

Appendix B

Supporting environmental information

Aboriginal Heritage

AHIMS registered sites within or in the immediate vicinity of Options B to E

Location	Site Name	Coordinates	Notes
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

AHIMS registered sites within or in the immediate vicinity of Option A

Location	Site Name	Coordinates	Notes
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Non-Aboriginal Heritage

Listed Non-Aboriginal Heritage items within or in proximity to the Nowra Bridge project study area

Place / Item	Location	Heritage Listing and No.	Other Listings	Description within the Nowra study area
Shoalhaven River Bridge/ Nowra Bridge over the Shoalhaven River	Princes Highway Nowra NSW 2541	RMS Section 170 Register Item #4301658	Register of the National Estate Place ID #15932	The existing crossing
		LEP 2014 Item #402		
Bomaderry Railway Station and Yard Group	77 Meroo Street Nowra NSW 2541	NSW State Heritage Register SHR #01090		Located near the intersection of Bolong Road and Meroo Road
		LEP 2014 Item #135		
Graham Lodge (former Greenhills Estate Homestead) and grounds/Graham Family Cemetery	10 Pleasant Way Nowra NSW 2541/ Lyrebird Drive Nowra NSW 2541	NSW State Heritage Register SHR #01699	National Trust of Australia register Item #4544;	Immediately east of the Princes Highway
		LEP 2014 Item #389 and 369		
Bomaderry Aboriginal Children's Homes former United Aboriginal mission	Brinawarr Street Nowra NSW 2541	NSW State Heritage Register SHR #01874		Not within Nowra study area bounds, but located in proximity
		LEP 2014 Item #125		

Place / Item	Location	Heritage Listing and No.	Other Listings	Description within the Nowra study area
"Greenleaves"— Federation Queen Anne style Residence and grounds	59 Bolong Road Nowra NSW 2541	LEP 2014 Item #122		Bolong Road, east of the Princes Highway
Federation Brick and Asbestos Tile Residence	67 Bolong Road Nowra NSW 2541	LEP 2014 Item #1123		Further east of the existing crossings / Princes Highway
Milk Factory (former)	31A Bolong Road Nowra NSW 2541	LEP 2014 Item #1124		Adjacent to station complex
"Lynburn" - Timber Federation Residence and garden	501 Princes Highway Bomaderry NSW 2541	LEP 2014 Item #1130		West of the Princes Highway
Weatherboard Cottage (formerly Mrs Pallett's Residence)	77 Meroo Street Nowra NSW 2541	LEP 2014 Item #1134		Near the station complex, east of the Princes Highway
"Illowra" - Federation Timber Berry Estate Residence and garden	472 Princes Highway Nowra NSW 2541	LEP 2014 Item #1136		East of the existing crossings / Princes Highway
Victorian Weatherboard Residence	8 Tarawara Street Nowra NSW 2541	LEP 2014 Item #1138		Not within Nowra study area bounds, but located in proximity
Victorian Weatherboard Residence	6 Tarawara Street Nowra NSW 2541	LEP 2014 Item #1139		Not within Nowra study area bounds, but located in proximity
"Kilsyth" - Federation Weatherboard Residence	33 Bridge Street Nowra NSW 2541	LEP 2014 Item #1331		West of the existing crossing / Princes Highway
"Uuna" - late Victorian Weatherboard Cottage and garden	35 Bridge Road Nowra NSW 2541	LEP 2014 Item #1332		West of the existing crossing / Princes Highway
Former Numbaa Red Cedar Flood Boat and Captain Cook Bicentennial Memorial	Bridge Road Nowra NSW 2541	LEP 2014 Item #1338		Item moved and is no longer in proximity to any of the options.
Inter-war Weatherboard Building and Timber Wharf	Wharf Road Nowra NSW 2541	LEP 2014 Item #1407		Immediately east of the existing crossings / Princes Highway

Additional (non-listed) Non-Aboriginal Heritage items within the Nowra Bridge project study area

Item	Description	Comment
Memorial graffiti and cross	On the pedestrian walkway on the northern side of the south-bound lanes of Shoalhaven Bridge, a floral memorial cross has been affixed to the fence. Directly under the north-bound lanes bridge, on the northern side on one of the bridge's support struts, a graffiti memorial has been painted reading: "RIP Tim". These are both commemorations relating to two people who lost their lives in a car accident off Nowra Bridge in the Shoalhaven River during September 2010. These are contemporary markers within the Nowra area that have significance to the local community.	This item is located within the Nowra study area. Option C is likely to require removal of the memorial cross due to demolition of the existing iron truss bridge.
Rock platform	A rock platform to the east of Shoalhaven Bridge, located adjacent to the northern bank of the Shoalhaven River, was identified by a landowner as having been built as a historical anchor point for paddle steamers along the river. In addition to the historic association of the rock platform itself, there is archaeological potential for historical artefacts to be present in a subsurface context in this section of the river and its adjoining creek bank, relating both to the platform construction and its period of historic usage.	A small portion of this rock platform extends into the study area, in line with the zoned rail infrastructure corridor that extends to the northern bank of the Shoalhaven River. Construction of Option E may potentially involve impacts to this item.
Rotary park monument	A monument for the Rotary Park dating to 1960 has been erected on the northern side of the Shoalhaven River. A car park, small park area and bike/walking path are located in close proximity to the monument. The monument is a contemporary marker within the Nowra area that may have significance to the local community.	This item is located within the Nowra study area. Due to its location west of the existing double crossing, Option B has the highest potential to impact this item.
Walk memorial park	Walsh Memorial Park, located adjacent to Bomaderry Railway Station, contains monuments and historic items on public display within its bounds. These items are part of a war memorial area within the park. The monument is a contemporary marker within the Nowra area that may have significance to the local community.	This item extends partially into the north-eastern corner of the Nowra study area. Depending on works required within the vicinity of the existing railway line, Option E may potentially involve impacts to this item.
Bell UH-1B Iroquois	A military aircraft has been restored and is on permanent public display alongside the Princes Highway in the central part of Nowra, located adjacent to Graham Lodge. An interpretation board is also present at this location providing information about the military aircraft. The monument is a contemporary marker within the Nowra area that may have significance to the local community.	This item is located within the Nowra study area. Depending on the design of connections to the Princes Highway south of the Shoalhaven River, all of these options have the potential to impact this item.
Rail siding	A raised earth embankment and trestle bridge over Bomaderry Creek (c.1893) were identified by a landowner as having previously been used as a rail siding. The Bomaderry Railway Station and Yard Group is a State significant item (SHR #01090) and this rail siding has the potential for associative significance. There is also the potential for historic archaeological sub-surface deposits to be present at the rail siding and at the Bomaderry Creek crossing	This item is located within the Nowra study area. Depending on works required within the vicinity of the rail siding, Option E may potentially involve impacts to this item.

Contamination

Areas and contaminants of concern

Figure ID	Area	Potential source of contamination	Potential contaminants
1	Former Nowra Gasworks Corner of Bridge Road and Lamonds Lane	<p>The former Nowra Gasworks site has been redeveloped into a council car park. The site has been declared a remediation site by the NSW EPA due to soil and groundwater contamination sourced from the former gasworks, which operated between the 1900s and 1960s.</p> <p>According to the Shoalhaven Council website, further investigations were being undertaken on down-gradient off-site properties in 2012/2013 between Bridge Road and Graham Street. The results of this investigation were not available to inform this Contamination Constraints Assessment.</p> <p>As the potentially impacted area is located up-gradient and adjacent to the Nowra study area, there is potential for soil and/or groundwater contamination to be present within the south-western most portion of the combined study areas of these proposed options.</p>	Total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, ammonia, cyanide, heavy metals
2	Harry Sawkins Park	<p>Harry Sawkins Park is located on the south side of Shoalhaven City Council's City Administration Centre between Graham Street and Princes Highway, Nowra.</p> <p>Council records indicate that gasworks-sourced contamination was identified in the park and remediation work was undertaken in 2009. Further contamination investigation works were being undertaken in 2012/2013.</p> <p>As the potentially impacted area is located up-gradient and adjacent to the Nowra study area, there is potential for soil and/or groundwater contamination to be present within the southernmost portion of the combined study areas of these proposed options.</p>	TPH, BTEX, PAHs, phenols, ammonia, cyanide, heavy metals
3	Bomaderry Substation Mattes Way, Bomaderry	<p>A substation is located about 40 metres north of the northwest portion of the study areas of Options B-E. Two groundwater monitoring wells are present within the substation site, indicating that a potential contamination investigation has taken place within the property.</p> <p>The substation could be a potential source of PCB contamination and is located up-gradient of the Nowra study area.</p>	TPH, polychlorinated biphenyls (PCBs), heavy metals
4	Petrol Station Corner of Belinda Street and Bolong Road, Bomaderry	<p>A petrol station is located within the north eastern portion of the Nowra study area.</p> <p>The petrol station site was observed to contain underground storage tanks (USTs), fuel dispensing pumps and associated underground fuel dispensing infrastructure.</p>	TPH, BTEX, PAHs and lead.
5	Mechanical Workshop 64 Bolong Road, Bomaderry	<p>Two mechanical workshops are located within the north eastern portion of the Nowra study area.</p> <p>These workshops may be a potential source of soil and groundwater contamination due to the use and storage of oils and solvents.</p>	TPH, BTEX, PAHs and lead.
6	Mechanical Workshop Corner of Bolong and		

Figure ID	Area	Potential source of contamination	Potential contaminants
	Coomera Street, Bomaderry		
7	Service Station 36 Bolong Road, Bomaderry	A service station is located adjacent to the north eastern boundary of the Nowra study area. The service station site was observed to contain underground storage tanks (USTs), fuel dispensing pumps and associated underground fuel dispensing infrastructure. The site was also observed to contain a mechanical workshop.	TPH, BTEX, PAHs and lead.
8	Agricultural Feed and Manufacturing 6 Bolong Road, Bomaderry	An above ground storage (AST) tank was observed at the rear of an agricultural feed supply/manufacturing property. The AST may potentially contain diesel for generators or chemicals for manufacturing.	TPH, BTEX and PAHs.
9	Shoalhaven Bridge	Historical use of leaded paint.	Lead
10	Shoalhaven Starches 36 Bolong Road, Bomaderry	The Manildra Group property is located about 350 metres east of the Nowra study area, on the northern bank of the Shoalhaven River. The site is a starch and ethanol manufacturing plant and has three EPLs listed under the NSW POEO register for dangerous goods production, general chemicals storage and agricultural storage.	TPH, volatile organic compounds (VOCs), ethanol.
11	Sewerage Treatment Plant	Bomaderry Sewerage Treatment Plant is located about 390 metres to the northeast of the Nowra study area. The site has an EPL for sewage treatment processing by small plants.	Nutrients
12	Railway	The Illawarra (South Coast) railway line ends at Bombaderry Station, immediately northeast of the Option E study area. There is potential for hydrocarbon soil and groundwater contamination from historical spills of diesel from diesel powered train engines.	TPH, BTEX, PAHs, PCBs, organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), metals and asbestos.
13	Petrol Station 68 North Street, Nowra	A petrol station is located up-gradient of the southern portion of the Nowra study area. The petrol station site was observed to contain underground storage tanks (USTs), fuel dispensing pumps and associated underground fuel dispensing infrastructure.	TRH, BTEX, PAHs and lead.
14	Former Petrol Station and Workshop 71-73 North Street, Nowra	A former petrol station is located up-gradient of the southern portion of the Nowra study area. The site is now a tyre fitting workshop. Evidence of former USTs and fuel dispensing pumps was observed. Vent pipes remain on walls.	TRH, BTEX, PAHs and lead.

Figure ID	Area	Potential source of contamination	Potential contaminants
15	Agricultural Land	<p>Agricultural properties account for a large proportion of land in the north-eastern area of Nowra study area.</p> <p>An organic farm is located in the northern portion of the Nowra study area, to the east of the existing double crossing, on the northern bank of the Shoalhaven River. A fill embankment (of unknown origin) associated with the railway alignment was observed on this property.</p> <p>Agricultural land is also located on the southern bank to the east of the Princes Highway. The specific historic use of these properties is unknown.</p>	OCPs and OPPs.
16	Residential or Commercial or Recreational Land Use	<p>The remainder of the land within the Nowra study area consists mainly of low density residential properties, parks and open space and retail or commercial businesses. Portions of land within the Option A study area are also comprised of these land uses.</p> <p>Potential contamination issues within these areas would relate to imported fill, use of hazardous building materials such as asbestos and lead paint and potential use of small quantities of pesticides and herbicides.</p> <p>The risk of soil and groundwater contamination from these properties is considered to be low, with the exception of those properties located close to the former Nowra Gasworks site and Harry Sawkins Park.</p>	TRH, BTEX, PAH, PCB, OCPs, OPPs, metals and asbestos.
Refer to sensitive land use figure - Option A study area (main body)	West Nowra Recycling and Waste Facility 120 Flatrock Road, Longreach	<p>The West Nowra Recycling and Waste Facility is located immediately west of the Option A study area. The Facility operates under EPL 5877 as a general solid waste (putrescible and non-putrescible) landfill.</p> <p>The risk of soil and groundwater contamination from buried waste and fill materials associated with the Facility is considered to be moderate. Route planning should recognise and manage the potential contamination risk associated with this site.</p>	Metals, OCPs, OPPs, herbicides, fungicides, TPH, BTEX, PAHs, VOCs, volatile halogenated compounds (VHCs)