

APPENDIX A
MINUTES OF DIP / NNA MEETING 11/02/10

NPI Stage 2: Sensitive waterway crossing construction method status: Meeting with NNA, LWP, DIP 11 Feb 2010

Crossing	DIP notes
1. Eudlo creek	Not subject to CG Report conditions 5, 26 or 27. Construction method proponent's decision.
2. Acrobat creek tributary	Not subject to conditions 5, 26 or 27. Construction method proponent's decision.
3. North Maroochy	NNA finalising agreement with Council to strap pipe to the bridge – classifiable as piling/non-invasive construction method – i.e. no change report process required
4. Lake mcdonald trib.	Possible frog – subject to investigations. If no frog present, condition 27 does not apply (construct method proponent's decision. DIP and DEWHA notification by proponent required.)
5. Paynter creek (1)	Possible frog – subject to investigations. If no frog present, condition 27 does not apply (construct method proponent's decision. DIP and DEWHA notification by proponent required.)
6. Paynter creek (2)	Possible frog – subject to investigations. If no frog present, condition 27 does not apply (construct method proponent's decision. DIP and DEWHA notification by proponent required.)
7. 6 mile creek left branch 1	Possible frog – subject to investigations. If no frog present, condition 27 does not apply (construct method proponent's decision. DIP and DEWHA notification by proponent required.)
8. Tuckers creek	Outcome of waterway crossing workshop MCA in consideration of requirements of condition 5 (tunnel boring or piling): <u>tunnel boring</u> . Trenching method would require request for change report process
9. Petrie creek	Outcome of waterway crossing workshop MCA in consideration of requirements of condition 5 (tunnel boring or piling): <u>tunnel boring</u> . Trenching method would require request for change report process
10. Paynter northern	Outcome of waterway crossing workshop MCA in consideration of requirements of condition 5 (tunnel boring or piling): <u>piling</u> . Trenching method would require request for change report process
11. 6 mile creek left branch 2	Frog confirmed – condition 27 triggered. Workshop MCA result (tunnel boring or piling): <u>piling</u>
12. South Maroochy/Mt Coombe creek	Outcome of waterway crossing workshop MCA (tunnel boring or piling): <u>tunnel boring</u>
13. Lake mcdonald spillway/6 mile creek	Agreed during waterway crossing workshop site tour as <u>piling</u>

APPENDIX B WATERWAY WORKING GROUP DOCUMENTS

WWG REPRESENTATIVES WWG CRITERIA AND WEIGHTING INFORMATION

Criterion	Unit	Weightings %	Ratings
Value		13%	
<i>Project cost</i>	\$/ crossing	80%	
<i>Maintenance cost</i>	1 to 5	20%	
Program		21%	
<i>Design</i>	Days	10%	
<i>Procurement</i>	Days	25%	
<i>Construction</i>	Days	40%	
<i>Potential for construction program delays</i>	1 to 5	25%	
Stakeholders (government and community)		11%	
<i>SCRC, DERM, DPI&F.</i>	1 to 5	70%	
<i>Non Government Organizations</i>	1 to 5	30%	
Stakeholders (landowners)		10%	
<i>Construction Impacts on directly affected and adjacent landowners (noise, dust, visual and vibration)</i>	1 to 5	20%	
<i>Duration of construction Impacts on landowners (construction activities including access)</i>	1 to 5	55%	
<i>Long term Impacts on landowners (future land uses visual long term impact)</i>	1 to 5	25%	
Constructability		17%	
<i>Topography</i>	1 to 5	25%	
<i>Geology</i>	1 to 5	35%	
<i>Hydrogeology</i>	1 to 5	15%	
<i>Hydrology</i>	1 to 5	35%	
significance		28%	
<i>Loss of RE</i>	1 to 5		
<i>Biodiversity significance</i>	1 to 5		
<i>Impacts on significant aquatic flora and fauna</i>	1 to 5		
<i>Impacts on significant terrestrial flora and fauna</i>	1 to 5		
<i>Impacts on water quality</i>	1 to 5		

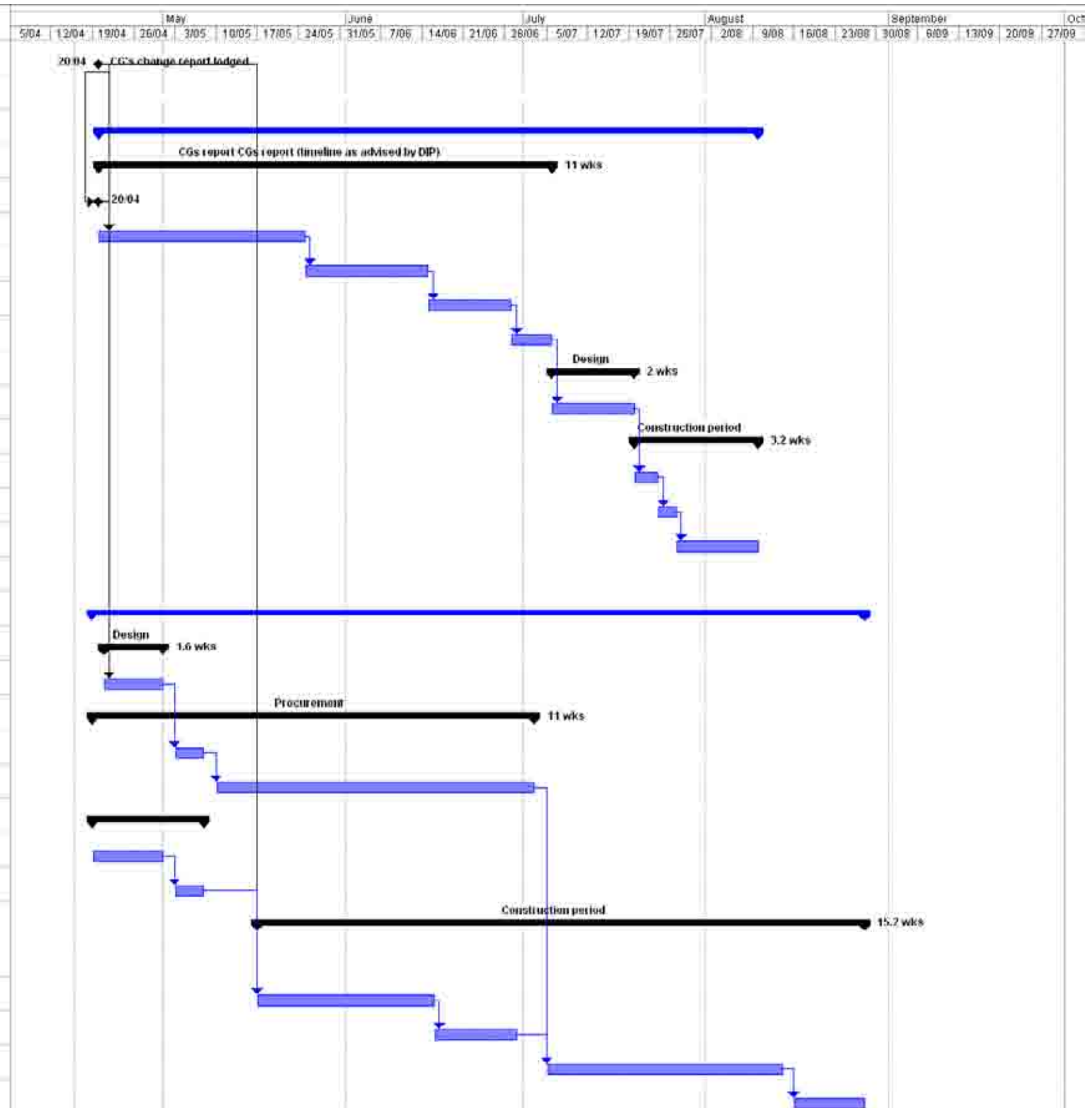
WATERWAY WORKING GROUP REPRESENTATIVES

Name	Position	Company
Athol Johns	Planning & Assessment Officer (Fisheries Queensland)	Department of Employment, Economy and Innovation
Ben Crosby	Tunnels Manager	Northern Network Alliance
Bruce Bedggood	Senior Communications and Stakeholder Consultant	Northern Network Alliance
Bryan Robinson	Senior Ecologist	Queensland Fauna Consultancy Pty Ltd
Cassandra Arkinstall	Environment Team Leader	Northern Network Alliance
Colin Jackson	LinkWater Project Manager	LinkWater Projects
David Reeves	Pipeline Construction Manager	Northern Network Alliance
Ian McFarland	Director SEQ Water Grid	Department of Infrastructure and Planning
Jamie Corfield	Principal Scientist (Aquatic Ecology)	Ecowise Environmental Pty Ltd
Jessica Johnson	Environment Officer	Department of Environment and Resource Management
Karen Giddings	Facilitator	Northern Network Alliance
Matthew Sciacca	Environment Officer	Department of Environment and Resource Management
Michael Robinson	Environment Officer	Department of Environment and Resource Management

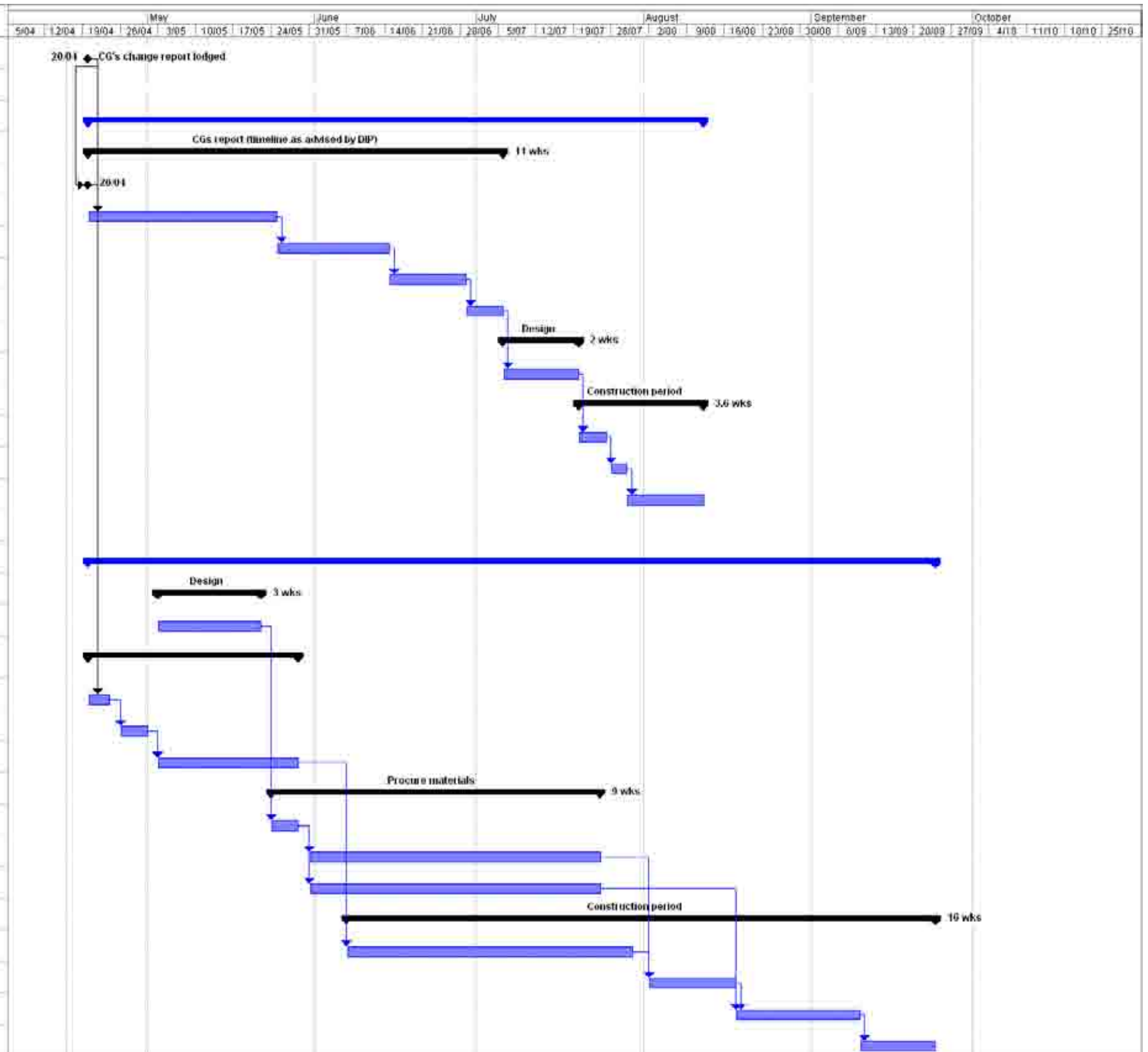
Name	Position	Company
Roger Chalmers	Environment Officer	Sunshine Coast Regional Council
Scott Forsdike	Communications Manager	Northern Network Alliance
Simon Stirrat	Environment Officer	Department of Environment and Resource Management
Sonia Doohan	Senior Communications and Stakeholder Relations Consultant	Northern Network Alliance
Sonya Booth	Project Manager - Significant Project Coordination	Department of Infrastructure and Planning
Steve Tracey	Waterways Project Officer	Sunshine Coast Regional Council
Terry Green	Lead Pipeline Engineer	Northern Network Alliance
Wes Horwood	Corridor Manager	Northern Network Alliance

APPENDIX C PROGRAM JUSTIFICATION

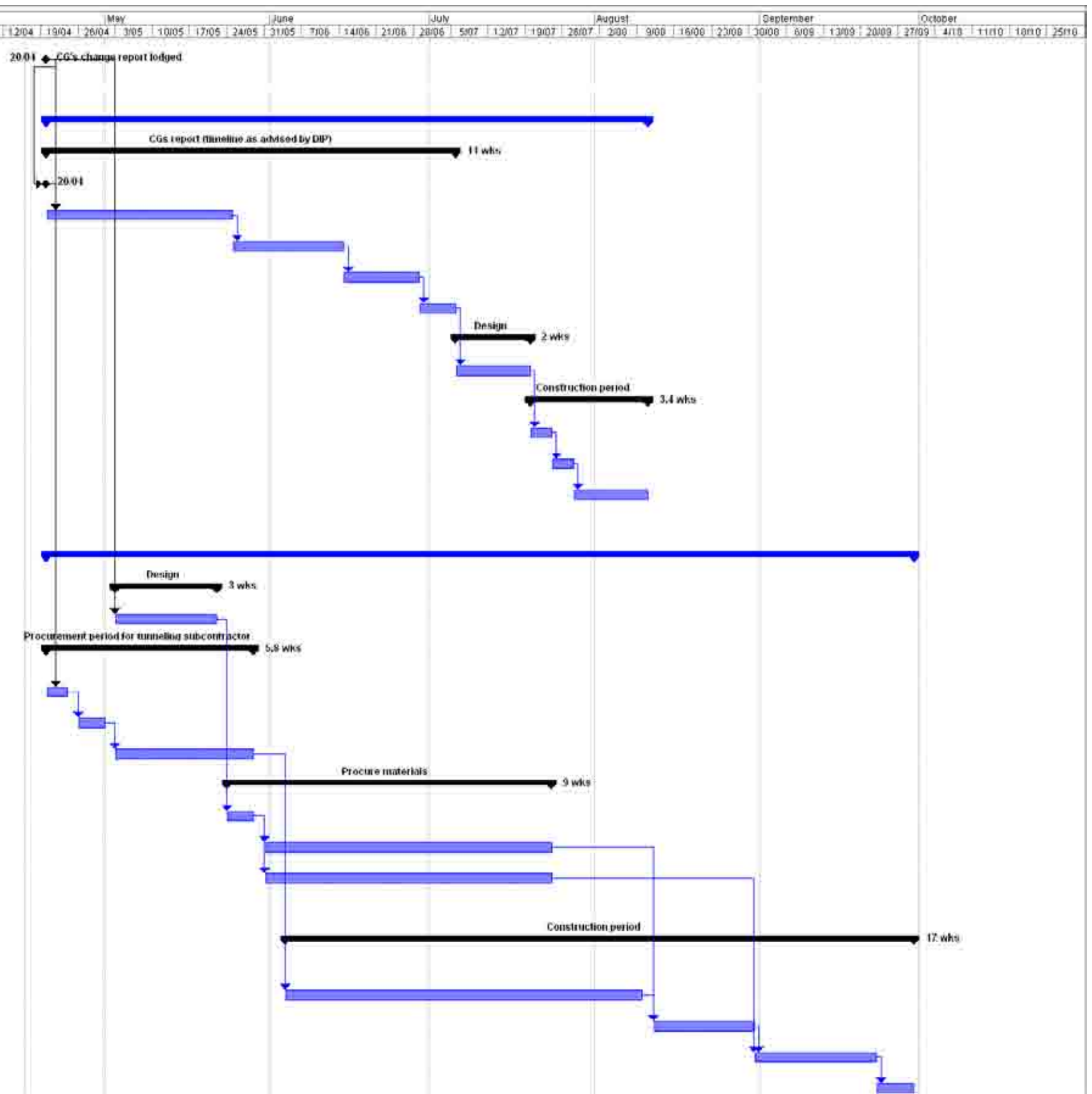
ID	Task Name	Duration	Start	Finish	Text	Timeline																											
						May	June	July	August	September	Oct																						
1	CG's change report lodged	0 days	Tue 20/04/10	Tue 20/04/10		5/04	12/04	19/04	26/04	3/05	10/05	17/05	24/05	31/05	7/06	14/06	21/06	28/06	5/07	12/07	19/07	26/07	2/08	9/08	16/08	23/08	30/08	6/09	13/09	20/09	27/09		
2	Payable Creek northern	19.2 wks	Mon 19/04/10	Fri 27/08/10																													
3	Trenching	16.2 wks	Tue 20/04/10	Mon 9/08/10																													
4	CG's report CG's report (timeline as advised by DIP)	11 wks	Tue 20/04/10	Mon 5/07/10	(1) DIP advised it will take 11 weeks to obtain approval (2) assumes change report will be lodged on Apr-20-2010																												
5	Submit report	0 days	Tue 20/04/10	Tue 20/04/10																													
6	Consultation period	25 days	Tue 20/04/10	Mon 24/05/10																													
7	CG develops report proposal	15 days	Tue 25/05/10	Mon 14/06/10																													
8	Consultation with agencies	10 days	Tue 15/06/10	Mon 28/06/10																													
9	Decision informed to NNA	5 days	Tue 29/06/10	Mon 5/07/10																													
10	Design	2 wks	Tue 6/07/10	Mon 19/07/10	(3) it will take up to 10 days to update drawings, review and IFC																												
11	period to IFC drawings	10 days	Tue 6/07/10	Mon 19/07/10																													
12	Construction period	3.2 wks	Tue 20/07/10	Mon 9/08/10	(4) construction period includes bulk reinstatement																												
13	Front end activities	4 days	Tue 20/07/10	Fri 23/07/10																													
14	Pipeline	2 days	Sat 24/07/10	Mon 26/07/10																													
15	Bulk reinstatement	10 days	Tue 27/07/10	Mon 9/08/10																													
16																																	
17	Piling	19.2 wks	Mon 19/04/10	Fri 27/08/10																													
18	Design	1.6 wks	Wed 21/04/10	Fri 30/04/10	(5) drawings will be IFC in 2 weeks (30-Apr-2010)																												
19	Period to IFC drawings	8 days	Wed 21/04/10	Fri 30/04/10																													
20	Procurement	11 wks	Mon 19/04/10	Fri 2/07/10	(6) assumes 8 week lead time to order, manufacture and deliver items to warehouse																												
21	Place order for conveyance pipebands	5 days	Mon 3/05/10	Fri 7/05/10																													
22	Bend manufacture and delivery period	40 days	Mon 18/05/10	Fri 2/07/10																													
23	Procurement period for piling subcontractor	3 wks	Mon 19/04/10	Fri 7/05/10																													
24	Tender award	2 wks	Mon 19/04/10	Fri 30/04/10																													
25	Contract execution	1 wk	Mon 3/05/10	Fri 7/05/10																													
26	Construction period	15.2 wks	Mon 17/05/10	Fri 27/08/10	(7) durations based on Master schedule (8) assumes that site preparation activities are not affected by procurement lead times (9) piling activities are dependent on procurement lead time (10) assumes construction crew will mobilise one time only																												
27	Site prep	22 days	Mon 17/05/10	Tue 15/06/10																													
28	Piling	10 days	Wed 16/06/10	Tue 29/06/10																													
29	Head stock	31 days	Mon 5/07/10	Fri 13/08/10																													
30	Bulk reinstatement	10 days	Mon 16/08/10	Fri 27/08/10																													



ID	Task Name	Duration	Start	Finish	Notes
1	CO's change report lodged	0 days	Tue 20/04/10	Tue 20/04/10	
32	Petrie Creek	22.8 wks	Tue 20/04/10	Thu 23/09/10	
33	Trenching	16.6 wks	Tue 20/04/10	Wed 11/08/10	
34	CG's report (timeline as advised by DIP)	11 wks	Tue 20/04/10	Mon 5/07/10	(1) DIP advised it will take 11 weeks to obtain approval (2) assumes change report will be lodged on Apr. 20-2010
35	Submit report	0 days	Tue 20/04/10	Tue 20/04/10	
36	Consultation period	25 days	Tue 20/04/10	Mon 24/05/10	
37	CG develops report proposal	15 days	Tue 23/05/10	Mon 14/06/10	
38	Consultation with agencies	10 days	Tue 15/06/10	Mon 28/06/10	
39	Decision informal to NWA	5 days	Tue 29/08/10	Mon 5/07/10	
40	Design	2 wks	Tue 6/07/10	Mon 19/07/10	(3) it will take up to 10 days to update drawings, review and IFC
41	period to IFC drawings	10 days	Tue 6/07/10	Mon 19/07/10	
42	Construction period	3.6 wks	Tue 20/07/10	Wed 11/08/10	(4) construction period includes bulk reinstatement
43	Front end activities	5 days	Tue 20/07/10	Sat 24/07/10	
44	Pipelay	3 days	Mon 26/07/10	Wed 28/07/10	
45	Bulk reinstatement	10 days	Thu 29/07/10	Wed 11/08/10	
46					
47	Tunneling	22.8 wks	Tue 20/04/10	Thu 23/09/10	
48	Design	3 wks	Mon 3/05/10	Fri 21/05/10	(5) drawings will be IFC in 15 days (this activity starts in May 3rd) due to design engineers working on Pilling
49	Period to IFC drawings	15 days	Mon 3/05/10	Fri 21/05/10	
50	Procurement period for tunneling subcontractor	5.8 wks	Tue 20/04/10	Fri 28/05/10	(6) assumes a 6 week period from tender analysis to execute the contract
51	Tender analysis	4 days	Tue 20/04/10	Fri 23/04/10	
52	Tender award	5 days	Mon 26/04/10	Fri 30/04/10	
53	Contract execution	20 days	Mon 3/05/10	Fri 28/05/10	
54	Procure materials	9 wks	Mon 24/05/10	Fri 23/07/10	
55	Place order to manufacturer	5 days	Mon 24/05/10	Fri 28/05/10	
56	Jacking Pipe Fabrication and delivery period	8 wks	Mon 31/05/10	Fri 23/07/10	
57	Bends Fabrication and delivery period	8 wks	Mon 31/05/10	Fri 23/07/10	
58	Construction period	16 wks	Mon 7/06/10	Thu 23/09/10	(7) Original duration in Master schedule: 20 weeks. Subcontractors' faster rate: 15 weeks
59	Site prep and shaft construction	40 days	Mon 7/06/10	Thu 20/07/10	
60	Tunneling	12 days	Mon 27/08/10	Tue 17/08/10	
61	Pipe install	17 days	Wed 18/08/10	Thu 9/09/10	
62	Bulk reinstatement	10 days	Fri 10/09/10	Thu 23/09/10	



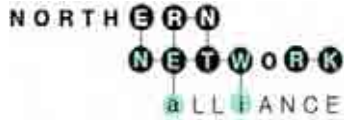
ID	Task Name	Duration	Start	Finish	Text
1	CG's change report lodged	0 days	Tue 20/04/10	Tue 20/04/10	
84	Tuckers creek	23.6 wks	Tue 20/04/10	Wed 29/09/10	
85	Trenching	16.1 wks	Tue 20/04/10	Tue 10/08/10	
86	CG's report timeline as advised by DIP)	11 wks	Tue 20/04/10	Mon 5/07/10	(1) DIP advised it will take 11 weeks to obtain approval (2) assumes change report will be lodged on Apr-20-2010
87	Submit report	0 days	Tue 20/04/10	Tue 20/04/10	
88	Consultation period	25 days	Tue 20/04/10	Mon 24/05/10	
89	CG develops report proposal	15 days	Tue 29/05/10	Mon 14/06/10	
90	Consultation with agencies	10 days	Tue 15/06/10	Mon 20/06/10	
91	Decision informed to NNA	5 days	Tue 29/06/10	Mon 5/07/10	
92	Design	2 wks	Tue 6/07/10	Mon 19/07/10	(3) it will take up to 10 days to update drawings, review and IFC
93	period to IFC drawings	10 days	Tue 6/07/10	Mon 19/07/10	
94	Construction period	3.4 wks	Tue 20/07/10	Tue 10/08/10	(4) construction period includes bulk reinstatement
95	Front end activities	4 days	Tue 20/07/10	Fri 23/07/10	
96	Pipelay	3 days	Sat 24/07/10	Tue 27/07/10	
97	Bulk reinstatement	10 days	Wed 28/07/10	Tue 10/08/10	
98					
99	Tunneling	23.6 wks	Tue 20/04/10	Wed 29/09/10	
100	Design	3 wks	Mon 3/05/10	Fri 21/05/10	(5) drawings will be IFC in 15 days (this activity starts in May 3rd) due to design engineers working on Pilling
101	Period to IFC drawings	15 days	Mon 3/05/10	Fri 21/05/10	
102	Procurement period for tunneling subcontractor	5.8 wks	Tue 20/04/10	Fri 28/05/10	(6) assumes a 6 week period from tender analysis to execute contract
103	Tender analysis	4 days	Tue 20/04/10	Fri 23/04/10	
104	Tender award	5 days	Mon 26/04/10	Fri 30/04/10	
105	Contract execution	20 days	Mon 3/05/10	Fri 28/05/10	
106	Procure materials	9 wks	Mon 21/05/10	Fri 23/07/10	
107	Place order to manufacturer	5 days	Mon 24/05/10	Fri 28/05/10	
108	Jacking pipe fabrication and delivery period	8 wks	Mon 31/05/10	Fri 23/07/10	
109	Barris fabrication and delivery period	8 wks	Mon 31/05/10	Fri 23/07/10	
110					
111	Construction period	17 wks	Fri 4/06/10	Wed 29/09/10	(7) Original durations based on Master schedule: 23 weeks. Subcontractors' faster rate: 17 weeks
112	Site prep and shafts construction	48 days	Fri 4/06/10	Mon 6/08/10	
113	Tunneling	13 days	Thu 12/08/10	Mon 30/08/10	
114	Pipe install	17 days	Tue 31/08/10	Wed 22/09/10	
115	Bulk reinstatement	5 days	Thu 23/09/10	Wed 29/09/10	



ID	Task Name	Duration	Start	Finish	Text	Gantt Chart Timeline											
						May	June	July	August	September	October	November	December				
1	CG's change report lodged	0 days	Tue 20/04/11	Tue 20/04/11		2004 CG's change report lodged											
97	North Maroochy River	27.6 wks	Mon 19/04/10	Tue 26/10/10		2004 CG's change report lodged											
98	Trenching	18.6 wks	Tue 20/04/10	Wed 25/08/11		CGs report timeline as advised by DIP 11 wks											
99	CGs report timeline as advised by DIP	11 wks	Tue 20/04/10	Mon 5/07/10	(1) DIP advised it will take 11 weeks to obtain approval (2) assumes change report will be lodged on Apr-20-2010	CGs report timeline as advised by DIP 11 wks											
100	Submit report	0 days	Tue 20/04/11	Tue 20/04/11		2004											
101	Consultation period	25 days	Tue 20/04/11	Mon 24/05/11													
102	CG develops report proposal	15 days	Tue 25/05/11	Mon 14/06/11													
103	Consultation with agencies	10 days	Tue 15/06/11	Mon 28/06/11													
104	Decision informed to NHA	5 days	Tue 29/06/11	Mon 5/07/11													
105	Design	2 wks	Tue 6/07/10	Mon 19/07/10	(4) it will take 10 days to update drawings, review and IFC	Design 2 wks											
106	period to IFC drawings	10 days	Tue 6/07/11	Mon 19/07/11													
107	Construction period	5.6 wks	Tue 20/07/10	Wed 25/08/11	(5) assumes a rate of progress of 11 mts/day for pipelay	Construction period 5.6 wks											
109	Front end activities	5 days	Tue 20/07/11	Sat 24/07/11													
109	Pipelay	5 days	Mon 26/07/11	Fri 30/07/11													
110	Bulk reinstatement	18 days	Mon 2/08/11	Wed 25/08/11													
111																	
112	Piling	27.6 wks	Mon 19/04/10	Tue 26/10/10													
113	Design	1.6 wks	Wed 21/04/11	Fri 30/04/11	(5) drawings will be IFC in 2 weeks (30-Apr-2010)	Design 1.6 wks											
114	Period to IFC drawings	8 days	Wed 21/04/11	Fri 20/04/11													
115	Procurement	9 wks	Mon 3/05/10	Fri 2/07/10	(6) assumes 8 week lead time to order, manufacture and deliver items to warehouse	Procurement 9 wks											
116	Place order for conveyance pipebands	5 days	Mon 3/05/11	Fri 7/05/11													
117	Send manufacture and deliver period	40 days	Mon 1/05/11	Fri 2/07/11													
118	Procurement period for piling subcontractor	3 wks	Mon 19/04/10	Fri 7/05/10		Procurement period for piling subcontractor 3 wks											
119	Tender award	2 wks	Mon 19/04/11	Fri 30/04/11													
120	Contract execution	1 wk	Mon 3/05/11	Fri 7/05/11													
121	Construction period	17.8 wks	Fri 25/06/10	Tue 29/10/10	(7) durations based on Master schedule (8) assumes construction crew will mobilise one time	Construction period 17.8 wks											
122	Site prep	8 days	Fri 25/06/11	Fri 2/07/11													
123	Piling	17 days	Mon 5/07/11	Mon 26/07/11													
124	Head stock and tie-in	46 days	Tue 27/07/11	Tue 20/09/11													
125	Bulk reinstatement	4 wks	Wed 28/08/11	Tue 26/09/11													

APPENDIX D SENSITIVE AREA PLANS

**PAYNTER CREEK NORTHERN SAP
PETRIE CREEK SAP
TUCKERS CREEK SAP
NORTH MAROOCHY RIVER SAP**



SENSITIVE AREA PLAN CHECKLIST

G-FRM-010	
File	FORM
Rev Num	0
Rev Date	31/07/09

Document Number: NNA001-008-SAP08a-U-ENV-021 **Revision:** 0 **Reason for Issue:** Use **Date:** 08/09/09
Site Name: 301-East Paynters Creek Northern Crossing-01
Construction Area: 08 **Property Numbers:** 31137 31139

SENSITIVE ENVIRONMENTAL FEATURES:

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Biodiversity Significance | <input type="checkbox"/> Confirmed matters of national environmental significance (MNES) | <input checked="" type="checkbox"/> Regional Ecosystems |
| <input checked="" type="checkbox"/> Ecosystems with important ecological functions | <input type="checkbox"/> Protected areas under the <i>Nature Conservation Act 1992</i> | <input type="checkbox"/> Confirmed Important Species (NCA listed) |

DETAILS:

State Biodiversity Significance values within and adjacent to the corridor. Core habitat for listed species and special biodiversity values.
Riparian vegetation within and adjacent to the corridor provides important ecological functions.
“Endangered” riparian vegetation within and adjacent to the corridor (RE 12.3.1).
Potential habitat for MNES – Giant Barred Frog (**Refer to Table 1 for site requirements**).
Potential habitat for NCA listed species – Tusked Frog & Elf Skink (**Refer to Table 1 for site requirements**).

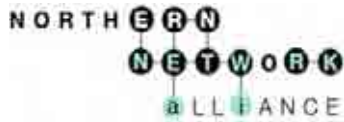
SITE-SPECIFIC REQUIREMENTS

Refer to Map (NNA001-008-SAP08a-U-GIS-001-0) and Table 1
Constrain corridor at waterway crossing to 20 m to protect riparian vegetation. Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures.
Construct waterway crossing during low-flow periods and use sediment and erosion controls to protect the waterway and aquatic habitat.
Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of waterway, in accordance with the Soil and Water Management Plan (NNA001-A-PLN-011)

SIGN-OFF

SUPERVISOR _____

CONSTRUCTION ENVIRONMENT MANAGER _____



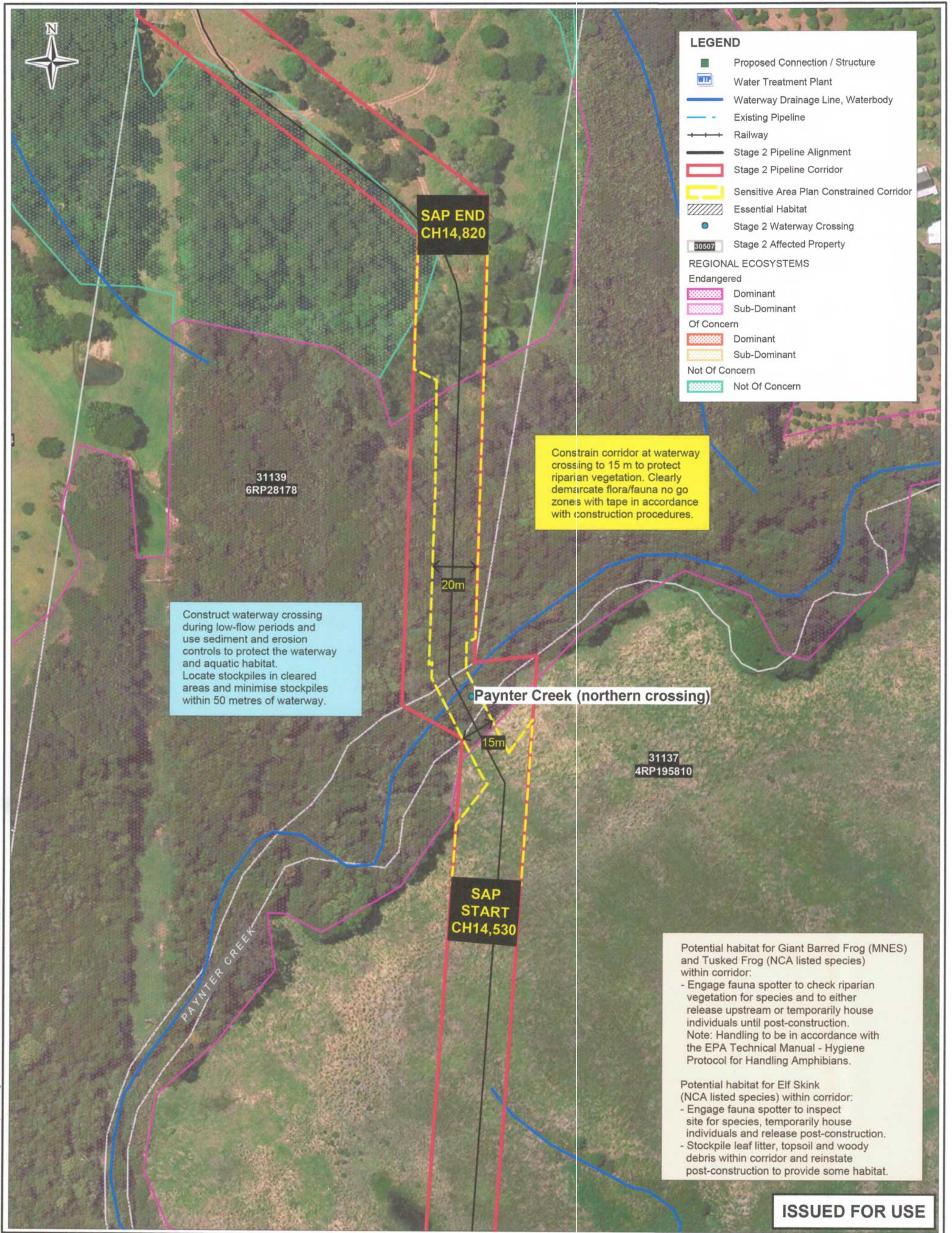
SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Table 1 MNES/NCA listed species potentially occurring within the sensitive area

Species Name	Status	Habitat	Suitable habitat within corridor	Site Requirements
Tusked Frog, <i>Adelotus brevis</i>	Vulnerable (NCA)	Occupies a wide range of habitats, including disturbed/degraded areas. Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	<p>Confirmed habitat: Winston Road, Woombye; Sandy Creek; Paynters Creek; Rocky Creek; Six Mile Creek (left branch).</p> <p>Potential habitat: Many other numerous waterways along the alignment.</p> <p>Potential impacts: Temporary displacement from and loss of existing habitat within the easement. Changes in water quality may also adversely impact eggs or tadpoles.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to check riparian vegetation for species and to either release upstream or temporarily house individuals until post-construction. Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians.
Giant Barred Frog, <i>Mixophyes iteratus</i>	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	<p>Potential habitat: Paynters Creek, Petrie Creek, Tuckers Creek, Six Mile Creek.</p> <p>Potential impacts: Temporary displacement from and loss of potential habitat. Temporary disruption of movements along riparian habitats. Transport of sediment into downstream reaches with temporary impacts on water quality. Impacts expected to be short-term and localised.</p>	
Elf Skink, <i>Eroticoscincus graciloides</i>	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	<p>Confirmed habitat: Petrie Creek crossing.</p> <p>Potential habitat: Several other similar creek crossings.</p> <p>Potential impacts: Minor, short-term disturbance to logs and leaf litter layer. Temporary disruption to movement within proposed corridor. No significant impacts are expected for this species.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to inspect site for species, temporarily house individuals and release post-construction. ▪ Stockpile leaf litter, topsoil and woody debris within corridor and reinstate post-construction to provide some habitat.



LEGEND

- Proposed Connection / Structure
- WTP Water Treatment Plant
- Waterway Drainage Line, Waterbody
- - - Existing Pipeline
- +—+ Railway
- Stage 2 Pipeline Alignment
- ▭ Stage 2 Pipeline Corridor
- ▭ Sensitive Area Plan Constrained Corridor
- ▨ Essential Habitat
- Stage 2 Waterway Crossing
- 30507 Stage 2 Affected Property

REGIONAL ECOSYSTEMS

Endangered

- ▨ Dominant
- ▨ Sub-Dominant

Of Concern

- ▨ Dominant
- ▨ Sub-Dominant

Not Of Concern

- ▨ Not Of Concern

Construct waterway crossing during low-flow periods and use sediment and erosion controls to protect the waterway and aquatic habitat. Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of waterway.

Constrain corridor at waterway crossing to 15 m to protect riparian vegetation. Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures.

Potential habitat for Giant Barred Frog (MNES) and Tusked Frog (NCA listed species) within corridor:

- Engage fauna spotter to check riparian vegetation for species and to either release upstream or temporarily house individuals until post-construction.

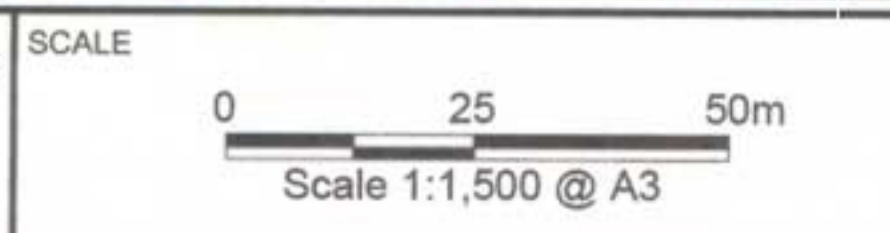
Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians.

Potential habitat for Elf Skink (NCA listed species) within corridor:

- Engage fauna spotter to inspect site for species, temporarily house individuals and release post-construction.
- Stockpile leaf litter, topsoil and woody debris within corridor and reinstate post-construction to provide some habitat.

ISSUED FOR USE

Based on or contains data provided by Department of Environment and Resource Management, Queensland [2009] which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission. The document cannot be reproduced without the permission of NNA.



REV	DESCRIPTION	DATE
1	ISSUED FOR USE (Rev J Corridor)	22/04/10
0	ISSUED FOR USE (Rev H Corridor)	30/07/09

	NAME	SIGNATURE
DRAFTING CHECK	K. ROSS	[Signature]
DESIGN	K. ROSS	[Signature]
DESIGN VERIFICATION	C. ARKINSTALL	[Signature]
PROJECT APPROVAL	W. HORWOOD	[Signature]
DRAFTER	K. ROSS	

SOURCE DCDB & LGA - © The State of Queensland (Department of Environment and Resource Management) [2009], Queensland Rail and 2008 Aerial Photography © Sunshine Coast Regional Council (2009)

PROJECTION MGA94, Zone 56
ORIG. SIZE A3

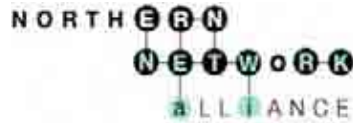
NORTHERN PIPELINE INTERCONNECTOR STAGE 2

NORTHERN NETWORK ALLIANCE

TITLE SENSITIVE AREA PLAN (SAP)
CA 08 31137 31139

DRAWING NUMBER NNA001-008-SAP08a-U-GIS-001
REVISION 1

O:\BRS\Projects\BEG\BEG601 - SRWP\T08 GIS Data\Northern Interconnector\Workspaces\SAP Plans\SAP CA 08 31137 31139.wor



SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Document Number: NNA001-010-SAP10-U-ENV-015 **Revision:** 0 **Reason for Issue:** Use **Date:** 03/08/09
Site Name: 302- Petrie Creek Crossing-01
Construction Area: 10 **Property Numbers:** 31168

SENSITIVE ENVIRONMENTAL FEATURES:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Biodiversity Significance | <input type="checkbox"/> Confirmed matters of national environmental significance (MNES) | <input checked="" type="checkbox"/> Regional Ecosystems |
| <input checked="" type="checkbox"/> Ecosystems with important ecological functions | <input type="checkbox"/> Protected areas under the <i>Nature Conservation Act 1992</i> | <input checked="" type="checkbox"/> Confirmed Important Species (NCA listed) |

DETAILS:

State Biodiversity Significance values and local wildlife corridor.

NCA listed species confirmed within corridor - Elf Skink **(Refer to Table 1 for site requirements)**.

Potential habitat for MNES - Giant Barred Frog **(Refer to Table 1 for site requirements)**.

Essential habitat for NCA listed species - Tusked Frog **(Refer to Table 1 for site requirements)**.

Degraded 'of concern' riparian vegetation within the corridor (RE 12.3.2).

SITE-SPECIFIC REQUIREMENTS:

Refer to Map (NNA001-010-SAP10-U-GIS-001-0) and Table 1

Constrain clearing corridor at waterway crossing to maximum 15 m width to minimise clearing of riparian vegetation. Clearly demarcate flora/fauna no go zones with tape, in accordance with construction procedures.

Construct waterway crossing during low-flow periods to avoid sediment and erosion impacts on aquatic habitat.

Use sediment and erosion control measures to protect waterway.

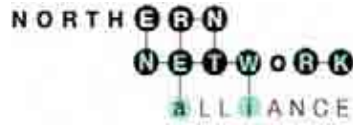
Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of waterway and drainage line, in accordance with the Soil and Water Management Plan (NNA001-A-PLN-011).

SIGN-OFF

SUPERVISOR _____

CONSTRUCTION ENVIRONMENT MANAGER _____

Document Location: Cabinets/Working/L - Corridor /L03 - Environmental/Construction Area - 010



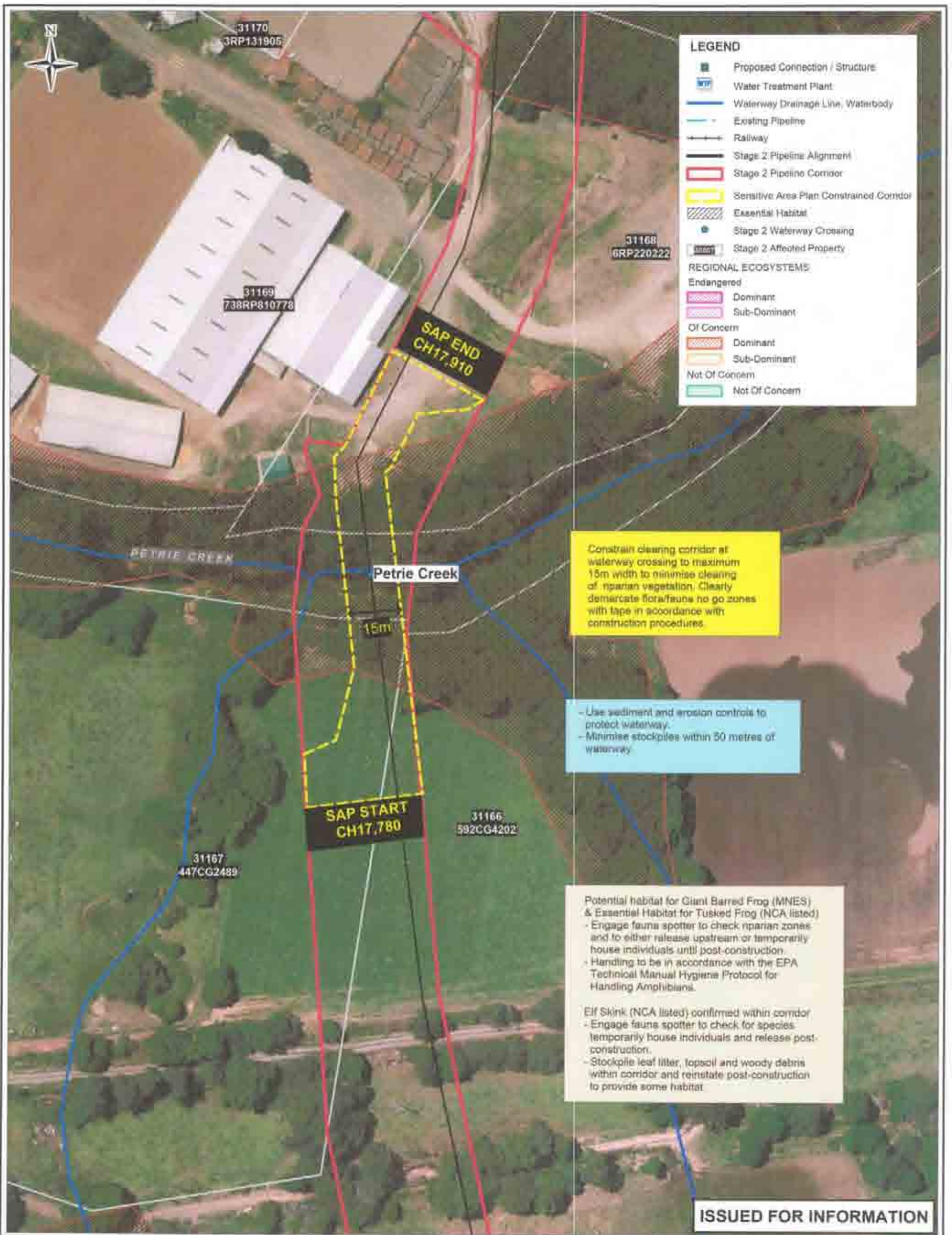
SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Table 1 MNES/NCA listed species potentially occurring within the sensitive area

Species Name	Status	Habitat	Suitable habitat within corridor	Site Requirements
Elf Skink, <i>Erotoscincus graciloides</i>	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	<p>Confirmed habitat: Petrie Creek crossing.</p> <p>Potential habitat: Several other similar creek crossings.</p> <p>Potential impacts: Minor, short-term disturbance to logs and leaf litter layer. Temporary disruption to movement within proposed corridor. No significant impacts are expected for this species.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to check for species, temporarily house individuals and release post-construction ▪ Stockpile leaf litter, topsoil and woody debris within corridor and reinstate post-construction to provide some habitat.
Giant Barred Frog, <i>Mixophyes iteratus</i>	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	<p>Potential habitat: Paynters Creek, Petrie Creek, Tuckers Creek, Six Mile Creek.</p> <p>Potential impacts: Temporary displacement from and loss of potential habitat. Temporary disruption of movements along riparian habitats. Transport of sediment into downstream reaches with temporary impacts on water quality. Impacts expected to be short-term and localised.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to check riparian zones for species and to either release upstream or temporarily house individuals until post-construction. Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians.
Tusked Frog, <i>Adelotus brevis</i>	Vulnerable (NCA)	Occupies a wide range of habitats, including disturbed/degraded areas. Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	<p>Confirmed habitat: Winston Road, Woombye; Sandy Creek; Paynters Creek; Rocky Creek; Six Mile Creek (left branch).</p> <p>Potential habitat: Many other numerous waterways along the alignment.</p> <p>Potential impacts: Temporary displacement from and loss of existing habitat within the easement. Changes in water quality may also adversely impact eggs or tadpoles.</p>	



LEGEND

- Proposed Connection / Structure
- Water Treatment Plant
- Waterway Drainage Line, Waterbody
- Existing Pipeline
- Railway
- Stage 2 Pipeline Alignment
- Stage 2 Pipeline Corridor
- Sensitive Area Plan Constrained Corridor
- Essential Habitat
- Stage 2 Waterway Crossing
- Stage 2 Affected Property

REGIONAL ECOSYSTEMS

Endangered

- Dominant
- Sub-Dominant

Of Concern

- Dominant
- Sub-Dominant

Not Of Concern

- Not Of Concern

Constrain clearing corridor at waterway crossing to maximum 15m width to minimise clearing of riparian vegetation. Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures.

- Use sediment and erosion controls to protect waterway.
- Minimise stockpiles within 50 metres of waterway

Potential habitat for Giant Barred Frog (MNES) & Essential Habitat for Tusked Frog (NCA listed)
- Engage fauna spotter to check riparian zones and to either release upstream or temporarily house individuals until post-construction.
- Handling to be in accordance with the EPA Technical Manual Hygiene Protocol for Handling Amphibians.

Elf Skink (NCA listed) confirmed within corridor
- Engage fauna spotter to check for species temporarily house individuals and release post-construction.
- Stockpile leaf litter, topsoil and woody debris within corridor and reinstate post-construction to provide some habitat

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REV#	DESCRIPTION	DATE
1	ISSUED FOR INFORMATION (Rev 2 Corridor)	22/04/15
0	ISSUED FOR LINE (Rev 1 Corridor)	30/07/09

SOURCE DCEP & UAA - © The State of Queensland (Department of Environment and Resource Management) (2008), Queensland (Sat and 2008 Aerial Photography) © Sunshine Coast Regional Council (2009)

SCALE

0 20 40m

Scale 1:1,000 @ A3

NAME	SIGNATURE
PROJECT MANAGER	
DESIGNER	
PROJECT ANALYST	
DRAWN BY	
CHECKED BY	

PROJECTION: MGA94, Zone 58
DRG. SIZE: A3

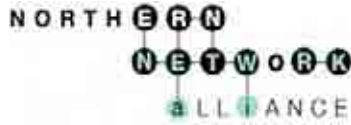
NORTHERN PIPELINE INTERCONNECTOR STAGE 2

NORTHERN NETWORK ALLIANCE

TITLE SENSITIVE AREA PLAN (SAP)
SAP CA 10 31168

DRAWING NUMBER NNA001-010-SAP 1D-U-GIS-001

1



SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Document Number: NNA001-011-SAP11a-U-ENV-027 **Revision:** 0 **Reason for Issue:** Use **Date:** 18/08/09
Site Name: 302-Tuckers Creek Crossing-01
Construction Area: 11 **Property Numbers:** 30331

SENSITIVE ENVIRONMENTAL FEATURES:

- Biodiversity Significance
- Confirmed matters of national environmental significance (MNES)
- Regional Ecosystems
- Ecosystems with important ecological functions
- Protected areas under the *Nature Conservation Act 1992*
- Confirmed Important Species (NCA listed)

DETAILS:

Riparian vegetation is a local wildlife corridor.

Regrowth of 'endangered' vegetation within the corridor (RE 12.3.1).

Potential habitat for MNES - Giant Barred Frog (**Refer to Table 1 for site requirements**).

Potential habitat for NCA listed species - Elf Skink (**Refer to Table 1 for site requirements**).

Essential habitat for NCA listed species adjacent to corridor - Tusked Frog (**Refer to Table 1 for site requirements**).

SITE-SPECIFIC REQUIREMENTS:

Refer to Table 1 and Map (NNA001-011-SAP11a-U-GIS-001)

Constrain clearing corridor at waterway crossing to maximum 15 m width to minimise clearing of riparian vegetation. Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures.

Construct waterway crossing during low-flow periods and use sediment and erosion control measures to avoid impacts on aquatic habitat.

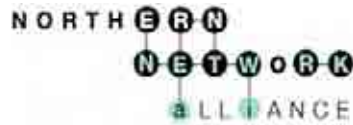
Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of waterway, in accordance with the Soil and Water Management Plan (NNA001-A-PLN-011).

SIGN-OFF

SUPERVISOR _____

CONSTRUCTION ENVIRONMENT MANAGER _____

Document Location: Cabinets/Working/L - Corridor /L03 - Environmental/Construction Area - 011



SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Table 1 MNES/NCA listed species potentially occurring within the sensitive area

Species Name	Status	Habitat	Suitable habitat within corridor	Site Requirements
Giant Barred Frog, <i>Mixophyes iteratus</i>	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	<p>Potential habitat: Paynters Creek, Petrie Creek, Tuckers Creek, Six Mile Creek.</p> <p>Potential impacts: Temporary displacement from and loss of potential habitat. Temporary disruption of movements along riparian habitats. Transport of sediment into downstream reaches with temporary impacts on water quality. Impacts expected to be short-term and localised.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to inspect riparian zones for species and to either release upstream or temporarily house individuals until post-construction. Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians. ▪ Construct waterway crossing during low-flow periods to avoid sediment and erosion impacts on aquatic habitat.
Tusked Frog, <i>Adelotus brevis</i>	Vulnerable (NCA)	Occupies a wide range of habitats, including disturbed/degraded areas. Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	<p>Confirmed habitat: Winston Road, Woombye; Sandy Creek; Paynters Creek; Rocky Creek; Six Mile Creek (left branch).</p> <p>Potential habitat: Many other numerous waterways along the alignment.</p> <p>Potential impacts: Temporary displacement from and loss of existing habitat within the easement. Changes in water quality may also adversely impact eggs or tadpoles.</p>	
Elf Skink, <i>Eroticoscincus graciloides</i>	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	<p>Confirmed habitat: Petrie Creek crossing.</p> <p>Potential habitat: Several other similar creek crossings.</p> <p>Potential impacts: Minor, short-term disturbance to logs and leaf litter layer. Temporary disruption to movement within proposed corridor. No significant impacts are expected for this species.</p>	



LEGEND

- Proposed Connection / Structure
- Water Treatment Plant
- Waterway Drainage Line, Waterbody
- Existing Pipeline
- Railway
- Stage 2 Pipeline Alignment
- Stage 2 Pipeline Corridor
- Sensitive Area Plan Constrained Corridor
- Essential Habitat
- Stage 2 Waterway Crossing
- Stage 2 Affected Property
- Local Law 19 Protected Vegetation

REGIONAL ECOSYSTEMS

Endangered

- Dominant
- Sub-Dominant

Of Concern

- Dominant
- Sub-Dominant

Not Of Concern

- Not Of Concern

30332
135NPW672

**SAP END
CH18.950**

15m

Tuckers Creek

Constrain clearing corridor at waterway crossing to maximum 15 m width to minimise clearing of riparian vegetation. Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures.

Construct waterway crossing during low-flow periods and use sediment and erosion control measures to avoid impacts on aquatic habitat.

Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of waterway.

**SAP
START
CH18.820**

30331
2SP107939

30330
12RP94474

Potential habitat for Giant Barred Frog (MNES) and Tusked Frog (NCA listed) within corridor:

- Engage fauna spotter to inspect riparian zones for species and to either release upstream or temporarily house individuals until post-construction.

Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians.

Potential habitat for Elf Skink (NCA listed) within corridor:

- Engage fauna spotter to inspect site for species, temporarily house individuals and release post-construction.
- Stockpile leaf litter, topsoil and woody debris within corridor and reinstatement post-construction to provide some habitat.

ISSUED FOR INFORMATION

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SCALE: 0 20 40m
Scale 1:1,000 @ A3

NORTHERN PIPELINE INTERCONNECTOR STAGE 2

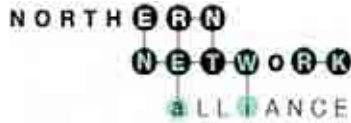
NORTHERN NETWORK ALLIANCE

TITLE: **SENSITIVE AREA PLAN (SAP)
SAP CA 11 30331**

REV	DESCRIPTION	DATE	DESIGNED	CHECKED	APPROVED	DRAWN
1	ISSUED FOR INFORMATION (Rev J Corridor)	25/02/20				
2	ISSUED FOR USE (Rev H Corridor)	25/02/20				

SOURCE: DCOR & LGA - © The State of Queensland (Department of Environment and Resource Management) (2006)
Geospatial Ref and 2008 Aerial Photography © Sunshine Coast Regional Council (2008)

PROJECTION: MGA94, Zone 56
DWD SIZE: A3
DRAWING NUMBER: NNA001-011-SAP11a-U-GIS-001
Page: 1



SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Document Number: NNA001-026-SAP26-U-ENV-037 **Revision:** 0 **Reason for Issue:** Use **Date:** 25/08/09
Site Name: 307-North Maroochy River-01
Construction Area: 26 **Property Numbers:** Road Reserve

SENSITIVE ENVIRONMENTAL FEATURES:

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Biodiversity Significance | <input type="checkbox"/> Confirmed matters of national environmental significance (MNES) | <input checked="" type="checkbox"/> Regional Ecosystems |
| <input checked="" type="checkbox"/> Ecosystems with important ecological functions | <input type="checkbox"/> Protected areas under the <i>Nature Conservation Act 1992</i> | <input type="checkbox"/> Confirmed Important Species (NCA listed) |

DETAILS:

State Biodiversity Significance values within and adjacent to the corridor.

State wildlife corridor.

Riparian vegetation adjacent to the corridor provides important ecological functions.

“Endangered” riparian vegetation within and adjacent to the corridor (RE 12.3.1).

Potential habitat for MNES - Giant Barred Frog (**Refer to Table 1 for site requirements**).

Potential habitat for NCA listed species - Tusked Frog, Elf Skink, Platypus and Echidna. (**Refer to Table 1 for site requirements**).

SITE-SPECIFIC REQUIREMENTS:

Refer to Table 1 and Map (NNA001-026-SAP26-U-GIS-001)

Clearly demarcate flora/fauna no go zones with tape in accordance with construction procedures

Construct waterway crossing during low-flow periods. Use sediment and erosion control measures to protect the waterway and aquatic habitat.

Locate stockpiles in cleared areas and minimise stockpiles within 50 metres of the waterway, in accordance with the Soil and Water Management Plan (NNA001-A-PLN-011)

SIGN-OFF

SUPERVISOR _____

CONSTRUCTION ENVIRONMENT MANAGER _____

Document Location: Cabinets/Working/L - Corridor /L03 - Environmental/Construction Area - 026

SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Table 1 MNES/NCA listed species potentially occurring within the sensitive area

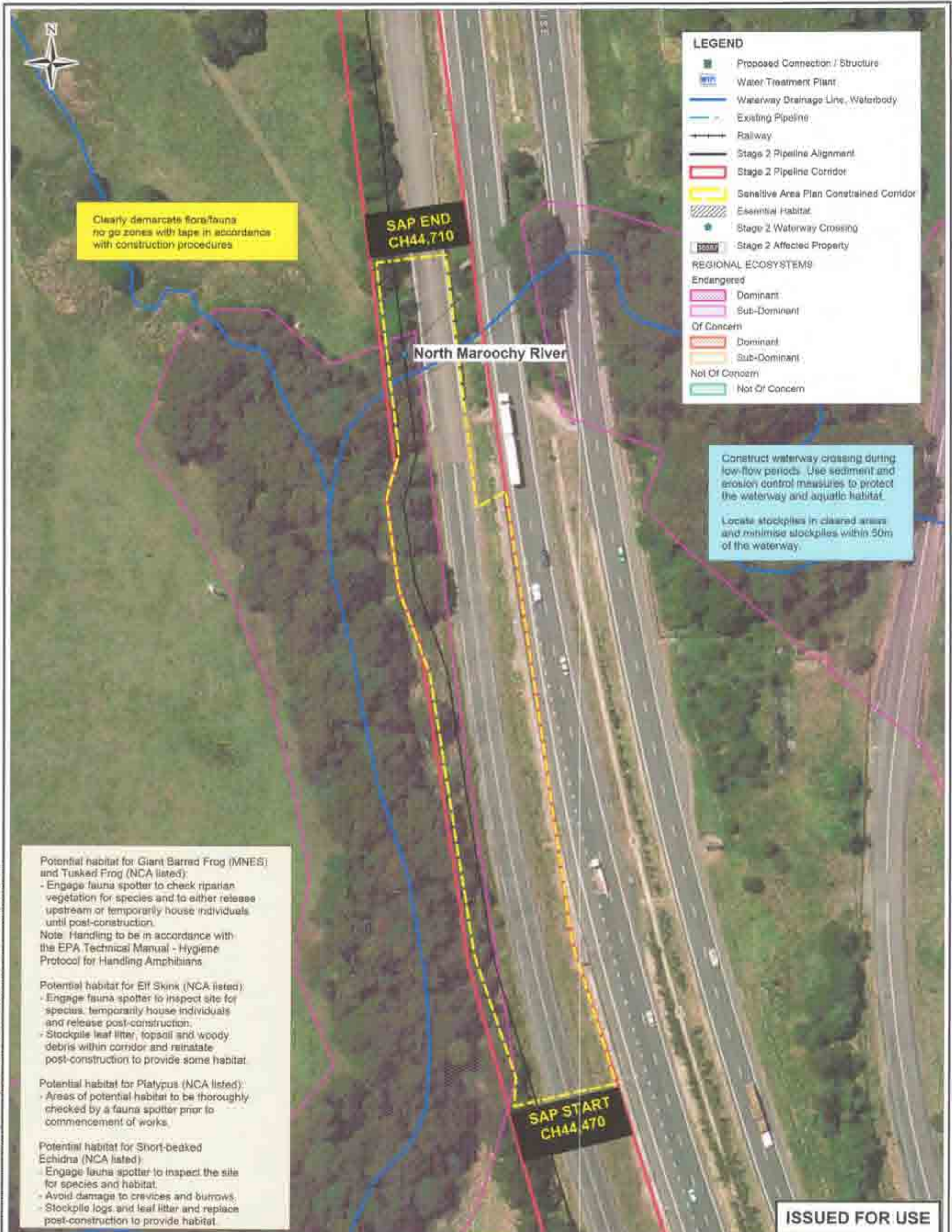
Species Name	Status	Habitat	Suitable habitat within corridor	Site Requirements
Giant Barred Frog, <i>Mixophyes iteratus</i>	Endangered (EPBC; NCA)	Deep, slow-flowing creeks with overhanging banks in lowland vine forest and riparian gallery forest habitat. Most movements are restricted to within 20 m of the stream. Breeding occurs in spring and summer, often on leaf litter near streams and ponds.	<p>Potential habitat: Paynters Creek, Petrie Creek, Tuckers Creek, Six Mile Creek.</p> <p>Potential impacts: Temporary displacement from and loss of potential habitat. Temporary disruption of movements along riparian habitats. Transport of sediment into downstream reaches with temporary impacts on water quality. Impacts expected to be short-term and localised.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to check riparian vegetation for species and to either release upstream or temporarily house individuals until post-construction. Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians.
Tusked Frog, <i>Adelotus brevis</i>	Vulnerable (NCA)	Occupies a wide range of habitats, including disturbed/degraded areas. Slow moving streams and dams in vine forest habitat, particularly around accumulated leaves and small woody debris. Breeding occurs between September and April, when males construct nests in concealed sites at the edge of ponds or stream pools.	<p>Confirmed habitat: Winston Road, Woombye; Sandy Creek; Paynters Creek; Rocky Creek; Six Mile Creek (left branch).</p> <p>Potential habitat: Many other numerous waterways along the alignment.</p> <p>Potential impacts: Temporary displacement from and loss of existing habitat within the easement. Changes in water quality may also adversely impact eggs or tadpoles.</p>	
Elf Skink, <i>Erotoscincus graciloides</i>	Rare (NCA)	Requires damp leaf litter, logs and stones for shelter and forages in shaded, moist environments. Breeding occurs in spring to mid-summer.	<p>Confirmed habitat: Petrie Creek crossing.</p> <p>Potential habitat: Several other similar creek crossings.</p> <p>Potential impacts: Minor, short-term disturbance to logs and leaf litter layer. Temporary disruption to movement within proposed corridor. No significant impacts are expected for this species.</p>	

SENSITIVE AREA PLAN CHECKLIST

G-FRM-010

File	FORM
Rev Num	0
Rev Date	31/07/09

Species Name	Status	Habitat	Suitable habitat within corridor	Site Requirements
Platypus, <i>Ornithorhynchus anatinus</i>	Culturally significant (NCA)	Generally found in clearer water areas with sandy gravel to sandy silty bottom sediments that better suit foraging behaviour. Constructs stream bank burrows around slow-moving water. Mating season occurs around August in Queensland, with young weaned around 4-5 months after hatching.	<p>Potential habitat: Eudlo Creek, Tuckers Creek, South Maroochy River, North Maroochy River and Rocky Creek.</p> <p>Potential impacts: Changes to riparian bank structure and potential loss of burrows. Sediment release into aquatic habitats downstream of construction sites. No significant impacts are expected for this species.</p>	<ul style="list-style-type: none"> ▪ Use sediment and erosion control measures around dams. ▪ Areas of potential habitat to be checked by a fauna spotter prior to commencement of works.
Short-beaked Echidna, <i>Tachyglossus aculeatus</i>	Culturally significant (NCA)	Uses a wide range of habitat types and shelters in logs, crevices, burrows and leaf litter. Mating takes place in July and August with juveniles seen from September.	<p>Potential habitat: North Maroochy River and several other locations along the alignment.</p> <p>Potential impacts: Minor, short-term loss of habitat. No significant impacts are expected for this species.</p>	<ul style="list-style-type: none"> ▪ Engage fauna spotter to inspect the site for species and habitat. ▪ Avoid damage to crevices and burrows. ▪ Stockpile logs and leaf litter and replace post-construction to provide habitat.



Potential habitat for Giant Barred Frog (MNES) and Tusked Frog (NCA listed):

- Engage fauna spotter to check riparian vegetation for species and to either release upstream or temporarily house individuals until post-construction.

Note: Handling to be in accordance with the EPA Technical Manual - Hygiene Protocol for Handling Amphibians

Potential habitat for Elf Skink (NCA listed):

- Engage fauna spotter to inspect site for species, temporarily house individuals and release post-construction.
- Stockpile leaf litter, topsoil and woody debris within corridor and reinstatement post-construction to provide some habitat.

Potential habitat for Platypus (NCA listed):

- Areas of potential habitat to be thoroughly checked by a fauna spotter prior to commencement of works.

Potential habitat for Short-beaked Echidna (NCA listed):

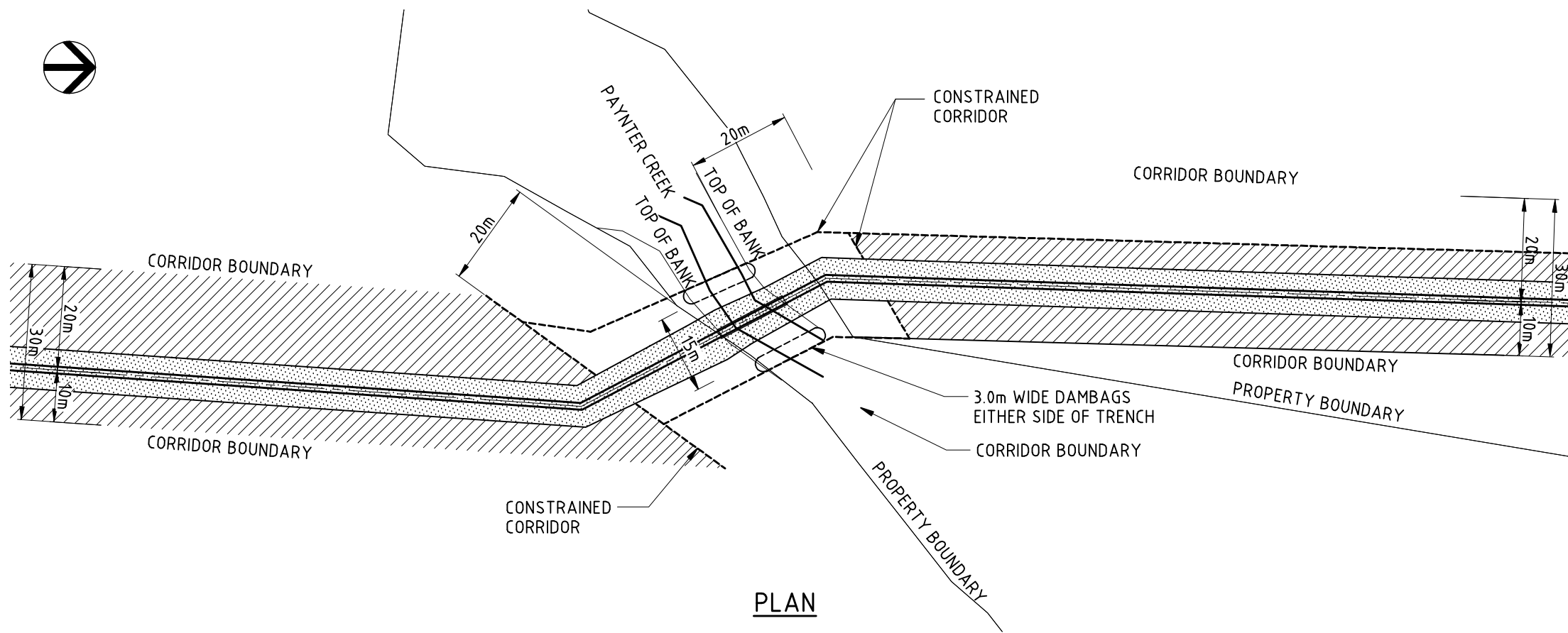
- Engage fauna spotter to inspect the site for species and habitat.
- Avoid damage to crevices and burrows.
- Stockpile logs and leaf litter and replace post-construction to provide habitat.

ISSUED FOR USE

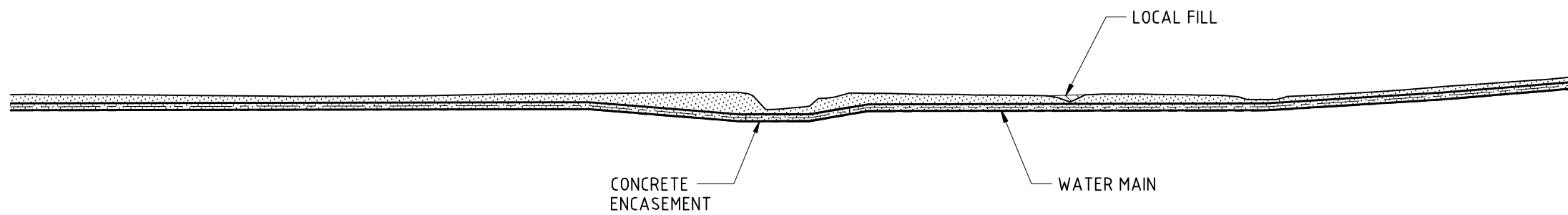
<p>Based on or contains data provided by Department of Environment and Resource Management, Queensland (2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) resulting to any use of the data.</p> <p>The document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for the commission. The document cannot be reproduced without the permission of NNA.</p>		<p>SCALE:</p> <p>0 20 40m</p> <p>Scale 1:1,000 @ A3</p>	<p>NORTHERN PIPELINE INTERCONNECTOR STAGE 2</p> <p>NORTHERN NETWORK</p> <p>ALLIANCE</p>																		
<table border="1"> <thead> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>REVISED</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>ISSUED FOR USE (Rev J Corridor)</td> <td></td> </tr> <tr> <td>0</td> <td>ISSUED FOR USE (Rev H Corridor)</td> <td></td> </tr> </tbody> </table>	REV.	DESCRIPTION	REVISED	1	ISSUED FOR USE (Rev J Corridor)		0	ISSUED FOR USE (Rev H Corridor)		<table border="1"> <thead> <tr> <th>NAME</th> <th>SIGNATURE</th> </tr> </thead> <tbody> <tr> <td>PROJECT CHECK</td> <td>IAN GIBSON</td> </tr> <tr> <td>DESIGN CHECK</td> <td>K. Ross</td> </tr> <tr> <td>DESIGN CERTIFICATION</td> <td>W. Marshall</td> </tr> <tr> <td>PROJECT APPROVAL</td> <td>A. Howard</td> </tr> </tbody> </table>	NAME	SIGNATURE	PROJECT CHECK	IAN GIBSON	DESIGN CHECK	K. Ross	DESIGN CERTIFICATION	W. Marshall	PROJECT APPROVAL	A. Howard	<p>TITLE</p> <p>SENSITIVE AREA PLAN (SAP) CA 26 307-NORTH MAROOCHY RIVER-01</p>
REV.	DESCRIPTION	REVISED																			
1	ISSUED FOR USE (Rev J Corridor)																				
0	ISSUED FOR USE (Rev H Corridor)																				
NAME	SIGNATURE																				
PROJECT CHECK	IAN GIBSON																				
DESIGN CHECK	K. Ross																				
DESIGN CERTIFICATION	W. Marshall																				
PROJECT APPROVAL	A. Howard																				
<p>SOURCE</p> <p>DCDE & LGA - © The State of Queensland (Department of Environment and Resource Management) (2009) Queensland Rail and 2009 Aerial Photography © Southern Coast Regional Council (2009)</p>	<p>PROJECTION</p> <p>MGAS4, Zone 56</p>	<p>ORIG. SIZE</p> <p>A3</p>	<p>DRAWING NUMBER</p> <p>NNA001-028-SAP 26-U-GIS-001</p>																		

APPENDIX E DESIGN DRAWINGS

**DISTURBANCE FOOTPRINTS FOR:
PAYNTER CREEK NORTHERN
PETRIE CREEK
TUCKERS CREEK
NORTH MAROOCHY RIVER**



PLAN

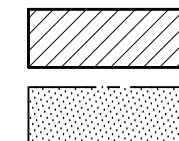


LONGITUDINAL SECTION

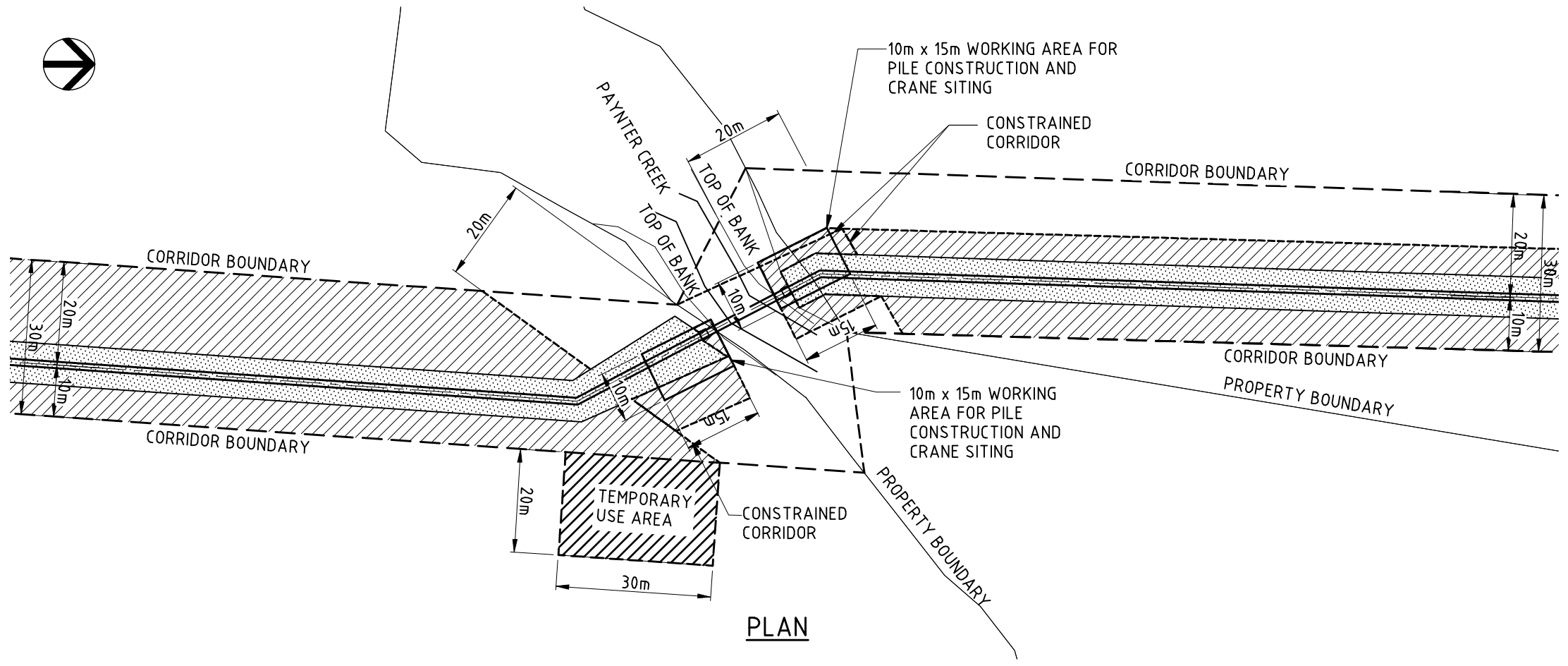
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DISTURBANCE FOOTPRINT

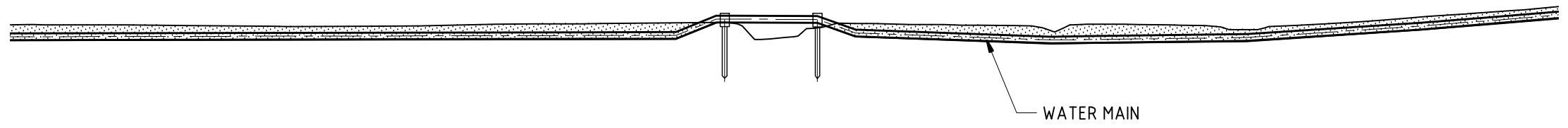
EARTHWORKS



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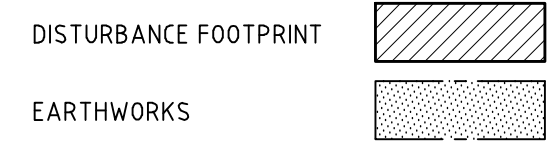


PLAN

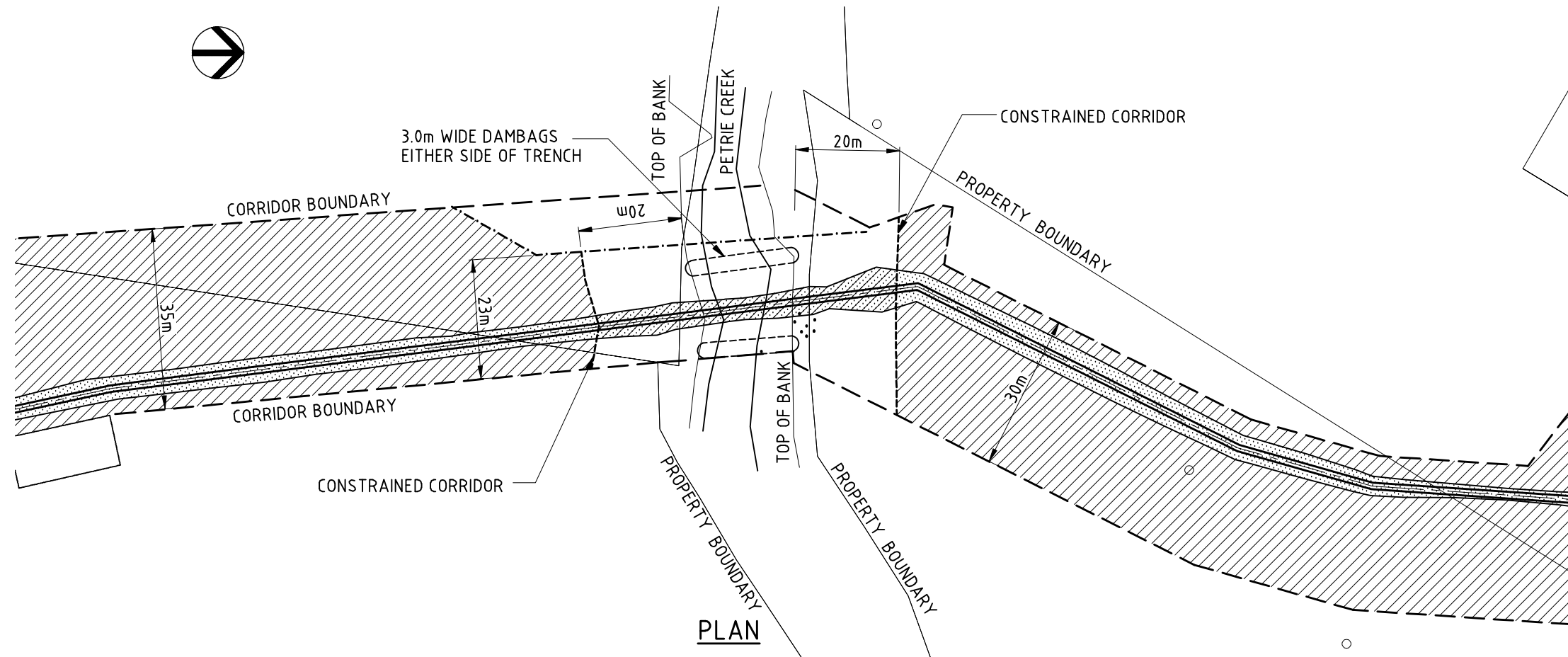


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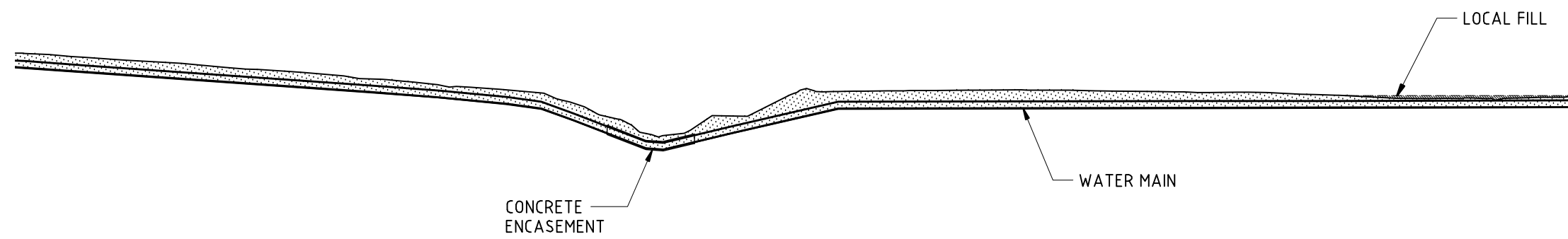
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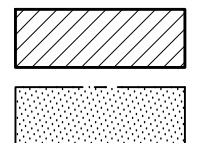


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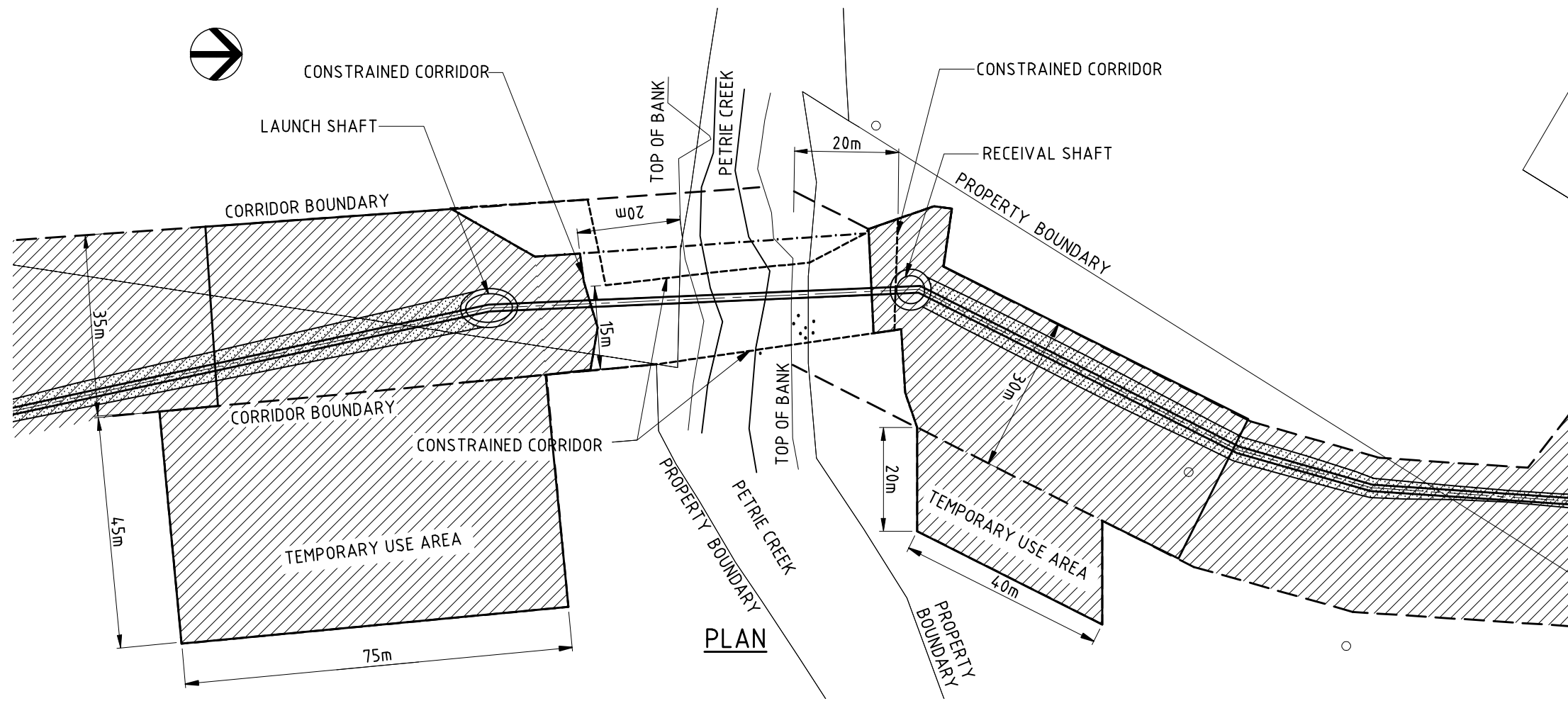
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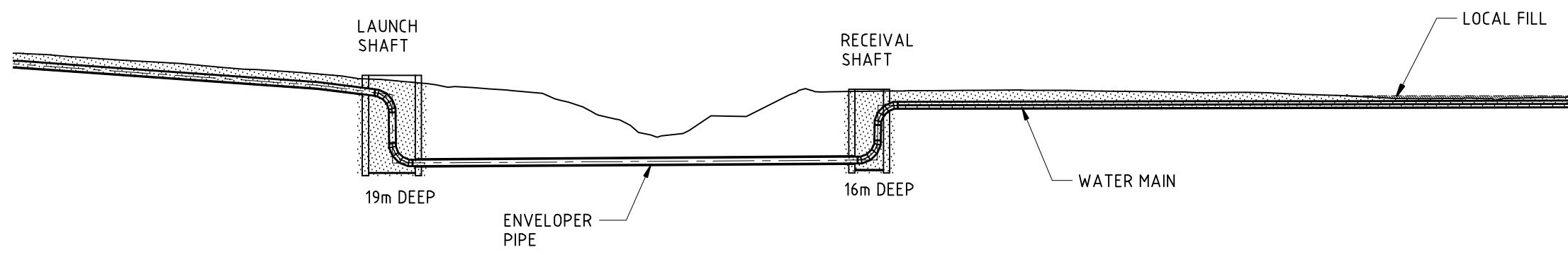
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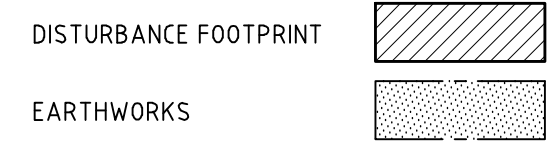


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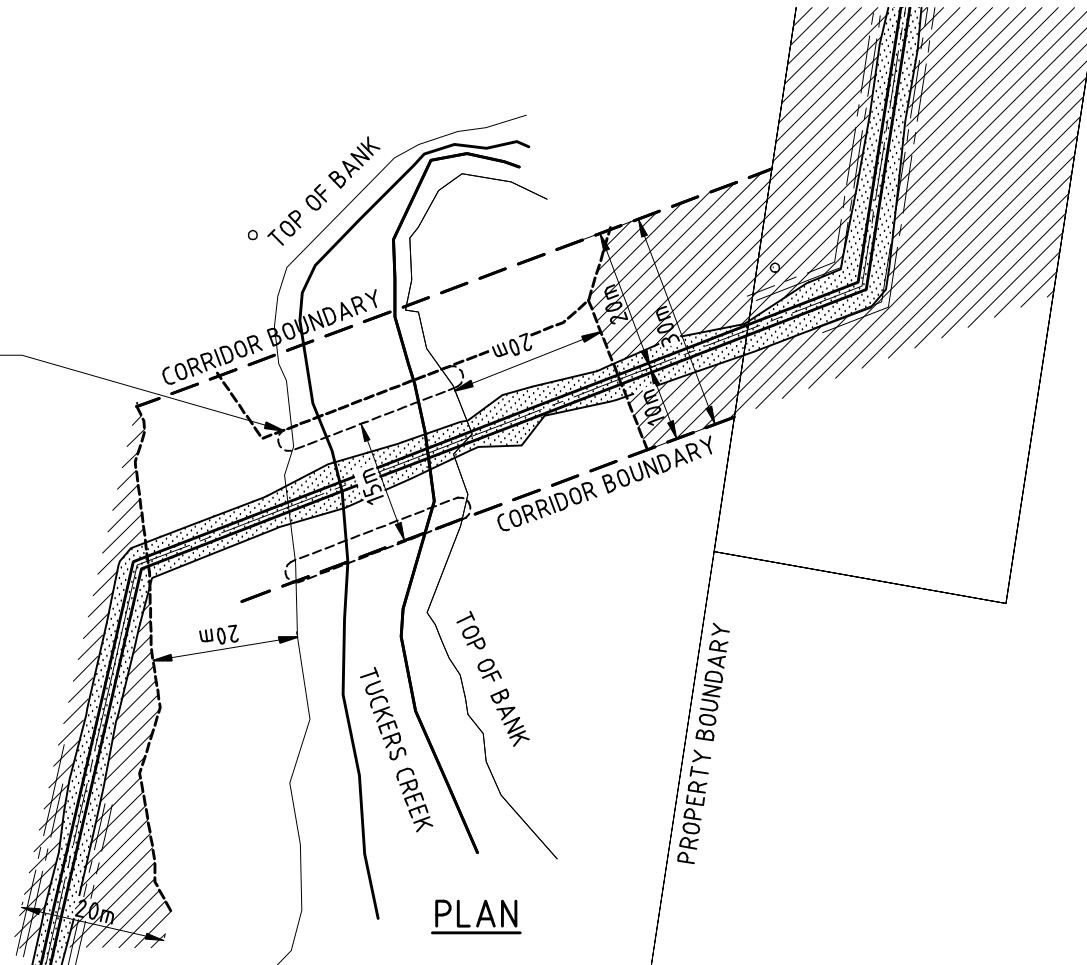
DISTURBANCE AREA 8585m²



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3.0m WIDE DAMBAGS
EITHER SIDE OF TRENCH



CONCRETE
ENCASEMENT

WATER MAIN

LONGITUDINAL SECTION

DISTURBANCE AREA = 3470m²

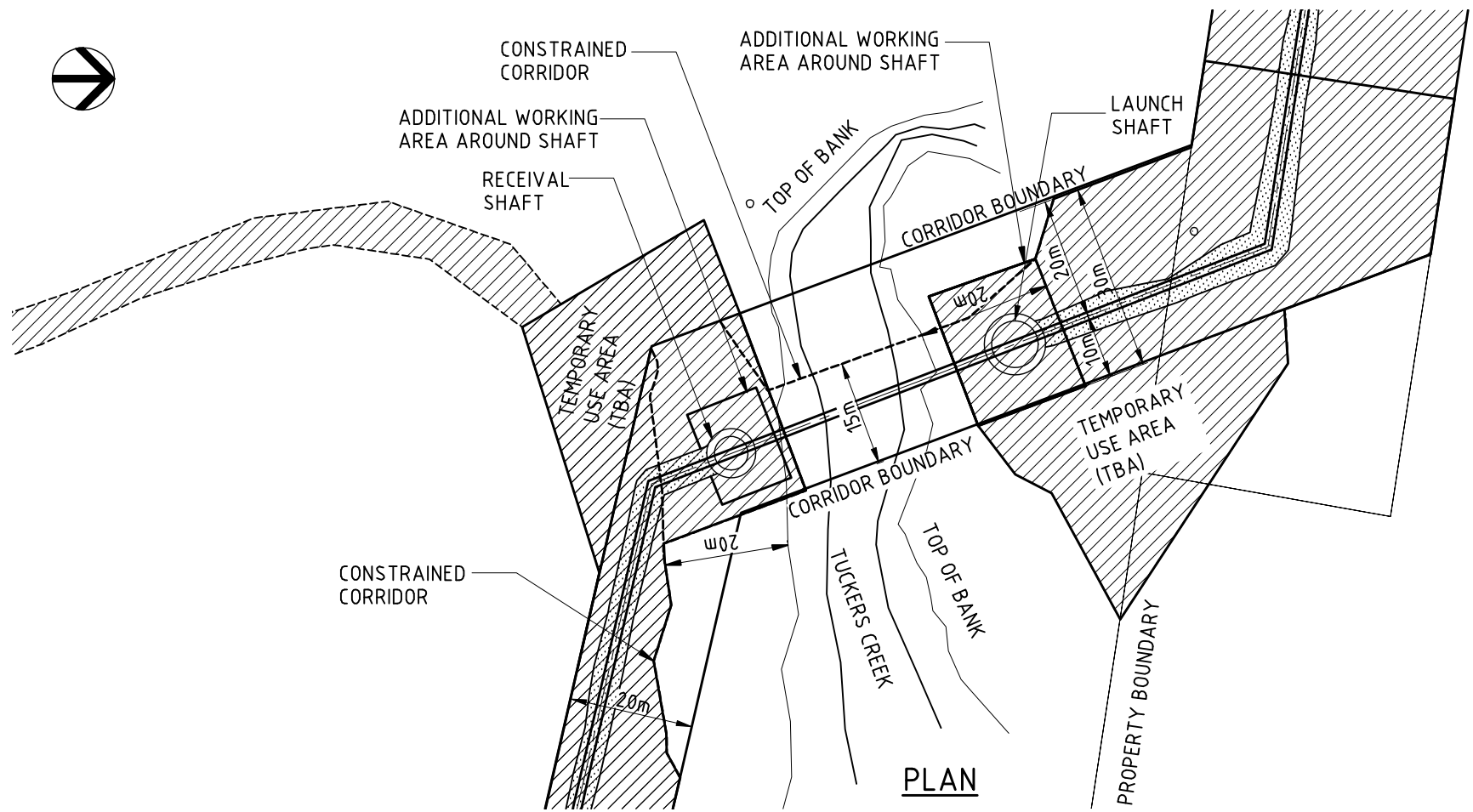
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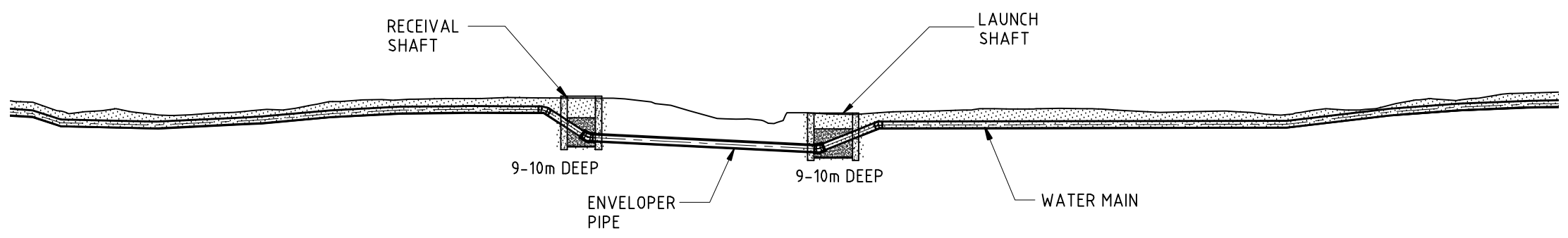
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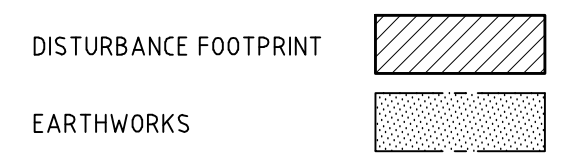


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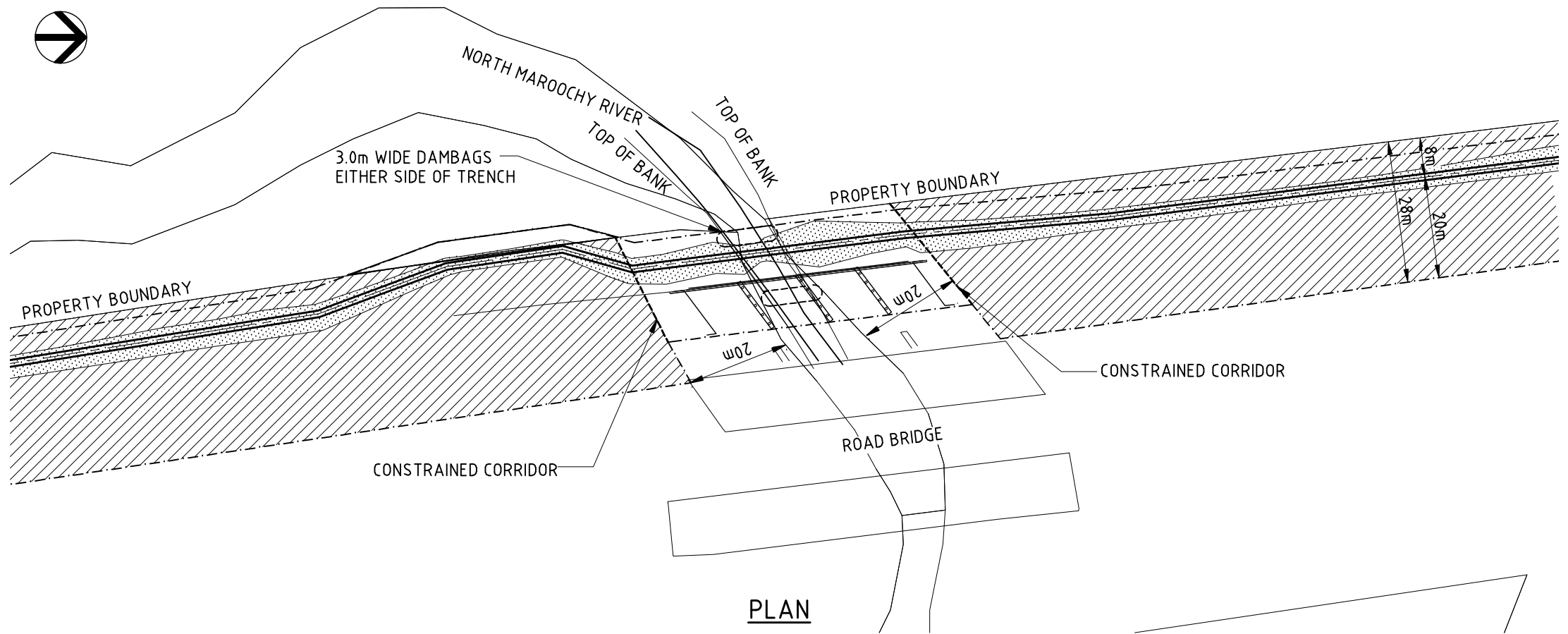


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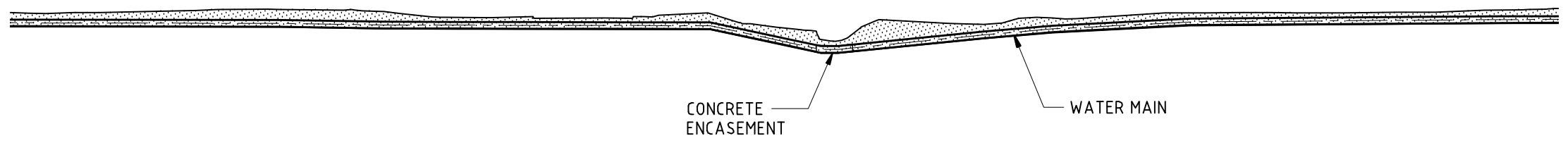
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PLAN

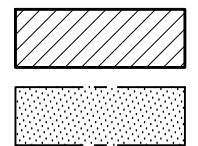


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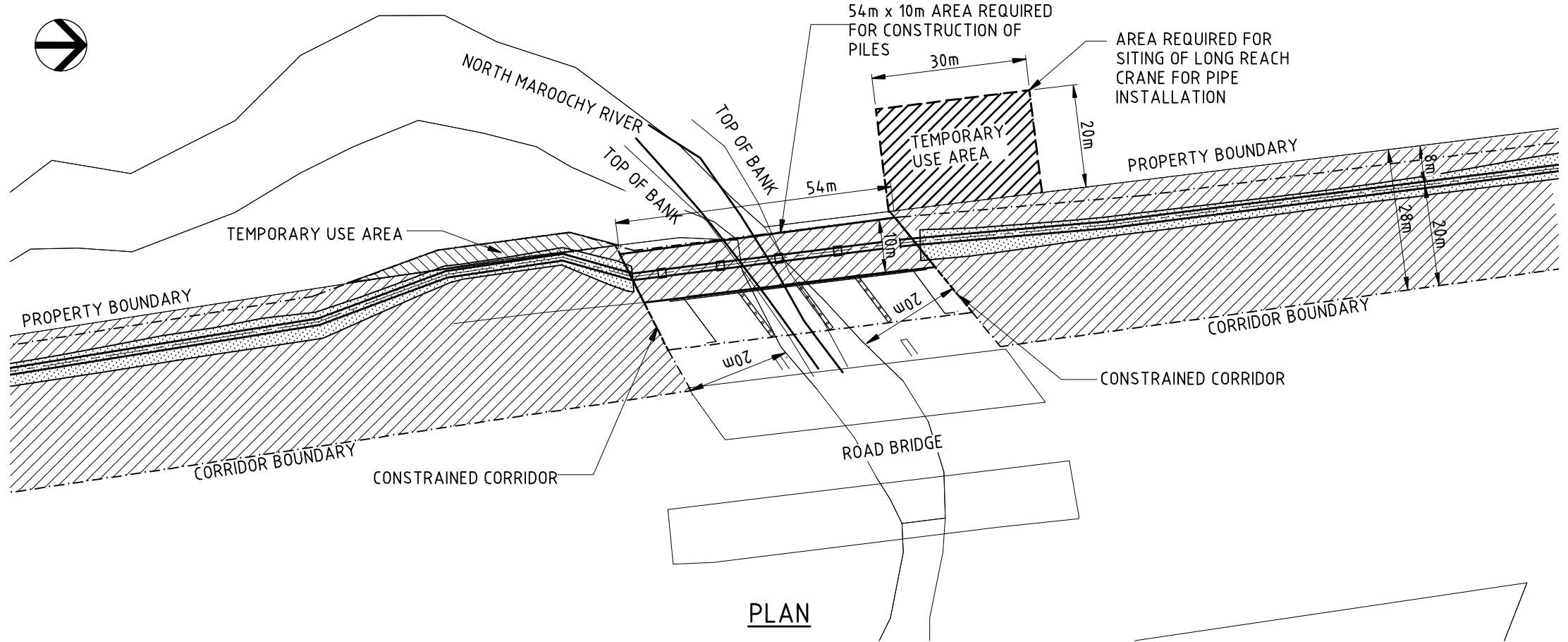
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DISTURBANCE FOOTPRINT

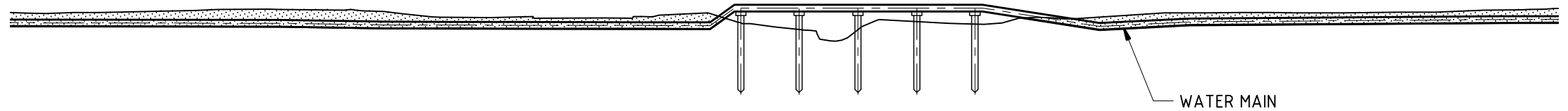
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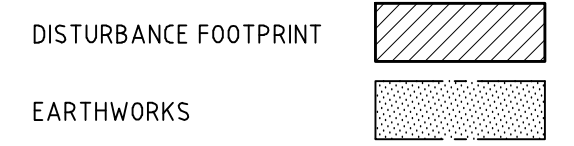


PLAN



LONGITUDINAL SECTION

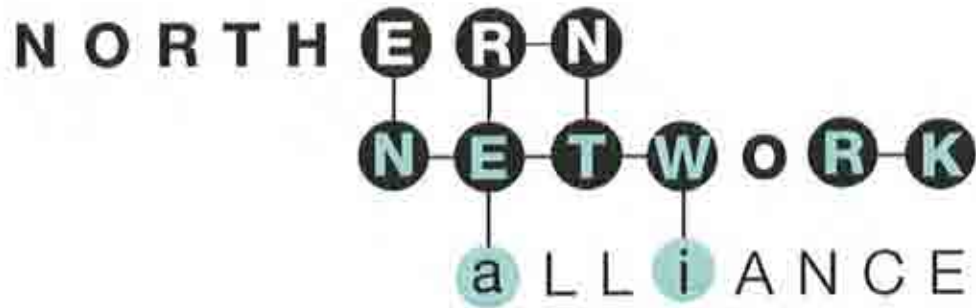
DISTURBANCE AREA = 5490m²



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APPENDIX F CONSTRUCTION EXECUTION PROCEDURE

WATERWAY CROSSING METHODOLOGY



NORTHERN PIPELINE INTERCONNECTOR PROJECT STAGE 2






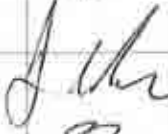


CONSTRUCTION EXECUTION PROCEDURE

WATERWAY CROSSING – OPEN TRENCHING

Document number: NNA001-A-PRO-113

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					Tom Dando			
1 Dec 09	Issue for Use	0	Hoang Nguyen		David Reeves		Leon Richards	
					Tom Dando			

Prepared by: Hoang Nguyen

Northern Network Alliance

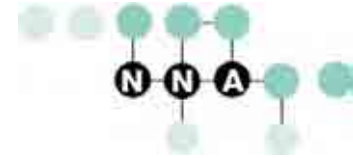
End of Sunridge Farm Road

Chevallum QLD 4555

PO Box 515 Nambour QLD 4560

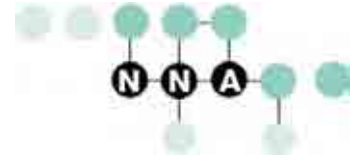
Telephone: (07) 3811 8800

Facsimile: (07) 5456 4203

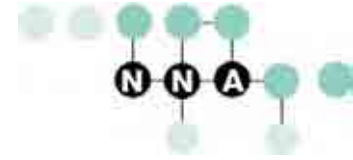


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1 PURPOSE AND SCOPE

The purpose of this Construction Execution Procedure (CEP) is to define specific instruction for the construction of pressure pipelines in a safe, professional, timely and controlled manner across a waterway using an open trenching technique.

The scope of work covers the installation of pressure pipelines and any other pipeworks up to and including DN1290 MSCL and communication conduit for the Northern Pipeline Interconnector Stage 2 Project. This CEP should be read in conjunction with the NNA CEP for Installation of DN1290 MSCL Pipeline NNA001-A-PRO-109. This document is only a supplement to these more specific documents for working in/crossing waterways.

2 MANDATORY REQUIREMENTS

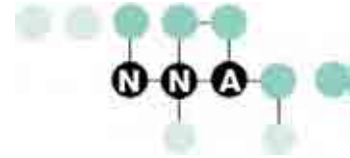
Prior to commencing work on site all personnel are required to have completed a site induction. The induction outlines the safe working practices, work site safety procedures and environmental precautions that must be adhered to at all times.

The mandatory PPE requirements on site shall be:

- Gloves
- Work boots with toe protection
- Safety helmet
- Eye protection with side shields
- Shirts with long sleeves
- Long trousers
- High visibility vests/clothing or clothing with reflective strips
- Radio to contact emergency controller
- Ear plugs when conducting/working within a noise environment
- Gumboots with toe protection.

2.1 Safety requirements

- All personnel involved must read and fully understand procedures being carried out.
- All personnel involved must read, sign off and fully understand the WMS.
- Any personnel coming on to site must be made aware of the operation (pre-start) and WMS and sign both documents.

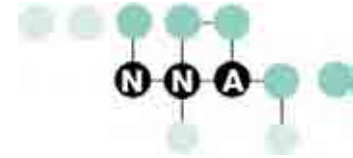


2.2 Quality Assurance Documents

Supervisors and Engineers must ensure all works are carried out in accordance with relevant Inspection Test Plans (ITP) and Verification Checklists (VCs). The ITP & VCs detail the acceptance criteria for each process and list the relevant specifications, inspection procedures, test frequency, inspection characteristics and the subsequent verifying records required.

2.3 Environmental requirement

- Prior to mobilising to site, the Supervisor must undertake a site walk with the Environmental Officer to identify any environmental issues and have agreed control measures in place.
- The Supervisor must ensure all environmental requirements detailed in the Environmental Verification Checklists are implemented.
- The Supervisor must ensure all works are carried out in accordance with the NNA Construction Environmental Management Plan (NNA001-A-PLN-017), SAP (NNA001-A-PLN-005) and to the conditions outlined in the Environmental Verification Checklist contained in the workpack. In addition, the Supervisor must consult and undertake instruction given by the Environmental Officer during site audits.



3 PROCEDURE

3.1 Preliminary Works

3.1.1 Mobilisation

Prior to mobilising resources to site, the Supervisor and the Engineer are required to undertake a thorough constructability assessment of the site in conjunction with the Environmental Officer to identify control measures needed to mitigate any potential risks that may impact the construction phase. These risks and control measures will form part of the Environmental Verification Checklist which will be included in the Supervisor's Pack.

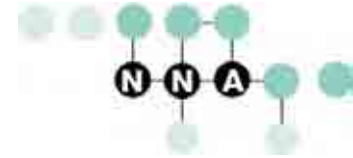
The Supervisor is to review and confirm that the following information is contained in the Supervisor's Pack prior to commencing any works onsite. The pack will include but not limited to:

- Permit to work
- Permit to Excavate
- DBYD
- Traffic Management Plan
- Relevant Construction Execution Procedures for each activity of the works
- Relevant Safe Work Instruction/WMS for each activity
- Verification checklist outlining any constraints from the Land owner, Government Authority, Community/stakeholder and Environmental including the LCRP (Landowner Construction & Rehabilitation Plan)
- NNA Construction Environmental Management Plan (NNA001-A-PLN-017)
- ITP
- Details design drawings and requirements
- Construction pre-start verification checklist
- QA documents.

The Supervisor and the Engineer are responsible for the execution of works in accordance to the materials contained in the Supervisor's Pack.

3.1.2 Survey Set-out

- The Supervisor is to ensure the pipeline alignment and grade has been set out by the Survey Team in accordance with the design drawings. No alteration of the alignment or grade shall be done without prior approval of the Design/Construction Coordinator via RFI (Request for Further Information).



- The Supervisor is to ensure the alignment of the pipeline is pegged at all bends in the horizontal alignment.
- The Supervisor is to ensure they have sufficient survey information to enable correct and accurate grading of the pipeline.
- Every IP, fence crossing and both sides of road and watercourse crossings will be similarly pegged by Surveyor.
- Survey pegs are to be marked with chainage and depth to invert level (IL) of pipe.

3.1.3 Services Location

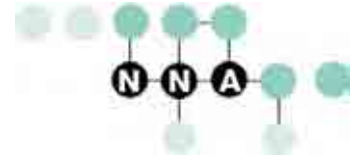
The Supervisor must ensure all existing services are located and control measures are in place to protect services prior to mobilising plant and commencing excavation works. Locating services must be undertaken in accordance with NNA CEP Service Location (NNA001-A-PRO-106).

3.1.4 Pre-start/Tool Box Meeting

- The Supervisor or Leading Hand must conduct a daily Pre-start meeting with the crew to discuss tasks for the day associated risks/requirements, and control measures. The Pre-start meeting record must be signed off by all members of the crew and sub-contractors.
- The Supervisor is to ensure all personnel and subcontractors have been inducted and signed onto all the relevant WMS before commencing any works. The signed copy of the WMS shall remain onsite for the duration of the works and handed to the Safety Department upon completion of the work.
- Should any of the tasks to be performed fall outside WMS; a Job Hazard Analysis (JHA) must be completed by the crew for that activity and signed off by all the people involved in the work prior to commencing that work.
- The Supervisor must ensure that each piece of plant has been inspected and a machinery pre-start checklist has been completed prior to starting work each day.
- The daily Pre-start forms must be handed to the Safety Department daily.

3.1.5 Temporary Access Tracks and Working Areas

- Should additional access tracks or working areas be required, the Supervisor must notify the Engineer so that VCs can be raised and signed off by relevant teams. No access tracks are to be installed without VCs being issued. Any conditions specified in the approval shall be adhered to.
- Additional access/working areas agreed and approved are to be pegged out by survey team prior to entry/construction.
- Any access that has been prohibited from use shall be flagged or fenced off where necessary with "No Access" signs erected. The Supervisor must clearly identify all access and restrictions to all personnel through Pre-start meetings.



- Safety measures that may be required to safeguard the public must be in place at all times as defined by the WMS, JHA and TMP. Traffic control measures in accordance with Traffic Management Plan must be implemented at all time where NNA works affect roads & traffic. The Supervisor is to consult with the Traffic Manager to determine required traffic control measures.

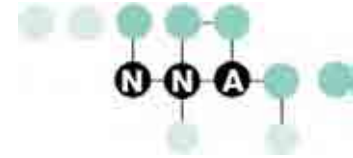
3.1.6 Clear, Grub and Grade

- Prior to mobilising the site, the Supervisor and the Engineer must undertake a site walk with the Environmental Officer to thoroughly assess the worksite and flag off any areas that must be protected and clearly flag “no go zones”.
- The Supervisor must ensure work is carried out without infringing on adjacent areas. Where trees and vegetation cannot be preserved aboveground, stabilising root material must be undisturbed wherever possible.
- The width of the cut in the ROW in the vicinity of the watercourse crossing must be minimised as detailed on the design drawings. Topsoil removed from the banks and approaches to the crossing must be conserved. No stockpiles shall be allowed to be within 50metres of the water course.
- The Supervisor must ensure the topsoil is not contaminated with other spoil material so it can be utilised for re-instatement works. The topsoil is not to be transferred between properties.
- After vegetation and topsoil removal and stockpiling, the bed and bank materials must be separately stockpiled in a location that will not obstruct the watercourse or cart off-side at an approved location for later use in restoration works. The Supervisor must ensure the banks are backfilled with selected materials that prevent erosion taking place as per standard drawings D-DWG-390-12.
- In addition to the above requirement, Clear, Grub and Grade activity must be carried out in accordance to NNA CEP for Clear, Grub & Grade (NNA001-A-PRO-111), and Environmental Verification Checklist (VC).

3.2 Environmental Management

3.2.1 Sediment & Erosion Control

- Prior to mobilising and commencing any works onsite, the Supervisor must undertake a site walk with the Environmental Officer to discuss any sediment and erosion control that is required other than detailed on the Environmental Verification Checklist.
- The Supervisor must ensure sediment & erosion control is installed as per instruction given by the Environmental Officer.
- The Supervisor is to ensure sediment and erosion control is in working order throughout the course of construction works.



3.2.2 Discharge of Water

The Supervisor must obtain approval from the Environmental Officer prior discharging/dewatering of ground/surface water. Any conditions given by the Environmental Officer shall be adhered to.

3.2.3 Clearing Width

The clearing width of the affected section of the waterway shall be restricting as per Table 3.2-1 below: The Supervisor must consult with the Environmental Officer to confirm the correct clearing width prior commencing clearing operation.

Table 3.2 - 1

Category	Description	Corridor Width
1	Bed & Banks are clearly defined and there are environmentally significant features (eg: vegetation, Giant Barred Frog, Mary River Cod)	Construction width limited to 10 metres within 20 metres of the top of bank
2	Bed & Banks are clearly defined, but there are no environmentally significant features	Construction width limited to 20 metres wide
3	Bed & Banks are not clearly defined and there is vegetation present (greater than 3 metres in height)	Construction corridor limited to 20 metres wide if clearing is required, otherwise to the limit of the cleared corridor
4	Bed & Banks are not clearly defined and there is no vegetation present (or vegetation is less than 3 metres in height)	Construction corridor up to 40 metres wide

3.2.4 Acid Sulphate Treatment

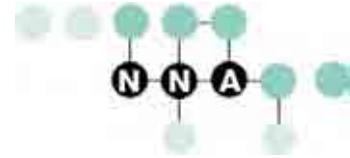
The Supervisor is to ensure treatment and disposal of Acid Sulphate Soil must be in accordance with the Environmental Verification Checklist (VC) and Acid Sulphate Soil (ASS) Management Plan (NNA001-A-PLN-003).

3.2.5 Stream Flows

The Supervisor is to ensure that the stream flows must not be stopped/impounded at any time due to construction activities.

3.3 Construction Sequence

Combinations of the following methods will be used. The Supervisor and the Engineer are to establish the construction sequence during the constructability walk of each crossing prior to mobilising the site.



3.3.1 Dewatering and Diversion of Flow

The construction methods to be adopted for temporary dewatering and diversion flow when crossing creek/waterway include:

- Temporary Aqua-dam bags and pump system
- Temporary sheet piles and pump system, or
- The combination of the two should the ground conditions dictate.

3.3.1.1 Temporary Aqua-Dam Bags & Pumps

- Prior to placement of the Aqua Dam Bag, the Supervisor must ensure the waterway bed on both edges of easement are clear of debris and sharp foreign objects such as rocks, wood etc that have the potential to damage the dam bag or prevent the bag from properly sealing with the waterway bed.
- The Supervisor is to use an excavator positioned on the opposite bank of the waterway and pull the bag across the waterway using a spreader bar attached to the lifting loops provided on the bag.
- Position by-pass pumps and suction hoses ready for connection (to minimise filling time against dam wall).
- Once the bag is fully laid across the waterway keep the non-filling end of the bag elevated and commence filling the bag from the working side using a flex-drive pump and water from the waterway. As the bag fills and drops to the waterway bed let the weight off the non-filling side and allow it to settle into position.
- The Supervisor will use either local dam water or water in the creek to fill the dam bag.
- Once the upstream bag is full, setup and start the by-pass pumps to stop the bag from overtopping. Monitor the bypass system to ensure it has sufficient capacity to cope with the waterway bed.
- Repeat the above steps to install a second bag on the downstream side of the easement.
- Once both bags have been installed and filled, pump the remaining water from between the bags and de-silt the waterway bed. Transport the silt off-site and stockpile on the RoW for drying out and for use upon/reinstatement of the RoW.
- The Supervisor is to undertake regular inspections of the bags to ensure the bags are stable and have a sufficient seal with the waterway bed to allow pipeline construction.
- Appendix A includes the installation manual for the Aqua-Dam Bag. Figure 1 shows a typical set up of a waterway crossing. The Supervisor must review this manual and adjust the installation to suit the specific worksite.

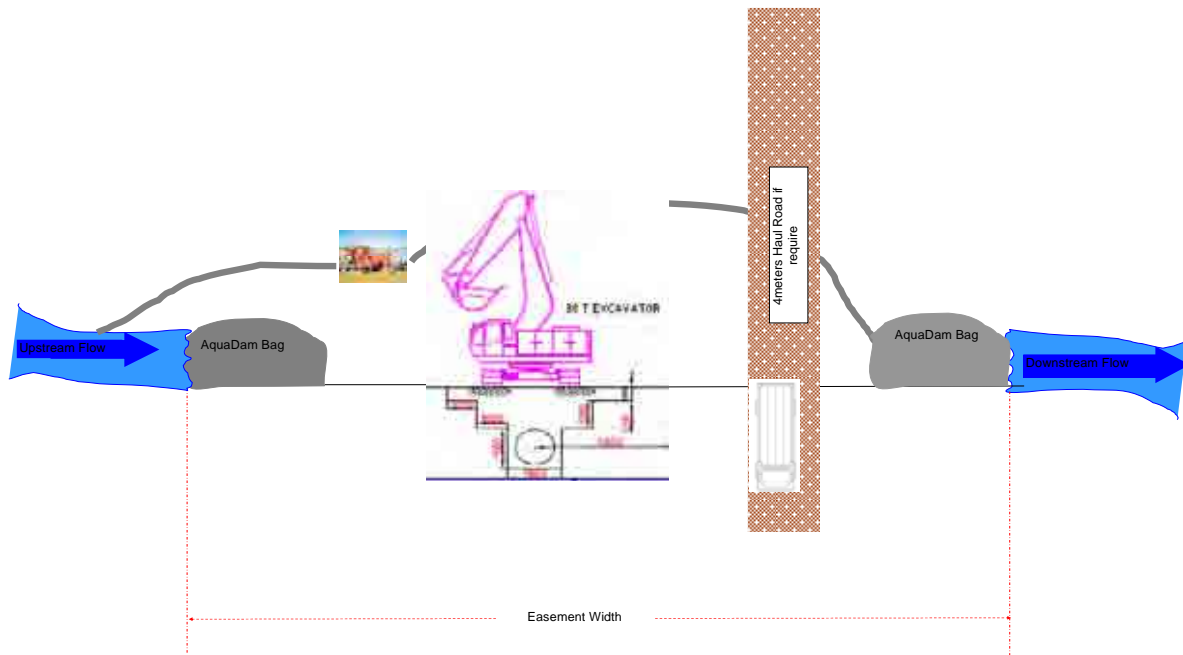
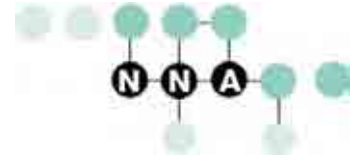


Figure 1 – Typical Creek Crossing Set-out (AquaDam Bag System)

3.3.1.2 Temporary Sheet Piles & Pumps Method

- Six metres long interlocking sheet piles will be used to dam the dam as set-out in Figure 2 of the CEP. Installation of sheet piles will be by the use of either excavator mounted vibrating hammer or pin jib crawler crane, depending on the reach.
- Only experienced and competent operators will be used to install these sheet piles. It is important that the sheet piles interlock with each other to ensure a water tight seal. Sheet piles are to be driven to a depth of 2 metres deeper than the pipe invert level to provide toe support. The top of the sheet piles should be 0.5 metre above normal creek level to allow for overtopping during heavy rain events.

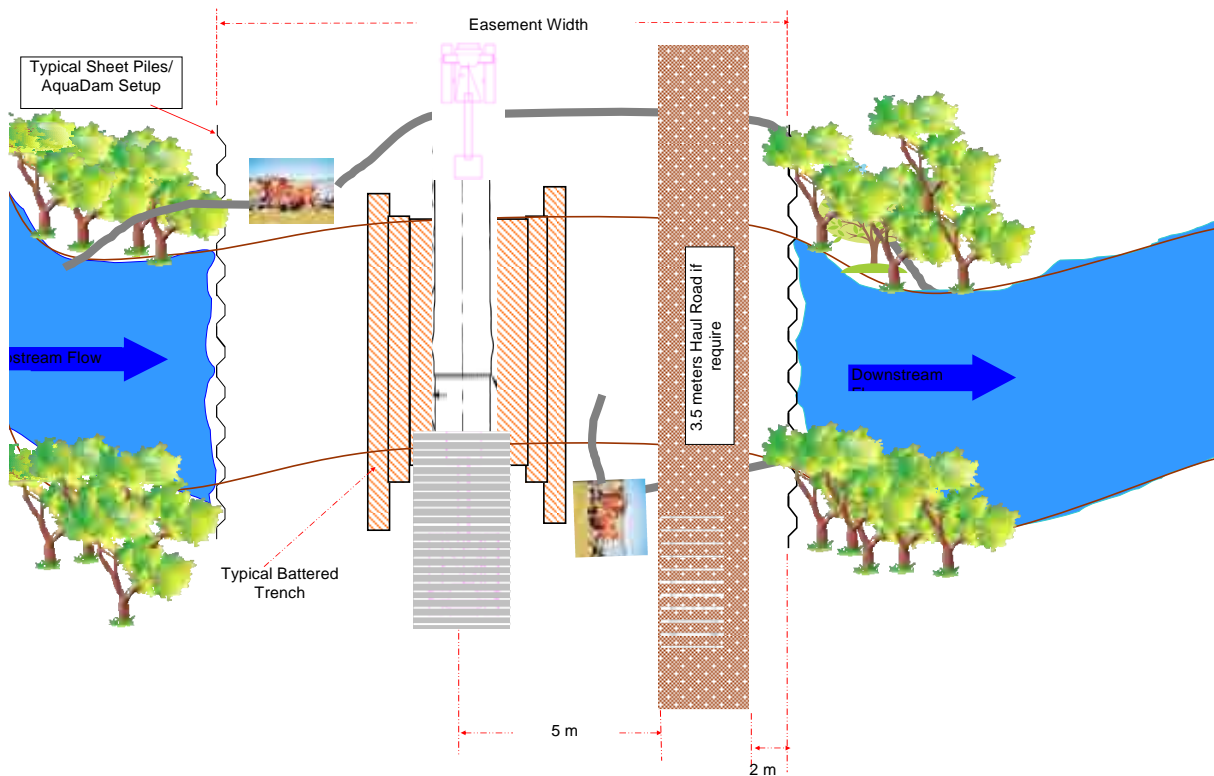
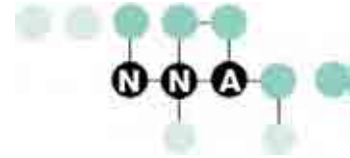


Figure 2 – Typical Creek Crossing Set-out (Sheet piles system)

3.3.1.3 Pumps Set Up

- Upon completion of installing dam bags/sheet piles, the Supervisor is to set up and start by pass pumps from the upstream side of the dam bag/sheet piles as setout in the Figure 1 & Figure 2. Where the discharge pipe crosses a haul road, protection of the discharge pipe at the crossing point is required by either a ramp or a temporary concrete culvert.
- The location of the pump must be set on top of the bank or away from the flood plan and must be in a bunded area to protect against any potential spill into the waterway. Where required, silenced pumps will be used to minimise noise impact of the surrounding areas. Extra caution must be taken when re-fuelling the pump to prevent any spilling. A spill kit must be available on site at all times.
- The position of the pump must be located at an accessible location so that in the event of a flood it can be retrieved in a timely manner.
- Flexi drive pumps will be used to pump water from between the row of sheet piles/dam bags. The Supervisor must obtain approval from the Environmental Officer prior to discharge.



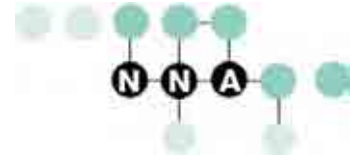
- The Supervisor is to ensure additional pumping resources are on standby in case of any changes in water flows and to ensure breakdowns do not jeopardise the successful completion of the crossing.
- The Supervisor must ensure that the bed and banks are protected during discharging of the water.

3.3.2 Construction of Haul Roads

- Prior to mobilising to site, the Supervisor and the Engineer must undertake a constructability walk to determine the access point and whether a haul road is needed to cross the waterway.
- Construction of haul road across the waterway can commence upon completion of pumping out the water between the rows of sheet piles/dam bags, construction of the haul road across the waterway can commence. The haul road will only be built when access is unavailable from the far side of the waterway or when the excavator cannot reach from both sides.
- When constructing the haul road across the waterway, an excavator is used to strip off soft material from the invert and sides of the waterway to find suitable ground to support filling. A geotextile fabric underlay must be laid prior to importing low porosity clay based material. This material will be used to fill on top of the geofabric. It will then be compacted between the sheet piles/dam bags to minimum of 0.1 of metres below the top of the sheet piles/dam bags to form the access track for vehicles and construction equipment.
- Reinstatement of the haul roads shall be undertaken as per Standard Drawings D-DWG-390-12.

3.3.3 Preparation of Trench

- Where necessary “swamp mats” will be utilised by the trenching excavator as a means of support and travel. The excavator will lift and reposition the “Swamp Mats” to suit.
- The Supervisor shall ensure when excavating for the pipeline it is in line, level and profile as specified on the alignment drawings. The minimum trench width shall be as set out in NNA Standard Drawing D-DWG-390-05.
- All excavations shall have a JHA undertaken on them to determine if ground support is required. All trenches greater than 1.5 metres in depth will be benched/battered/shore and/or signed off by qualified geotechnical engineer deeming the trench does not require to be benched/battered or shored.
- In soft and unstable ground conditions, trench boxes and shoring will be used to prevent trench collapse. A JHA must be undertaken to determine extent of trench shoring required, when in doubt, consult with the Geotechnical Engineer to confirm the level of protection required. No Personnel shall be allowed to work in the trench without proper trench protection under any circumstances.
- If necessary, the Supervisor must use additional pumps to dewater the trench to create as safe a working environment as possible.



3.3.4 Haulage of Pipe & Bedding Materials

Pipes, fittings and bedding materials are to be transported from the nearby laydown yard to site upon completion of preparing the trench. The Supervisor is to liaise with the Logistics Supervisor for the delivery of the required quantity of pipes/fittings and bedding materials on an as needed basis. The Supervisor must ensure all work is carried out in accordance with the NNA CEP for Material & Handling (NNA001-A-PRO-110).

3.3.5 Installation of Mainline

Once the trench is excavated to the design level, installation of sandbags along the base of trench for the pipe to be laid on can commence. Sandbags are to be spaced to allow for pipe support and space for concrete to flow under the pipe. An excavator/crane is to be used to lift the pipe and lower same into the trench (the Supervisor must ensure the pipe is jeepled before lower into trench) in accordance with Design Drawing and NNA CEP for Installation of DN1290 MSCL Pipeline (NNA001-A-PRO-109). The Supervisor must ensure no personnel enter the unprotected trench.

Prior to backfilling of the pipe, the Supervisor must check the grading of the pipe to ensure it has been installed to the correct grade and level. The Supervisor must also use the PDA provided to record the bar code and the coordinates of the pipes and concrete encasement.

3.3.6 Installation of Fibre Optic Conduit

Once the pipe is lowered into the trench, install the 50mm diameter communication Fibre Optic conduit, with Telstra rope inside, through sand bags at the end of the encasement.

The conduit to be tied in a position to allow concrete to be poured and vibrated around the pipe, then lowed the conduits into the concrete as shown on the Design Drawings D-DWG-390-05.

The Supervisor must ensure that any joint in the conduit is fully sealed and covered with duct tape to prevent foreign objects, including concrete entering during concrete pour.

If ends of conduits have to be buried, cover them with plastic caps and duct tape before hand.

Install markers to indicate the location of the end of conduits and pipe to assist the mainline crew when tie-in takes place.

3.3.7 Concrete Encasement & Backfilling

Sand bag each end of encasement area once the pipe is in place and 50mm fibre optic communication conduit is installed. Figure 3 shows typical details of the concrete encasement.

The Supervisor must ensure groundwater inside the trench is pumped out as much as practicable prior to commencing concrete pour to prevent any buoyancy of the pipes and weakening the strength of the concrete pour.

Where a concrete truck is cannot reach the excavated trench, placement of concrete can either be done by using an excavator or concrete pump. A concrete vibrating needle must be used to vibrate the concrete throughout the pouring process to ensure concrete is evenly compacted.

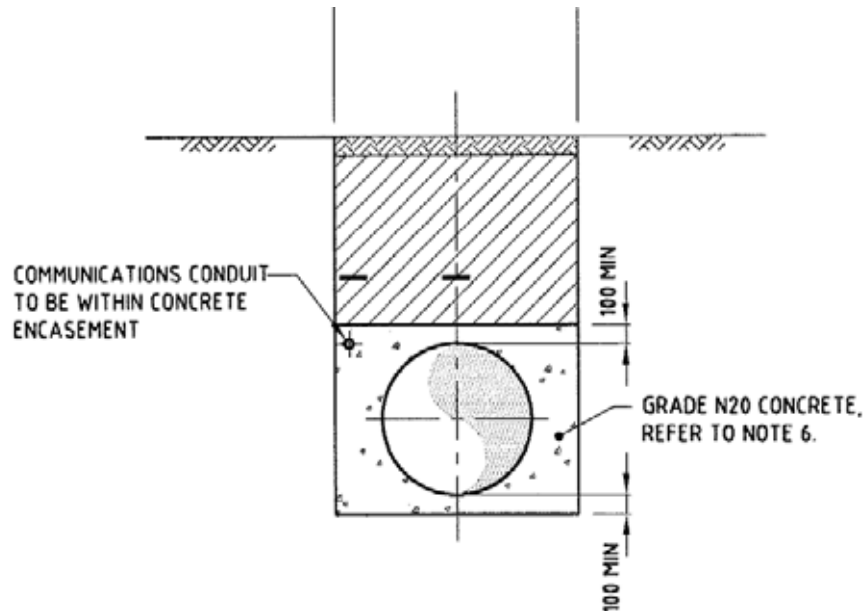
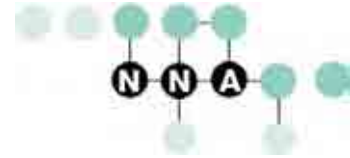


Figure 3 – Typical Detail of Concrete Encasement

Where concrete is to be poured over or in the proximity of a ring joint of the pipe, the Supervisor must ensure the rubber ring joint is protected by utilising sandbags to form up around the joint to stop concrete from entering into the pipe during a pour.

Similarly, the joint of the communication conduit must also be protected by using duct tape wrapping around the joint where affected by the concrete work.

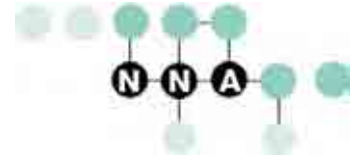
Concrete must be poured in stages/layer to prevent floatation of the pipe. In addition, the pipe must be installed and backfilled at least one length of pipe past either side of the waterway to prevent floatation during the concrete pours (For details on Concrete Pours; refer to CEP for Concrete Pours NNA001-A-PRO-122).

The Site Engineer must ensure the correct grade of concrete is ordered and a concrete tester is booked when placing a concrete order from the supplier. Concrete must be tested on the first load and every third load. A concrete pour card must be filled-out and signed by both the site engineer and supervisor. The Site Engineer must file each concrete pour card into relevant QESE Lot folder for QA verification close out

Once the concrete is cured, backfilling of the trench to depth using selected materials as detailed on the Design Drawing can commence. Trim the floor and banks of the affected section of the waterway and install scour protection as per Design Drawing D-DWG-390-12 (refer to section 3.4 of this CEP for more details).

3.4 Backfilling and Compaction

Backfilling and compaction of the trench shall be in accordance with NNA CEP for Installation of DN1290 MSCL Pipe (NNA001-A-PRO-109).



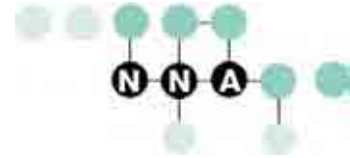
3.5 Clean Pipe

Every effort must be made to ensure the pipe and communication conduit is clean. End caps must be installed at either end of the pipe and conduit to keep the pipe clean at the end of each shift and before backfilling. The crew must ensure no rubbish or tools are left inside pipes and the conduit. The crew must install markers to indicate the location of the ends of the pipe and conduit to assist the mainline crew to locate the ends when tie-in takes place. The Supervisor is to ensure all rubber ring joints (RRJ) in concrete encased section are to be wrapped with tape to prevent concrete ingress.

3.6 Re-instatement & Revegetation

Reinstatement of the bank must be in accordance with Design Drawing D-DWG-390-12 (Refer to Appendix B) as summarised below:

- The bank shall be graded as directed by the Environmental Officer or otherwise restored back to its original profile.
- Prepare the bank by removing all stumps, organic matter and loose spoil material. Excavate at toe of bank to key rip rap into bed of waterway. However, where a rip rap is not installed, the stumps must be left intact.
- Rip rap materials must be clean, dense, durable and roughly equidimensional as per Design Specification.
- Rip rap for placement on banks shall be graded material between nominally 300mm and 600mm except where use of coarser material is directed by the Environmental Officer.
- Rip rap for placement over trench must be well-graded material between nominally 150mm and 400mm except where use of coarser material is directed by the Environmental Officer.
- Rip rap must be placed with minimum void space and with a well interlocked smooth finished surface to resist movement by water. No rocks are to protrude more than 300mm above design lines and grades.
- Rip rap must not alter elevation of the bed or restrict width of flow and have smooth transitions to adjoining surfaces.
- All edges of rip rap must be keyed in and constructed in a manner that resists undercutting.
- Rip rap height up the bank must extend to 500mm minimum above normal high water level or top of bank if normal high water level is above top of bank. Normal high water level is to be as determined by the Environmental Officer
- Width of bank rip rap must be sufficient to protect all disturbed bank
- An apron must extend into the waterway bed where directed by the Environmental Officer
- Rip rap must be placed over trench where directed by the Environmental Officer
- Once the scour protection has been installed, the removal of the temporary works platform/haul road will commence. All temporary works will be removed in its entirety. During removal of the haul road/work platform, the Supervisor must ensure that no machinery is allowed to travel near the pipeline centreline.



- The Supervisor is to ensure the rehabilitation and revegetation works are carrying out in according with NNA Rehabilitation and Revegetation Plan and Environmental Verification Checklist.

3.7 Removal of Sheet Piles & Aqua Dam

Upon completion of removal of the temporary haul road/works platform, removal of the sheet piles/Aqua Dam can commence.

3.7.1 Removal of Aqua-dam Bags

Once the works within the waterway are complete, connect the excavator to the spreader bar on the downstream bag and remove the drain plug to allow the water to drain out gradually (not cause erosion or disturb flora and fauna). Continue to lift the bag as water drains out until all water is removed. Pull the bag completely out from the waterway. Fold and roll the bag in the same packaging configuration as received, place on a pallet and strap down, ready for transport off site.

Repeat this step for the removal of the upstream bag. Refer to Appendix A for further details.

3.7.2 Removal of sheet piles

The Supervisor is to use an excavator with a vibrating hammer to remove the installed sheet piles from the downstream side of the easement prior to the upstream side.

Position an excavator as far down to the bank as practicable and remove the sheet piles that are farthest away from the bank first, gradually work back towards the top of the bank. Repeat these same methods for the removal of the sheet piles on the other side of the waterway.

The Supervisor must obtained approval from the Environmental Officer prior discharging/dewatering of ground/surface water. Any conditions given by the Environmental Officer shall be adhered to.

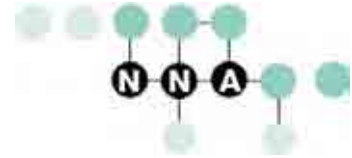
Upon completion of the removal of the temporary sheet piles/Aqua-dam, full re-instatement of the ROW can commence in accordance to NNA CEP for Re-instatement, Revegetation and Rehabilitation (NNA001-A-PRO-119).

3.7.3 Removal of Pump set

Once the sheet piles/Aqua Dam Bag has been removed, the Supervisor is to use an excavator to lift the pumps and hoses onto a truck and remove off site. Extra care must be taken to ensure no spills of hydrocarbons occur during lifting the pump sets from its position onto a truck. Should any spills of hydrocarbons occur, the Supervisor must clean up and rehabilitation of the site to the satisfaction of the Environmental Officer.

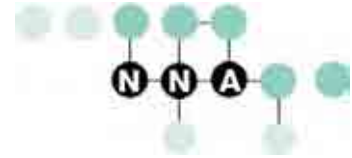
3.8 General Waste

Waste segregation on site – waste materials, including spoil and demolition construction waste, will be separated on site into dedicated bins/areas, where practicable, for either reuse on site or collection by a waste contractor and transport to approved offsite facilities.



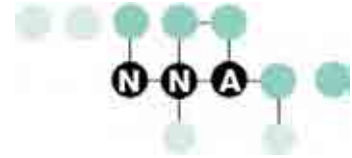
3.8.1 Concrete Slurry Waste

A dedicated concrete slurry washout area shall be prepared on site prior to any concrete works commencing, for example, an excavated pit or within the trench. The dried concrete slurry shall be removed at the end of the concreting activities or on a regular basis and disposed at an approved site or where directed by the Supervisor or the Pipeline Construction Manager. Adequate control measures are to be installed and maintained to ensure no contaminants are released from the washout area. The washout area must be bunded and at least 50 metres away from the bed and banks of the waterway.



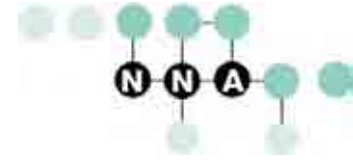
4 STORAGE OF CONTAMINANTS

Storage of dangerous goods must be stored within an impervious bunded and covered area to prevent stormwater ingress. Storage of all dangerous goods must comply with the *Dangerous Goods Safety Management Act 2000* and Australian Standards. Spilt contaminants or stormwater within the bunded area should be removed by a licensed waste transporter on a regular basis, to prevent mosquito breeding and contamination. The Storage area must be at least 50 metres away from the waterway.



5 RE-FUELLING MACHINE/EQUIPMENT

All equipment shall be re-fuelled off-site where practical or at least 50 metres away from a watercourse. A spill mat or designate bunded area should be utilised during the re-fuelling process of plant and equipment. A spill kit must be available onsite at all time.



6 CONSTRUCTION RESOURCES

6.1 Personnel

The Pipeline Construction Manager must confirm to the Supervisor responsible for the works that all personnel involved in the works have attended the NNA safety/environmental induction course.

The Supervisor responsible for the pipe laying process shall ensure that all safety and environmental precautions and recommendations have been implemented, a Job Hazard Analysis (JHA's) has been reviewed, discussed and signed on to, and that all personnel involved have the required safety equipment and Personal Protective Equipment (PPE). An Environmental Officer will be available to ensure all controls are adequately maintained during construction and available for advice if required.

6.1.1 Supervisor

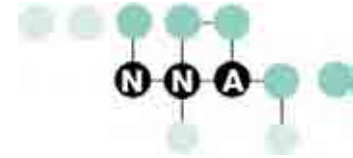
The Supervisor is responsible to the Pipeline Construction Manager for:

- Implementing this work method statement and other procedures affecting the Pipe laying operations of the Northern Pipeline Interconnector Stage 2 project.
- Participating in the risks assessment for the pipe laying operations of the Northern Pipeline Interconnector Stage 2 project.
- Ensuring erosion and sediment control measures are installed and maintained where required and operate to achieve the objectives.
- Ensuring that adequate and competent or appropriately trained personnel are available to perform the work.
- Supervising all pipe laying crews.
- Ensuring plant and equipment is inspected and maintained in good order.
- Ensuring all Pipes laying operations are carried out safely and under the correct conditions.

6.1.2 Safety Adviser

The Safety Adviser responsible for:

- Participating in the risk assessment for the Pipe laying operations of the Northern Pipeline Interconnector Stage 2 project.
- Ensuring that the Supervisors of the Pipe laying activities of the Northern Pipeline Interconnector Stage 2 project are performed in a safe manner in accordance with Project HSE procedures.



6.1.3 All Employees

All employees are responsible to the Forman and must:

- Comply with statutory requirements and the HS&E Plan;
- Maintain erosion and sediment control measures;
- Follow instructions by Alliance Management and other supervisory personnel;
- Report product non-conformance, safety and environmental hazard, accidents and injuries; and take reasonable care to maintain a high standard of workmanship, protect the health and safety of themselves, their fellow workers and other persons on site and protect the environment.

6.1.4 Environmental Officer

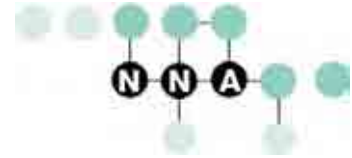
Environmental Officer responsible for:

- Ensuring all relevant environmental legislation and permits are complied with on site as well as NNA management Plans & Verifications Checklists (VCs).
- Provide advice to all employees particularly Construction Manager and Site Supervisors;
- Conduct regular weekly documented inspections and provide feedback to staff, supervisors and Construction Managers.

6.2 Plant and Equipment

The following equipment shall be utilised in completing the Pipe laying works;

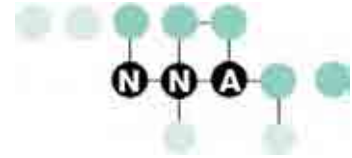
- 4wd Utility or Wagon
- Excavator/s/Backhoes
- Tippers
- Sheet piles
- AquaDam Bag
- Vacuum Pumps
- Concrete truck
- Concrete Vibrator
- Vibrating Hammer
- Welding equipment
- Vibrating Skis
- Pumps



7 HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROL

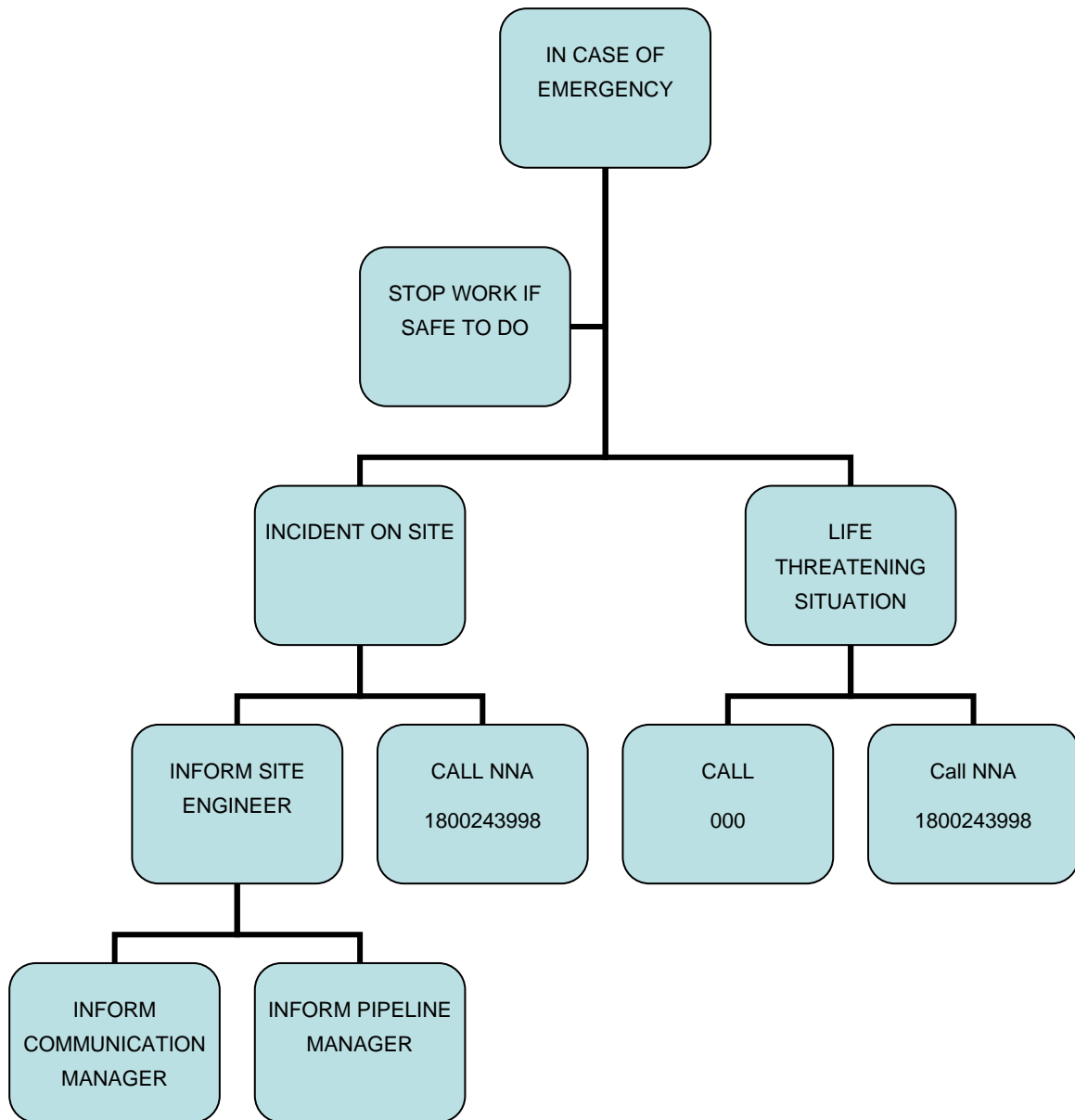
7.1 General

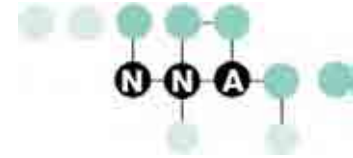
Prior to commencing work on site all personnel are required to have done a site induction. The induction will outline the safe working practices, work site safety procedures and environmental precautions that must be adhered to at all times.



8 EMERGENCY CONTACTS

In an event of emergency, the following procedure shall be followed





9 PROCEDURES, REPORTS ETC

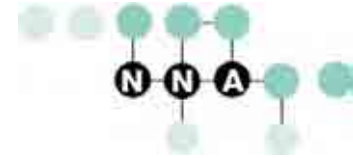
The following safety, environmental and quality documents shall be utilised:

Work Method Statement

- NNA001-K-WMS- 390-007 Construction Survey
- NNA001-K-WMS-390- Service Location & Potholing
- NNA001-K-WMS-390-021 Installation of MSCL Pipeline
- NNA001-K-WMS-390-022 General Earthworks
- NNA001-K-WMS-390-020 Material Handling (Unloading & Storage)
- NNA001-K-WMS-390-024 Welding of MSCL Pipe & Fitting
- NNA001-K-WMS-390-013 Concrete Pours
- NNA001-K-WMS-390-008 Sheet Piling & Temporary Works/Trench Support
- NNA001-K-WMS-390-010 Reinstatement, Revegetation and Rehabilitation
- NNA001-K-WMS-390-011 Generic Lifting Plans
- NNA001-K-WMS-390-015 Air Valve & Drain Down Valve Installation
- NNA001-K-WMS-390-017 Mechanical Installations
- NNA001-K-WMS-390-023 Creek Crossing(Open Trench)

Construction Execution Procedure

- D-SPE-390-02 Technical Specification
- NNA001-A-PLN-017 Construction Environmental Management Plan
- NNA001-A-PLN-028 Cultural Heritage Management Plan
- NNA001-A-PRO-109 Installation of MSCL Pipeline
- NNA001-A-PRO-109 Material Handling (Unloading and Storage)
- NNA001-A-PRO-111 Clear, Grub & Grade of RoW
- NNA001-A-PRO-112 General Earth Works
- NNA001-A-PRO-114 Welding of MSCL Pipe & Fitting
- NNA001-A-PRO-117 Sheet Piling & Temporary Works/Trench Support
- NNA001-A-PRO-119 Reinstatement, Revegetation & Rehabilitation
- NNA001-A-PRO-120 Generic Lifting Plans
- NNA001-A-PRO-122 Concrete Pours
- NNA001- A- PRO- 124 Air Valve & Drain Down Valve Installation
- NNA001-A-PRO-040 Working in Proximately Overhead Powerline
- NNA001-A-PRO-106 Service Location & Potholing



NNA001-A-PRO- 042 Permit to Excavate

NNA001-A-PRO-008 Inspection of External Coating of MSCL Pipe for Defects using Portable Holiday Detectors

Management Plan

NNA001-A-PLN-017 Construction Environmental Management Plan

NNA001-A-PLN-005 Sensitive Areas Plan

Quality Assurance Documents

Inspection and Test Plans

ITP-ST-CONC – Structures Concrete

ITP-PL-EarthWKS – General Earth Works

ITP-PL-PIPECON – Pipeline Construction

ITP-PL-FIBREOPTIC – Fibre Optic Installation

ITP-PL-STORMDRAIN – Stormwater Drainage

ITP-PL-REVEG – Reinstatement & Revegetation

Verification Checklists

Corridor

Environmental (incl. Cultural Heritage) Approvals

Community & Stakeholder Stage 1 & 2

Pipeline Construction

Construction Pre-start

General Earthworks (including applicable Test Results and Certificates)

Stormwater Drainage (including applicable Test Results and Certificates)

Permits

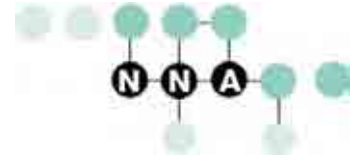
Traffic Management Plan (where require)

Hot work permit (O-FRM-014)

Permit to excavate (O-FRM-041)

Permit to Work (Y-RM-012)

Confined Space Entry Risk Assessment – Entry Permit (O-FRM-028)



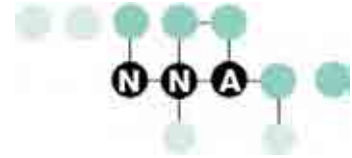
10 REFERENCES

In addition to those procedures documents referenced in the Section 9 above, the following references shall apply:

- Australian Standards AS3798 -1996 Guidelines on earthworks for commercial and residential developments
- Electrical Safety Act 2002
- Electrical Safety Regulation 2002
- Workplace Health & Safety Act 1995
- Workplace Health & Safety Regulation 1997
- Workplace Health & Safety's Plant Code of Practice 2005
- Mains Road Specifications, MRS 11.04 General Earthworks and MR11.03 Drainage, Retaining Structures & Protective Treatments

10.1 Drawings

- Pipeline Alignment Sheets
- Standard Design Drawings



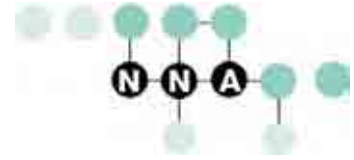
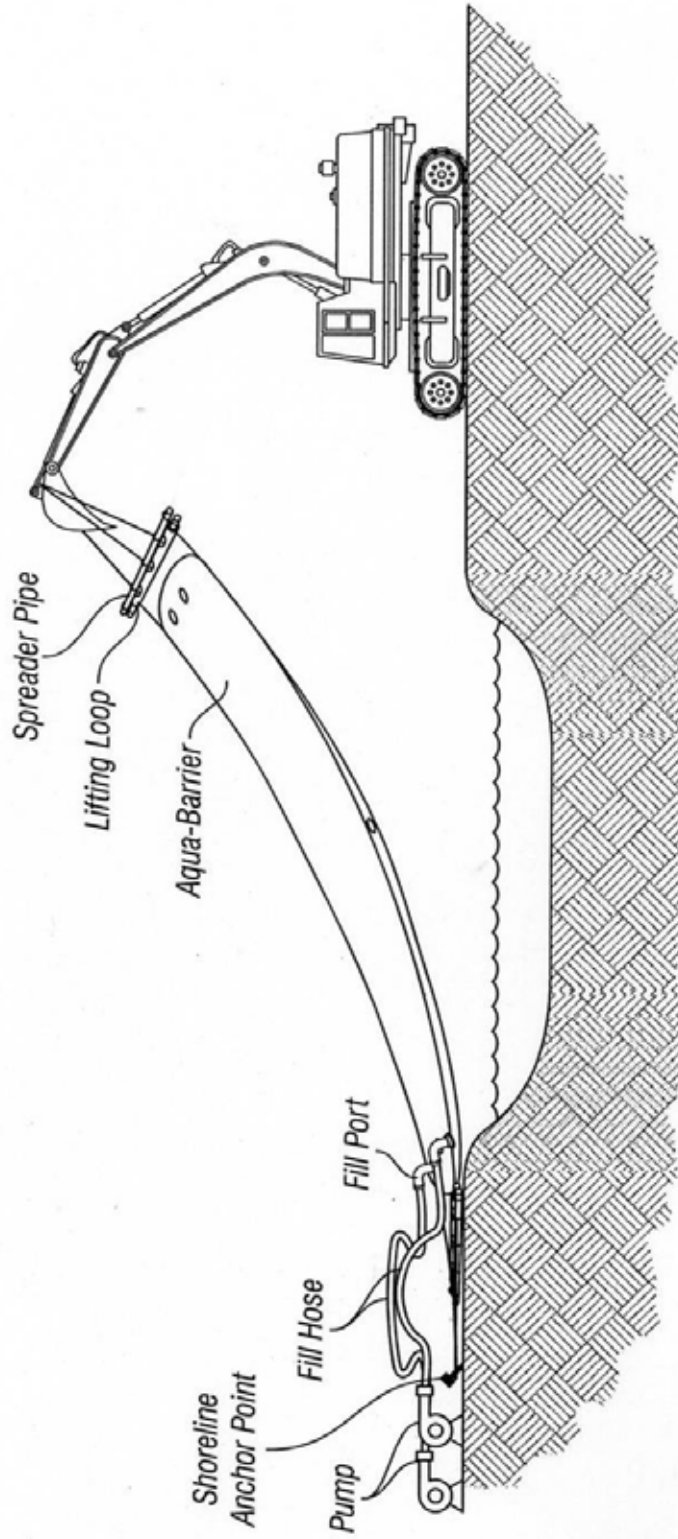
APPENDIX A – INSTALLATION AND REMOVAL OF AQUA-DAM BAG PROCEDURE

Aqua-Barrier Deployment Method

Using one track hoe and shoreline anchor

Phase 1

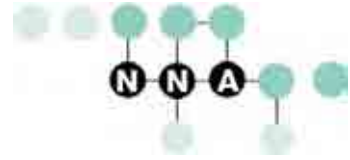
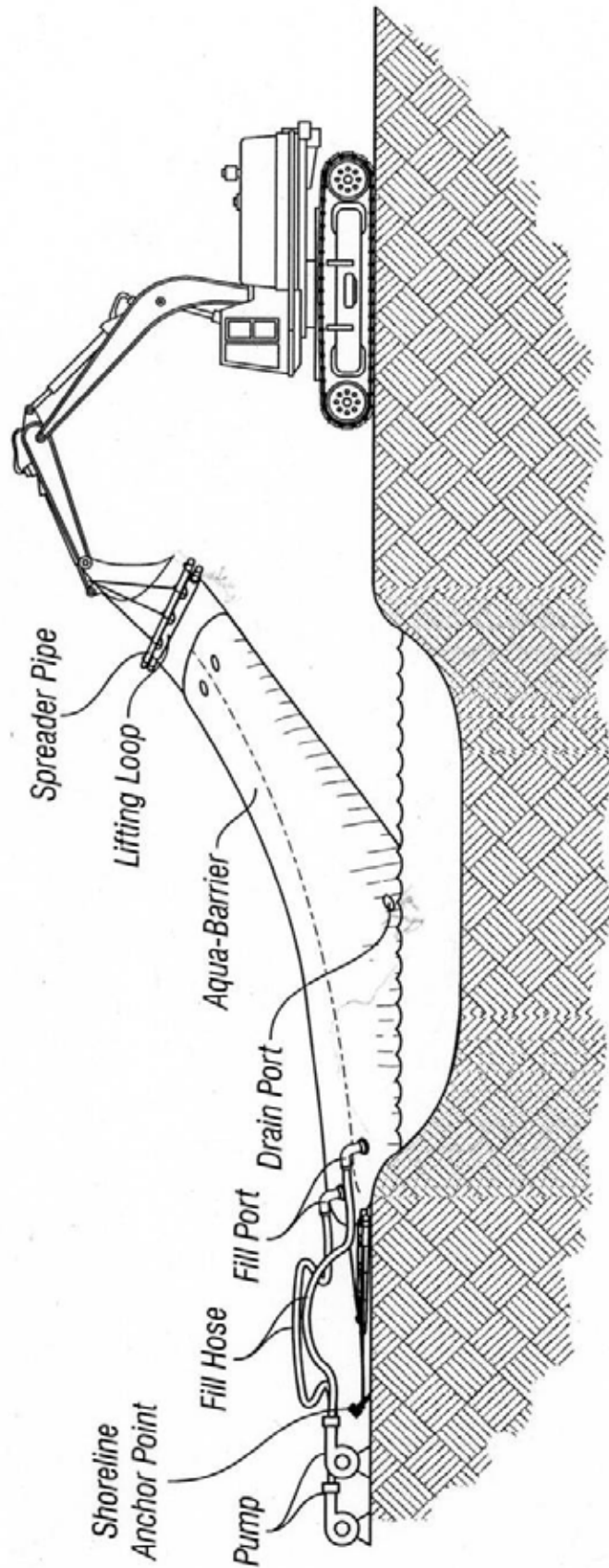
MOVING WATER INSTALLATION



Aqua-Barrier Deployment Method

Using one track hoe and shoreline anchor

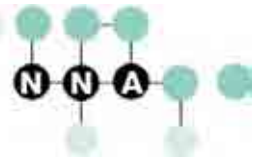
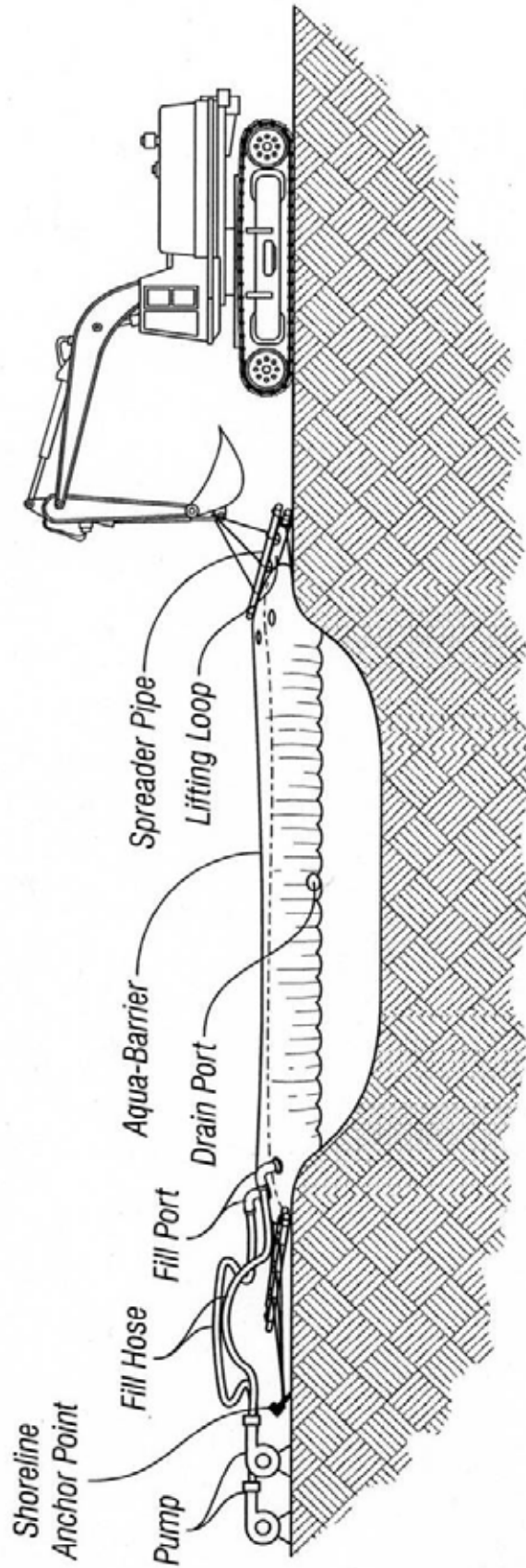
Phase 2



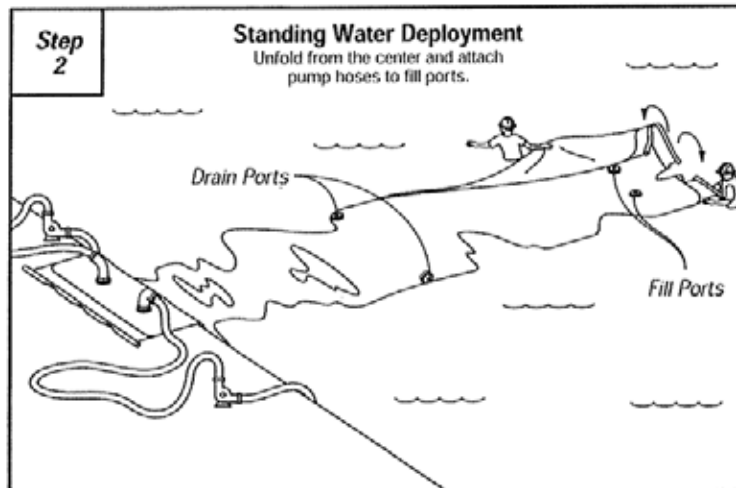
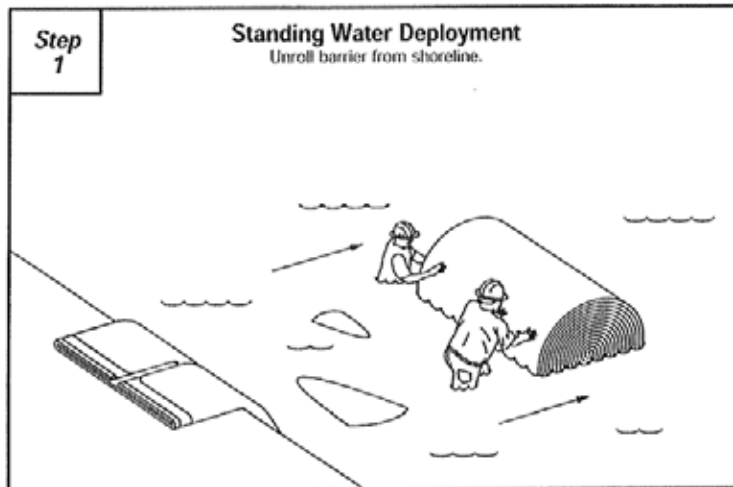
Aqua-Barrier Deployment Method

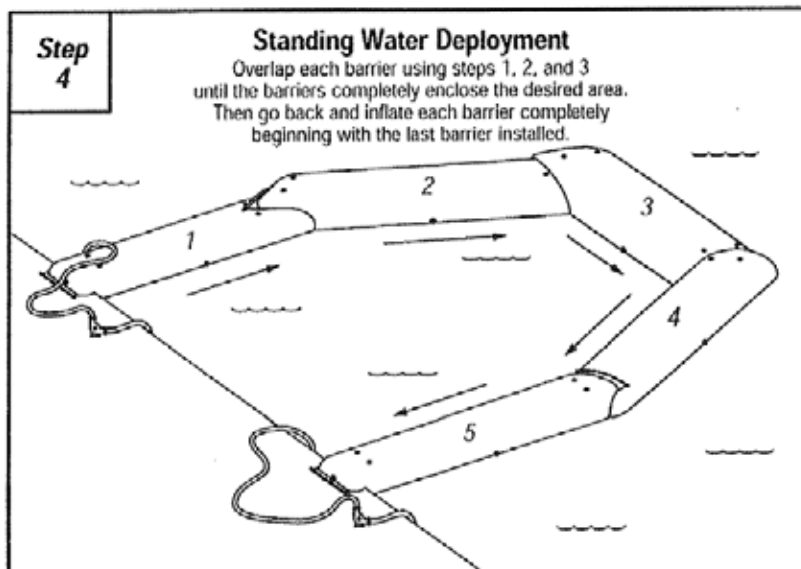
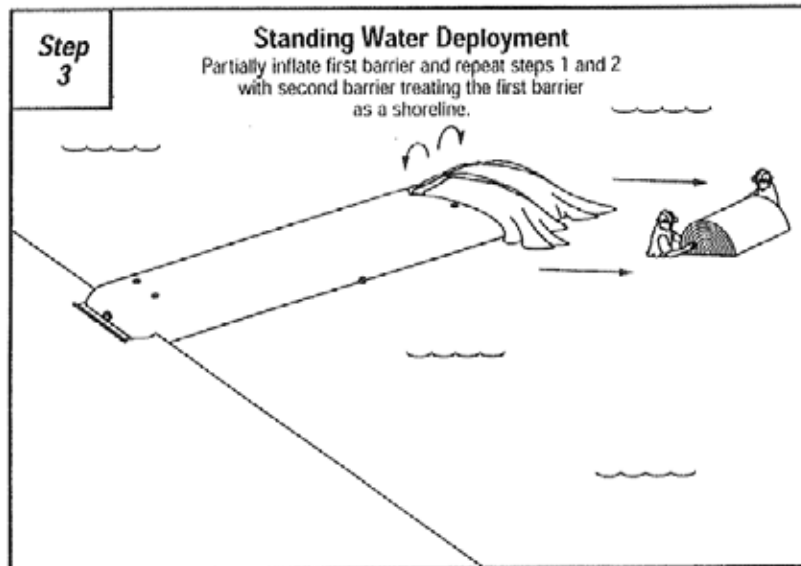
Using one track hoe and shoreline anchor

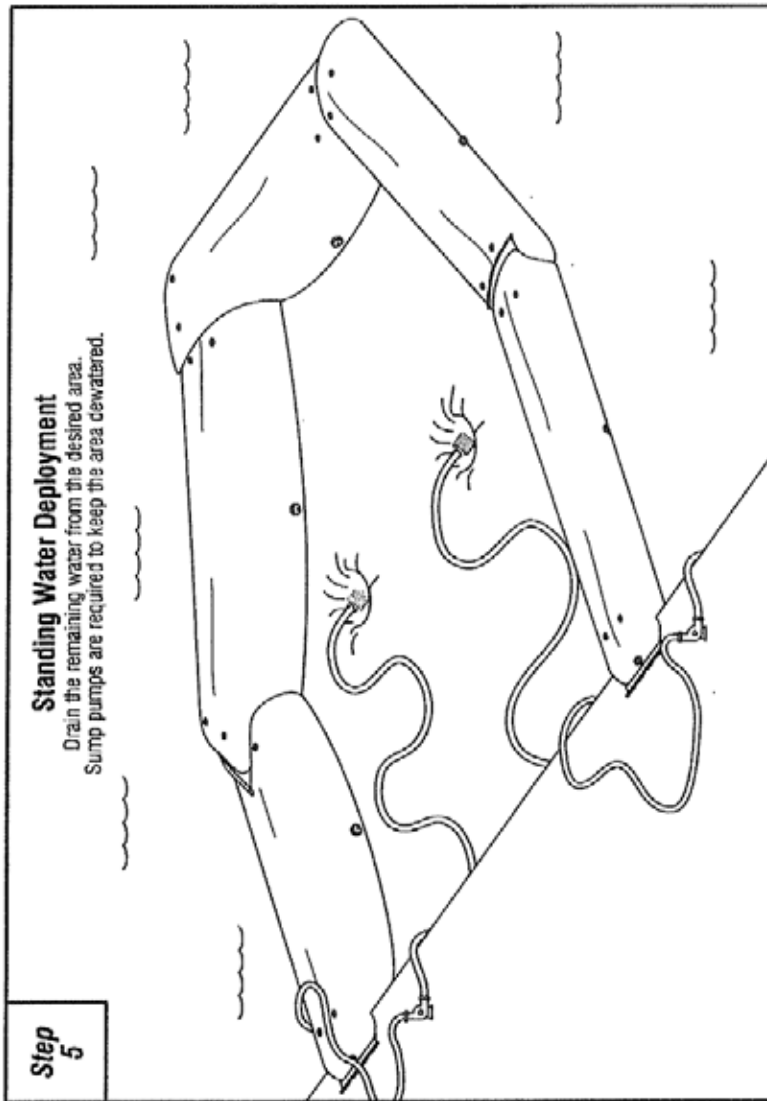
Phase 3



STANDING WATER INSTALLATION PROCEDURE

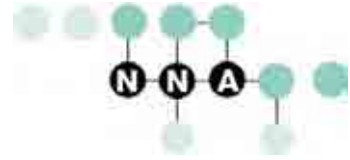
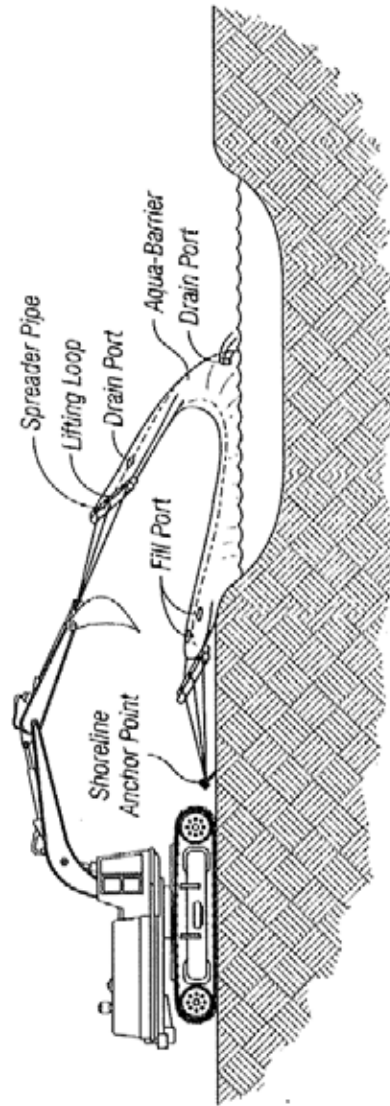




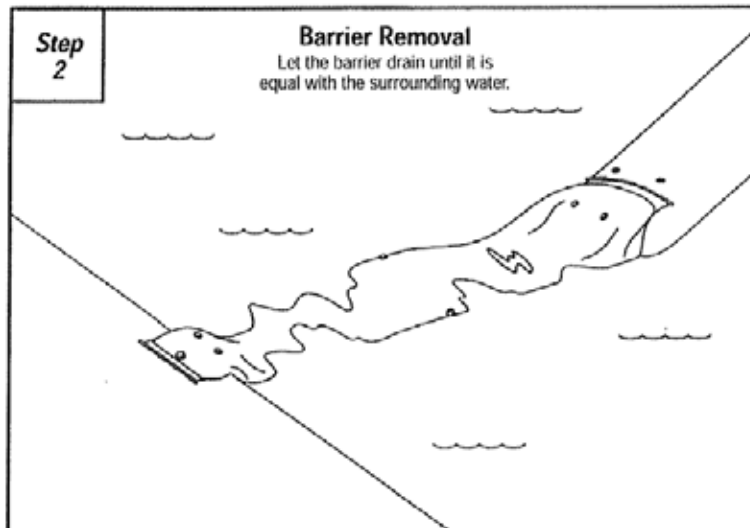
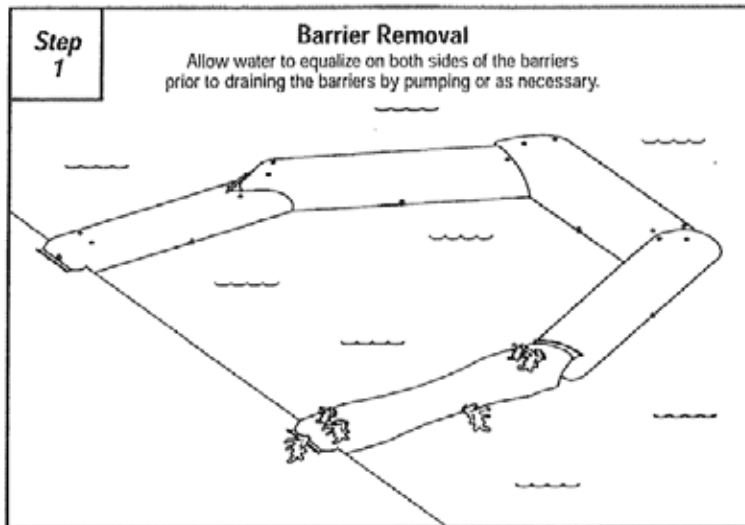


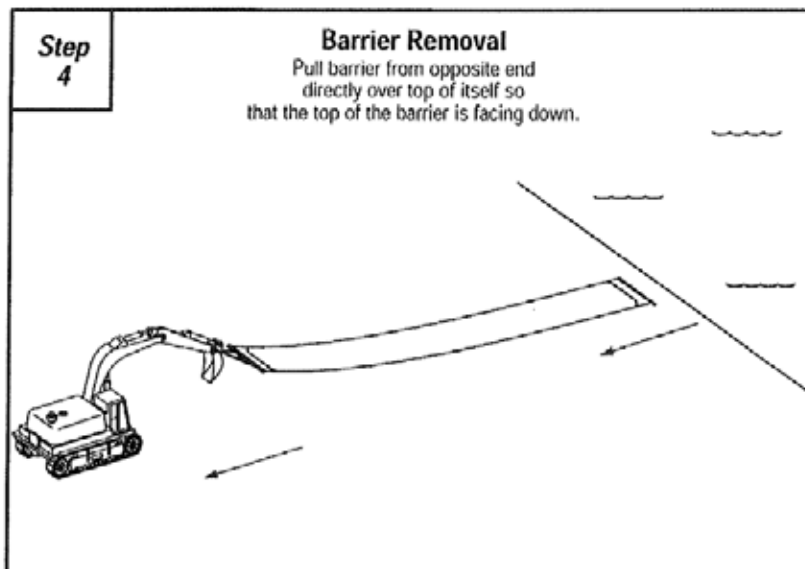
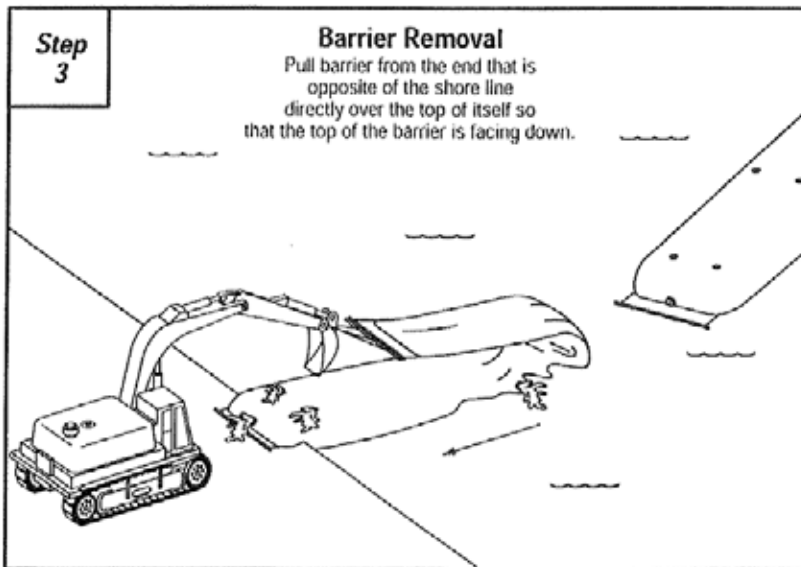
Aqua-Barrier Removal Method

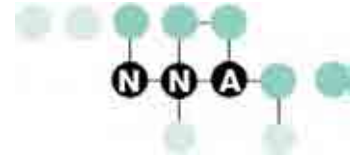
Using one track hoe and shoreline anchor
Phase 1



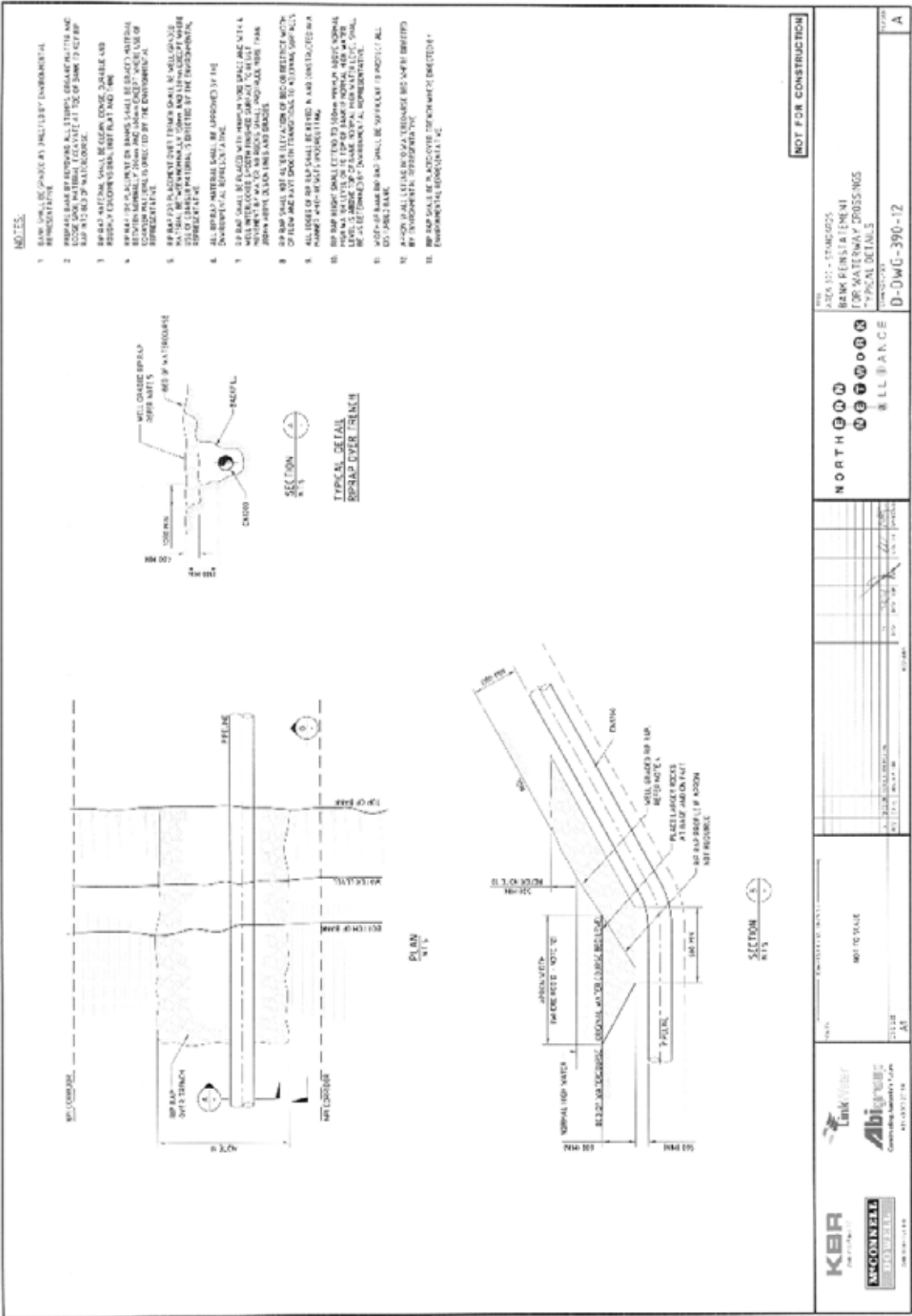
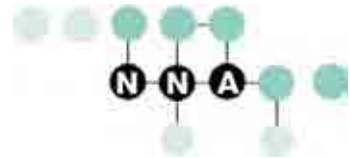
REMOVAL PROCEDURES







APPENDIX B – BANK REINSTATEMENT FOR WATERWAY CROSSINGS



- NOTES:**
1. BANK SHALL BE GRADED AS INDICATED BY ENVIRONMENTAL REPRESENTATIVE.
 2. PREPARE BANK BY REMOVING ALL STUMPS, GRASS, WEEDS AND LOGS AND NATURAL LOGS AT TOP OF BANK TO EXPOSE RIP RAP OVER TRENCH.
 3. RIP RAP MATERIAL SHALL BE CLEAN, DRY, DURABLE AND RESIST WEAR AND TEAR.
 4. RIP RAP PLACEMENT ON BANKS SHALL BE SUCH THAT WATER FLOW IS NOT OBSTRUCTED AND THERE IS NO SIGNIFICANT EROSION OCCURRING DURING THE CONSTRUCTION PERIOD.
 5. RIP RAP PLACEMENT OVER TRENCH SHALL BE SUCH THAT WATER FLOW IS NOT OBSTRUCTED AND THERE IS NO SIGNIFICANT EROSION OCCURRING DURING THE CONSTRUCTION PERIOD.
 6. ALL RIP RAP MATERIAL SHALL BE APPROVED BY THE ENVIRONMENTAL REPRESENTATIVE.
 7. RIP RAP SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK AND SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK AND SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK.
 8. RIP RAP SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK AND SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK.
 9. ALL TRENCHES SHALL BE REGRADED AND RESTORED TO ORIGINAL CONDITION WITHIN 30 DAYS OF COMPLETION OF CONSTRUCTION.
 10. RIP RAP HEIGHT SHALL BE SET TO ALLOW WATER TO FLOW OVER THE RIP RAP WITHOUT CAUSING EROSION OR DAMAGE TO THE RIP RAP.
 11. WATER OVER RIP RAP SHALL BE SUPPLEMENTED BY PROTECTIVE LOGS AND BRANCHES.
 12. RIP RAP SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK AND SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK.
 13. RIP RAP SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK AND SHALL BE PLACED WITH A MINIMUM OF 18" OVER THE TOP OF THE BANK.

NOT FOR CONSTRUCTION

SECTION 11 - STANARDS
BANK RESTORATION
FOR WATERWAY CROSSINGS
TYPICAL DETAILS
D-DWG-390-12

NORTH
SECTION
DETAIL
RIPPRAP OVER TRENCH

KBR
McGONNELL
DOUGHERTY
CONSULTING ENGINEERS

DATE: 11/11/11
BY: [Signature]
CHECKED BY: [Signature]