



Construction Water Quality Management Plan

Prepared for

Northern Midlands Irrigation Scheme

This is a sub-plan of the Construction Environmental Management Plan

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A	31/10/23	J. Hamilton	G. Smith	
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EMP Scope and Purpose

1.1 Scope

This document is to be read in conjunction with Tasmanian Irrigation's (TI) Construction Environment Management Plan Northern Midlands Irrigation Scheme EPBC Number:2022/09295 (TIs CEMP).

The Construction Water Quality Management Plan (CWQMP) addresses the environmental aspects and impacts of the Northern Midlands Irrigation Scheme. The CWQMP applies to the scope of work described in the Project Integrated Construction Management Plan (ICMP) and complies with the TI *Environmental Protection Guideline - EPG 5 Watercourse Crossings* and the commitments made in the *Northern Midlands Irrigation Scheme Preliminary Documentation (EPBC Act Ref: 2022/09295)*, report for Tasmanian Irrigation Pty Ltd by North Barker Ecosystem Service.

Project Environmental Aspects and Impacts

Rivers and creeks within the project are classified as cobble and gravel-based rivers. The main risk to this watercourse type is coarse sediment and silt entering the watercourse. The result of these incursions would be the smothering of essential bed vegetation, damage to aquatic habitats, causing the conversion of gravel creeks into clay-based creeks and damage to riffle systems.

Objectives and Targets

The goal of the CWQMP is to prevent and mitigate harm to protected matters by minimising the potential for erosion within the construction corridor and avoidance of sedimentation in waterways, adjoining properties and drains.

Environmental objectives are based on environmental aspects of the project. Environmental targets provide verifiable evidence that the environmental objectives have been achieved.

The environmental objectives and targets for this project are:

Environmental Aspect	Objective	Target
Surface Water	Minimise construction impacts on aquatic ecosystems	Occurrences of increase in turbidity due to construction activities of less than 10 NTU between immediately upstream and downstream of construction (per NRE). Occurrences of turbidity less than the nominal natural level of 60 NTU downstream of construction.

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Environmental Aspect	Objective	Target
Threatened Fauna (Swan galaxias)	Minimise the impact of construction activity on the Swan galaxias	100% of potential Swan galaxias habitat watercourse crossings assessed for the presence of protected matter and impact of construction activity. Not clear in, dig in, or cause the pipeline to cross any waterway containing running or open water with potential Swan Galaxias habitat unless an aquatic fauna expert undertakes an aquatic survey of the waterway and the aquatic fauna expert has determined that Swan Galaxias is absent from the waterway. If the presence of Swan Galaxias is detected in any waterway the approval holder must submit a proposed waterway crossing method to the department for approval. The approval holder must not clear in, dig in, or cause the pipeline to cross that waterway unless the Minister has approved the method of crossing that waterway. The approval holder must implement the approved waterway crossing method.

Environmental Control Measures

The alignment of the distribution pipeline crosses watercourses in 206 locations. The locations of the crossings are listed in TI *EPG5 Watercourse Crossings* and the *Northern Midlands Irrigation Scheme – Pipelines, Turbidity Management Framework*.

Construction methods for watercourse crossings will not impede flow wherever possible. Where this is not practicable a maximum of three days of flow interference is permissible.

Table 1 identifies the impacted permanent watercourses for the works and identifies the construction technique for the installation. Typical environmental control maps are included as appendices to this document. Note that these will be refined prior to each water crossing commencing with consideration to, weather conditions (pre-, during and post-) works, soil

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types and geotechnical conditions, Swan galaxias assessment outcomes and physical site constraints. **Note that these maps address environmental items only and are not construction methodologies.**

Table 1: Watercourse Crossing Method

No. (Align. Sheets)	No. (EPGS)	Waterway	Permanent or Transient	Hydrology Class	ECM/Notes
120	11	Not Named	Permanent	Minor River	Horizontal directionally drilled
119	17	Macquarie River	Permanent	Major River	Horizontal directionally drilled
93	34	Macquarie River	Permanent	Major River	Horizontal directionally drilled
70	40	Blanchards Creek	Permanent	Minor Tributary	Horizontal directionally drilled
71	41	Blanchards Creek	Permanent	Major Stream	Horizontal directionally drilled
55	54	Not Named	Permanent	Major Stream	Horizontal directionally drilled
114	62	Blackman River	Permanent	Major River	Horizontal directionally drilled
115	69	Blackman River	Permanent	Minor Tributary	Horizontal directionally drilled
59	70	Not Named	Permanent	Minor Stream	Horizontal directionally drilled
38	72	Macquarie River	Permanent	Major River	Horizontal directionally drilled
86	81	Elizabeth River	Permanent	Minor River	Horizontal directionally drilled
87	91	Not Named	Permanent	N/A (farm dam)	Horizontal directionally drilled
116	93	Blackman River	Permanent	Tributary	Horizontal directionally drilled
8	95	Woodside Rivulet	Permanent	Major Stream	Horizontal directionally drilled
23	98	Lake River	Permanent	Minor River	Horizontal directionally drilled
24	105	Lake River	Permanent	Minor Stream	Horizontal directionally drilled
28	106	Not Named	Permanent	Major Stream	Horizontal directionally drilled
13	120	Dairy Creek	Permanent	Stream	Horizontal directionally drilled
178	125	Not Named	Permanent	Tributary	Horizontal directionally drilled
169	126	Macquarie River	Permanent	Major River	Horizontal directionally drilled
150	141	Macquarie River	Permanent	Major River	Horizontal directionally drilled
132	147	Not Named	Permanent	Minor Stream	Horizontal directionally drilled
139	149	Isis River	Permanent	Major Stream	Horizontal directionally drilled
137	162	Kingstone Rivulet	Permanent	Stream	Horizontal directionally drilled

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No. (Align. Sheets)	No. (EPGS)	Waterway	Permanent or Transient	Hydrology Class	ECM/Notes
125	163	Not Named	Permanent	Stream	Horizontal directionally drilled
166	177	Isis River	Permanent	Major Stream	Horizontal directionally drilled
155	185	Not Named	Permanent	Minor Stream	Horizontal directionally drilled

All other water crossings are identified as transient. These crossings are listed in Appendix A1 of this plan.

1.2 Swan Galaxias Controls

There will be no clearing, digging in or causing the pipeline to cross any waterway containing running or open water with potential Swan Galaxias habitat unless an aquatic fauna expert has undertaken an aquatic survey of the waterway, and the aquatic fauna expert has determined that Swan Galaxias is absent from the waterway.

If the presence of Swan Galaxias is detected in any Waterway, a proposed waterway crossing method will be submitted to the Department for approval. The approved waterway crossing method will be implemented in accordance with the approval given by the Minister.

Environmental Monitoring & Reporting

Monitoring will occur within 200 m, upstream and downstream, of all construction on or adjacent to watercourses.

1.3 Monitoring Locations

All watercourse crossings with running water will require, at minimum, upstream and downstream monitoring. Appropriate monitoring sites are sites as detailed below:

Upstream:

- Located upstream of all watercourse crossing works and potential sedimentation inputs from the site
- Downstream of any confluences with significant creeks, streams or rivers
- Not to be undertaken less than 10m or further than 200 m upstream from the site.

Downstream:

- Located downstream of all construction sediment inputs (from both point and diffuse sources)
- Upstream of any confluences with significant creeks, streams or rivers
- Not be undertaken less than 20m or further than 200 m downstream of the construction site.

All water crossing monitoring locations will be recorded in a Survey123 form that will be provided by Tasmanian Irrigation prior to construction.

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1.4 Monitoring Requirements

Appendix A5 is an example of a water quality monitoring checklist and the information that will be recorded at each monitoring location. Prior to construction commencing, a Survey 123 form will be created by Tasmanian Irrigation for monitoring.

If the watercourse is running:

Monitoring is to be undertaken using a turbidity meter in accordance with the following:

1. Daily reading taken one day prior to construction commencing.
2. Minimum three upstream and downstream readings taken daily once construction has commenced:
 - Prior to the commencement of daily works
 - During daily works
 - At the completion of daily works
 - At any other time that there is a visible change in turbidity downstream resulting from site activities.
3. All readings are to be checked against the *NMIS Turbidity Management Framework* and actions taken as necessary.

If the watercourse is NOT running:

Visual monitoring up and downstream prior to, during, and after any construction works adjacent to, or in the bed of, the watercourse is to be undertaken. Appropriate sediment management and erosion controls must still be implemented.

Valleyfield Pump Station

Valleyfield Pump Station is adjacent to a transient watercourse. Due to this, the watercourse must be monitored, and appropriate sediment management mitigations must be implemented.

Monitoring during the Valleyfield Pump Station construction must be completed as detailed for watercourse crossings above.

Compliance will be outlined in:

- Daily Site Diary
- HB Water Quality Monitoring Checklist
- Weekly environmental checklists (submitted to TI)

Monthly reports provided to TI compiling the results of weekly inspections.

1.5 Project Audits

The project is subject to internal and external audits as determined by the Hazell Bros Audit Schedule. The aim is to conduct an internal management system audit on all projects within

three months of project commencement and six monthly thereafter. Projects may also be subject to external surveillance and recertification audits depending on project size, funding and duration. Client audits will be scheduled as per the requirements of section 2.2.2 in the technical specification.

Environmental Incidents

An environmental incident will include, but will not necessarily be limited to the following events for reporting and investigation purposes:

- Hazardous material spills to ground or water
- A notifiable incident that results in actual or potential environmental nuisance or harm
- Exceedances in turbidity:
 - Where the downstream turbidity is less than 10 NTU higher than the upstream turbidity, but upstream and/or downstream is greater than 43 NTU, an investigation will be undertaken to identify the likely reason for high turbidity e.g. recent rainfall, adjacent paddocks being cultivated.
 - Where the downstream turbidity is more than 10 NTU higher than the upstream turbidity, but less than 43 NTU, current work activities are to be suspended until an assessment of existing controls can be completed and further action is taken to minimise turbidity on-site and downstream.
 - Where the downstream turbidity is more than 10 NTU higher than the upstream turbidity, and greater than 43 NTU, investigation and reporting is to be completed per the *NMIS Turbidity Management Framework*.

1.6 Emergency Response

If a breach of compliance regarding watercourse environmental controls occurs, HB environmental representative will:

- immediately notify the Superintendent and the TI Project Manager
- collect evidence at the site and complete an investigation of the incident, and
- on advice from the Superintendent, may be required to engage a suitably qualified person to determine whether harm has occurred or if there is an ongoing threat to the flora and fauna in the vicinity.

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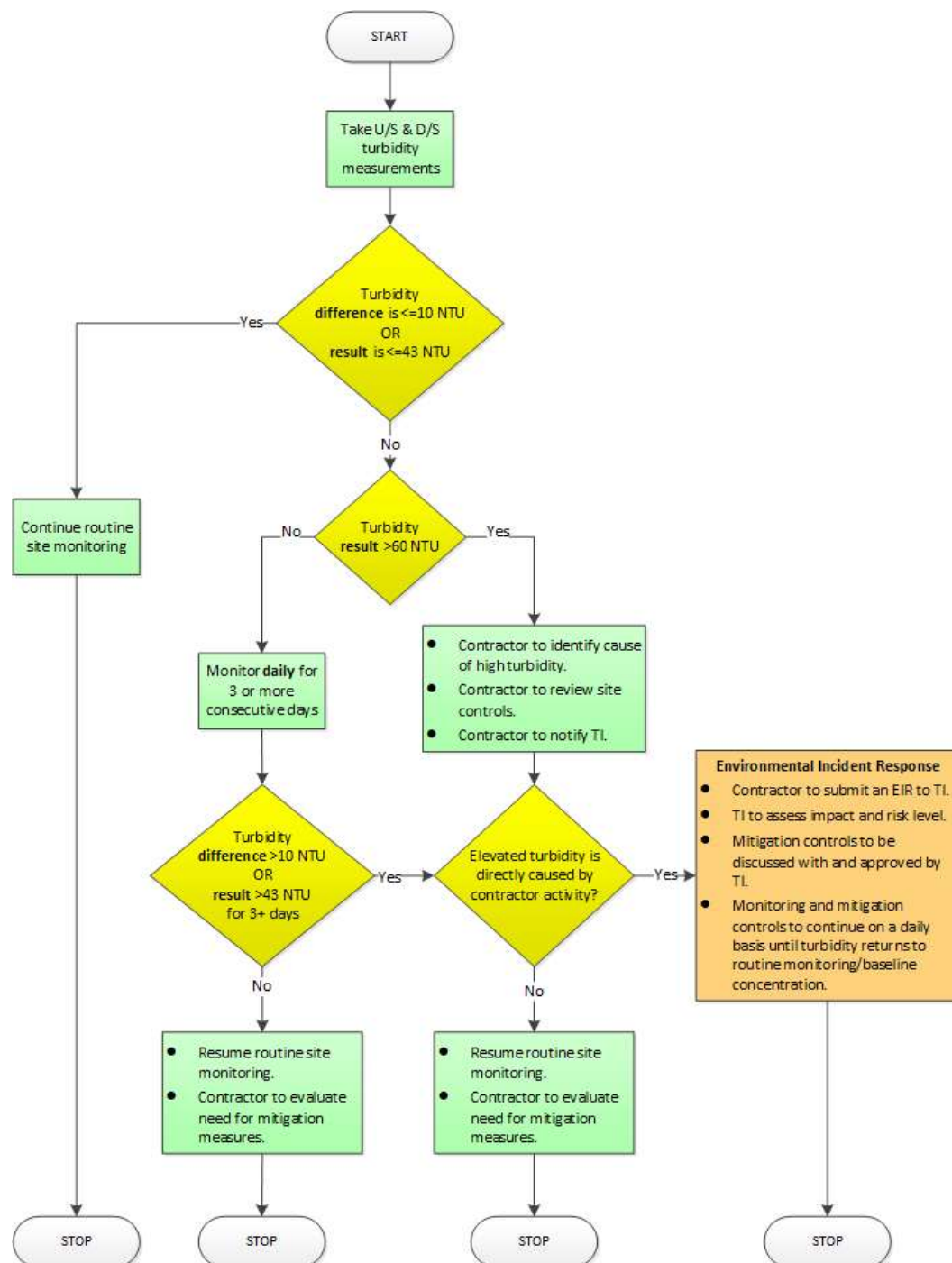


Figure 1: Northern Midlands Irrigation Scheme - Turbidity Management Framework

Appendix A1 – Water Crossing Schedule

Water Crossing Identifier	Pipeline Designation	Approximate Chainage Start	Approximate Chainage End	Pipe Size (DN)	Waterway Classification	Permanent or Transient	Waterway Name
WC-001	N1A	800	805	2x 1000	Tributary	Transient	
WC-002	N1A	905	910	2x 1000	Stream	Transient	
WC-003	N1A	1085	1090	2x 1000	Minor Tributary	Transient	
WC-004	N1A	1270	1275	2x 1000	Minor Tributary	Transient	
WC-005	N1A	1460	1465	2x 1000	Tributary	Transient	
WC-006	N1A	2165	2170	2x 1000	Tributary	Transient	
WC-007	N1A	2335	2340	2x 1000	Minor Stream	Transient	
WC-008	N1A	2520	2540	2x 1000	Major Stream	Permanent	Woodside Rivulet
WC-009	N1A	3005	3010	2x 1000	Stream	Transient	
WC-010	N1A	3220	3225	2x 1000	Tributary	Transient	
WC-011	N1A	3905	3910	2x 1000	Tributary	Transient	
WC-012	N1A	4090	4095	2x 1000	Minor Tributary	Transient	
WC-013	N1A	4160	4180	2x 1000	Stream	Permanent	Dairy Creek
WC-014	N1A	4480	4485	2x 1000	Minor Tributary	Transient	
WC-015	N1B	810	815	2x 1000	Minor Stream	Transient	
WC-016	N1B	1000	1005	2x 1000	Minor Tributary	Transient	
WC-017	N1B	1120	1125	2x 1000	Minor Stream	Transient	
WC-018	N1B	1690	1695	2x 1000	Tributary	Transient	

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Water Crossing Identifier	Pipeline Designation	Approximate Chainage Start	Approximate Chainage End	Pipe Size (DN)	Waterway Classification	Permanent or Transient	Waterway Name
WC-019	N1B	2380	2385	2x 1000	Minor Tributary	Transient	
WC-020	N1B	2790	2795	2x 1000	Minor Stream	Transient	
WC-021	N1B	3460	3465	2x 1000	Minor Tributary	Transient	
WC-022	N1B	3540	3545	2x 1000	Minor Tributary	Transient	
WC-023	N1B	4625	4660	2x 1000	Minor River	Permanent	Lake River
WC-024	N1B	4940	4985	2x 1000	Minor River	Permanent	Lake River
WC-025	N1B	6360	6365	2x 1000	Minor Tributary	Transient	
WC-026	N1B	6630	6635	2x 1000	Minor Tributary	Transient	
WC-027	N1B	6820	6825	2x 1000	Minor Tributary	Transient	
WC-028	N1B	7540	7550	2x 1000	Major Stream	Permanent	
WC-029	N1B	8270	8275	2x 1000	Minor Stream	Transient	
WC-030	N1B	9825	9830	2x 1000	Minor Tributary	Transient	
WC-031	N1B	10510	10515	2x 1000	Minor Tributary	Transient	
WC-032	N1B	10945	10950	2x 1000	Stream	Transient	
WC-033	N1B	11425	11430	2x 1000	Minor Tributary	Transient	
WC-034	N1B	11720	11725	1000	Minor Stream	Transient	
WC-035	N1B	12355	12360	1000	Minor Tributary	Transient	
WC-036	N2	475	480	1000	Tributary	Transient	
WC-037	N2	1270	1275	1000	Tributary	Transient	
WC-038	N2	1575	1620	1000	Major River	Permanent	Macquarie River

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Water Crossing Identifier	Pipeline Designation	Approximate Chainage Start	Approximate Chainage End	Pipe Size (DN)	Waterway Classification	Permanent or Transient	Waterway Name
WC-039	N2	1995	2000	1000	Minor Tributary	Transient	
WC-040	N2	2580	2585	1000	Minor Tributary	Transient	
WC-041	N2	2595	2600	1000	Minor Tributary	Transient	
WC-042	N2	2905	2910	1000	Minor Tributary	Transient	
WC-043	N2	3295	3300	1000	Minor Tributary	Transient	
WC-044	N2	3435	3440	1000	Minor Tributary	Transient	
WC-045	N2	3620	3625	1000	Minor Tributary	Transient	
WC-046	N2	5135	5140	1000	Tributary	Transient	
WC-047	N2	5705	5710	1000	Minor Tributary	Transient	
WC-048	N2	5715	5720	1000	Minor Stream	Transient	
WC-049	N2	5935	5940	1000	Tributary	Transient	
WC-050	N2	6445	6450	1000	Tributary	Transient	
WC-051	N2	6480	6485	1000	Tributary	Transient	
WC-052	N2	6510	6515	1000	Tributary	Transient	
WC-053	N2	6985	6990	1000	Tributary	Transient	
WC-054	N2	7640	7645	1000	Minor Stream	Transient	
WC-055	N2	9455	9465	1000	Major Stream	Permanent	
WC-056	N2	10315	10320	1000	Tributary	Transient	
WC-057	N3	235	240	1000	Tributary	Transient	
WC-058	N3	1215	1220	1000	Minor Stream	Transient	
WC-059	N3	2660	2665	1000	Minor Stream	Permanent	

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WC-060	N3	2765	2770	1000	Minor Tributary	Transient	
WC-061	N3	3830	3835	1000	Minor Tributary	Transient	
WC-062	N3	6475	6515	1000	Minor Tributary	Transient	
WC-063	N3	6790	6795	1000	Minor Tributary	Transient	
WC-064	N3	7015	7020	1000	Minor Tributary	Transient	
WC-065	N3	7100	7105	1000	Minor Tributary	Transient	
WC-066	N3	7165	7170	1000	Minor Tributary	Transient	
WC-067	N3	7295	7300	1000	Minor Tributary	Transient	
WC-068	N3	7575	7580	1000	Minor Tributary	Transient	
WC-069	N3	7665	7670	1000	Minor Tributary	Transient	
WC-070	N3	7640	7680	1000	Major Stream	Permanent	Blanchards Creek
WC-071	N3	8140	8150	1000	Major Stream	Permanent	Blanchards Creek
WC-072	N3	8390	8395	1000	Minor Tributary	Transient	
WC-073	N3	8450	8455	1000	Minor Tributary	Transient	
WC-074	N4	1295	1300	1000	Minor Tributary	Transient	
WC-075	N4	1395	1400	1000	Minor Tributary	Transient	
WC-076	N4	1995	2000	1000	Minor Tributary	Transient	
WC-077	N4	2095	2100	1000	Minor Tributary	Transient	
WC-078	N4	2185	2190	1000	Minor Tributary	Transient	

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WC-079	N4	4595	4600	4600	Minor Tributary	Transient	
WC-080	N5	3060	3065	900	Minor Tributary	Transient	
WC-081	N5	3900	3975	900	Farm Dam	Permanent	
WC-082	N5	5715	5720	800	Minor Tributary	Transient	
WC-083	N5	6155	6160	800	Tributary	Transient	
WC-084	N5	6680	6685	800	Minor Tributary	Transient	
WC-085	N5	7135	7140	800	Minor Tributary	Transient	
WC-086	N5	8440	8470	800	Minor River	Permanent	Elizabeth River
WC-087	N5	9680	9780	800	Farm Dam	Permanent	
WC-088	N5	10470	10475	800	Minor Tributary	Transient	
WC-089	N5	11395	11400	800	Tributary	Transient	
WC-090	N6	220	225	630	Minor Tributary	Transient	
WC-091	N6	565	570	630	Tributary	Transient	
WC-092	N6	1460	1465	630	Stream	Transient	
WC-093	N6	1820	1880	630	Major River	Permanent	Macquarie River
WC-094	N6	5195	5200	630	Minor Stream	Transient	
WC-095	N6	6070	6075	630	Tributary	Transient	
WC-096	N6	7005	7010	630	Stream	Transient	Abbotts Creek
WC-097	N7	0	10	630	Tributary	Transient	
WC-098	N7	735	740	630	Minor Tributary	Transient	

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WC-099	N7	790	795	630	Minor Tributary	Transient	
WC-100	N7	825	830	630	Minor Tributary	Transient	
WC-101	N7	2635	2640	630	Tributary	Transient	
WC-102	N7	5015	5020	560	Tributary	Transient	
WC-103	N7	5460	5465	560	Tributary	Transient	
WC-104	N7	5980	5985	560	Tributary	Transient	
WC-105	N7	7170	7175	560	Tributary	Transient	
WC-106	N7	7335	7340	560	Tributary	Transient	
WC-107	N7	7565	7570	560	Tributary	Transient	
WC-108	N7	7610	7615	560	Tributary	Transient	
WC-109	N7	7900	7905	560	Minor Stream	Transient	
WC-110	N7	8110	8115	560	Minor Tributary	Transient	
WC-111	N7	8855	8860	560	Minor Tributary	Transient	
WC-112	N7	8920	8925	560	Minor Tributary	Transient	
WC-113	N7	9035	9040	560	Minor Tributary	Transient	
WC-114	N7	9480	9510	560	Major River	Permanent	Blackman River
WC-115	N7	9620	9645	560	Major River	Permanent	Blackman River
WC-116	N7	9695	9720	560	Major River	Permanent	Blackman River
WC-117	N7	9745	9765	560	Minor Tributary	Transient	
WC-118	NA	390	395	200	Minor Tributary	Transient	

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WC-119	NA	1390	1440	200	Major River	Permanent	Macquarie River
WC-120	NB	1850	1860	400	Minor River	Permanent	
WC-121	NB	3475	3480	400	Tributary	Transient	
WC-122	B1	95	100	1000	Tributary	Transient	
WC-123	B1	655	660	1000	Tributary	Transient	
WC-124	B1	2535	2540	1000	Minor Tributary	Transient	
WC-125	B1	4395	4400	1000	Stream	Permanent	
WC-126	B1	5065	5070	1000	Minor Tributary	Transient	
WC-127	B1	5870	5875	1000	Minor Tributary	Transient	
WC-128	B1	5960	5965	1000	Minor Tributary	Transient	
WC-129	B1	6450	6455	1000	Tributary	Transient	
WC-130	B1	7115	7120	1000	Minor Tributary	Transient	
WC-131	B1	7285	7290	1000	Minor Tributary	Transient	
WC-132	B1	7580	7585	1000	Minor Stream	Permanent	
WC-133	B1	9355	9360	1000	Minor Tributary	Transient	
WC-134	B1	9435	9440	1000	Minor Stream	Transient	
WC-135	B1	10085	10090	1000	Minor Stream	Transient	
WC-136	B1	10735	10740	1000	Tributary	Transient	
WC-137	B1	11775	11780	1000	Stream	Permanent	Kingstone Rivulet

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WC-138	B1	11965	11975	1000	Tributary	Transient	
WC-139	B1	11975	12000	1000	Major Stream	Permanent	Isis River
WC-140	B1	13030	13035	1000	Minor Tributary	Transient	
WC-141	B1	15625	15630	1000	Tributary	Transient	
WC-142	B1	16370	16375	1000	Minor Stream	Transient	
WC-143	B1	16545	16550	1000	Minor Tributary	Transient	
WC-144	B1	17970	17975	1000	Minor Tributary	Transient	
WC-145	B1	18250	18255	1000	Minor Tributary	Transient	
WC-146	B1	18390	18395	1000	Tributary	Transient	
WC-147	B1	18670	18675	560	Tributary	Transient	
WC-148	B1	19035	19040	560	Minor Tributary	Transient	
WC-149	B1	19315	19320	560	Minor Tributary	Transient	
WC-150	B2	220	270	800	Major River	Permanent	Macquarie River
WC-151	B2	1035	1040	800	Minor Tributary	Transient	
WC-152	B2	1165	1170	800	Minor Tributary	Transient	
WC-153	B2	1425	1465	800	Minor Tributary	Transient	
WC-154	B2	3010	3015	800	Minor Tributary	Transient	
WC-155	BA	130	135	400	Tributary	Permanent	
WC-156	BA	1475	1480	400	Tributary	Transient	
WC-157	BA	1590	1595	400	Minor Tributary	Transient	

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WC-158	BA	1845	1850	400	Minor Tributary	Transient	
WC-159	BA	3295	3305	400	Tributary	Transient	
WC-160	BA	3715	3720	400	Tributary	Transient	
WC-161	BA	3785	3790	400	Minor Tributary	Transient	
WC-162	BA	3875	3880	400	Minor Tributary	Transient	
WC-163	BA	3965	3970	400	Minor Tributary	Transient	
WC-164	BA	4105	4110	400	Minor Tributary	Transient	
WC-165	BA	4175	4180	400	Minor Tributary	Transient	
WC-166	BA	4190	4200	400	Major Stream	Permanent	Isis River
WC-167	P1	300	305	800	Tributary	Transient	
WC-168	P1	3920	3925	800	Minor Tributary	Transient	
WC-169	P1	4510	4575	800	Major River	Permanent	Macquarie River
WC-170	P1	4925	4930	800	Minor Tributary	Transient	
WC-171	P1	5730	5735	800	Minor Tributary	Transient	
WC-172	P1	5825	5830	800	Minor Tributary	Transient	
WC-173	P1	5950	5955	800	Minor Tributary	Transient	
WC-174	P1	6765	6770	630	Minor Tributary	Transient	
WC-175	P1	8210	8215	630	Minor Tributary	Transient	
WC-176	P1	8435	8440	630	Minor Stream	Transient	
WC-177	P1	9325	9330	630	Minor Stream	Transient	

Construction Water Quality Management Plan

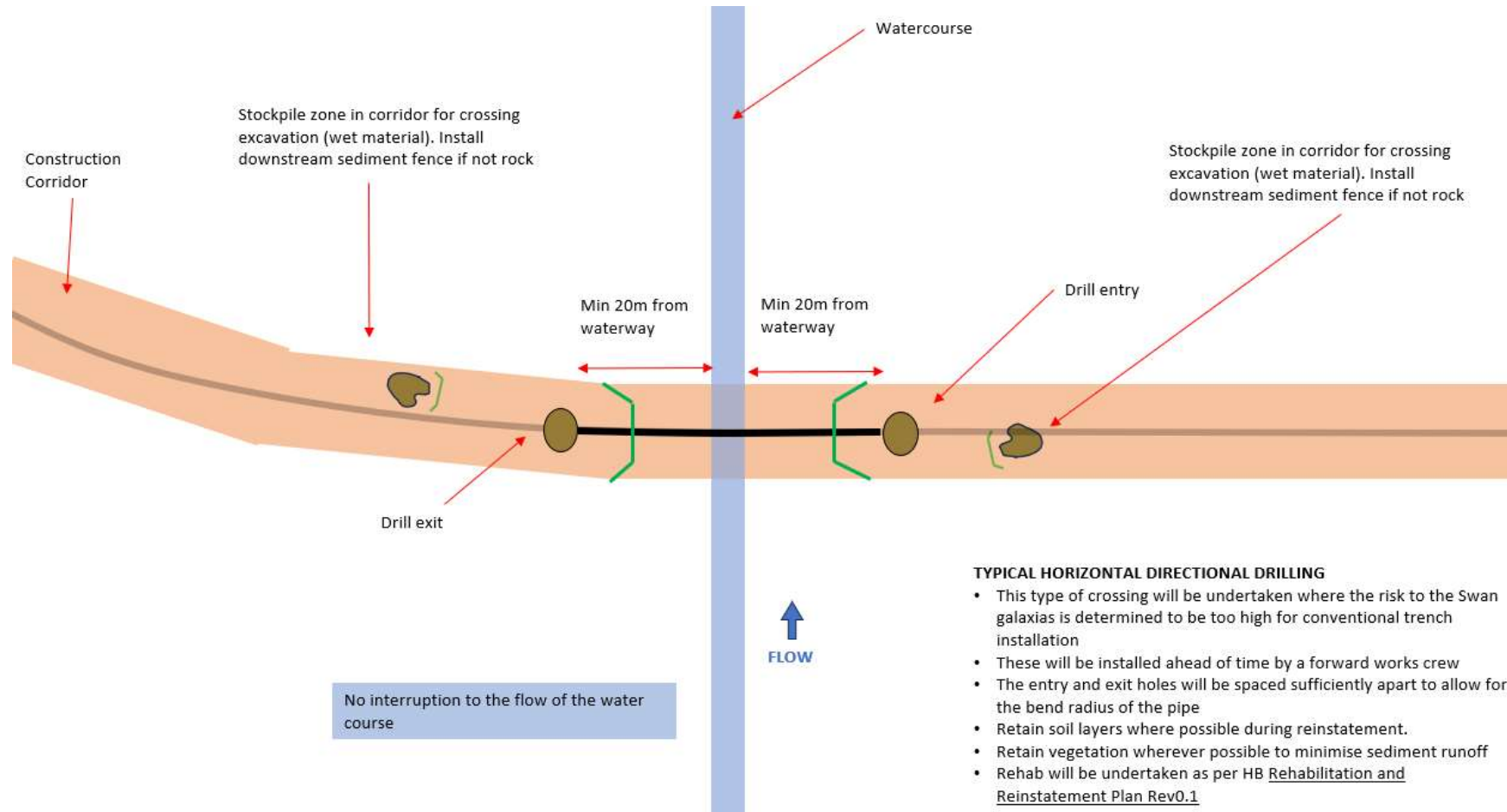


Northern Midlands Irrigation Scheme

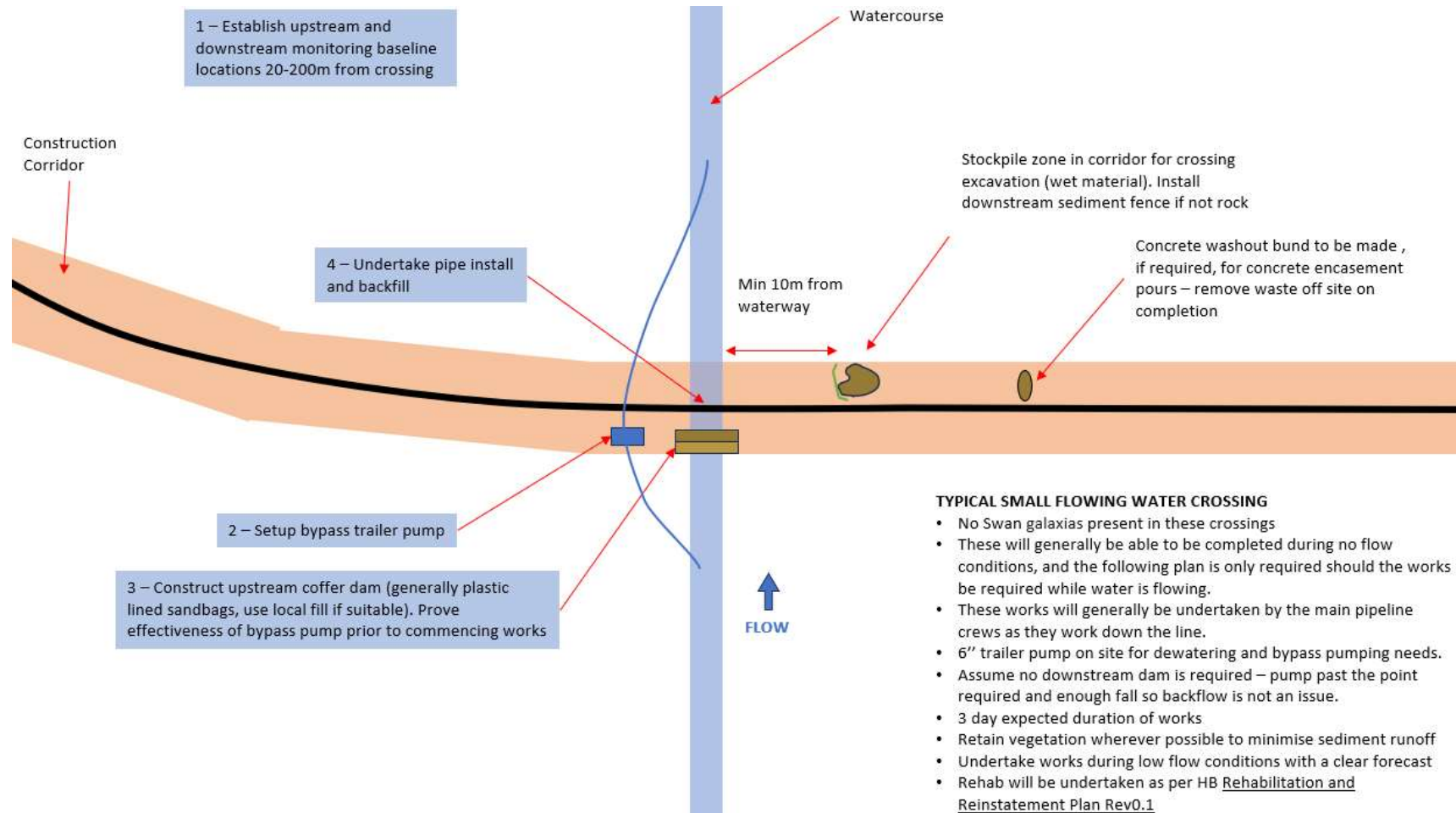
PLA-CST-003-C21150

Water Crossing Identifier	Pipeline Designation	Approximate Chainage Start	Approximate Chainage End	Pipe Size (DN)	Waterway Classification	Permanent or Transient	Waterway Name
WC-178	P1	10225	10230	630	Tributary	Permanent	
WC-179	P2	990	1010	355	Tributary	Transient	
WC-180	P2	1035	1040	355	Stream	Transient	
WC-181	P2	1780	1785	355	Minor Stream	Transient	
WC-182	E1	670	675	630	Tributary	Transient	
WC-183	E1	1785	1790	630	Minor Tributary	Transient	
WC-184	E1	2585	2590	630	Tributary	Transient	
WC-185	E1	3625	3630	630	Minor Tributary	Transient	
WC-186	E1	4430	4435	630	Major Stream	Transient	
WC-187	E1	4825	4830	630	Minor Tributary	Transient	
WC-188	E1	5855	5860	630	Minor Tributary	Transient	
WC-189	E1	6390	6395	630	Minor Stream	Transient	
WC-191	E1	7215	7220	630	Stream	Transient	
WC-192	EA	940	945	200	Minor Tributary	Transient	
WC-193	EA	960	965	200	Minor Tributary	Transient	
WC-194	EA	1015	1020	200	Minor Tributary	Transient	
WC-195	C1	0	5	630	Minor Tributary	Transient	
WC-196	CB	535	540	200	Minor Tributary	Transient	
WC-197	CB	995	1000	200	Minor Tributary	Transient	
WC-198	CB	1510	1515	200	Minor Tributary	Transient	
WC-199	CB	1575	1580	200	Minor Tributary	Transient	

Appendix A2 – Typical horizontal directional drilling environmental controls map



Appendix A3 – Typical transient (flowing) environmental controls map



Appendix A4 – Valleyfield Pump Station Site Plan

Construction Water Quality Management Plan

Northern Midlands Irrigation Scheme

Appendix A5 – Water Quality Monitoring Checklist (Example)

- Date/time (automatic)
- Sampler name (automatic)
- Site/Crossing No. (from list in Turbidity Management Framework - Table 1 Pipeline watercourse crossing locations with permanent flows)
- Construction phase
- PRE-construction ==> daily measurements required for at least one day before construction
- DURING construction ==> 3+ daily measurements required
 - before daily works
 - during daily works
 - after daily works
- at any time of a visible change D/S from site activities
- POST-construction ==> daily measurements required for at least one day after construction
- Site Conditions
 - Wind - nil, light, moderate, strong, gale
 - Cloud cover - nil, 1-25%, 25-75%, 75-99%, 100%
 - Current rainfall - nil, drizzle, showers, steady, downpour
 - Visual Observations - U/S and D/S of construction works site, including adjacent to and in the stream bed of the watercourse
 - Flow - no flow, slow, medium, fast, rapid, storage/dam
 - No flow = no turbidity measurements required; visual observation only. Appropriate E&SC must still be implemented. Check these.
 - Water level - falling, stable, rising
 - Water surface - smooth, choppy, rough
 - Clarity - clear, some sediment, moderate sediment load, high sediment load
- Comments
- Site photo – if anything unusual is observed
- Field Turbidity Measurements (NTU)
- Upstream result
 - (10 - 200 m upstream from water crossing works or potential sedimentation inputs from the site; D/S of any confluences with significant waterways)
- Downstream result
 - (20 - 200 m downstream of all construction sediment inputs (point and diffuse sources); U/S of any confluences with significant waterways)