17B AQUATIC ECOLOGY

17B.1 INTRODUCTION

This chapter provides further assessment and information on aquatic flora and fauna for the Supplementary EIS, in response to the completion of seasonal wet aquatic flora and fauna surveys, various submissions on the EIS, and refinements/modifications to the Project. The information presented builds on the EIS Volume 2, Chapter 17B Aquatic Ecology and should be read in conjunction with the EIS chapter.

Further detailed information is located in an Addendum to the aquatic ecology technical report relating to the Supplementary EIS, presented in TR 17B-1-SV2.5 Southern Coal Seam Methane Water Supply Pipeline, Aquatic Ecology.

17B.2 METHODOLOGY OF ASSESSMENT

17B.2.1 RELEVANT LEGISLATION

The legislation and guidelines relevant to aquatic ecology were described in EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.2 and the associated technical report, and Addendum to the technical report STR 17B-1-SV1.5.

In summary:

- the Project is highly unlikely to impact on any listed rare or threatened aquatic species or communities
- the Project is highly unlikely to impact on any wetlands of national, state or regional significance
- an approval through the *Integrated Planning Act 1997*, under the provisions of the *Water Act 2000*, will be required for the construction of pipeline crossings of watercourses
- approvals under the *Integrated Planning Act 1997* for construction of waterway barrier works, as outlined in Division 8 of the *Fisheries Act 1994*, are likely to be required for the construction of the pipeline if the waterways are temporarily bunded e.g. by the use of coffer dams.

17B.2.2 DESCRIPTION OF STUDY AREA

The proposed route for the southern pipeline is as presented in the EIS, with the exception that the preferred alignment for the northern section (north of Giligulgul) now runs from the northern end of Bailey's Road north along the Leichhardt Highway to the south-eastern corner of MLA 50230. The methodology for route selection is discussed in the Supplementary EIS, Volume 2, Chapter 2 Project Need and Alternatives, section 2.5.1.

The preferred northern pipeline route is located in the Dawson River Catchment. Waterways crossed by the revised section of pipeline include Six Mile Creek and at least seventeen minor tributaries of Juandah Creek, many of which are channels within a large floodplain area.

17B.2.3 STUDY METHODOLOGY

Aquatic floral and faunal wet season surveys and collection of water quality data were repeated along the pipeline route from the 3rd to the 12th February 2009.

Study sites

Twenty-two sites on waterways crossed by the proposed pipeline route were surveyed, as shown in Figure 17B-1-SV2.3 and Table 17B-1. Wet season surveys were completed at the eight sites that held water and dry crossing locations were revisited. These surveys were generally completed at the same location as in the dry season (August 2008) with the following exceptions:

- Site 5a located at the proposed pipeline crossing of Dogwood Creek
- Sites 19, 20 and 21 located on the amended northern portion of the proposed pipeline.

All waterways north of site 21 to the boundary of the MLA areas were dry at the time of survey (including Six Mile Creek), and habitat at each crossing was consistent with that at Sites 19 to 21. Therefore, habitat assessments were not repeated at every crossing location, rather, brief field notes and photographs were taken.

Table 17B-1:Study sites on the proposed southern coal seam methane water supply pipeline alignment

Crossing Number	Channel name	Survey completed		Location (UTM, GDA 94, Zone 56J)	
		Dry season (August 2008)	Wet season (February 2009)	Easting	Northing
4	Tributary to Dogwood Creek	Dry, habitat descriptions only	Dry, no habitat changes	221 873	7 051 744
5	Dogwood Creek	Habitat, water quality and aquatic flora and fauna	Not surveyed, replace with Site 5a at crossing location	219 858	7 049 837
5a	Dogwood Creek	—	Habitat, water quality and aquatic flora and fauna	221 200	7 051 839
6	Dogwood Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	219 216	7 048 343
7	Tributary to Eleven Mile Creek	Dry, habitat descriptions only	Dry, no habitat changes	217 315	7 055 369
8	Tributary to Eleven Mile Creek	Dry, habitat descriptions only	Dry, no habitat changes	216 871	7 056 204
9	Wallan Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	215 832	7 058 483
10	Nine Mile Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	215 115	7 060 738
11	Tributary to Eleven Mile Creek	Dry, habitat descriptions only	Dry, no habitat changes	213 744	7 062 528
12	Eleven Mile Creek	Dry, habitat descriptions only	Dry, no habitat changes	212 860	7 063 034
13	Tributary to Nine Mile Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	209 572	7 065 554
14	Tributary to Nine Mile Creek	Dry, habitat descriptions only	Dry, no habitat changes	208 828	7 067 415
14a	Tributary to L Tree Creek	Dry, habitat descriptions only	Dry, no habitat changes	207 921	7 069 373
14b	Tributary to L Tree Creek	Dry, habitat descriptions only	Dry, no habitat changes	207 420	7 071 372
15	Tributary to L Tree Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	207 395	7 071 544
16	L Tree Creek	Habitat, water quality and aquatic flora and fauna	Habitat, water quality and aquatic flora and fauna	207 502	7 073 845
16a	Tributary to Juandah Creek	Dry, photographs only	Dry, no habitat changes	206 115	7 074 312
17	Tributary to Juandah Creek	Dry, habitat observations only	Dry, no habitat changes	204 251	7 079 579
18	Juandah Creek	Dry, habitat observations only	Dry, no habitat changes	204 909	7 081 153
19	Tributary to Juandah Creek	—	Habitat, water quality and aquatic flora and fauna	206 478	7 085 487

Crossing Number	Channel name	Survey completed		Location (UTM, GDA 94, Zone 56J)	
		Dry season (August 2008)	Wet season (February 2009)	Easting	Northing
20	Tributary to Juandah Creek	—	Dry, habitat observations only	206 450	7 088 511
21	Tributary to Juandah Creek	—	Dry, habitat observations only	205 831	7 090 694

Methods

Unless otherwise noted, the methods adopted for the wet season aquatic floral and faunal survey, encompassing aquatic habitat, water quality, aquatic flora, aquatic macro-invertebrates, fish, turtles and other aquatic vertebrate communities, are the same as those for previous surveys as described in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.2.3. A detailed description of all variations to the study methods is provided in the Addendum to the technical report (Supplementary EIS Volume 2, STR 17B-1-SV2.5).

Aquatic habitat

Habitat assessments and observations were not repeated at sites that remained dry in the wet season.

Water quality

Water quality data was collected to describe conditions at each site at the time of survey and thus aid in the interpretation of biological data. There was no flow during either the dry (August 2008) or wet (February 2009) season surveys, therefore an assessment of water quality under baseflow conditions could not be made. For a description of water quality, refer to the surface water quality impact assessment technical report, included in the EIS Volume 2, Chapter 11 Water Supply & Management (TR 11-1-V2.5).

The *Queensland Water Quality Guidelines* (QWQG) apply to water quality sampled under normal baseflow conditions, and the use of these guidelines is not appropriate for assessment of the physical water quality and other parameters such as nutrient levels in small isolated pools (EPA 2007a).

Turtles and other aquatic vertebrate communities

At sites where water depths were suitable, five large baited cathedral traps were set along the bank and adjacent to cover (vegetation, snags etc.) for a minimum of two hours. The design of the traps was consistent with traps used by the DERM turtle research group and in previous surveys (EIS Volume 2, TR 17B-1-V2.5 Aquatic Ecology Impact Assessment). Turtles captured or observed were identified to species level and a photographic record was kept. The sampling of turtles was conducted under Scientific Purposes Permit WISP05080608 and Animal Ethics Approval No. CA 2006/03/106.

Limitations

The assessment of impacts has been updated where appropriate, based on the results of the wet season field survey (February 2009), and on changes to the pipeline alignment.

Waterways crossed by the alignment for the northern portion of the proposed pipeline and Site 5a on Dogwood Creek, which could not be surveyed due to property access restrictions, were only assessed in the wet season. This does not have a significant impact on the interpretation of results or the assessment of impacts, as habitat at these sites were consistent with the other sites surveyed, and seasonal variation in aquatic flora and fauna communities at these sites is expected to be similar to that at the other sites surveyed in both the dry and wet seasons.

17B.3 EXISTING ENVIRONMENT

Unless otherwise noted, the wet season aquatic floral and faunal environment, encompassing aquatic habitat, water quality, aquatic flora, aquatic macro-invertebrates, fish, turtles and other aquatic vertebrate communities, is largely the same as that described the EIS Volume 2, Chapter 17B Aquatic Ecology,

section 17B.3. A detailed description of the wet season aquatic environment is provided in the Addendum to the technical report, STR 17B-1-SV2.5.

17B.3.1 AQUATIC HABITAT

Sites surveyed along the proposed pipeline typically have a moderate River Bioassessment Program habitat assessment score, both in the dry (August 2008) and early wet (February 2009) seasons.

Habitats on the waterways crossed by the revised northern portion of the proposed pipeline are similar to other smaller, dry watercourses further south. Generally the aquatic habitats are in similar condition to those found throughout the wider catchment.

17B.3.2 WATER QUALITY

There was no flow during either baseline survey events, and the sites sampled were characterised by isolated pools. Man-made structures such as culverts created artificial pool habitat at some sites, such as in Dogwood Creek and a number of the creeks crossed by the Leichhardt Highway.

A description of the wet season water quality results for temperature, dissolved oxygen, pH and electrical conductivity, and a comparison with dry season results is provided in the Addendum to the technical report STR 17B-1-SV2.5.

17B.3.3 AQUATIC FLORA

In the wet season survey, the majority of aquatic macrophytes were native, diversity was generally high, and coverage at each site was generally greater than 38%.

The number of species found across the study area increased substantially from nine species in the dry season (August 2008), to 20 species in the wet season (February 2009). Floating and submerged growth forms were found in the wet season, while only emergent forms were found in the dry season.

The common rush (*Juncus usitatus*) was the most commonly occurring macrophyte, which was present at five of the eight sites sampled during the wet season. The coverage of any one species was generally less than or equal to 20% at all sites sampled in the wet season.

17B.3.4 AQUATIC MACRO-INVERTEBRATE COMMUNITIES

Non-biting and phantom midge larvae, diving beetles and water bugs dominated the macro-invertebrate communities of the study area in both the dry and wet seasons. These taxa are tolerant of a range of environmental conditions and are common in systems with poor or degraded habitats (Chessman 2003).

The calculated index scores for taxonomic richness, PET richness and SIGNAL 2 results are similar for both the dry and wet seasons.

Macro-crustacean communities

A total of 505 macrocrustaceans from at least four different species were captured across the eight sites surveyed in the wet season. The species richness was consistent between seasons at most sites, except at Wallan Creek (Site 9) and a tributary of Eleven Mile Creek (Site 10), where richness has decreased slightly from the dry to the wet season. In the wet season, abundance was greatest at Eleven Mile Creek (Site 10) and the culvert on the Leichardt Highway (Site 19), where between 175 and 215 individuals were captured per site.

The freshwater yabby (*Cherax destructor destructor*) was the most common species, recorded at seven of the eight sites surveyed.

Table 17B-2:Abundance of macro-crustaceans sampled at each site (all survey methods combined in the dry (August 2008) and wet (February 2009) season surveys

Family/*Species*	Common name	5		5a	6		9		10	13		15		16		19
		Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Wet
Atyidae																
Caradina sp.	freshwater shrimp	5	2	—	2	1	13	1	196	—	—	—	—	—	—	—
Paratya sp.	freshwater shrimp	48	—	6	—	64		21	—	2	—	—	—	—	—	—
Palaemonidae																
Macrobrachium sp.	river prawn	—	—	1	—	3	1	3	—	—	—	—	—	—	—	—
Parastacidae																
Cherax destructor destructor	Common freshwater yabby	—	—	—	5	3	6	17	19	—	13	9	20	17	53	175

Aquatic macro-invertebrate summary

The structure of aquatic macro-invertebrate communities in the study area was representative of poor to moderate habitat and/or water quality during both seasons. Differences in macro-invertebrate community structure appeared to be related to site-specific differences in habitat complexity, with very large differences between communities in bed and edge habitats. There were no consistent differences between seasons.

Macro-invertebrate communities of Dogwood Creek are more indicative of moderate habitat conditions than those sampled in smaller tributaries within the sub-catchment. The larger waterways in the study area are likely to have more permanent water, and therefore offer more stable habitat for macro-invertebrates. In contrast, the communities living within the smaller creeks of the study area are influenced by harsh and variable physical conditions, such as the drying of pools, so are more indicative of communities found in these ephemeral or intermittent waterways.

17B.3.5 FISH COMMUNITIES

In total, 2,641 fish from eleven species were captured across the eight sites where water was present in the wet season. Species richness varied among sites from zero to seven species. In the wet season, fish abundance also varied among sites, from no fish at L Tree Creek (Site 16) and the road culvert on the Leichardt Highway (Site 19), to 1,901 fish caught in the tributary to Nine Mile Creek (Site 13). High numbers of fish at some sites may reflect the perennial nature of the pools and serves to highlight the importance of these areas as fish habitat.

All life history stages (juvenile, intermediate and adult) were captured for most species (Agassiz's glassfish, bony bream, carp gudgeons, spangled perch, Australian smelt, and mosquitofish). Across the study area, intermediates were the most abundant life history stage for most species of fish. The largest species (on average, in terms of length) was common carp and the smallest species' (on average, in terms of length) were carp gudgeons and Australian smelt.

Difference in the richness and abundance of fish among sites is probably related to site-specific factors such as pool size, and the availability and suitability of habitat features such as large woody debris. For example, where the quality of habitat was good, there was commonly a high diversity of fish (Dogwood Creek Sites 5a and 6). Conversely where habitat quality was poor, fish assemblages were less diverse (e.g. the tributary to L Tree Creek, Site 15).

Three introduced species (i.e. goldfish, common carp and mosquitofish) were captured during the survey. In total, 287 introduced fish were captured at five of the six sites surveyed. No introduced species were captured at L Tree Creek (Site 15) during the dry and wet season surveys. Introduced species account for 26% of the total catch at Dogwood Creek (Site 5) and 41% at Eleven Mile Creek (Site 10).

Carp gudgeons were the most widely distributed and abundant species during the dry and wet seasons. Less common species included Agassiz's glassfish, bony bream, spangled perch, common carp, Murray River rainbowfish, golden perch and Australian smelt, however many of these species were only caught in Dogwood Creek.

Fish community summary

No species listed as threatened were captured during the surveys.

Fish richness and abundance was generally higher in the wet season than the dry season. Seasonal differences in the richness and abundance of fish may be caused by variation in fish migration and dispersal behaviour between the dry and wet seasons (Pusey et al 2004). Table 17B-3 summarises the abundance of fish species at each site during both seasonal surveys.

17B.3.6 TURTLE AND OTHER AQUATIC VERTEBRATE COMMUNITIES

Krefft's river turtle (*Emydura macquarii krefftii*) was the only species of turtle captured or observed throughout the study area in the wet season survey. This species was only captured in Dogwood Creek, with one juvenile and one adult captured at Site 5a, and one adult captured at Site 6.

Based on available information, no aquatic amphibians or reptiles of conservation significance have been recorded from, or are likely to occur in the study area (DEWHA 2008a; EPA 2007b, 2008).

17B.3.7 SUMMARY OF AQUATIC ENVIRONMENTAL VALUES

The results of surveys in the wet season were consistent with those in the dry season. While the aquatic flora and fauna communities are spatially and temporally variable, the assessment of aquatic ecological Environmental Values (EV) remains unchanged and consistent with that presented in EIS Volume 2, Chapter 17B Aquatic Ecology and the associated technical report. The assessment of EVs at the new sites surveyed along the revised northern portion of the pipeline route is consistent with that made for the other sites surveyed.

No rare or threatened aquatic species were recorded during either survey period.

17B.4 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed pipeline development is as described in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.4, except for the revised northern portion from the northern end of Bailey's Road north along the Leichhardt Highway to the south-eastern corner of MLA 50230. The Supplementary EIS Chapter 6 Project Operations, section 6.2.1 describes the entire pipeline alignment, including the revised northern portion.

17B.5 POTENTIAL IMPACTS

The assessment of impacts presented in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.5 for the dry season survey are considered to be accurate and current based on the results of the wet season survey, except where substantiated in the following sub-sections.

17B.5.3 CONSTRUCTION OF CREEK CROSSINGS

Construction of temporary vehicle and permanent pipeline creek crossings will disturb bed and bank stability, leading to increases in localised erosion, potentially leading to increases in turbidity and sediment deposition, the impacts of which were outlined in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.5.3 and discussed further in the associated technical report.

The waterways crossed by the revised northern portion of the proposed pipeline are small order streams, predominantly located within a floodplain of Juandah Creek. These waterways do not contain any significant habitat, and are similar to the small order creeks crossed by the remainder of the pipeline alignment. As such, the likely consequence of impacts to these habitats is considered to be ecologically insignificant in a local and regional context. Nevertheless, mitigation of impacts to aquatic habitat is required.

Table 17B-3:Abundance of fish species at each site (all survey methods combined) sampled in the dry (August 2008) and wet (February 2009) season surveys

Family/*Species*	Common name	Site															
		5	5a	6		9		10		13		15		16		19	
		Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Ambassidae																	
Ambassis agassizi	Agassiz's glassfish									8	1,024	1	19				
Ariidae																	
Tandanus tandanus	eel-tailed catfish			1													
Clupeidae																	
Nematalosa erebi	bony bream	1		7	27												
	unidentified			1													
Cyprinidae																	
*Cyprinus carpio**	common carp*	1	1	1	1												
*Carassius auratus**	goldfish*	7	2	14			1	8	2	30	5						
Eleotridae																	
Hypseleotris spp.	carp gudgeon	117	144	23	74	36	71	76	19	107	815	12	49				
Melanotaeniidae																	
Melanotaenia fluviatilis	Murray River rainbowfish			1	8												
Melanotaenia splendida	Eastern rainbowfish		1														
Percichthyidae																	
Macquaria ambigua	golden perch					1	1										
Poeciliidae																	
*Gambusia holbrooki**	mosquitofish*	5	58		95	3	109	35	13								
Retropinnidae																	
Retropinna semoni	Australian smelt	3	29		12												

Family/*Species*	Common name	Site															
		5	5a	6		9		10		13		15		16		19	
		Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Terapontidae																	
Leiopotherapon unicolor	spangled perch			2			3		3	2	53		1				
TOTAL		134	235	50	217	40	185	119	37	147	1 897	13	69	0	0	0	0

**introduced species*

17B.5.4 SUPPLY AND STORAGE OF RAW WATER

In relation to the supply of raw water across river catchments, there is a theoretical possibility for inter-basin transfer of aquatic disease associated with the water supply option. However, the risk of inter-basin disease transfer is considered to be negligible for this Project because:

- CSM by-product water is sourced from sub-surface aquifers and is unlikely to contain aquatic diseases that are a threat to aquatic flora and fauna found in surface waters
- surface water from watercourses in the Condamine catchment should not at any time enter or mix with CSM by-product water used for this Project
- CSM by-product water should not be discharged into a watercourse without first being treated.

17B.5.7 THREATENED SPECIES AND ECOLOGICAL COMMUNITIES

As discussed in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.5.7, Murray Cod may be present in Dogwood Creek. However, they were not recorded during the dry or wet season surveys and the likelihood that they are present at the crossing location is low. Therefore, no impacts to threatened aquatic species or ecological communities are expected as a result of the Project, where the appropriate measures to avoid, minimise or mitigate impacts to riparian and aquatic habitat are followed.

17B.6 MITIGATION MEASURES

The assessment of appropriate measures to avoid, minimise and mitigate impacts of the proposed pipeline as presented in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.6 are considered to be accurate and current based on the results of seasonal surveys and the nature of the changes to the pipeline alignment, except where discussed below.

17B.6.3 CREEK CROSSINGS

Construction of creek crossings

This section has been updated in accordance with AS2885: Pipelines – Liquid Gas and Petroleum and the Australian Pipeline Industry Association Code of Environmental Practice (APIA 2009). In addition to the mitigation measures discussed in the EIS and aquatic ecology technical report, which are consistent with the objectives of the standard and code of practice, additional mitigation measures to minimise the impacts associated with the construction of creek crossings could include:

- following existing road corridors, which is being done for the majority of the southern CSM water supply pipeline
- the avoidance of sensitive or problem soil/geotechnical areas, such as contaminated soil, where practicable
- recontouring, revegetation and rehabilitation of pipeline corridors and the banks of watercourse crossings
- observation of flood and severe weather warnings on a daily and longer term basis during construction.

Pipeline installation will avoid drought refuge pools as far as practicable, and waterway barrier works approvals are likely to be required for the construction of temporary crossings and pipeline crossings where coffer dams are required for construction. Depending on the nature of the works required at each crossing, the works may be either assessable or self-assessable development under the *Integrated Planning Act 1997*. This will be determined for each crossing during the detailed design of the proposed pipeline, and applications will be made for development approvals where required.

The Wandoan Joint Venture (WJV) has committed to using underground (trenchless) pipeline installation techniques (such as drilling) for crossing of larger waterways holding water, such as Dogwood Creek. The use of these techniques will not impact on fish passage or aquatic ecology where the recommended mitigation measures outlined in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.6.3 are followed, with the addition of the following (APIA 2009):

- drilling muds shall consist of approved water based products or synthetic lubricants and shall be contained within the fluid circulation system during drilling
- drilling muds shall be recycled where practicable, or disposed of in accordance with regulatory requirements

- sediment and erosion control measures should be in place around bellholes and drill exit points.

Stranding of fish and other aquatic fauna

If an isolation method is used, fish and other aquatic fauna will become stranded once the work area is isolated. Stranded fish will be captured and translocated, following the DPI&F *Fish Salvage Guidelines* (DPI&F 2004), as outlined in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.6.3. Captured fish will be relocated to suitable waterholes in the same waterway to prevent the transfer of exotic fish or aquatic disease.

17B.6.4 SUPPLY AND STORAGE OF CSM BY-PRODUCT WATER

As noted in section 17B.5.4, the risk of aquatic flora and fauna and their associated diseases being present in the CSM by-product water is considered to be negligible as the water is sourced from underground and will not be allowed to mix with surface water in the CSM water collection pond. Where practicable, the water will be stored in the CSM water collection pond which will be an isolated, secured area that does not allow mixing with surface water flows, humans, birds or other animals that could introduce aquatic species or diseases into the water.

Where storage in an isolated secured area is not possible, the supplier of the CSM by-product water will sample the water in the CSM water collection pond to determine what species are present, and therefore the risk posed to the aquatic ecology of the Fitzroy Basin if aquatic flora or fauna and potential associated diseases are translocated via the pipeline. Mitigation measures will be designed to address this risk, and will include ensuring that the supplied water is free from micro and macroalgae, macrophytes and aquatic fauna including seeds, eggs and larvae. This may be achieved in a number of ways, for example, by treating the water prior to supply, and/or screening at the pipeline intake. This is considered to be adequate and reasonable for the prevention of the transfer of species and aquatic diseases to the Fitzroy River Basin.

Additionally, to prevent aquatic disease transfer, no equipment that is used in surface waters in the Condamine Catchment, such as water quality meters or sampling equipment, will have contact with the CSM water or direct contact with surface waters of the Fitzroy River basin, unless it has been thoroughly cleaned with an appropriate chemical product.

17B.6.5 BITING INSECTS

The WJV commits to developing and implementing a biting insect management plan for the proposed pipeline. In brief, the biting insect management plan will be prepared in accordance with the Guidelines to Minimise Mosquito and Biting Midge Problems in New Development Areas (Queensland Health 2002). The plan will include, as required, consideration of the following:

- extent of potential mosquito and biting midge breeding habitat within the development footprint and surrounding areas
- mosquito and biting midge species likely to occur in the region
- incidence of arboviruses in the region
- extent to which construction and operation of the proposed pipeline will create mosquito and biting midge breeding habitat
- extent to which mosquitoes and biting midges will pose a threat to the health to construction crews, and visitors to and residents of the region
- opportunities available to minimise the incidence of mosquitoes and biting midges on the site, and
- recommended guidelines for the monitoring and control of mosquitoes and biting midges on the site.

17B.7 RESIDUAL IMPACTS

The residual impacts presented in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.7 are considered to be accurate and current, based on the results of seasonal surveys and the nature of the changes to the proposed pipeline alignment.

17B.8 CONCLUSIONS

Results of the wet season survey in the southern CSM water supply pipeline study area have not altered the assessment of environmental values or potential impacts of this component of the Project.

The assessment of potential impacts and mitigation measures is consistent with that presented in the EIS Volume 2, Chapter 17B Aquatic Ecology. In summary to the comments raised in EIS submissions:

- where the CSM water (and surface waters within the Fitzroy River basin) does not come into contact with surface waters from the Condamine Catchment, or equipment that has been used in the surface waters of the Condamine catchment, the risk of inter-basin transfer of noxious carp and aquatic disease is considered to be negligible
- the alignment of the proposed pipeline alignment along exiting road corridors, and the mitigation measures discussed in the EIS Volume 2, Chapter 17B Aquatic Ecology, section 17B.6 are consistent, with the objectives of AS2885: Pipelines – Liquid Gas and Petroleum and the Australian Pipeline Industry Association Code of Environmental Practice (APIA 2009)
- pipeline installation will avoid drought refuge pools where practicable, and waterway barrier works approvals are likely to be required for the construction of temporary crossings and pipeline crossings
- depending on the nature of the works required at each crossing, waterway barrier works may be either assessable or self-assessable development under the *Integrated Planning Act 1997*. This will be determined for each crossing during the detailed design of the proposed pipeline, and applications will be made for development approvals where required
- if an isolation method is used, stranded fish will be captured and translocated, in accordance with the *Fish Salvage Guidelines* (DPI&F 2004) and relocated to suitable waterholes in the same waterway to prevent the transfer of exotic fish or aquatic disease
- the WJV has committed to using underground (trenchless) pipeline installation techniques (such as drilling) for crossing of larger waterways holding water, such as Dogwood Creek, and
- the WJV has committed to developing and implementing a biting insect management plan for the proposed pipeline, which will be developed prior to the commencement of construction.

17B.9 REFERENCES

APIA 2009, *Australian Pipeline Industry Association Ltd. Code of Environmental Practices; onshore pipelines*, Australian Pipeline Industry Association Ltd.

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