There was no evidence of any suitable raw material for stone tool manufacture.						
T19	N extent S extent	0399457 0399439	6436490 6435979	4th order creek, lower spur, gentle slope, steep lower slope	Bull Creek crossing, Wards River; Harrison / Grant properties. The landscape in this transect consists of a gently inclined lower slope that descends northwards, ending abruptly in the steep sides of the creek gully. A 10 m wide terrace on the northern side rises abruptly up a steep (15%) slope. Vegetation consists of thick pasture on the southern side. The northern side is characterised by thick eucalypt and melaleuca regrowth in the easement, as well as grass, tussock grass and taller stratum within the creek margins. Exposures were limited to small (1-2 m ²) exposures in the creek banks and small (0.5 m ²) exposures amongst the melaleuca regrowth on the northern slope. Total exposure size was about 10 m ² . Grass cover ranged from 95% on the northern slopes and 100% cover on the southern side. Very few lithics observed except for patches of cobble in the creek bed.	3.084	0.03	0.001	100	0.001	0.03
T20	N extent S extent	0399337 0399472	6434852 6434731	4th order creek, creek flats, low ridge	Chainy Flat Creek; Chapman property, Wards River. This sample area consists of a narrow, shallow creek gully meandering through a 50 m wide creek flat with low, gently inclined ridges either side. Vegetation consists of pasture grasses/weeds (100% cover) with taller stratum in the creek line. Exposures were limited to flood-scours in the creek banks, a small vehicle ford, various cattle tracks and two large exposures in the ridge slope on the northern side. Total exposure area about 100 m ² . Soils were uniform, pedal sandy loams in the A horizon (no B horizon evident). Lithic material was	0.728	1.37	0.01	100	0.01	1.37

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					restricted to isolated patches of river gravel in the creek bed and banks and sandstone-based lithic material in the exposures on the northern slopes; none observed elsewhere.						
T21	N extent S extent	0399346 0399063	6433403 6432908	2nd order creek, 3rd order creek, lower footslopes, creek flats, spur crest	Unnamed creeks on Howard's property, Wards River area. This transect traverses several landform elements commencing with a steep (>10%) spur at the northern end before crossing the 3rd order creek, a 50 m wide creek flat and then along a gently inclined lower slope, which runs parallel to the 2nd order creek. Vegetation consists almost completely of thick pasture grasses and weeds with 100% cover, except in the creek lines where taller stratum and sedge occur. There is a very large exposure (500 m ² ; 100% visibility) on the spur slope where the soil profile shows a deep, skeletal, uniform soil above a conglomerate C horizon. Other minor exposures occur in the flood-scoured banks (50 m ² ; 100% visibility) and the road cutting (30 m ² ; 100% visibility). A low density scatter of lithic material was evident in these exposures but no suitable material for stone tool manufacture.	2.292	2.53	0.058	100	0.058	2.53
T22	N extent S extent	0398429 0398511	6430890 6430413	Lower footslopes, spur crests	Moylan / Holmes properties, near Wiesmantels. This transect sought to sample a series of 1st order creeks at the base of a steep escarpment 2 km west of Mammy Johnsons River and north of the Karuah River. The transect followed a cleared transmission line easement through a bush block (Moylan), then veered NW along the base of the escarpment (Holmes). The landscape consisted of a series of rolling spur lines (easterly aspect; 8-10% gradient) that have been cleared of vegetation except for thick pasture and weed cover (100% cover). The only exposures occur near fence lines (~15m ² ; 80% cover; lithic density 1/3m ²) and on the upstream edge of a dam (~3 m ² ; 60% cover; lithic density 20+/m ²). No suitable material for stone tools was observed.	1.944	0.09	0.0018	100	0.0018	0.09

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
T23	N extent S extent	0397617 0397648	6428777 6427648	2nd order creek, 4th order creek, river flats, loer gentle slopes	Karuah River, Groom Creek and Black Soil Creek, traversing Moylen, Madden and Welgosinski properties and RLPB Stock Route. The pipeline route here follows a narrow strip of land between Black Soil Creek / Karuah River and the Bucketts Way. At the southern end it veers across the road to cross Groom Creek before veering back to the western side of the road again. Vegetation consists of thick pasture ground cover (100% cover) with taller stratum in the River and creek margins; there is also a stand of very mature eucalypts (n= 20+) in the RLPB block. Many exhibit large scars but these are considered to be the result of natural causes such as fire and insect attack. Exposures are limited to several minor exposures associated with Groom Creek (total 10 m ²) with few lithics (1-2 m ²). The creek bank is highly disturbed with a large area of fill deposited. Soils along the bank are a uniform clay. This area is considered to have a low potential for subsurface deposits.	4.68	0.02	0.001	100	0.001	0.02
T24	E extent W extent	0398026 0397778	6428117 6428230	1st & 2nd order creeks, simple slope (3-10%)	Yad-el property, Bucketts Way, 1 km south of Monkerei Road. A wide double creek crossing, just east of a confluence of un-named 1st and 2nd order creeks. The landscape rises sharply to the east. The landscape consists of low but thick (>90% cover) open pasture with isolated eucalypt trees and/or small copses. Exposures are limited to streambank erosion, where some banks are up to 2 m high (but mostly <1 m), and within cattle pads throughout. Total exposure area is approximately 200 m ² . Visibility within exposures is approximately 70-80%. Lithics consist of sandstone cobbles and boulders on hillslopes with sandstone and shale gravel throughout. No raw material was observed. Archaeological potential is considered to be low.	1500	1500	5	7.5	0.27%	0.0200
T25	N extent S extent	0398098 0398087	6427691 6427501	2nd order creek, simple	Groom Creek crossing, accessed via Yad-el. A second order creek within a very steep-sided valley. Virtually no creek flats. Creek channel here is 1.5 m deep x 2 m wide, with some minor streambank	370	740	5	3.7	100.00%	3.7000

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				slopes (>10%)	erosion. Vegetation includes an ironbark/spotted gum canopy in the creekline (no mature trees) with a grass understorey (80% cover); some lantana. No archaeological potential observed here.						
T26	N extent S extent	0397888 0398023	6426634 6426388	1st order creek confluence, simple slopes (>10%), mid-slope bench	Edwards property, off Buckets Way, Clareval. Located in a fairly steep-sided valley with the confluence of two first-order creeks. Within the 'V' of the confluence there is a relatively flat mid-slope bench, approximately 10 m above creek level. The remainder of the area consists of steep simple slopes. Upper stratum vegetation is confined to upper slopes, remainder is very low, thick pasture (>90% cover). Exposures are limited to minor streambank erosion (10 m ² total) and about 10 m ² within cattle pads. Lithics limited to sandstone gravel and cobbles on hillslopes. No raw material. Low archaeological potential.	780	1000	5	5	100.00%	5.0000
T27	N extent S extent	0398361 0398469	6425517 6424312	1st, 2nd & 3rd order creeks, saddles, simple slopes (3-10%)	Shultz property, north side of Duralie Coal Mine Road, near Clareval. Pipeline traverses steeply undulating country crossing several creeklines with steep-sided valleys. Vegetation consists of low, thick pasture (100% cover) with isolated trees and woodland copses nearby. Very few exposures: minor streambank erosion and isolated cattle hoof scrapes - total for transect about 50 m ² . Very limited occurrence of any lithic material - volcanic cobbles on hillslopes, none in creek beds (100% reed cover). No raw material observed. Low potential for archaeological deposit.	1320	2640	5	13.2	0.04%	0.0050
T28	N extent S extent	0398646 0398827	6423574 6423104	1st & 2nd order creeks, simple slope (3-10%), sour crest, dam	Shultz property, adjacent to Bucketts Way, near Clareval. Pipeline route here runs close to Bucketts Way (following an optical fibre cable route), crossing several 1st order drainage lines, then veering eastwards over a spur crest to cross another 2nd order creek. Slopes range from <3% to around 10%. Vegetation mostly low, thick pasture (>90% cover) with isolated individual trees and small copses. Exposures occur around dam and along banks of southern-	530	1060	5	5.3	1.32%	0.0700

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				near house	most creek (about 70 m ² total for transect). Lithics consist of various volcanic-type rocks around the dam; no raw material, no artefacts. Low potential for deposit.						
T29	N extent S extent	0398175 0398281	6422518 6421426	River flats, river terrace, lower gentle slopes	Karuah River Crossings (x2) on Williams / Schultz / Jones / Wilson properties, Clareval area. In this sample area the pipeline crosses from the western side of the Karuah River where the pipeline traverses steeply undulating lands (Williams), to a wide river terraces (50-100 m wide) and flats (100-150m wide) on the eastern side, before crossing again to the western side about 800 m to the south. The flats on the western side are much narrower before rising steeply on the foot slopes to the west of Williams Road. The land is mostly cleared grazing paddocks with thick pasture and weed (100% cover), except for the river margins which have a taller stratum. Exposures were limited to flood-scours on the river banks (200 m ²). Lithics were limited to river gravel and cobbles on the river bed and banks. No suitable stone for artefacts located. A thin scatter of freshwater mussel shells was located on the eastern bank of the river (northern crossing) at MGA 0398226E 6422360N scattered over an area of 100 m ² . The scatter is not considered to be a midden. This area has been heavily disturbed by pastoral activities; the archaeological potential is considered to be low.	4.52	0.44	0.02	100	0.02	0.44
T30	NE extent SW extent	0398278 0398121	6420313 6420123	4th order creek, creek flats, steep spur, lower foot slope	Dingo Creek Crossing; Bratfield property, Stroud Road area. This transect samples the last creek crossing before the two options (Black Camp Creek Rd and Ramstation Creek) commence. The crossing lies approximately 400 m north of the confluence of Dingo and Ramstation Creeks. A steep ridgeline to the west of Dingo Creek descends to the creek gully, which is 1-2 m wide and up to 2 m deep. the creek flats are relatively narrow on the eastern side (about 40-50 m wide) and extensive on the western side as they form part of the Ramstation Creek flats. On the western side there is a steep	1.488	0.67	0.01	100	0.01	0.67

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					spur that rises to the NW. Sandstone outcrops occur on both the spur and in the creek banks, but there was no evidence of engravings visible. Vegetation was limited to thick pasture on the flats and spur (100% cover) with taller eucalypt stratum in the creekline and as an obvious tree-line on the mid-upper slopes of the spur (20 m+ elevation above creek). Observable soils in the creek profile showed a uniform brown alluvial loam. The archaeological potential in this area is considered to be low on the flats, but moderate on the lower spur.						
T31	NE extent SW extent	0398177 0397366	6419919 6419627	4th order creek, creek flats, lower foot slope	Ramstation Creek crossing (Ramstation option); Bratfield property. This area is situated about 800 m west of T18 and T19. The area is characterised by the meandering channel of Ramstation Creek which is 8-10 m wide and 3-5 m deep. There is a narrow river terrace on the northern side of the creek and extensive flats on both sides before rising gently onto low ridges. The flats and terraces are generally covered in thick pasture/weed (100% cover) with taller stratum in the creek line. Exposures consist of cattle tracks along fence lines; under the overhanging vegetation on the creek banks (2 m wide), and in extensive flood-scour erosion banks on the creek margins. Total exposure area is about 300 m ² . The soil profile in the creek bank shows a deep duplex soil with dark alluvial A1 horizon over a bleached A2 above a red-orange clay B horizon. Lithic material was restricted to sandstone boulders in the creek line (no engraving/grooves observed) and gravel/cobbles in the creek bed. There was very little lithic material on the banks and exposures and no suitable stone tool material observed. This area is considered to have low archaeological potential.	2.364	1.27	0.03	100	0.03	1.27
T32	N extent S extent	0397745 0397767	6418619 6418291		Rumble/Walters property, Black Camp Road						

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
T33	N extent S extent	0397845 0397806	6417889 6417513	4th order creek, lower gentle slopes, creek flats	Barnes Creek, Black Camp Road; Walters / Osborne properties. This transect sampled a narrow corridor between the road and creek. The creek gully here is deeply cut (5-6 m deep; 3-20 m wide) with a high gradual slope at the north culminating before dropping very steeply into the creek gully. The south bank rises more gradually to the south and is not as high (<10%; 2 m high). The creek has a sharp bend and the easement crosses the creek twice before emerging onto wide creek flats at the southern end. Vegetation cover consisted of thick pasture with 100% cover except in the creek gully which had a taller stratum. Exposures were only evident in cattle tracks, on a dam wall north of the creek, and in flood-scours in the creek banks. Total exposure about 10 m ² . No lithic material observed. Archaeological potential is considered to be low.	1.52	0.07	0.001	100	0.001	0.07
T34	NE extent SW extent	0397729 0397807	6417368 6417514	4th order creek, 2nd order creek, lower slopes, creek flats and terraces, low spurs	Barnes Creek, Black Camp Creek Road; Osborne property. This transect follows a narrow strip between the creek and the road, traversing along the creek margin on gentle foot slopes and low spurs, and includes a crossing of a minor ephemeral 2nd order creek. Vegetation consists of cleared pasture (100% cover) and taller stratum in the creek margins. Exposures limited to minor areas along the creek banks (~200 m ²). Sandstone outcrops occur on the banks of Barnes Creek. A stand of mature gums occurs in a creek bend at the western end but no scars were evident. The far western end rises up a large spur with a northerly aspect. Minor exposures (1 m ² - 20 m ²) occur throughout the transect. surface lithic density ranges from 1/5 m ² to 20+/m ² . No suitable stone-working material identified. A bora ring (AHIMS # 38-1-006) has previously been recorded in this area but was not relocated during the survey. Archaeological potential is considered to be moderate in this area and a PAD (PAD4) is located on the large spur at the western end. it is recommended that the pipeline remains within the road easement,	3.927	0.51	0.02	100	0.02	0.51

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					which is heavily disturbed, to avoid possible impacts to sub-surface deposits.						
T35	NE extent SW extent	0396750 0396599	6416301 6416116	4th order creek, creek flats, terraces, low spur lines	Barnes Creek crossing, Black Camp Creek Road, Gorton's property. In this area, the pipeline route veers eastwards and crosses the creek approximately 200 m east of a bend in the road. The area is characterised by the meandering creek winding through narrow creek flats with gently inclined westerly-aspect spur lines on either side. The vegetation has been cleared either side of the creek margins and in a N-S strip through which the proposed easement runs. On the northern side the ground cover is thick pasture (100% cover) and on the clearings on the southern side have a thick cover of low paperbark regrowth (100% cover). Few exposures observed (total area ~ 10 m ²). Few lithics observed except in creek banks, but no suitable stone material for artefacts. No mature trees. Archaeological potential considered to be low. A historic heritage place (LEH4) was identified in this area.	0.956	0.10	0.001	100	0.001	0.10
T36	NE extent SW extent	0395584 0395204	6411836 6411344	Steep upper slopes, steep lower slopes, 2nd order creek, creek flats	Black Camp Creek Road, "Bottle Corner", adjacent to Watson's property. This transect commences high on a steep ridgeline and descends sharply to the south before crossing a narrow, shallow tributary of Black Camp Creek, with narrow creek flats on the southern side. This area is very steep and thickly vegetated throughout. Ground visibility was 0% except in the road easement. The only lithics observed were gravel/cobbles in the creek bed. This area was considered to have low archaeological potential. Two historic heritage items were identified adjacent to the road (LEH5 and LEH6).	1.762	0.00	0	100	0	0.00
T37	NE extent SW	0394949 0394609	6410417 6410020	4th order creek banks,	Black Camp Creek and Bottle Corner Gully; James and Hull property. This transect samples the southern banks of Black Camp Creek, the eastern bank of Bottle Corner Creek and a 2nd order	3.144	0.32	0.01	100	0.01	0.32

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
	extent			2nd order creek, creek flats, gentle lower slopes, hill crest	tributary that drains westwards into Black camp Creek. The transect traverses along lower slopes south of Black Camp Creek, and crosses a minor 2nd order drainage line at the NE end, Bottle Corner Creek mid-way before rising gently to a small hill crest at the SW end. Vegetation consisted of pasture grass (100% cover) except in various exposures. Taller stratum occurred in the creek lines. Exposures consisted of sheet erosion scars formed on vehicle tracks, minor natural exposures (1 m ²), flood-scours in creek banks and in cattle tracks/pads. Total exposure area is considered to be 100 m ² . Many lithics in the exposures (100+/m ²), but few pieces of suitable raw material. Two Aboriginal sites (LEA6 and LEA7) and two historic sites (LEH7 and LEH8) were identified in this area. In addition the archaeological potential at the northern end is considered to be medium to high and a PAD measuring 180 x 30 m (PAD5) was identified.						
T38	NE extent SW extent	0393294 0393061	6409287 6409118	2nd order creek, terraces, flats, low hill, spur, and lower foot slope	Black Camp Road; Muddle property, including "Margaret's Folly" - Cedar Tree Creek crossing. The pipeline traverses the property close to the road reserve, but within private property. The transect started on the foot slope of a large hill at the northern end, came down onto creek flats that ranged from 40-200m wide. It then dropped 1 m onto a 50 m wide creek terrace (swampy with a small drainage line). The creek gully was about 1 m below the northern terrace, about 10 m wide with bare, sandy banks underneath the creek line tree canopy. On the southern side, the creek banks emerged onto a narrow (10 m wide) creek terrace, which then started to rise gradually up the side of a spur. The only exposures occurred on the creek banks and along the fence line to the south east of the crossing (total area ~ 200 m ²). There were no lithics in the creek line and about 10/m ² along the fence line. No artefacts. Two mature eucalypt trees situated on the northern foot slope were	1.152	1.74	0.02	100	0.02	1.74

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					devoid of scars. Apart from the taller creek line vegetation, the rest of the landscape uniformly consisted of pasture grass/fireweed with 100% cover. One potential historic heritage site (LEH9) was located in this area.						
T39	NE extent SW extent	0391642 0391259	6408158 6407806	4th order creek, 3rd order creek, gentle lower slopes, very low spurs, creek flats	Black Camp Creek, off (Old) Black Camp Creek Road; Muddle property. This transect samples a section of the pipeline along the edge of a road easement where it passes in close proximity to Black Camp Creek. At the NE end, the transect passes over an un-named third order creek that drains northwards into Black Camp Creek. West of this creek is a very low spur with a northerly aspect, and a narrow belt of gentle lower slope before the road turns southwards. The SW end is characterised by creek flats before rising over another low spur (westerly aspect) at the southern end. Transect was almost completely cleared pasture (100% cover), except for the creek margins, which had the usual taller strata. Exposures were limited to the road itself (800 m ² ; 100% visibility), the banks of the 3rd order creek and dam wall (200 m ² ; 20% visibility). Soils were duplex with a thin A horizon of grey-brown pedal sandy loam over a thicker orange clay B horizon. Lithic material was minimal off the road, but densely scattered 50+/m ² on the road surface. No suitable material observed; no mature trees observed. A potential historic heritage site (LEH10) was identified in this area.	4.2	2.38	0.1	100	0.1	2.38
T40	N extent S extent	0391216 0391161	6406326 6406179	4th order creek, moderately steep lower foot slope, creek flats and	Black Camp Road; Rodgers & Herbert property "Bynsam Ponds". This transect samples an un-named 4th order creek crossing, which drains westwards into Black Camp Creek. The creek gully is 5-10 m wide x 1-4 m deep and has sheer sides. The creek winds through relatively wide flats between two spur lines with a westerly aspect. Vegetation is thick pasture throughout (100% cover) except in the creek margins (taller stratum of eucalypts and paperbark). very few exposures except in creek sides (ranges from 1 m ² - 10 m ² ; total	0.96	0.42	0.004	80	0.0032	0.33

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
				terraces, spur with gentle slopes	area ~40 m ² ; visibility 80%). Very little lithic material observed in exposures (~1/5 m ²); no suitable stone material identified. Archaeological potential considered to be low.						
T41	NE extent SW extent	0391172 0391082	6405095 6404881	4th order creek, creek flats & terrace, gentle lower slope	Little Black Camp Creek, Black Camp Road; Carlton property. This transect sampled the creek crossing just east of its confluence with Black Camp Creek. The area consists of the meandering creek gully winding through a narrow strip of creek flats on both sides with gentle lower slopes north and south. Vegetation consisted of eucalypt open woodland on the slopes and flats on the southern side to woodland in the creek margins and cleared pasture on the northern flats. Ground cover consisted of pasture grasses and thick leaf litter throughout (0% visibility). Occasional exposures of about 1-2 m ² occur on the southern side with dense lithic scatters of 100+/m ² (mostly ironstone material) - total exposure area about 50 m ² . The area is considered to have low archaeological potential.	1.398	0.36	0.005	90	0.0045	0.32
T42	N extent S extent	0390377 0390398	6401576 6401367	2nd order creek, steep spurs	Bridge Creek, Glen Martin Road; Gorton / Smith properties, Glen Martin. This transect samples the crossing of a very steep second order creek that rises between the steep sides and spurs of Pretty Hill (elev. 190 m) on the northern side and Table Top (elev. 239 m) on the southern side. The creek drains westwards and southwest until it meets the Williams River at Glen Martin. The creek margins have a low forest upper stratum, while the slopes consist of thick pasture grasses/weeds, which extends under the forest cover (100% ground cover). Exposures were limited to the margin of the dam on the southern side of the creek (~60 m ²), another along the fence line on the southern side (~10 m ²) and occasional scours along the creek banks (10 m ²). Total exposed area is 80 m ² . The soil along the dam edge shows a thin duplex soil with a bleached A2 horizon overlying an orange clay B horizon. There were virtually no lithic materials	1.272	0.63	0.008	90	0.0072	0.57

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					observed anywhere in the transect. Archaeological potential is considered to be low.						
T43	N extent S extent	0390337 0390312	6400228 6399996	3rd order creek, creek flats, spur slopes, swamp	Glen Martin Road; Horn's property. This transect crosses an unnamed 3rd order creek that drains westwards into Bridge Creek. The creek drains through a fairly narrow belt of flats bordered to the north and south by two low spur crests (westerly aspect). Vegetation consists mainly of thick pasture grasses with occasional purple-top, paperbark and eucalypts scattered along the flats and creek margin, and sedge/tussock grass in the swampy area near the road. Groundcover offered 0% visibility except in a few minor exposures along the creek banks (total area <20 m ²). Soils were alluvial loams in the creek gully; subsoils not observed. Very few lithics observed; no suitable raw material; no mature trees. Archaeological potential is considered to be low.	1.404	0.14	0.002	100	0.002	0.14
T44	NE extent SW extent	0389161 0388974	6394985 6394902	4th order creek, low ridge crests and slopes	Boatfall Creek crossing, Glen Martin Road, Clarence Town; Allen's property. Topography in this area consists of generally undulating, low-lying creek flats surrounding Boatfall Creek. Low ridges lay adjacent to the creek on the eastern side. Vegetation consisted mainly of thick pasture with taller stratum in the creek line and along creek terraces and occasional isolated trees in the paddocks. Soils were duplex clays. Exposures consisted of vehicle and cattle tracks, a single scour at the western end of the transect and a 3 m wide belt of bare earth along the eastern bank of the creek (total area about 100 m ²). Very few lithic materials observed even in the creek bed. Archaeological potential is considered to be low.	1.212	0.83	0.01	100	0.01	0.83
T45	N extent S extent	0382363 0382137	6389652 6389225	narrow river flats with natural	Williams River area, near Seaham; James' property. This transect samples an area of undulating river flats punctuated by a large back swamp and small second order water courses, backed by a high ridgeline to the south west. Vegetation was pasture grasses and	2.91	0.86	0.025	80	0.02	0.69

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
				levee, 2nd order creek, low-lying ridges, back swamp, steep footslopes	weeds, with isolated copses or individual eucalypts scattered throughout; sedgeland and paperbark woodland around the swamp margins. Two mature eucalypts occur on a ridge crest on the northern boundary of the property (no scars). Exposures consist on large recently burnt patch of pasture (200 m ²), cattle tracks, flood-scours along creek banks (20 m ²) and along the steep foot slopes on the western side of the back swamp. Total exposure area (250 m ²). Minor sandstone outcrops occur behind the back swamp (no engravings/grooves evident). Ground surface visibility 0% except in exposures (80%). No lithics observed except behind the swamp associated with sandstone bedrock; no suitable material for stone tools. Archaeological potential is considered to be low-moderate on the ridgeline at the northern end of the property; low elsewhere.						
T46	N extent S extent	0382064 0382080	6388916 6388806	Spur crest & slopes	Williams River area, near Seaham; O'Keefe property. This transect samples a low-lying rocky spur (westerly aspect) that rises above the floodplains of the Williams River. Vegetation cover consisted of young eucalypt woodland (regrowth) with pasture ground layer (20% visibility). Exposures consisted of several natural exposures throughout the area (2-20 m ² ; total exposure area 40 m ²). Lithic material occurs throughout the transect but is mainly granitic material. A small outcrop of silcrete occurs on a cleared easement 40 m west of the fence line (although this is not an Aboriginal site as such, it is designated LEH8 as a means of identifying it as a possible source of raw material for stone-tool manufacture). Archaeological potential is considered low to moderate.	0.444	0.90	0.004	100	0.004	0.90
T47	N extent Mid-point S extent	0382091 0382089 0381395	6388463 6388272 6387790	marshland, very low spur, low ridge crest,	Williams River margins; Parker / Hughes properties, Seaham area. This area is low-lying floodplain associated with the Williams River margins and is truncated by areas of extensive marsh/swamp and very low ridges. Vegetation was entirely pasture grass on the higher landforms and sedge/reed in the low-lying swamps. Isolated copses	6.204	0.08	0.005	100	0.005	0.08

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
				floodplain flats, gentle lower slope	of eucalypt woodland regrowth occur on some higher landforms. There were few exposures except for stock pads and tracks in the horse paddocks at the northern end and along a fence line adjacent the transmission line easement at the southern end. Total exposed area ~50 m ² . Very few lithics observed; densities in exposure at southern end 2-10/m ² . No suitable stone-working material; no mature trees; no sandstone bedrock. Archaeological potential considered to be low.						
T48	NE extent SW extent	0380856 0380607	6387311 6387173	narrow river flats, natural levee, low-lying ridge, back swamp	Williams River, northern bank; Duncan property. This transect samples an area of the Williams River bank (eastern side). Although the area within 100 m of the river was surveyed, it is likely that there will be no impacts to this area since the pipeline will be drilled beneath the river channel starting about 100 m away from the river bank. The main areas of interest were the low ridgeline and the back swamp. Vegetation consisted of thick pasture/weeds on the flats and low ridge (also eucalypt woodland on ridge) with small copses of paperbark woodland around the backswamp and along minor drainage lines. Ground visibility was about 10% in the pasturelands and about 20% in the few exposures associated with vehicle tracks (~20 m ²). No lithics observed at all; no mature eucalypts (no scars); no sandstone bedrock. Archaeological potential considered to be low in low-lying areas; possibly moderate in the low ridge.	1.71	0.12	0.002	10	0.0002	0.01
T49	NE extent SW extent	0380207 0380058	6386865 6386757	Spur crest, steep lower foot slopes, 3rd order creek, creek flats	Williams River area, off Clarence Town Road, Seaham; Forjacs' property. This transect samples an area of the western bank of the Williams River. Much of the flats within about 100 m of the river bank will be unaffected since the pipeline will be drilled beneath the river channel. A moderately steep spur descends south easterly to meet the flats and shallow channel of Carmichaels Creek, which drains westerly in to the river. Vegetation was pasture (100% cover with eucalypt open woodland on the steep spur slopes and paperbark	0.732	0.27	0.002	100	0.002	0.27

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					along the creek margin. Exposures consisted of narrow cattle tracks on the spur slope (20 m ² ; 100% visibility). Isolated granitic boulders occur in isolated areas of the transect, and some silcrete material occurs on the spur (no artefacts). Archaeological potential is considered to be low due to steep terrain and regular flooding.						
T50	N extent S extent	379846 379846	6386588 6385825	Simple slopes (v. gentle, gentle, mod.-steep. Creek flats, 1st, 2nd, 3rd order creeks	Jackass and Carmichael Creeks, off Clarence Town Road, Seaham; Elbourne property (7DP708057). Transect follows an existing 50 m-wide transmission line easement from due east of Rockgidge Hill northwards across Jackass Creek, thence northeast over a high steep ridge to the banks of Carmichael Creek, thence eastwards over undulating terrain with 1st order drainage lines off the ridge, to meet Clarence Town Road north of Seaham. The easement has been cleared of all upper stratum, although bounded each side by eucalypt woodland; Ground cover is pasture/weeds with about 80% cover. The Jackass Creek flats have been modified by pastoral activities including dam and track construction. Small exposures scattered throughout (total 500 m ²). Archaeological potential is considered to be low, except on the northern side of Jackass Creek where it is considered to be low-moderate.	1800	1800	3	5.4	100.00%	5.4000
T51	W extent E extent	377971 378155	6384445 6384655	3rd order creek, creek flats	Deadmans Creek crossing, Clarence Town Road (northern side), Seaham; Hansom Quarry Ltd's lands. Topography in this area consists of generally low-lying creek flats surrounding Deadmans Creek. Creek channel is 10-20 m wide and 3-4 m deep with steep banks to creek flats. Vegetation consisted mainly of thick pasture on the flats, with taller stratum in the creek line. Soils were duplex clays. Exposures consisted of minor vehicle and cattle tracks, and single scours beneath the canopy of trees along the creek banks (total area about 100 m ²). Very few lithic materials observed on the western	540	1080	3	3.24	1.54%	0.0500

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					side of the creek; higher quantities on the eastern side though these appear to be imported road-base gravel. Archaeological potential is considered to be moderate on the western side of the creek.						
T52	N extent S extent	0376863 0376963	6383293 6382909	Floodplain , wetland (swamp)	North western margins of McClement Swamp, Brandy Hill. Topography in this area consists of extremely low-lying swamp margins, periodically inundated. At the time of survey, heavy rain had fallen and the ground surface was covered in water and the soils saturated. There are no low rises in this area, except to the east where rural housing has been developed. No lithic material was observed. Isolated tree copses occur, but are all regrowth. The area traversed by the pipeline route is considered to have low archaeological potential.	1150	1150	3	3.45	0.00%	0.0000
T53	View point (looking SW through arc of 40°)	376847	6381325	Floodplain , wetland (swamp), 1st order creek	Eastern margins of McClement Swamp and Barties Creek, accessed via Warrigal Close, Brandy Hill. The land in this area was inundated at the time of survey, which precluded ground survey. Survey was by vehicle-based observation of landforms only. However the low-lying, periodic flooding of this area suggests a low archaeological potential along the pipeline route. The rises to the east (currently under rural subdivision) are considered to have moderate archaeological potential.	0	0	3	0	0.00%	0.0000
T54	N extent S extent	0377291 0377748	6379113 6378561	Floodplain , wetland (swamp), modified creek	Eastern margins of Barties Creek and south eastern extent of McClement Swamp; "Hinton Vale", of Hinton Road, Osterley. Topography in this area consists of extremely low-lying creek flats and swamp margins, periodically inundated. At the time of survey, heavy rain had fallen and the ground surface was covered in water and the soils saturated. The creek channel itself has been extensively modified by agricultural activity and the pipeline route follows an existing fibre-optic cable route. There are no low rises in this area, except to the east where rural housing has been	710	710	3	2.13	0.00%	0.0000

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					developed, and Kanwary Hill itself. The land in this area was inundated at the time of survey, which precluded ground survey. Survey was by vehicle-based observation of landforms only. However the low-lying, periodic flooding of this area, the modifications to the creek channel and the existing trenching for fibre-optic cables suggests a low archaeological potential along the pipeline route. The rises to the east (currently under rural subdivision) are considered to have moderate archaeological potential.						
T55	N extent S extent	0377682 0377603	6377613 6377182	River flats, floodplain	Hunter River (south bank); Peacock's property, off Duckenfield Road, Duckenfield. This transect samples an area of low-lying river flats/floodplain on the southern bank of the Hunter River. The area is completely cleared for grazing and is covered in 100% cover of pasture grasses through the transmission line easement (20 m wide). Either side of the route, the paddocks have been recently ploughed showing bare earth (80% visibility). No lithic material was evident; no mature trees were in the vicinity; no sandstone outcrops evident. Archaeological potential is considered to be low.	1.764	79.93	1.41	100	1.41	79.93
T56	N extent S extent	0376506 0376445	6372409 6371987	3rd order creek, swamp, floodplain	Chichester-Newcastle pipeline (Hunter Water easement); Greenways Creek crossing off Woodberry Road, Woodberry. This transect sampled an area of low-lying floodplain where the easement crossed Greenways Creek between the Hunter River to the east and Woodberry Swamp to the west. The proposed gas pipeline will be in the transmission line easement, rather than the water pipeline easement. Vegetation in the area consisted almost exclusively of thick pasture (100% cover); upper stratum consisted of <i>Allocasuarina</i> open woodland in a wide belt along the creek margins (But ground cover was still thick pasture). Exposures were limited to minor areas	1.72	0.06	0.001	100	0.001	0.06

Transect No	Point	MGA Easting	MGA Northing	Landforms	Description	Area (Ha)	Exposure (%)	Exposure (Ha)	Visibility (%)	Detection Area (Ha)	Effective Coverage (%)
					along the creek bank and in cattle tracks in the paddocks (total exposure area ~10 m ²). Archaeological potential in this area is considered to be low.						
T57	View point (looking SW through arc of 30°)	376603	6371648	3rd order creek, swamp, floodplain	Greenways Creek, off eastern side of Woodbury Road, north east of Woodbury. The land in this area was inundated at the time of survey, which precluded ground survey. Survey was by vehicle-based observation of landforms only. However the low-lying, periodic flooding of this area suggests a low archaeological potential along the pipeline route. The rises to the south and west (Woodbury ridge) are considered to have moderate to high archaeological potential.	0	0	3	0	0.00%	0.0000
T58	N extent S extent	0378076 0377804	6367604 6367346	Disturbed terrain, swamp margins	Old Punt Road, Tomago. Transect follows the western side of the road verge across what was formerly wetland adjacent to the Hunter River to the caravan park. Roadsides heavily modified. Caravan park occupies a slight rise over the swamp, but the rise is comprised almost completely of imported fill. Archaeological potential in this area is considered to be low.	440	880	3	2.64	100.00%	2.6400

TableT2: Aboriginal Sites Identified During the Field Survey

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
LEA1	Object	0402611	6452503	Mitchell's property on western bank of the Avon River, approximately 400 m west of its confluence with Waukivory Creek. (Approximately 300 m NE of the Fairbairn Rd bridge over the Avon.)	Scarred tree	River bank	This site is a dead eucalypt (species unknown) with a scar on the western side. The scar is approximately 400 mm wide at its widest point, and tapers to a uniform point at the top and extends to a flat bottom, 400 mm from the ground. It is approximately 2.2 m long. The scar is in extremely poor condition with the surface completely decayed and the tree hollowed out within. The scar is not uniform in shape (ovoid at the top but straight horizontal at the base). Its shape suggests that this site is NOT an Aboriginal site, but its poor condition makes conclusive identification unreliable.	Nil required. This site is considered to be too close to the creek bank to be affected.
LEA2	Object	0402096	6449859	Tiedman's Block (Lucas Energy). Located approx 200 m NE of the ford over the Avon River (just north of its confluence with Dog Trap Creek).	Isolated find	Lower slope, re-entrant	This site consists of a single small silcrete multi-platform core (unifacial). L: 24 mm; W: 7 mm. The site lies within a small re-entrant in the low ridge that runs along the eastern bank of the Avon at this point. Within the re-entrant there is an extensive "L-shaped" contour bank that has been excavated around the eastern and northern sides. Running parallel to, and on the northern side of the contour bank, is an extensive exposure (~5 m wide by 30 m long) where the fill for the bank has been excavated. There is also a small exposure 2 m south and 4 m west of the NE corner of the bank. This is where the artefacts is located. Veg cover is 60% in the exposures; 100% elsewhere. The site is approximately 100 m east of the river bank.	Avoid any ground-breaking activities within a 100 m of this location. It is understood that the proponent is not considering any further development in this area.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
							Other lithic material in the exposures consists mainly of ironstone.	
LEA3	Centroid	0402011	6449027	Tiedman's Block (Lucas Energy). Located on the eastern side of Dog Trap Creek, approx 200 m SE of its confluence with the Avon River.	Artefact scatter	River flat	This site consists of two mudstone (gray) flakes. The site lies approximately 10 m east of the creek bank in a small dry tributary that comes of the eastern side of the creek and then turns SE. The site is located in a very short eroded section out of the tributary's northern bank. Given their location, it is considered that the area overlying this tributary, up to the bank of Dog Trap Creek, is a PAD measuring 20 m E-W and 10 m N-S.	Nil required. This site is considered to be too close to the creek bank to be affected. It is understood that the proponent is not considering any further development in this area.
LEA4	Object	0398996	6442117	Yates' property (1DP1003762); southern side of Woods Road. The artefact is situated on the road verge next to the western-most fence post next to a timber stock gate at the front of the property.	Isolated find	Gentle lower slope	This site is an isolated find of a core, measuring 32 mm long by 23 mm wide by 10 mm thick. The platform shows a minor amount of cortex, there is a negative flake scar with two scar ridges, a bulb of percussion, and possible usewear on one of the lateral margins. The artefact is formed from a coarse-grained siliceous material that may be silcrete, although it is of a darker, greyish-red than the material seen elsewhere in the Gloucester region. There is very little exposure here except around the fence posts. However, there is extensive ground surface exposure around the shed behind the gate and extending some 20-30 m southwards to where the property's driveway comes close to the eastern boundary fence. It is estimated that the total exposure in this area 50 m2. Ground surface visibility is	This site was originally identified on 2 October 2008. A subsequent inspection of the site on 10 October 2008 failed to relocate the object, despite it being located in a prominent position.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
							estimated to be about 60% in the exposure but 0% elsewhere due to thick pasture cover.	
LEA5	Object	0398904	6440693	Bosma's property (2DP1003762); on the rising gentle slope approximately 200 m north of Coal Creek. The site is located on an exposure on the northern side of a large tree stump that has been left on a pedestal of eroded soil, 2 m west of the property's eastern boundary fence (adjacent to a large wooded block to the east) and 30 m south of an east-west fence and gate.	Isolated find	Gentle mid-slope	The site is an isolated find consisting of a single single-platform, multi-facial core, measuring 34 mm long by 26 mm wide by 7 mm thick. There is a single negative flake scar and a possible bulb of percussion. Other scars do not show diagnostic features. The site is located on a 4 x 3.5 m (14 m ²) exposure that has a total surface lithic density of approximately 5 lithics/m ² . Other nearby exposures have 20+ lithics/m ² . Ground surface visibility in the exposures is estimated to be about 80%, and only 10% elsewhere due to thick pasture ground cover.	It is understood that the pipeline route is situated approx 10 m west of the fence line. It is recommended that the pipeline route be detoured approximately 20 m further west (around the site) to avoid impacts from trenching and spoil deposition. Should realignment be unfeasible and damage to the site unavoidable, it is considered that collection of the artefact under a s.90 permit is not necessary.
LEA6	Object	0394945	6410460	Black Camp Road; Farrell's property (35DP95407). On eastern boundary of property adjacent to road reserve.	Artefact Scatter	First order creek, lower foot slope	The site is an artefact scatter consisting of two stone artefacts: a thin mudstone core, measuring 44 mm long by 32 mm wide by 10 mm thick (Plate P10), and an indurated mudstone flake, measuring 24 mm long by 17 mm wide by 8 mm thick. The core has four ridge scars, ripple marks and possible usewear on the right lateral margin. Its platform has been reduced to about 5 mm ² and there is no indication of any bulb of percussion. It retains about 50% cortex. Both artefacts lie on an exposure measuring 10 x 2 m (20 m ²) and there is a fairly dense scatter of surface lithics (50-100/m ²) within the	This site is in the general vicinity of sites LEA7, PAD8, LEH6 and LEH7. It is recommended that the pipeline route avoid this property completely and follow the road easement only.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
							exposure, but no other artefacts were found. The artefacts lie about 15 m apart.	
LEA7	Object	0394770	6410201	Bottle Corner Gully, Black Camp Road; James and Hull's property (122DP526671). It lies about 30 m west of the road's creek crossing and about 2m from the northern creek bank.	Scarred tree	2nd order creek	The site is a scarred tree that may be of Aboriginal cultural origin. The scar is elliptical or diamond-shaped and non-uniform in shape, and measures 650 mm long by 280 mm wide by 70 mm deep, and the base 480 mm above the ground surface. The surface of the scar is fairly rough and is deteriorating; however it is till intact and there is what appears to be hand-axe cut near the apex. The scar is on the southern side of a large smooth-barked eucalypt (blue gum?). The tree is located on a second order creek that crosses Black Camp Road, running east to west, draining into Black Camp Creek.	This site is in the general vicinity of sites LEA6, PAD8, LEH6 and LEH7. It is recommended that the pipeline route avoid this property completely and follow the road easement only.
LEA8	Objects	0378005	6384593	Clarence Town Road; Dead Man's Creek crossing. It lies about 140 m north of the road on the west bank of the creek (about 4 m back from the bank edge).	Artefact Scatter	Creek flat	The site is an artefact scatter consisting of two stone artefacts: a white silcrete medial flake, measuring 36 mm long by 14 mm wide by 9 mm thick, and red silcrete flaked piece, measuring 12 mm long by 12 mm wide by 6 mm thick. The only diagnostic features on these objects are flake scar ridges, offering some doubt as to the identification of these objects as artefacts. Both artefacts lie on an exposure measuring 1 x 2 m (2 m ²). No other lithic material was observed. The artefacts lie about 0.5 m apart. The site is considered to be part of a continuous subsurface deposit incorporating LEA9 (130 m south east).	Recommend test excavation along the western bank of Deadmans Creek and collection of surface artefacts.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
LEA9	Objects	0378093	6384498	Clarence Town Road; Dead Man's Creek crossing. It lies about 10 m north of the road on the west bank of the creek (about 4 m back from the bank edge).	Artefact Scatter	Creek flat	The site is an artefact scatter consisting of two white silcrete broken flakes, measuring 13 x 21 x 6 mm and 18 x 15 x 3 mm respectively. The only diagnostic features on these objects are flake scar ridges, offering some doubt as to the identification of these objects as artefacts. Both artefacts lie on an exposure measuring 6 x 4 m (24 m ²) about 4 m north of the roadside fence. Visibility within the exposure is about 70-80%. The artefacts lie about 0.2 m apart. The site is considered to be part of a continuous subsurface deposit incorporating LEA8 (130 m north west).	Recommend test excavation along the western bank of Deadmans Creek and collection of surface artefacts.
AHIMS #38-1-0006	AHIMS Actual	0397660 0397679	6417050 6417220	Immediately adjacent to Black Camp Road, approx 2 km south of the Stroud-Dungog Road on a flat adjacent to a minor creek.	Bora Ring	Creek flat	This site is recorded in AHIMS as being on the western side of Black Camp Road. It is recorded as a Bora (ceremonial) ring consisting of a circular ditch with a mound inside the ditch. This site was relocated during the survey. It is located at the northern end of creek flats where a creek comes in close proximity to the road. It consists of a ditch (now covered in reeds) encircling an 8 m diameter mound (1 m high).	The pipeline alignment is on the eastern side of the road easement. All works should remain within the road easement to avoid potential damage to the site. Erosion barriers should be erected along the western side of the road, on the rise above the Bora ring, during construction to avoid siltation.

TableT3: Potential Archaeological Deposits Identified During the Field Survey

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
PAD1	Centroid	404041	6450702	Cole property; northern side of Waukivory Creek, approx 150 m east of the house and sheds.	PAD	Low ridge crest	This PAD is located on a small spur off the low ridge overlooking a billabong and creek flats. The PAD is considered to be 30 m x 20 m. This site is within the general route of a proposed gas spine line.	The spur crest in this area should be avoided. It is recommended that the route of the spine line be moved approximately 20 m westwards to climb the ridge via a shallow re-entrant between two spurs.
PAD2	E extent W extent	399018 398768	6439629 6439872	Harris' property (417DP753173); southern side of Spring Creek.	PAD	Lower foot slope	The PAD is considered to be a 20 x 20 m area on the southern side of the creek on the low rise to the road.	PAD unavoidable. Recommend test excavation to confirm presence of PAD.
PAD3	Centroid	399052	6439271	Burnett's property (2DP874695); approximately 110 m SSW of the house on the southern side of Spring Creek (Berrico) Road.	PAD	Spur crest	The PAD lies at the crest of a spur that leads down towards Spring Creek and is situated in a copse at the top of the hill. The area covered by the PAD is estimated to be about 30 m north to south by 30 m east to west, centred over the position above. The ground surface visibility on this slope was 0% due to a very thick layer of pasture grass/fireweed. There were no exposures in this area.	The current proposed route skirts around the SW corner of this PAD. It is recommended that any realignment does not move any further eastwards than the current alignment (and does not impact on the woodland copse at the top of the spur).
PAD4	E extent W extent	399575 398971	6436300 6436391	Bull Creek crossing, Wards River; Harrison / Grant properties. Southern side of Bull Creek on a small terrace above the creek channel	PAD	Lower gentle foot slope	This PAD is considered to follow the creek channel to a width of 100 m wide to a depth of up to 50 m from the creek bank.	PAD unavoidable. Recommend test excavation to confirm presence of PAD.
PAD5	E extent W extent	399540 399371	6434799 6434689	Chainy Flat Creek; Chapman property, Wards River (6DP1107984).	PAD	Low ridge crest	This PAD is located on a low rise on the northern side of Chainy Flat Creek. It follows a north westerly direction, and is considered to be 100 x 20 m.	PAD unavoidable. Recommend test excavation to confirm presence of PAD.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
PAD6	E extent W extent	397686 397206	6417213 6417273	Osborn's property, Black Camp Road (9DP95639 and 681DP95674). This PAD is located where Black Camp Road heads south, then does a sharp right-angle turn to the west.	PAD	Lower foot slopes; creek flats	This PAD is considered to have two parts: a 200 x 50 m section along the gentle foot slope where the road is oriented N-S; and a 400 x 50 m section along the north side of the road where the road is oriented E-W, and includes a long narrow, shallow spur that runs NNE. This PAD is associated with a registered Bora ceremony site and is considered to have a high level of significance.	It is recommended that the gas pipeline remains within the road easement. Recommend retaining archaeologist and Aboriginal community representatives to monitor excavation works in this area of Black Camp Road, under the provisions of an AHMP.
PAD7	Centroid	396931	6417094	This PAD is situated on Osborn's property on Black Camp Road (676DP1114165) on a long, gentle NW facing spur.	PAD	Gentle, mid-slope	The PAD straddles both sides of the road. It is estimated to be approximately 300 m long by about 30 m wide (9000 m ²). It is truncated by the road easement which has been heavily disturbed. .	It is recommended that the gas pipeline remains within the road easement. However, should the preferred route pass through this PAD, a permit will not be required, but the provisions of an AHMP apply.
PAD8	N extent S extent	394950 394794	6410465 6410318	This PAD is situated on James and Hull's property, on the western side of Black Camp Road (122DP526671).	PAD	First order creek; lower foot slope	This PAD consists of a 180 x 40 m (7200 m ²) strip encompassing the east-west drainage line north of the house (see Site LEA7) from the boundary fence 60 m west to Black Camp Creek, thence south along the gentle slope fronting Black Camp Creek to the vehicle ford 120 m south.	This PAD is in the general vicinity of sites LEA6, LEA7, LEH6 and LEH7. It is recommended that the pipeline route avoid this property completely and follow the road easement only.
PAD9	N extent S extent	393075 393137	6409146 6409065	Muddle's property (14DP95008); south side of Cedar Tree Creek on the northern side of Black Camp Road.	PAD	Low-lying spur	This PAD is located on a low spur and is considered to be approximately 150 m long by 80 m wide oriented to the spur.	The pipe line is located within the disturbed road easement and will pass to the south of this PAD; impact is unlikely.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
PAD10	E extent W extent	391213 391052	6407650 6407688	Western side of (Old) Black Camp Creek Road; southern side of Black Camp Creek	PAD	Low-lying spur crest	This PAD is considered to cover an area of 150 x 80 m oriented with the spur.	The pipe line is located within the disturbed road easement and will pass to the east of this PAD; impact is unlikely.
PAD11	N extent S extent	389067 389126	6395054 6394908	Allen's property (10DP1040379); eastern side of Boatfall Creek.	PAD	Low ridge crest	This PAD is located on a low ridge that follows the course of the creek. It is considered to be at least 100 m long by 50 m wide, oriented along the ridge	PAD unavoidable. Recommend test excavation to confirm presence of PAD.
PAD12	E extent W extent	382530 382439	6389641 6389658	James' property (100DP1039833); northern boundary, adjacent to Williams River.	PAD	Low ridge crest	The landform consists of a low E-W ridge along the northern property boundary. It is considered to run the extent of the ridge before it rises sharply on to high hills to the east.	PAD unavoidable. Recommend test excavation to confirm presence of PAD.
PAD13	Centroid	382073	6388896	O'Keefe's property (151DP1067987), off Holmwood Road. It is located on the northern side of a west-facing spur line, approximately 30 m west of the eastern boundary fence in a relatively cleared corridor through the woodland.	PAD	Low ridge crest	This location appears to be a source of raw material (red silcrete) that is commonly used in the manufacture of stone tools. The site consists of a 5 x 5 m surface scatter of silcrete cobbles and at least one large rock that is mostly buried, indicating the material is <i>in situ</i> and suggests that a seam runs through this location. As such there is the potential that sub-surface indications exist of Aboriginal usage. Due to the cleared corridor, this area was considered by the proponent as an alternative route for the pipeline. However, the original alignment has been retained, thus avoiding this PAD.	Original corridor alignment to be retained along boundary fence. Provisions of AHMP apply.

Site No.	Point	MGA Easting	MGA Northing	Location	Site Type	Landform	Description	Mitigation
PAD14	E extent W extent	380274 380097	6386745 6386726	This PAD is located on the southern side of Carmichaels Creek, which drains into the Williams River.	PAD	Low ridge crest	PAD consists of a very low ridge on the southern side of creek flats; the property is currently used as horse agistment. It is considered to be 100 x 10 m, oriented with the ridge.	Current alignment of pipeline will pass to the north of this PAD; no impacts are expected.

Table T4: Historic Heritage Items Identified During the Field Survey

Site No.	Point	Easting	Northing	Location	Site Type	Landform	Description	Mitigation
LEH1	Object	398142	6429351	Old 'Wiesmantels Inn' property, 1655 The Bucketts Way, Weismantels. It is situated on the eastern side of Bucketts Way, approximately 150 m off the side of the road.	Cobb and Co Hut	Low hill top	Since this item is not in the path of the proposed pipeline, it was not inspected.	Nil required. This building is located greater than 100 m outside the proposed alignment (and on the opposite side of the highway) and is therefore not considered to be under threat from the pipeline.
LEH2	Object	397480	6427560	Wielgosinski's property, Buckett's Way, near Stroud Road (31DP828026). It is situated on the eastern side of Bucketts Way, approx 100 m south of Groom Creek.	European Scarred Tree	Lower slope	The site consists of a single box-type eucalypt tree that was said to have been emblazoned with the initials of Fred Ward (aka Captain Thunderbolt). Although the tree was not seen close up, discussions with the owner indicate that the story is an urban myth and the tree is, in fact, relatively recent regrowth. The size of the bole tends to support that theory. Another local tale is that Groom Creek is so-named because it is where Thunderbolt is said to have groomed his horse. There is no corroborating evidence for this.	Nil required. The current alignment of the pipeline is approximately 80 m west of the item; impact is unlikely.
LEH3	Object	396564	6416168	Gorton's property, off the western side of Black Camp	Hut and Stockyards	Creek flats	The hut is an end-gabled, rectangular timber hut. The walls are framed with round-log	Nil required under current alignment. This item is located

Site No.	Point	Easting	Northing	Location	Site Type	Landform	Description	Mitigation
				Road, west of Stroud (3DP744888). It is situated about 20 m from the road edge.			corner posts with top and bottom beams. They are clad with vertical timber slabs (most are missing off the front and side walls, but mostly intact on the rear wall). The roof is clad with corrugated iron and the gables are also clad with several small sheets of corrugated iron. The roof appears to be newer than the rest of the hut since it is framed with sawn timber joists and rafters. There is a single door and window at the front. There is no glass in the window but there is a leaf hinge attached to the frame indicating a timber shutter. There is also the remains of a very small CI water tank and stand at the southern end. About 20 m south of the hut is an old stockyard with newer extensions that may still be in use. Several sections of old timber fence lie around the hut consisting of timber posts with rebates for two rails. A small refuse scatter is located about 5 m south of the hut.	more than 100 m west of the proposed alignment and is not considered to be under any threat from the development. Should realignment be considered in the vicinity of this site any ground-breaking activities should not be conducted within 50 m of the building with preference given to the eastern side of Black Camp Road or within the road easement.
LEH4	Object	395584	6411836	Fearon and Nosworthy's property on Black Camp Road (103DP570275)	Stockyard	Upper slope	The site consists of a small stockyard measuring about 20 x 10 m with a stock ramp and chute at the southern end. It appears to have had three pens, but many of the fences have fallen down leaving gaps in the structure. It is constructed of 1.5 m high round-log posts (at ~3 m centres) with three split-log rails and a top-rail. All rails are wired to the posts. The stock ramp has a base of coarse rock that was probably covered in loose gravel that has since been washed away. The rock fill is between vertical round log sides.	All care should be taken for construction to avoid impact to this site, which is located within 2 m of the edge of the road. The pipeline may remain within the road easement (on the eastern side of the road) or may detour approx 50 m west of the item to cut the road corner.

Site No.	Point	Easting	Northing	Location	Site Type	Landform	Description	Mitigation
LEH5	Object	395201	6411570	Farrell's property on the eastern side of Black Camp Road (35DP95407). It lies just north of the confluence of the road and the transmission line easement.	Brick Pile	Lower slope	This site consists of a small pile of red-orange bricks and rocks. The bricks have a "V" notch on one surface and the remains of mortar is still attached. The bricks are stacked in a neat pile indicating that they are not in situ, but probably come from a former house/hut site nearby (location unknown)	Nil required if the pipeline alignment is restricted to the western side of the road easement. This site is not considered to be significant.
LEH6	Object	394663	6410184	Black Camp Road. James & Hull property (122DP526671)	Hut	Gentle northerly slope	This site consists of a hut that has been added to over many years. It is clad in various state of corrugated iron (walls and roof), has a skillion-form roof, and measures approximately 20 x 4 m. It has a small 'settler's hut' type chimney and a small water tank and stand at the SE end. It appears to have been added-to and now has what appears to be a vehicle bay at the NW end. The hut appears to be serviceable but is showing signs of marked deterioration. The roof cladding at the SE end is held down by the weight of several sawn timber beams lying on top. Several rusting farm implements lie along the rear wall.	This site is in the general vicinity of sites LEA6, LEA7, PAD8 and LEH7. It is recommended that the pipeline route avoid this property completely and follow the road easement only. On the southern side of the un-named creek where LEA7 is located, the route then deviates back into private property to pass between LEH6 and LEH7.
LEH7	Object	394609	6410020	Black Camp Road. Just off roadside and just south of entry gate into James & Hull's property (122DP526671)	Stockyard	On crest of northerly-facing spur	The stockyard was originally constructed of round log posts with round log rails wired to the posts. Several sections appear to have been either repaired or extended using round log posts with sawn timber rails (also attached by wire). The interior of the yards have been reinforced by wire mesh; the yard appears to be in useable condition though modifications mean that it has only moderate integrity.	This site is in the general vicinity of sites LEA6, LEA7, PAD8 and LEH6. It is recommended that the pipeline route avoid this property completely and follow the road easement only. On the southern side of the un-named creek where LEA7 is located, the route then deviate back into

Site No.	Point	Easting	Northing	Location	Site Type	Landform	Description	Mitigation
								private property to pass between LEH6 and LEH7.
LEH8	Object	393225	6409125	Black Camp Road; Cedar Tree Creek crossing. Adjacent to Muddle's property and 20 m SE of "Margaret's Folly"	Bridge	2nd order creek and flats	Site consists of a small vehicular bridge measuring 10 x 3.5 m, consisting of several longitudinal log spans side by side and covered in coarse rubble. There are two large mature eucalypt trees at each corner of the SW end. The base of the northernmost tree has grown over one of the side longitudinal spans suggesting the bridge has been in existence for many years. The bridge is similar to many existing farm-track bridges still evident in the Gloucester region, and is of the same construction style as site LEH9.	This bridge may require removal and upgrade during the road reconstruction project. Further research and a statement of heritage impacts may be required prior to impact to the item.
LEH9	Object	391638	6408132	(Old) Black Camp Road; road easement adjacent to Muddle property (33DP95007).	Bridge	3rd order creek	Site consists of a small vehicular bridge measuring 10 x 2.5 m, consisting of several longitudinal log spans side by side and covered in coarse rubble. The central log spans have collapsed making the bridge impassable. The bridge is similar to many existing farm-track bridges still evident in the Gloucester region, and is of the same construction style as site LEH8.	This bridge may require removal and upgrade during the road reconstruction project. Further research and a statement of heritage impacts may be required prior to impact to the item.
LEH10	Centroid	376589	6371963	Woodberry, Greenways Creek, approx 150 SE of the Hunter Water pipeline crossing over Greenways Creek.	Mound	Creek flats	Site consists of 3 x 3 m earth mound that appears to be the foundations of a former structure that has since been demolished. The mound has battered sides and rises 0.5 m above the surrounding flats. This site is possibly the foundations of a former pump house. No structural remains extant.	This site is not considered to be significant. The existing alignment within the transmission line easement is acceptable.
LEH11	Centroid	376590	6371984	Woodberry, Greenways Creek, approx 150 SE of the	Bridge	3rd order creek	Site consists of an old timber bridge over Greenways Creek, measuring 8 x 2 m. Bridge	This site is not considered to be significant. The existing

Site No.	Point	Easting	Northing	Location	Site Type	Landform	Description	Mitigation
				Hunter Water pipeline crossing over Greenways Creek.			is constructed of timber sleepers over five round-log longitudinal bearers. The sleepers are fastened to the bearers by large-diameter iron spikes. Some sleepers are missing and most of those remaining are decayed to some extent.	alignment within the transmission line easement is acceptable.

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Plates

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Plate P1: Example of typical (0%) ground surface visibility (Transect 3 on Avon River)



Plate P2: Example of transect where ground surface visibility was <10%
This image is of PAD13 on Transect 46 where silcrete cobbles were found



Plate P3: Example of a large eroded exposure on the banks of a second order creek in Transect 21



Plate P4: The highly damaged scar on the trunk of a dead eucalypt at LEA1



Plate P5: Site view of LEA2. Artefacts are in the eroding bank of a gully draining into the Avon River. Looking NE



Plate P6: One of the grey mudstone flakes found at LEA2



**Plate P7: Site view of LEA3. Artefact is on the downhill side of a long contour bank.
Looking ENE**



Plate P8: Small silcrete core found at LEA3



Plate P9: Site view of LEA4. The artefact is (was) laying beside the gate post. Looking south

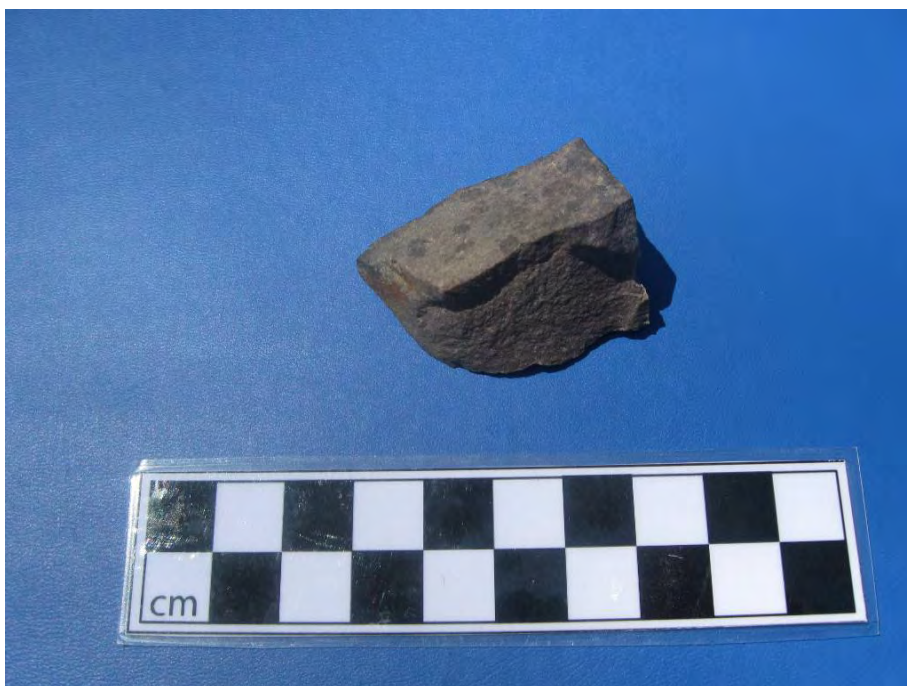


Plate P10: A red fine-grained siliceous core found at LEA4



Plate P11: Site view of LEA5. The artefact is lying on the northern (uphill) side of this stump



Plate P12: Core found at LEA5



Plate P13: Location of LEA6. The two artefacts are located on either side of the small drainage line. Exposure is along a vehicle track fording the drainage line.



Plate P14: A white mudstone core found at LEA6



Plate P15: The unusual-shaped scar on a eucalypt tree beside Bottle Corner Gully at LEA7



Plate P16: Site view of LEA8 looking south east. Artefacts are located where the blue folder is lying.



Plate P17: Silcrete artefact found at LEA8



Plate P18: Site view of LEA9. Artefacts are on exposure in bottom left of picture. Looking NNE across ford over Deadmans Creek, next to Clarence Town Road.



Plate P19: Silcrete artefacts found at LEA9



Plate P20: The large eucalypt said to be emblazoned by Captain Thunderbolt.



Plate P21: Hut and Stockyards at LEH3



Plate P22: Stockyard at LEH4



Plate P23: Pile of bricks at LEH5



Plate P24: Hut at LEH6



Plate P25: Stockyards at LEH7



Plate P26: Bridge at LEH9



Plate P27: Bridge at LEH9



Plate P28: Mound at LEH10



Plate P29: Bridge at LEH11

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