
Planning and Environment Act 1987

SUGARLOAF INTERCONNECTOR PIPELINE

PROJECT IMPACT ASSESSMENT REPORT

REPORT OF THE ADVISORY COMMITTEE

TO:

**MINISTER FOR PLANNING - VICTORIA
FEDERAL MINISTER FOR THE ENVIRONMENT,
HERITAGE AND THE ARTS:**

Advisory Committee:

Kathryn Mitchell

Darrel Brewin

Stephen Hancock

Nick Wimbush

16 May 2008

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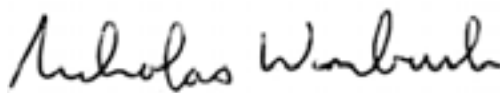
Kathryn Mitchell, Chair



Darrel Brewin, Member



Stephen Hancock, Member



Nick Wimbush, Member

16 May 2008

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EXECUTIVE SUMMARY

The Sugarloaf Alliance, comprising a partnership between Melbourne Water Corporation, SKM, GHD and John Holland Pty Ltd, propose to construct a 70 kilometre pipeline from the Goulburn River at Killingworth Reserve north of Yea, to the Sugarloaf Reservoir near Yarra Glen.

The pipeline is a major element of Victorian Government's water policy and will deliver up to 75 gigalitres of water per annum from the Goulburn River Catchment to Melbourne. The Government is investing significant funds in the Food Bowl Modernisation Project to update irrigation infrastructure in the Goulburn-Murray Irrigation District. It is anticipated that this project will save 225 gigalitres per annum of water in a normal irrigation year, of which one third has been allocated for Melbourne's water supply via the Sugarloaf Interconnector Pipeline.

The proposed pipeline route parallels the Melba Highway for most of its length. North of the Great Dividing Range the pipeline will be 1.75 metres in diameter (for 50 kilometres) and south of the Divide 1.404 metres in diameter (for 20 kilometres). Two pump stations will need to be constructed, a low lift pump station near the Goulburn River off take and a high lift pump station on the 'Sheoaks' property just south of Yea.

An 800 metre tunnel is proposed in the Toolangi Forest section to avoid construction across steep slopes above a narrow road cutting on the Melba Highway. Construction of the pipeline is proposed to be undertaken between July 2008 and September 2009.

The Minister for Planning determined in late 2007 that an Environment Effects Statement for the project would not be required, but that the Alliance must prepare and exhibit a Project Impact Assessment (PIA) report.

Additionally, the Federal Minister for the Environment, Heritage and the Arts determined that the pipeline proposal was a 'controlled action' under the Environment Protection and Biodiversity Conservation Act 1999, and must be assessed by an accredited assessment process.

The PIA was prepared and exhibited for four weeks in February and March 2008, and 104 submissions were received.

The Minister for Planning appointed an Advisory Committee under Section 151 of the Planning and Environment Act 1987 to consider the PIA and submissions, and to advise both the State and Commonwealth Governments of the environmental effects of the pipeline,

recommendations for a preferred pipeline route and any mitigation or offset requirements to minimise the environmental effects of the project. Terms of Reference were issued to guide the deliberations of the Advisory Committee. The policy decision to bring water south from the Goulburn River to Melbourne was not a matter for review by the Advisory Committee.

In the course of its investigations, the Advisory Committee held seven days of public hearings in the Yarra Valley and heard from the Alliance, Government authorities and agencies, municipal Councils, interest groups and individual submitters on their respective views on the project.

The Advisory Committee was required to consider a significant number of complex environmental, social and economic issues related to the project. In essence the Advisory Committee has concluded that the environmental effects of the preferred pipeline route as put to it in the hearings (known as the 'blue line') can be managed subject to improvements in the environmental and construction management frameworks for the project, further detailed site investigations and a comprehensive risk assessment process being undertaken.

The Advisory Committee acknowledges this is a difficult project. To realise the project with minimal environmental effects will require a very high level of project control to manage the risk to matters of national environmental significance, ecological values of State significance, local and sub-regional land and water systems, and impacts on the community along the pipeline alignment.

*After considering the PIA report, and the submissions made in response to it, the Advisory Committee recommends the adoption of the preferred pipeline route as **A3 – B1c - C3 – D2 - E1 (including 800 metre tunnel) – F3 – G6 – H2**. It makes a number of recommendations in support of this primary finding, one of which is that an independent auditor be appointed to oversee aspects of the pipeline construction and post reinstatement. Additionally, the impacts of the project on the local community must be carefully and sensitively managed.*

PART 1: BACKGROUND

1. INTRODUCTION

The Sugarloaf Interconnector Pipeline Project is an integral component of the Victorian Government's plan for securing Victoria's water supply and is part of the proposed Food Bowl Modernisation Project, which aims to capture up to 225 gigalitres (GL) of water currently being lost from the Goulburn Murray Irrigation System. These savings are proposed to be shared equally between irrigators, the environment and Melbourne.

This proposal relates to one third of those savings being directed to the Sugarloaf reservoir at Christmas Hills, through construction of a 70 kilometre long pipeline from the Goulburn River north of Yea, principally along an alignment that parallels the Melba Highway. This pipeline aims to capture up to 75 GL of water. An Advisory Committee has been appointed to assess the Project Impact Assessment report and to advise both the State and Federal Governments on the proposed route in accordance with the Terms of Reference.

1.1 The Advisory Committee

The Minister for Planning appointed the Advisory Committee on 18 February 2008 under the provisions of Section 151 of the *Planning and Environment Act 1987*, to consider the proposed Sugarloaf Interconnector Pipeline, and specifically, the Project Impact Assessment (PIA) report. The Advisory Committee comprised:

- Kathryn Mitchell: Chair
- Darrel Brewin: Member
- Stephen Hancock: Member
- Nick Wimbush: Member

The proponent for this project is the Sugarloaf Project Alliance (the Alliance), which is a partnership between Melbourne Water Corporation (MWC), Sinclair Knight Merz (SKM), Gutteridge Haskins Davey (GHD) and the John Holland Group Pty Ltd (JHD).

The Advisory Committee is required to provide advice in the form of a written report to the Minister for Planning and the Australian Government Minister for the Environment, Heritage and the Arts within four weeks of its last hearing day.

The Advisory Committee has been greatly assisted in its work by Michael Crossman, Panel Associate and Adrian Williams, Business Manager, both of Planning Panels Victoria (PPV).

1.2 Terms of Reference

The Minister for Planning issued Terms of Reference for the Advisory Committee on 15 February 2008 (see Appendix 1). The Terms of Reference provided background information on the proposal and then outlined its tasks at point 2:

The Advisory Committee is to investigate and provide advice in relation to the following key matters only:

- (i) The likely environmental impacts (effects) of the Sugarloaf Interconnector Pipeline project, in relation to each of the 'preferred' and 'non-preferred' corridor alignment options, the siting and design of ancillary infrastructure, and pipeline and infrastructure construction techniques which are identified in the PIA Report, as well as, if relevant, any feasible variations to these options that could reduce adverse impacts. Relevant environmental impacts include:*
 - those impacts associated with construction and operation of the pipeline;*
 - the downstream environmental impacts of the water off-take from the Goulburn River for transport through the pipeline; and*
 - relevant impacts with respect to the controlling provisions under the EPBC Act.*
- (ii) Recommendation of a preferred pipeline alignment and key construction techniques for each section of the route (A to H) from the off-take at the Goulburn River to the Sugarloaf Reservoir, as well as for the siting and design of ancillary project infrastructure.*
- (iii) The environmental mitigation, off-setting, monitoring and management measures needed to minimise adverse environmental effects of the project, including on matters of national environmental significance.*

The Advisory Committee should have regard to relevant provisions of Victorian legislation, policies, strategies and guidelines, as well as the EPBC Act and associated regulations and guidelines.

The Minister made it clear that the Advisory Committee should not consider Government policy in relation to its water strategies and said:

It must be noted that the strategic policy decision in relation to the intended allocation of water savings from the Goulburn-Murray Irrigation District is outside these Terms of Reference, and is not a matter for review.

Further, the Terms of Reference note that the Advisory Committee must prepare and submit a report to the Minister for Planning and the Australian Government Minister for the Environment, Heritage and the Arts that provides;

- (i) *a description of the project, places affected by the project and any significant environmental assets, including threatened species listed under the EPBC Act, that are affected or are likely to be affected by the project;*
- (ii) *a summary of the environmental impacts, including relevant impacts on threatened species listed under the EPBC Act, of the project options for the pipeline alignment and key construction techniques, as well as for the siting and design of ancillary project infrastructure, that are referred by the proponent;*
- (iii) *a description of feasible mitigation measures, and any changes to the preferred project or procedures to prevent or minimise environmental impacts on threatened species listed under the EPBC Act and any other significant environmental assets, either proposed by the proponent or suggested in public submissions to the Advisory Committee;*
- (iv) *to the extent practicable, a description of any feasible alternatives for the pipeline alignments and ancillary project infrastructure that have been identified by the Advisory Committee and the impact on threatened species listed under the EPBC Act, as well as their likely environmental implications in the context of State legislation;*
- (v) *recommendations for a preferred pipeline alignment and key construction techniques for each section (A to H) of the pipeline route from the off-take at the Goulburn River to the Sugarloaf Reservoir, as well as for the siting and design of ancillary project infrastructure;*
- (vi) *recommended conditions for environmental mitigation, off-setting and management measures, including monitoring, enforcement and review procedures, needed to minimise adverse environmental impacts of the project, including on threatened species listed under the EPBC Act.*

The Advisory Committee has prepared this report as a single document to respond to the relevant State and Federal Ministers and its Terms of Reference.

Whilst primarily considering the written material in the Project Impact Assessment and the written submissions in response, the Advisory Committee determined that it would hold public hearings on this matter as provided for in the Terms of Reference. After reviewing the submissions, it invited various groups to make a brief presentation to expand on their views as they related to the Terms of Reference.

1.3 Preliminary Work

At the commencement of its work, the Advisory Committee, at its own request, had a briefing from the Alliance on the scope of the proposed Sugarloaf Interconnector Pipeline. Those present included the four members of the Advisory Committee, Michael Crossman of PPV, Rod Clifford - Project Manager for the Alliance and Brad

Richards, Elizabeth Cleary and Jo Beatty, all from the Department of Sustainability and Environment (DSE).

The Advisory Committee then undertook a preliminary inspection of the proposed route of the pipeline on 12 and 13 March 2008, and held open that it may undertake further inspections as required at the conclusion of the hearing. At various stages of the initial inspections, the Advisory Committee was accompanied by representatives from the Goulburn Broken Catchment Management Authority, DSE and Yarra Ranges Shire Council, in order to assist it identify, for preliminary purposes, key sites and issues. No member or representative of the Alliance accompanied the Advisory Committee.

The Advisory Committee is grateful to those landholders who very kindly allowed it to view the pipeline route from their property.

1.4 Submissions and Hearings

The PIA was placed on public exhibition for one month, from 19 February to 18 March 2008. A total of 104 written submissions were received in response to this, and the name of each submitter is provided in Appendix 2. The Advisory Committee began its work at the commencement of the exhibition period.

Under **3 Procedures**, the Terms of Reference provide that:

The Advisory Committee will commence its investigations during the public exhibition of the PIA report.

The Advisory Committee is to consider:

- (i) the exhibited PIA Report;*
- (ii) any submissions received in response to the exhibited PIA Report;*
- (iii) the proponent's response to submissions, including a Project Refinement Report that may put forward minor changes to the proposed project works; and*
- (iv) other relevant information provided to or obtained by the Advisory Committee, at the discretion of the Advisory Committee.*

Written submissions that specifically respond to the tasks of these Terms of Reference will be the principal means of providing input to the Advisory Committee process.

The Advisory Committee will consider submissions 'on the papers' but at its discretion may invite particular submitters or groups of submitters to attend a public hearing to clarify their submissions and/or to enable dialogue and closer examination on particular matters. A public hearing, if held, is not to exceed 10 sitting days.

After reviewing the submissions, the Advisory Committee held a public hearing in relation to the proposal over seven days (2, 3, 8, 9, 10, 16 and 17 April 2008) in rooms

at Chateau Yering at Yarra Glen, during which time the following parties were represented and/or heard:

Submittor	Represented By
The Alliance	<ul style="list-style-type: none"> • Michelle Quigley SC, instructed by Allens Arthur Robinson, who called supporting information from: <ul style="list-style-type: none"> - Rod Clifford, (MWC) Project Director - Rod Cranston, (JHG) Alliance Project Manager - John Ware, GHD - David White, JHG - Tony Overman, SKM - Simon Treadwell, SKM - Peter Sandercock, SKM - Jeremy Barber, GHD - Tim Anderson, GHD - David Endersby, SKM - Chris Timewell, SKM - Tim Wells, GHD - Scott Graham, GHD - Bridget Cramphorn, SKM - David Cotterill, SKM - Paul Walsh, SKM - Barry Cook, GHD - Vanessa Edmonds, SKM - Andrew Costello, SKM - Corey Bannister, SKM - Daniel Gregor, GHD - Robert Stein, GHD - John Myers, SKM
Shire of Yarra Ranges	<ul style="list-style-type: none"> • Councillor Jeanette McRae • Councillor Samantha Dunn • Simon Thomas, Director Environment and Engineering • Marty White, Biodiversity Coordinator • Caroline Carvalho, Manager Environment • Mark Varmalis, Manager Civil Development Services • Alison Cran, Director Social and Economic Development
Murrindindi Shire Council	<ul style="list-style-type: none"> • Councillor Lyn Gunter, Mayor • Councillor Janet Gilmore, Deputy Mayor • Councillor Leanne Pleash • Michael Chesworth, Director Environmental Sustainability and Planning

Submittor	Represented By
Moira Shire Council	<ul style="list-style-type: none"> • Councillor Frank Malcolm, Mayor
Goulburn Broken Catchment Management Authority (GBCMA)	<ul style="list-style-type: none"> • Bill O'Kane, CEO • Guy Tierney, Floodplain Manager • Tim Barlow, Manager Biodiversity • Wayne Tennant, Manager Waterways and River Health • Tom O'Dwyer, By Laws Officer
DSE - Biodiversity	<ul style="list-style-type: none"> • Kimberly Dripps, Executive Director, Biodiversity and Ecosystems Services
Country Greens Network	<ul style="list-style-type: none"> • Louis Delacretaz
Balgownie Winery	<ul style="list-style-type: none"> • Des Forrestor
C4healesville	<ul style="list-style-type: none"> • Stephen Meacher
3717 Watch Inc	<ul style="list-style-type: none"> • Sally Abbot Smith • Pam McKenzie
Victorian National Parks Association	<ul style="list-style-type: none"> • Jenny Barnett
Glenburn Hall and Progress Association Inc	<ul style="list-style-type: none"> • Reg Staggard • Doug McArthur • Margaret Taylor
Healesville Environment Watch Inc	<ul style="list-style-type: none"> • Stephen Meacher • Maureen Bond • Jeanette McRae • Malcolm Calder • Ian Whitford
Yea River Catchment Landcare Group	<ul style="list-style-type: none"> • Ian Purcell
Yarra Glen and District Township Group	<ul style="list-style-type: none"> • Malcolm Calder
3775 Pipeline Group	<ul style="list-style-type: none"> • Fred Lyons • Graeme Miller
Yarra Valley Tree Group	<ul style="list-style-type: none"> • Barry Sheffield
Sugarloaf Sailing and Boating Club	<ul style="list-style-type: none"> • Harvey Sabine • Greg Bannister • John Mead
Gauri International Corporation P/L	<ul style="list-style-type: none"> • Rick Miles • Tony Dhar
Glendevlin Highland Cattle	<ul style="list-style-type: none"> • Jeff Spencer
Dilkusha Park Stud P/L	<ul style="list-style-type: none"> • Ivan Waters • Jim Viggers
Acheron Valley Watch Inc	<ul style="list-style-type: none"> • Rita Seethaler
Environment Victoria	<ul style="list-style-type: none"> • Juliet LeFeuvre

Submittor	Represented By
Steels Creek Landcare Group	<ul style="list-style-type: none"> • Ian Filsell
Yea Wetlands Committee of Management	<ul style="list-style-type: none"> • Russell Wealands
Plug the Pipe Group	<ul style="list-style-type: none"> • Jan Beer • Bob Richardson • Eril Rathjen • Ken Pattison • Lesley Fischer • Rodney Ridd • Roy Patterson • Bridget Clarke • Maria Reidl • Deb Bertalli • Ellen Hogan • Wayne Chamley
Community Submitters	<ul style="list-style-type: none"> • Christine Fyffe, MP, Member for Evelyn • Sharman Stone, Federal Member for Murray • Robert McGregor • Wendy Warnock • Iain McPherson • Phil Masters • Peter and Marianne Murray • Ian Scott • Ellen Hogan • Ann Jelinek • Jo Wormald • Don Lawson • Maria Riedl • Maria Riedl for Mary Chandler • Sally Abbott Smith • Bruce Nixon • Malcolm and Diane Towt • Brian and Lyn Mullins • Michelle Harper • Michelle Harper for John Flynn • Jim Noonan • Diana Oldfield • Richard Oldfield

The Advisory Committee thanks submitters for their contribution to the Committee and hearing process.

1.5 Approach to Report

The Advisory Committee was provided with a limited time to conduct this review. To meet its Terms of Reference it has approached consideration of the Sugarloaf Interconnector Pipeline and this report in the following way.

The Terms of Reference make it clear that the key role of the Advisory Committee is to review the PIA and the impacts of the preferred and non preferred route. The PIA report (February 2008) comprises a summary document, supported by 19 Appendices (numbered A to S). The Summary Document provides an overview of the project, with key components including the strategic context and project rationale; background to the project; project design, construction and maintenance; legislative approvals; environmental and technical investigations; stakeholder input; project assessment of the non-preferred, rejected and preferred corridor options; discussion on associated infrastructure; stakeholder engagement; and finally, environmental management and mitigation. The Appendices are presented as 19 discrete chapters to support the summary report, all of which are discussed in Part 2, Chapters 5 to 9 of this report.

In undertaking this work, the Advisory Committee saw little merit in providing a detailed assessment of the rejected and non preferred routes. The PIA clearly was prepared in a short space of time, and the information in it is continually being upgraded and amended. This made it difficult for submitters in particular to evaluate, as there were incomplete sections, and only those at the hearing would have been aware of the proposed changes and amendments to the report. As the hearing progressed it became increasingly obvious that further investigation work is required, especially in the areas of flora and fauna evaluation; risk identification, analysis and processes leading to risk management; traffic management; post construction maintenance; and social engagement and impact management.

The Alliance presented its final preferred route at the commencement of the hearing (this was commonly referred to the '*blue line*'). Most discussion related to this preferred route, so the Advisory Committee focuses most of its attention to this. It accepts that for various reasons, the non preferred routes are redundant.

In providing its response to the Minister for Planning and the Federal Minister for the Environment, Heritage and the Arts, the Advisory Committee has segmented this report in four key ways.

- **Part 1: Background** - This provides information about the Advisory Committee and its processes, a description of the proposal, the relevant State and Commonwealth legislation and planning control, and the community consultation process. (*Chapters 1 to 4*)
- **Part 2: Analysis of Effects and Impacts** - These sections of the report take each of the key issues addressed in the PIA (19 Appendices A to S), and discuss them in summary form as they relate to Physical Environment; Ecology; Social and Cultural Environment; Amenity and Infrastructure; and Risk and Environmental Management. In each of these chapters, the Advisory Committee has provided recommendations where applicable. (*Chapters 5 to 9*)
- **Part 3: Response to Terms of Reference** - These sections “*de-construct*” the Terms of Reference, and provide the findings of the Advisory Committee as they relate to the three tasks, namely the likely environmental effects; the preferred pipeline route; and mitigation, off-set, monitoring and management. It also summarises the response to matters of Commonwealth interest. The Advisory Committee provides additional recommendations where warranted in this part of the report. (*Chapters 10 to 13*)
- **Part 4: Conclusions and Recommendations** – this section provides the overall conclusions of the Advisory Committee and its specific recommendations. (*Chapter 14*)

1.6 The Role of the Advisory Committee

At the outset of the hearings the Advisory Committee made it clear that all submissions (and evidence) should focus on the tasks set out in Section 3 of the Terms of Reference. In particular, the Advisory Committee noted that it could not make comment or findings in relation to the policy decisions underlying the Sugarloaf Pipeline Project.

In spite of these opening remarks, many of the submissions focussed on the likelihood (or not) of the water savings being achieved, the Goulburn River downstream from Nagambie, the plight of irrigators with regard to existing water shortages, the impact of the project on the Goulburn River and Lake Eildon, and the alleged ‘*wrongness*’ of the Government’s policy position.

In addition to these submissions, many submitters raised particular concerns in relation to particular route options and possible construction impacts.

In its closing submissions, the Alliance, in responding to concerns raised by submitters about the community consultation processes, noted that essentially, the task for the Committee is to provide advice and make recommendations on its Terms of Reference. In paragraph 9 of its closing, the Alliance said:

This does not mean the Committee decides whether the Project proceeds or not. Rather, its report is to advise and make recommendations on the manner in which the project should proceed. The focus for the Committee is, and properly should be, those tasks set out by the Terms of Reference (notwithstanding the Committee's patience with submitters who persist in raising matters outside the Terms of Reference).

As mentioned, there was consistent and unrelenting criticism of the Terms of Reference and the role of the Advisory Committee, with the key concerns including:

- The proposal should have been assessed as part of an Environment Effects Statement;
- The time allowed for reading the PIA report and making a submission was inadequate;
- The work in the PIA was incomplete and did not allow for full consideration of the project;
- Additionally, work is still being undertaken and is not able to be assessed;
- There is no Environmental Management Strategy or Plan to review;
- Submitters are not able to debate the proposed water savings, where they will come from and whether the project is viable and feasible; and
- Issues relating to the downstream impacts below Goulburn Weir could not be reviewed.

Accepting that these issues are outside the Terms of Reference, the Advisory Committee acknowledges these concerns as raised by submitters.

The Committee therefore focuses on the process by which the preferred route has been finalised; including the veracity/adequacy of the investigations; the validity/integration of the parallel processes and whether it has appropriately integrated route selection and construction techniques; the extent to which State and Commonwealth policies and legislation have been adhered to; and the adequacy of planning of pipeline routes across individual landholdings with respect to avoid, minimise, off-set strategies.

1.7 Other Matters

(i) Key Issues

At the commencement of the hearing, the Advisory Committee noted that it had a number of key issues which it considered the Alliance should address during the course of the proceedings. These were tabled as Document 4 and included the following:

- *Timing of Aboriginal Cultural Heritage Management plan and its submission, and how it relates to the approvals process for this project.*
- *Full outline of project approval process and timing for such.*
- *Process for use/lease/acquisition of pipeline easement.*
- *Construction techniques proposed for shallow water table areas, including identification of the logistics of such operations in respect to Tunnel Boring/Pipe Jacking; excavation within shields and associated operations and time advance rates.*
- *Proposed tunnelling operations still under consideration.*
- *Proposals for ameliorating the potential for pipe bedding to redistribute interflow and or groundwater flow with consequence for soil moisture and or spring flow redistribution.*
- *Proposals for pipe trench and service road rehabilitation away from water way crossings including ongoing responsibility for maintenance and rectification of the development of unacceptable conditions.*
- *Views on independent construction and rehabilitation auditing and reporting as has been a feature of most major infrastructure projects in recent years.*
- *Traffic management arrangements, particularly in relation to the management of traffic on the Melba Highway.*
- *Current proposals and findings in relation to managing matters of National Environmental Significance.*
- *Current status and findings of further ecological survey work identified in the Project Impact Assessment.*
- *Proposals for erosion control, managing surface water runoff and sediment flow in the construction corridor, particularly on steep slopes.*
- *Measures for controlling off-site contamination, from escaping sediment, particularly into watercourses.*
- *Measures for guaranteeing protection of rare or endangered flora and fauna during construction.*
- *Approaches to surface rehabilitation with native vegetation cover to meet needs in the construction corridor.*
- *Spread of environmental and agricultural weeds in disturbed areas.*
- *Implications/limitations/accuracy of the fauna and flora survey carried out in a dry/drought season.*

- *Ongoing impacts of native vegetation fragmentation on native fauna.*
- *Impacts from increased predation opportunities for foxes and cats in pipeline corridor.*
- *Visual and landscape locations permanently impacted.*
- *Consolidation and making good of surface roads.*
- *The location and feasibility of providing adequate native vegetation offsets as per the native vegetation framework.*
- *Issues to be resolved prior to finalisation of the Environmental Management Plan.*

Additionally, the Advisory Committee would like the proponent to address the tasks as specifically set out in the Terms of Reference.

Some of these issues were addressed during the verbal presentations by the various consultants for the Alliance on Days 1 and 2 of the hearing. However, the Alliance responded formally to these through written responses, primarily as Documents 29 to 34.

(ii) Request for Adjournment

During the course of Day 1 of the hearing, Plug the Pipe requested an adjournment to the hearings, as it was concerned that the Alliance was providing new information that no other party had time to consider. The Committee responded that some of the information tabled and provided was due to specific requests of the Committee, while other work was recognised as being part of an ongoing process. The Committee did not support an adjournment and ruled that the hearings would proceed as scheduled.

(iii) Additional Site Inspections

Plug the Pipe requested that the Advisory Committee undertake further site inspections, particularly in areas outside of the proposed pipeline alignment and general corridor. Some of these areas included the Eildon Weir, areas of the Goulburn River (up or downstream) and parts of the Murray River.

The Committee initially declined to take up this invitation and the request was pursued and raised again by Plug the Pipe. The Committee then accepted the invitation on notice, and advised that it would hear all the submissions first, evaluate the issues raised and then make its decision. It did not announce its decision on this at the hearing, as it had not reviewed and assessed the relevant material. Some of the photographs and other visual material, including a video provided by Plug the Pipe and other submitters, was extremely useful in understanding the context of this proposal in the broader riverine environment.

Upon preparation of this report, the Advisory Committee has concluded that it has been provided with suitable information, and it has enough knowledge and understanding of the broad issues, without undertaking any further site inspections, especially in the wider region and in areas external to the proposed pipeline route. However, during the course of the hearing, and post-hearing, the Committee did re-visit a number of sites and areas along the route, particularly in Sections G and H.

(iv) Request to be Heard

On the final day of the hearings, two people who had not made a submission wished to be heard. The Committee declined this as the sole purpose of the hearing was to provide the opportunity for submitters to speak to their written submissions. Additionally, the office of Planning Panels Victoria had received some requests from others who wished to present to the Committee. These requests were also declined due to the fact that no written submission had been received.

(v) Mapping and Aerial Photography

During the course of the hearing process, the Committee became aware that some of the base aerial photography used was several years old. It asked the Alliance to verify the date of the aerial photographs, to which they replied they were using photographs dated January 2007 for areas north of the Divide and December 2004 south of the Divide. This is surprising for a project of this nature. The Committee is unable to understand why they did not use project oriented photography throughout to ensure that all buildings, structures, vegetation, fencing, roads, etc were included, particularly as much of the southern route lies over private property. Significant changes in structures and vegetation have occurred south of the Divide over that four year period. For example, the Balgownie Estate development on Gulf Road does not even appear on the aerial photography used.

Some submitters were concerned that particular features on their land would be impacted, yet the photography did not show these features.

The Advisory Committee considers the Alliance should have had the route flown with full colour and false colour infrared photography. This would have better assisted in identifying key ecological features and hydrology.

(vi) Commonwealth Referral

Following the conclusion of the hearing the Committee became aware that the Federal Minister for the Environment, Heritage and the Arts had released a Statement of Reasons regarding the controlled actions for the project. The Committee considered a direct response from the Alliance would be beneficial and appropriate, and it wrote to Mr Rob Skinner (Managing Director of Melbourne Water) on 5 May 2008 seeking that response. Additionally it also sought an update on the timing of the Cultural Heritage Management Plan and the Environmental Management Strategy and Environment Management Plans. A response was provided by Mr Skinner on 7 May. The Committee's letter, the Commonwealth Statement of Reasons and Mr Skinner's response are provided in Appendix 4. The attachments to Mr Skinners response have been posted on the DPCD (Planning – Sugarloaf link) website.

2. THE PROPOSAL

2.1 Background

In response to predicted future pressures on water resources relating to drought, climate change and increased population, the Victorian Government released the Water Plan “*Our Water, Our Future: the Next Stage of the Government’s Water Plan*” in June 2007. The Sugarloaf Pipeline is one of many components of this plan. Preliminary work on the Sugarloaf Interconnector Pipeline was then commenced.

In December 2007, the Minister for Planning determined that an Environment Effects Statement (EES) would not be required to consider this pipeline under the *Environment Effects Act 1978*, subject to a number of conditions (which are set out in the Advisory Committee’s Terms of Reference). One condition was that a Project Impact Assessment (PIA) report be prepared. In publishing reasons for his decision, the Minister noted that the PIA report is to be completed to the satisfaction of the Department of Planning and Community Development, in consultation with the Department of Sustainability and Environment, and:

- i. *this report is to incorporate studies on the potential environmental effects and environmental management of the project, including with respect to: flora and fauna, cultural heritage, land stability, landscape values, waterway environments, land use, social amenity;*
- ii. *further, the report is to incorporate a study assessing the environmental implications of transferring water savings from the Goulburn River, through an off-take via the Sugarloaf Interconnector, including:*
 - a. *the environmental implications of the water take-off for downstream environmental values, including any relevant matters of national environmental significance;*
 - b. *the rules for managing the water take-off;*
 - c. *relevant environmental management measures.*

The PIA report was exhibited between 19 February and 18 March 2008.

In further outlining his reasons for concluding that an EES was not warranted for this project, the Minister for Planning noted that:

- i. *the effects of the project on land uses, human communities and cultural heritage are unlikely to be significant at a State or regional level ...;*

- ii. *the diversion of 75 GL per year water from the Goulburn River Basin when the Sugarloaf Interconnector becomes operational is unlikely to have a significant effect ...;*
- iii. *potential effects on biodiversity, landscape, waterways and other matters are not likely to be so complex or significant as to warrant detailed scoping or major new studies;*
- iv. *the suite of Project Impact Assessment studies being prepared by the proponent, if completed to a satisfactory standard, can provide a suitable body of technical investigations ...; and*
- v. *an opportunity for public comment on the proposed pipeline route and supporting Project Impact Assessment studies ... can provide a sufficient form of consultation and review*

The proponent for this project is collectively known as the Sugarloaf Project Alliance. The PIA states that the responsibilities of the Alliance are to *“undertake planning and environmental assessments, engineering design, community and stakeholder consultation, construction and overall project management of the Sugarloaf Pipeline Project.”*

2.2 What is Proposed?

The proposed Sugarloaf Interconnector Pipeline Project (the project) involves a 70 kilometre pipeline (50km of 1.75m diameter north of the divide and 20km of 1.404m diameter south of the divide) to transfer water from the Goulburn River to Melbourne Water’s Sugarloaf Reservoir. The Project is designed to transfer a maximum of 100GL/yr from the Goulburn River, north of Yea, to the Sugarloaf Reservoir in the northeast of Melbourne. On average, it is expected that 75GL/yr will be available for transfer. The additional design capacity of the pipeline attempts to allow flexibility in managing the operational requirements of transferring 75GL/yr in accordance with flow constraints in the Goulburn River and treatment capacity constraints at the Winneke Treatment Plant at Sugarloaf Reservoir.

The transferred water will be sourced from the modernisation of irrigation infrastructure in the Goulburn-Murray Irrigation District. This program of irrigation modernisation works, known as the Food Bowl Modernisation Project, aims to allow water savings of up to 225GL annually by reducing water losses through leaks, evaporation and other inefficiencies in the Goulburn-Murray Irrigation District. The PIA states that these water savings will be shared equally between irrigators, the environment and Melbourne.

The project includes supporting infrastructure such as two major pump stations, associated power supply connections and balancing storage(s).

In July 2007 the estimated cost for construction of the Project was \$625 million, and this was later revised to \$750 million.

As proposed, the pipeline would be constructed predominantly on private land with some sections in road reserves, while the route through the Toolangi State Forest and across the Great Dividing Range would be on public land forest reserve.

To facilitate assessment, the PIA separates the project area between the Goulburn River and Sugarloaf River into 8 sections (Sections A to H), based on broad geographical divisions. The final preferred route ('the blue line') was presented at the hearing and is shown in Figure 1 below. The sections are as follows.

- **Section A – Goulburn River to Goulburn Valley Highway**

Section A extends between the Goulburn River at Killingworth and the Goulburn Valley Highway, on the east (left) bank of the Yea River flood plain, and is located within the Shire of Murrindindi.

- **Section B – Goulburn Valley Highway to Murrindindi Road**

Section B extends from the Goulburn Valley Highway to Murrindindi Road, approximately 8 kilometres south of Yea, within the Shire of Murrindindi. Land within this section is used primarily for rural residential and farming purposes.

- **Section C – Murrindindi Road (8km south of Yea) to Devlin Bridge**

Section C extends between Murrindindi Road and Devlin Bridge. The corridor is located in both private property and within the road reserve of the Melba Highway. Land within this section is used primarily for farming purposes and is located within the Shire of Murrindindi.

- **Section D – Devlin Bridge to High Voltage Power Easement**

Section D extends between Devlin Bridge and the High Voltage Power Easement, which crosses the Melba Highway on the east-west axis to the north of the Toolangi State Forest and the Great Dividing Range, in the Shire of Murrindindi. The corridor is located in both private property and in the road reserve of the Melba Highway, and it crosses the Yea River at Devlin Bridge.

- **Section E – High Voltage Power Easement to Healesville-Kinglake Road**

Section E extends from the High Voltage Power Easement to the Healesville-

Kinglake Road, within the Shire of Murrindindi. The pipeline corridor generally runs parallel to the Melba Highway and will cross the Yea River. Toolangi State Forest is located on the east side of the Highway, with the Kinglake National Park to the west. Within the State Forest, there are two quarries, one still operational and the other disused. Small private properties are located between the Castella and Healesville-Kinglake Roads. The Yea River runs parallel on the western side of the Melba Highway for approximately 7.5kms. The land between the river and the highway is State Forest. To the west of the Yea River is the Kinglake National Park. Further south there are smaller private properties.

- **Section F – Healesville-Kinglake Road to Hunts Lane**

Section F extends between Healesville-Kinglake Road (Toolangi State Forest) and Hunts Lane. This section is located within the Shire of Yarra Ranges. The corridor is located in Toolangi State Forest, private property and in the road reserve of the Melba Highway.

- **Section G – Hunts Lane to Eltham-Yarra Glen Road**

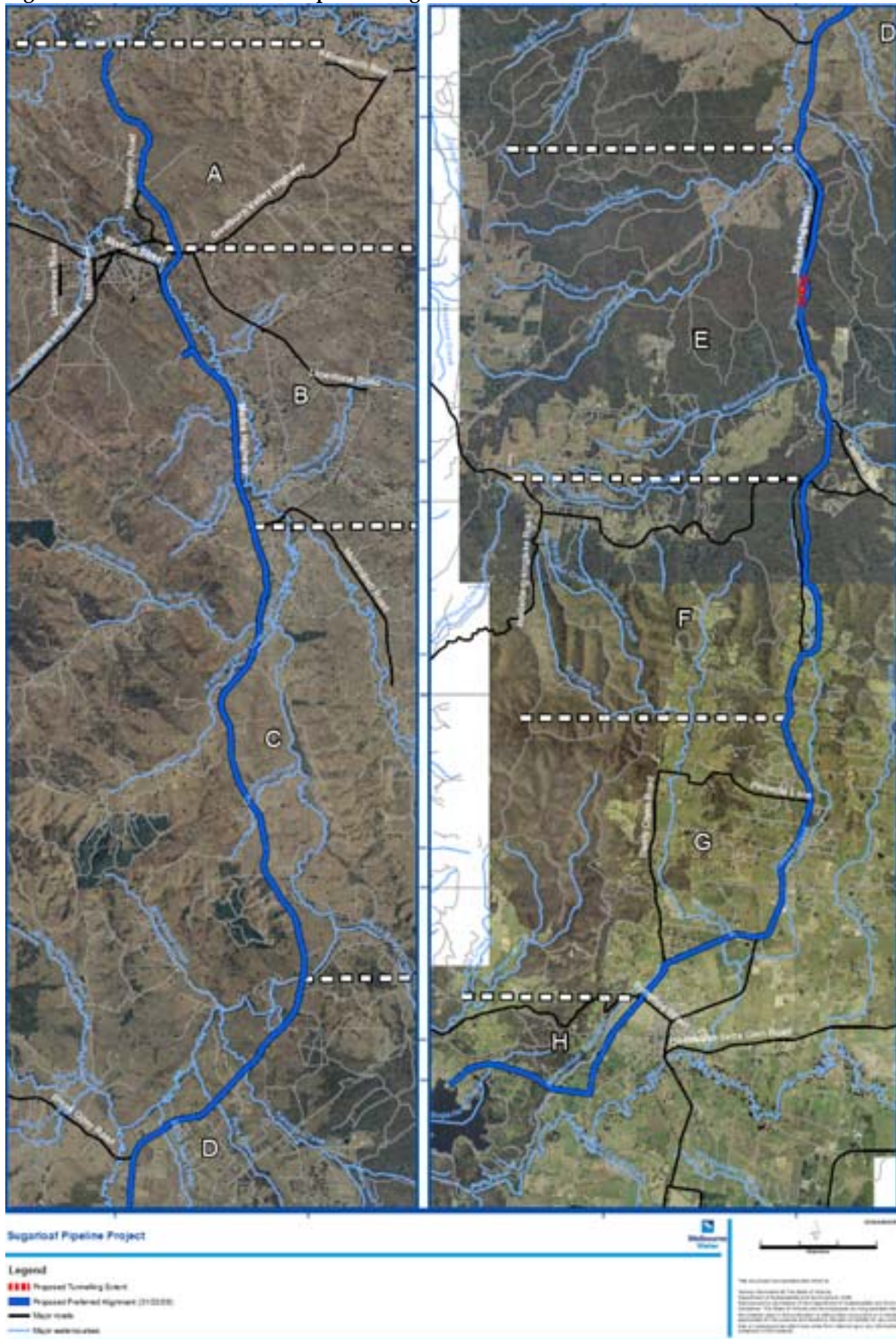
Section G extends between Hunts Lane and the Eltham-Yarra Glen Road, within the Shire of Yarra Ranges. The corridor is located within both private property and in road reserves.

- **Section H – Eltham-Yarra Glen Road to Sugarloaf Reservoir**

Section H is located between Yarra Glen and the Sugarloaf Reservoir Inlet. Most of this section is located within the Shire of Yarra Ranges, however land to the west of Skyline Drive is located within the Shire of Nillumbik. The pipeline corridor starts at the intersection of Eltham-Yarra Glen Road and follows the Glenview Road reserve south to the vicinity of Yarraview Road before turning west to cross private land, the Maroondah Aqueduct and the Yarra Fault escarpment to the boundary of Melbourne Water land surrounding Sugarloaf Reservoir (bounded by Skyline Road, Muir Road and Ridge Road).

The PIA states that a Triple Bottom Line (TBL) approach has been used in the process for selecting the preferred pipeline corridors. Using this TBL approach, the PIA sets out preferred pipeline corridors and the siting of major assets while *'considering impacts to the environment, potential social impacts and the practicability and cost of construction'*. The selection criteria were based around weightings of 60/20/20 in terms of economic, social and environment.

Figure 1: Preferred "Blue Line" Pipeline Alignment



2.3 Timing and Staging

During the course of the hearings, the Alliance tabled the *"Indicative Construction Sequencing"* (Document 74 and reproduced as Appendix 5) which provided an overview of the proposed construction schedule, including further survey work and key social/economic activities. The schedule highlights the following:

- There will be up to four 'pipeline crews' in operation at the one time, with work proposed to begin in July 2008 and finishing in late September 2009. Crew No 1 would start work within Section A in August 2008, and then move on to Section H at the start of April 2009, while Crew No 2 would work within Sections F and G from October 2008 to September 2009. Crew Number 3 would start work in sections B, C and D in July 2008 and continually work along the corridor until September 2009. And finally, Crew No. 4 would start work in Sections D, E and F in mid-August 2008 and work through until the end of August 2009.
- The Goulburn River pump station would be constructed across an eight month period between January and August 2009, while the high lift pump station would be built between February and September 2009.
- Work on the tunnel section in Section E would begin in August 2008 and be completed by the end of July 2009.
- Work on the major river crossings (including Yea River and Dixons Creek) would be undertaken across a 5 month period beginning December 2008 and completed in April 2009. Each crossing will take between 2 to 4 weeks to complete.
- Work on minor river crossings would be carried out across a six month period between November 2008 and April 2009.
- Major road crossings would be constructed between July 2008 and April 2009.

Further, it is noted that two further terrestrial and aquatic flora and fauna surveys will be conducted on isolated properties in August 2008 and between October and December 2008. As a result, pipe laying activities by certain work crews will not be continuous. The key aquatic events of Macquarie Perch spawning in the Yea River and Damsel fly in the Yea flood plain both occur from October 2008 to end of December 2008.

3. LEGISLATIVE AND POLICY FRAMEWORK

The following is an overview of the various State and Commonwealth legislation and policy affecting the project, as well as the approval processes and planning controls.

3.1 State Legislation

(i) *Planning and Environment Act 1987*

The *Planning and Environment Act 1987* provides a system of control for the use and development of land in Victoria. The Act is administered across Victoria via planning schemes created under this Act, and which set out specific detail on the types of uses and development that are permitted within each municipal area.

(ii) *Flora and Fauna Guarantee Act 1988*

The main objectives of this Act are to conserve the State of Victoria's flora and fauna, to manage potential threats, to ensure that any human use of flora and fauna is sustainable and to make certain that the diversity of Victoria's flora and fauna is maintained at its present level. The Act highlights its key role as the main piece of Victorian legislation that deals with the conservation of threatened species.

(iii) *Heritage Act 1995*

This Act establishes a framework for heritage protection in Victoria. It provides protection for a wide range of cultural heritage places and objects.

(iv) *Aboriginal Heritage Act 2006*

The *Aboriginal Heritage Act 2006* (Vic) replaced the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Comm.) and the *Archaeological and Aboriginal Relics Preservation Act 1972* (Vic.). Key features of the Act include:

- the creation of the Aboriginal Heritage Council, with membership of traditional owners who will advise on the protection of Aboriginal heritage;
- the use of cultural heritage management plans for certain development plans or activities;

- the ability for registered Aboriginal parties to evaluate management plans, advise on permit applications, enter into cultural heritage agreements and negotiate the repatriation of Aboriginal human remains; and
- alternative dispute resolution procedures.

(v) *Road Management Act 2004*

The *Road Management Act 2004* establishes a coordinated management system for public roads that will promote safe and efficient State and local public road networks and the responsible use of road reserves for other legitimate purposes, such as the provision of utility services.

(vi) *Crown Land (Reserves) Act 1978*

The *Crown Land (Reserves) Act 1978* is the principal legislation dealing with the reservation and management of Crown lands in Victoria.

(vii) *Land Act 1958*

The *Land Act 1958* governs the management and disposition of unreserved Crown land, including the granting of leases and licences over unreserved Crown land for commercial, industrial, agricultural and other purposes.

(viii) *Land Acquisition and Compensation Act 1986 (LACA)*

The *Land Acquisition and Compensation Act 1986* sets out methods for acquiring interests in land (freehold and easements).

(ix) *Wildlife Act 1975*

The purposes of the *Wildlife Act* are in summary, to protect and conserve native wildlife and to regulate the conduct of persons engaged in activities relevant to wildlife. All native wildlife is protected under the Act unless otherwise exempted.

(x) *Fisheries Act 1995*

This Act provides for the regulation, management and conservation of Victorian fisheries including aquatic habitats.

(xi) *Forest Act 1958*

The *Forest Act 1958* sets out that approval is required to occupy land within the State

Forest on a permanent basis.

(xii) *Water Act 1989*

Under Section 1, the stated purposes of the Act are to provide for the integrated management of the terrestrial phase of the water cycle, its conservation and management for sustainable use, community involvement in the pursuit of those objectives, the elimination of inconsistencies in the treatment of surface and groundwater resources and waterways, definition of water entitlements and the responsible and efficient allocation to various needs and consumers. The Act contains provisions for the licensing of water use, with applications having to be made to the Minister administering the *Water Act* for a licence to take and use water from various sources such as rivers and groundwater.

(xiii) *Heritage Rivers Act 1992*

This Act prohibits diversions from Heritage Rivers (such as the Goulburn River) without approval of the Governor in Council.

(xiv) *National Parks Act 1975*

This Act sets out that approval is required for buildings and works on and to permanently or temporarily occupy land managed by Parks Victoria.

3.2 State Government Policy

(i) *Victorian River Health Strategy, 2002*

The *Victorian River Health Strategy* was released in August 2002 and outlines the Government's long-term direction for the management of Victoria's rivers. It aims to provide a clear vision for the management of rivers in Victoria and a comprehensive policy direction on issues affecting river health. It provides a blueprint for integrating "*all Victorians' efforts on rivers and for ensuring that the state gets the most effective river health benefits for the effort and resources invested.*"

(ii) *Native Vegetation Management Framework, 2002*

The *Native Vegetation Management: A Framework for Action* was released in 2002, and is the State Government's strategy to protect, enhance and revegetate Victoria's native vegetation. It was developed to implement the objectives of Victoria's Biodiversity Strategy and the National Strategy for the Conservation of Australia's Biological Diversity. The Framework's main goal is "*to achieve a reversal, across the*

entire landscape of the long-term decline in the extent and quality of native vegetation, leading to a net gain."

(iii) Victorian Greenhouse Strategy, 2002

The *Victorian Greenhouse Strategy* was released in 2002 and details the actions the Government is taking in response to climate change on three fronts:

- The reduction of greenhouse gas emissions;
- The sequestering of carbon through enhancement of greenhouse sinks; and
- The development and implementation of strategies to adapt to climate change.

The Strategy outlines the action Government Departments must take to reduce greenhouse gas emissions from their own operations, including: reducing building energy consumption; increasing the use of electricity from renewable sources; reducing vehicle fleet related greenhouse gas emissions; offsetting vehicle fuel emissions through tree plantings; and incorporation of high levels of energy efficiency in all major project developments.

(iv) Our Water Our Future: The White Paper, 2004

In 2004 the Victorian Government launched *Our Water, Our Future: The White Paper* action plan to secure water for homes, farms, businesses and the environment. *Our Water Our Future* sets out 110 new initiatives for water conservation and is aimed at every sector of the community. It examines household use, industrial and agricultural use, recreation and tourism, environmental impacts, pricing, population increases and climate change to ensure there is adequate water to sustain growth over the next 50 years.

(v) Victoria's Environmental Sustainability Framework, 2005

Victoria's *Environmental Sustainability Framework* was released in April 2005 and aims to make environmental sustainability a consideration in everything Victorians do by taking "*a long term perspective and holistic approach to improving the environment.*" It sets out a vision for Victoria to become a sustainable state within one generation by setting three strategic directions, including:

- Maintaining and restoring our natural assets;
- Using our resources more efficiently; and
- Reducing our everyday environmental impacts.

(vi) Our Environment Our Future – Sustainability Action Statement, 2006

Our Environment Our Future is a \$200 million package of 150 “priority sustainability initiatives to secure a sustainable state for future generations of Victorians.” It identifies five areas for immediate action:

- Responding to the challenge of climate change;
- Maintaining and restoring our natural assets;
- Using our resources more efficiently;
- Reducing our everyday environmental impacts; and
- Government leadership

(vii) Melbourne Water: Sustainable Water – A Strategic Framework, 2007

Sustainable Water – A Strategic Framework formalises Melbourne Water’s commitment to sustainability. It links the organisation’s programs to a range of government policy platforms including *Our Water Our Future*, *Central Region Sustainable Water Strategy*, *Our Environment Our Future* and *Melbourne 2030*. It provides the context for Melbourne Water’s planning processes to ensure that social, economic and environmental impacts are all considered.

(viii) Our Water, Our Future: the Next Stage of the Government’s Water Plan, 2007

In response to predicted future pressures on water resources relating to drought, climate change and increased population, the Victorian Government released “*Our Water, Our Future: the Next Stage of the Government’s Water Plan*” in June 2007. This document outlines the major infrastructure projects to increase the supply for Melbourne and regional centres, and identifies the following components:

- A desalination plant;
- Modernising Victoria’s Food Bowl irrigation system to capture lost water for farms, the environment and Melbourne;
- Expansion of Victoria’s water grid;
- Upgrading Melbourne’s Eastern Treatment Plant to provide recycled water;
- Supporting new and existing water conservation programs for homes and industry; and
- New Victorian water grid projects, including the Sugarloaf Interconnector Pipeline.

3.3 Commonwealth Legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment, Heritage, Water and the Arts. The EPBC Act requires that an environmental approval be obtained from the Minister administering the Act before taking any action that has/will have/is likely to have a significant impact on matters of national environmental significance relevant to various sections of this Act. Approval is required for actions involving the Commonwealth, including activities concerning Commonwealth land and activities of Commonwealth agencies that may have a significant effect on the environment.

In respect of proposals involving the Commonwealth, the Act prohibits a person taking action on Commonwealth land that *“has/will have/is likely to have a significant impact on the environment and outside Commonwealth land that has/will have/is likely to have a significant impact on the environment on Commonwealth land”*.

The EPBC Act is the enabling legislation for the implementation of international agreements relating to the protection of flora and fauna species and communities, including:

- the Ramsar Convention on Wetlands;
- the International Convention on Biological Diversity;
- International Migratory Bird Agreements (Japan-Australia MBA and China-Australia MBA); and
- the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention).

As outlined earlier, on the 13 February 2008 the Minister’s delegate determined that this project is a *controlled action*, and therefore requires approval by the Commonwealth Government Minister for the Environment, Heritage and the Arts before it can proceed. The Victorian Government PIA process for the project has been accredited by the Commonwealth for its assessment needs.

The *Native Title Act 1993* provides native title claimants and appropriate Aboriginal groups with the opportunity to be involved and make comments on proposals that may affect native title.

3.4 Planning and Approvals Process

At the request of the Advisory Committee, the Alliance provided a summary of the various approvals required for this project, and below is a summary of the approvals required for each section of the pipeline. This has been broken up into planning controls and specific approvals for each section of the pipeline.

(i) Planning Controls for each Section of the Pipeline

The following is an overview of the planning controls affecting the project. Land within the pipeline corridor is affected by three local planning schemes. The Murrindindi Planning Scheme covers Sections A to E, and the Yarra Ranges Planning Scheme covers Sections F, G and H, with the exception of land in Section H to the west of Skyline Drive, which is located in the Nillumbik Planning Scheme. An outline of the planning controls and relevant maps is contained in Document 53.

Section A - Goulburn River to Goulburn Valley Highway

Land within this section is used primarily for rural residential and farming purposes, with land at the northern end of Killingworth Road located within the Farming Zone, whilst land to the south and along Carey Road is located within the Rural Living Zone. Land within and adjacent to the Goulburn River is within the Public Conservation and Resource Zone and is subject to an Environmental Significance Overlay (Schedule 1) and Floodway Overlay. Land on the western side of Killingworth Road is affected by the Heritage Overlay (HO10 – Killingworth Ruins, Killingworth).

Section B – Goulburn Valley Highway to Murrindindi Road

Land within this section is used primarily for rural residential and farming purposes, with land located within the Farming Zone, and is not affected by any overlays.

Section C – Murrindindi Road to Devlin Bridge

Land within this section is used primarily for farming purposes, with land located within the Farming Zone. Land along the Yea River to the east of the Melba Highway and at Devlin Bridge is located within the Public Conservation and Resource Zone. This land is affected by the Land Subject to Inundation Overlay. Land on the east side of the Melba Highway is affected by the Heritage Overlay (HO20 – Glenmore Station).

Section D – Devlin Bridge to High Voltage (HV) Power Easement

Land along the Yea River at Devlin Bridge and to the west of the Melba Highway is located within the Public Resource and Conservation Zone, and is affected by the Land Subject to Inundation Overlay.

Section E – HV Power Easement to Healesville-Kinglake Road

Land within the Toolangi State Forest and the Kinglake National Park is within the Public Conservation and Resource Zone. Land between Glenburn and the Healesville-Kinglake Road is within the Public Park and Recreation Zone. Land to the east and west of the Melba Highway is located within the Environmental Significance Overlay (Schedule 1) and the Wildfire Management Overlay.

Section F – Healesville-Kinglake Road to Hunts Lane

The land within the Toolangi State Forest, on both sides of the Melba Highway, is located within the Public Conservation and Resource Zone. Between the Toolangi State Forest and Hunts Lane, land on both sides of the Melba Highway is located within the Green Wedge Zone (Schedule 5). Land within the Toolangi State Forest is affected by the Environmental Significance Overlay (Schedule 1) and the Wildfire Management Overlay. Areas affected by the Erosion Management Overlay are scattered throughout the area on both sides of the Melba Highway.

Section G – Hunts Lane to Eltham-Yarra Glen Road

Between Hunts Lane, and the northern edge of Yarra Glen, all land on both sides of the Highway is located within the Green Wedge Zone (Schedule 5) except for land occupied by the Dixons Creek Primary School which is located in land within the Public Use Zone (Schedule 6). Land on both sides of the Highway between the northern edge of Yarra Glen and the Eltham-Yarra Glen Road is within the Residential 1 Zone. Land within the Maroondah Aqueduct is within the Public Use Zone (Schedule 1). Areas affected by the Erosion Management Overlay are scattered throughout the area to the west of the Highway. A small area on both sides of the Melba Highway adjacent to the junction with Williamson Road and near the intersections of Steels Creek and Gibbs Road is affected by the Environmental Significance Overlay (Schedule 1).

Section H – Eltham-Yarra Glen Road to Sugarloaf Reservoir

Land in Yarra Glen is within the Residential 1 Zone. Outside the town, all land is within the Green Wedge Zone (Schedule 5), except for land located between the Eltham-Yarra Glen Road and Skyline Drive and Mt. Wise Road, which is within the Rural Conservation Zone (Schedule 1), and land occupied by the Maroondah Aqueduct and Sugarloaf Reservoir and Reserve which is within the Public Use Zone (Schedule 1).

(ii) Specific Approvals for each Section of the Pipeline

The various approvals required for each section of the pipeline and the agency/authority responsible are listed below:

- **Department of Sustainability and Environment:**
 - To construct structures within the Goulburn River pursuant to the *Heritage Rivers Act* 1992 (Section A).
 - To remove or destroy native flora and fauna identified by the *Flora and Fauna Guarantee Act* 1988 (Sections A, B, C, D, E, F, G and H).
 - To damage, destroy or relocate wildlife pursuant to the *Wildlife Act* 1975 (Sections A, B, C, D, E, F, G and H).
 - Buildings and works and permanent occupation of Crown Land adjacent to the Goulburn River pursuant to the *Crown Land (Reserves) Act* 1978 and the *Land Act* 1958 (Section A).
 - Works within the Toolangi State Forest pursuant to the *Forest Act* 1958 and associated Crown land pursuant to the *Crown Land (Reserves) Act* 1978 and the *Land Act* 1958 (Sections E and F).
- **Goulburn Broken Catchment Management Authority:**
 - Works adjacent to and to cross waterways and in floodplains pursuant to the *Water Act* 1989 (Section A).
 - Works adjacent to and to cross the Yea River, other waterways and in floodplains pursuant to the *Water Act* 1989 (Sections B, C, D, E and F).
- **Melbourne Water (on behalf of the Port Phillip and Westernport Catchment Management Authority):**
 - Works adjacent to, to cross waterways and in floodplains pursuant to the *Water Act* 1989 (Sections G and H).
- **Parks Victoria:**
 - Works and to occupy within Perts Reserve pursuant to the *National Parks Act* 1975 (Section B).

- **Shire of Murrindindi:**
 - Works within the road reserve, to create new accesses and to cross Killingworth Road pursuant to *Road Management Act 2004* (Section A).
 - Works within the road reserve, to create access to and to cross minor roads pursuant to *Road Management Act 2004* (Sections B, C, D, E and F).
 - Works and to occupy within the picnic ground (freehold land) to the south of the Goulburn Highway from the Shire of Murrindindi as the owner (Section B).
- **Shire of Nillumbik:**
 - Works within the road reserve, to create access to and to cross minor roads pursuant to the *Road Management Act 2004* (Section H).
- **Shire of Yarra Ranges:**
 - Works within the road reserve, to create access to and to cross minor roads pursuant to the *Road Management Act 2004* (Section H).
- **SP Ausnet:**
 - Works within the High Voltage Power Easement (Section D).
- **VicRoads:**
 - Works within the road reserve, to create new accesses and to cross Goulburn Valley Highway pursuant to the *Road Management Act 2004* (Section A).
 - Works within the road reserve, to create access to and to cross Melba Highway pursuant to the *Road Management Act 2004* (Sections B, C, D, E, F, G and H).

The Committee notes that north of the Divide, the GBCMA needs to issue works on waterway permits but south of the Divide, Melbourne Water basically review their own permits.

While not making it as a formal recommendation, the Committee suggests that a streamlined approvals process be considered and undertaken, particularly on matters relating to the issue of native vegetation permits, the various planning processes and the like. Combined 'blanket' applications have some merit.

4. COMMUNITY CONSULTATION

Consultation and engagement with an affected local community is a critical component of any development proposal, in order to inform, advise and engage. Good consultation ensures that a local community impacted by a proposal can ‘*be part of the journey*’ and perhaps embrace, support and help deliver outcomes. Poor, or little consultation alienates a community and once disengaged, it becomes very difficult for a project proponent to work side by side with the community in a positive manner.

There is no doubt however, that if a community does not wish to be engaged, consultation becomes very difficult, and instead of consultation, it often becomes confrontation.

It would appear that this proposal has developed very quickly. The project was announced by Government in mid 2007, and since that time, the Alliance was formed and the various studies were undertaken. Late 2007, the Minister for Planning advised that the project did not need an Environmental Effects Statement, and this current process (preparation of a PIA and examination by an expert Advisory Committee) was announced.

Almost without exception, the local communities affected from Yea to Yarra Glen, have rejected this project. A special interest group – Plug the Pipe – was formed by the local community as soon as the project was announced to “*fight this proposal*”.

The Alliance provided evidence of the extent of community consultations, and on any view, it would seem appropriate. The PIA sets out the stakeholder engagement process in Section 10 of the summary report. In the overview to this section, the report states:

Due to the highly contentious nature of this project, engaging stakeholders is a core component of the successful implementation of this project. Effective two-way communication between the Alliance and stakeholders will be the key to achieving the goals of this project. ...

A vital part of Community and Stakeholder Engagement is the consultation process.

The PIA notes the formation of an Agency Reference Group, which comprises the following:

- Shire of Murrindindi;

- Shire of Yarra Ranges;
- Aboriginal Affairs Victoria;
- Goulburn Broken Catchment Management Authority;
- Goulburn-Murray Water;
- Yarra Valley Water;
- Goulburn Valley Water;
- Southern Rural Water;
- VicTrack;
- Country Fire Authority;
- Department of Planning and Community Development;
- Department of Sustainability and Environment;
- Environment Protection Authority;
- Department of Primary Industries;
- Parks Victoria; and
- VicRoads.

Some of the members of the Agency Reference Group prepared a submission about the project and/or presented at the hearing, including the two Shires, DSE and Goulburn Broken CMA.

There was considerable criticism by various submitters of the consultation approach adopted by the Alliance at the hearing, and in response, the Alliance submitted Document 30, which provided an outline of community engagement from July 2007 to February 2008. It provided information on:

- community information sessions (20 meetings);
- Agency Reference Group meetings (5);
- meetings with Plug the Pipe (3);
- meetings with Shire of Yarra Ranges, Murrindindi and Mansfield (11); and
- community groups issues meetings (11).

Copies of the Sugarloaf Pipeline Project Fact Sheets were tabled as Documents 31 and 32, while Document 33 tabled examples of media and landholder engagement.

Notwithstanding all of the above, it is obvious that the community did not want to be consulted, nor informed. The opposition to the project was such that it would seem no matter what the proponent did, it would not break down the barriers. This is rather unusual, because often opponents are able to concede various points, but there is little about this project that was accepted by the local community.

The common view of submitters was that “*Melbourne*” was taking water from north of the divide. While there was an understanding by some that the water to be piped

is from savings from the proposed Food Bowl Modernisation Project, there was little acceptance of the philosophy of the project. The Alliance did not resile from the Government position, but unfortunately, some of their consultants initially advised the Committee early on in the hearing that there seemed to be little that the local community would gain from this project.

Most conflict in the process centred around resolution of a state wide issue - the transfer of water from one region (rural Victoria) to another (metropolitan Melbourne) - in a local context. The intent of the State Government is clear, but the local communities see this proposal as taking their water with little or no community benefit to them.

Unfortunately State wide policy objectives are not always able to be translated into local benefit. This proposal is a 'big picture' matter, but with local amenity considerations. A simple corollary could be building a State medical centre (hospital) in an area where there might be local amenity impacts, but there are State wide benefits.

The environment is critically important, and the project attempts to address micro environmental issues, but of equal significance are the macro environmental and community benefits. Most environments are resilient, and while there may be some short term environmental and ecological impacts, the conclusions of this Advisory Committee are that these should not result in long term damage or loss of natural assets.

In the state wide context, a 70 kilometre pipeline built along a 20 to 30 metre wide construction corridor over an 18 month period, while having short term impacts, will not result in permanent and irreversible loss of ecological communities, vegetation and wildlife.

At most, some areas of vegetation and habitat will need to be replaced or offset, some parts of farms will need to be rehabilitated and there will be some visual damage to the landscape. This will recover. There will be traffic and road disruption and this will be a nuisance. There will be some visual amenity impacts, and short term noise, dust and other localised impacts.

In their closing, the Alliance responded to "complaints about the 'community consultation' process" and said in paragraphs 4, 5 and 6 (Document 85):

It is the Alliance's task to prepare and obtain the approvals required to facilitate the Project and to construct the Pipeline. Ultimately, Melbourne Water Corporation will own and operate the infrastructure, including maintenance of that infrastructure.

The Alliance is not responsible for, nor does it have to justify, the policy decision which requires the construction of the Pipeline to enable a third of the water savings from other infrastructure upgrades to be stored in Sugarloaf Reservoir to assist in providing security for Melbourne's water supply.

The State Government has a policy which states that the Pipeline is to be constructed. The State Government has made a decision to go ahead with this Project and the decision that the Alliance is to build and Melbourne Water is to operate that infrastructure. In this context, the Projects opponents claim that the Project is a "done deal" is correct. What is not a "done deal" is the final detailed design and alignment of the Pipeline route, the construction techniques and the mitigation measures to be employed.

It would seem that now the project is at this stage, further consultation will primarily be in the form of one on one negotiation with land owners, rather than broad ranging "community consultation" as such. It is apparent that many land owners are not willing to be involved in discussions with the Alliance, nor do they wish to be seen to have discussions. It was evident to the Committee that in undertaking some of its inspections, some landholders were not really fazed by the project, but felt they should present a united front for the sake of the ongoing community opposition to the project. The Committee urges both the Alliance and the local community to continue with consultation (and one-on-one discussions) throughout the life of the project. This is further discussed in Chapter 7.1 – Social Impact.

PART 2: ANALYSIS OF EFFECTS AND IMPACTS

5. PHYSICAL ENVIRONMENT

The Sugarloaf Interconnector Pipeline will involve the engineering of linear infrastructure and support facilities across terrain which includes the variously modified physical environment of the Goulburn and Yarra River catchments. The preferred pipeline routes essentially are oriented north to south parallel to the Melba Highway between Yea and Yarra Glen with the start being on the Killingworth Reserve on the Goulburn River and the discharge direct to the preferred northern inlet of the Sugarloaf Reservoir. In between it is expected that the preferred route will cross about 104 waterways including 67 designated waterways, 175 private properties and 14 pieces of public land.

The physical environment of these is described in the PIA report as follows:

- Appendix B – Hydrology, Water Resource and Water Crossing Impact Assessment;
- Appendix D – Hydrogeology Assessment;
- Appendix E - Geomorphological Assessment;
- Appendix F - Contaminated Land; and
- Appendix G - Geotechnical Assessment.

The Design Assessment is set out in Appendix A of the PIA report and the preferred construction techniques (in so far as they have been finalised) are set out in various documents submitted by the Alliance during the Hearings. These include:

- Construction Techniques – April 2008;
- Typical Pipeline Construction – March 2008;
- Pipeline Construction Methodology – Waterway Crossing Crossings – April 2008; and
- Work Method Statement – Yea River Crossing at Devlins Bridge – April 2008.

The above mentioned reports were accompanied by a Draft Environmental Management Strategy dated March 2008 which outlined the manner in which the Alliance propose the construction and post construction periods are to be controlled. Most particularly it refers to Work Activity Packs (WAPs) which are yet to be developed but which will be prepared on a site/issues basis covering amongst other matters, environmental issues.

The WAPs can be prepared when design and construction consultation with landholders along the final preferred pipeline route is completed (only 71 such

meetings had been completed as at 10th March 2008). The WAP development will be further facilitated by the completion of detailed mapping of the physical environment along the construction alignment. This process will be significantly improved by the gathering and collation of local knowledge from individual landholders and land care groups. When this has been done the pipeline construction easement can be fixed and the WAPs then finalised.

When the WAPs are complete, the preferred construction techniques can then be selected and detailed design plans drawn up. This process will involve the identification and evaluation of the magnitude and probability of all the risks associated with construction activities, post construction operations, maintenance and easement rehabilitation. This analysis process would also benefit from the involvement of local knowledge including Landcare groups, statutory bodies and the landholders (if they are willing to participate).

It is further understood that individual agreements will be signed between the Alliance and affected landholders. These agreements are to cover the activities which will be carried out upon their land including the route of the construction easement, the replacement commitments for facilities necessarily affected by the work, and the rehabilitation standards that will be achieved.

For design purposes, the preferred pipeline route has been divided into eight sections (A – H), each of which have until recently had a number of subsets denominated by a number (eg. G6). It is to be expected that as construction and design consultations are completed with landholders and others, some variations in the specific route may be desirable from the preferred route as now selected (referred to as the “blue line” in the hearing) as shown previously on Figure 1. These variations are not expected to be material, and will generally involve minor diversions to avoid valued environmental assets, or private infrastructure within reasonable flexibility of pipeline construction (which is stated by the Alliance to be 1 to 3 degrees lateral variability per 13.5m pipe length).

It is accepted by the Committee however that some significant diversions may be desirable within individual properties where these can be rationally accommodated by the pipeline alignments upstream and downstream of the property. Such diversions would likely be driven by either commercial or environmental preferences of the landholder which are agreed by the Alliance as being acceptable.

At this time the Alliance’s preferred route has been selected as the best route consistent with State policies on environmental protection, rational engineering and economic responsibility as arrived at through a multi parameter evaluation using semi quantitative data and expert judgement. Any subsequent variations seem

unlikely to vary the route to the extent that subsequent evaluations are invalid. For reasons that become clear throughout this report, the Advisory Committee therefore recommends that the Alliance.

- **Adopt the preferred pipeline route as: A3 – B1c - C3 – D2 - E1 including 800 metre tunnel – F3 – G6 – H2.**

5.1 Hydrology, Water Resource and Crossing

The major streams along the preferred pipeline route are as follows:

- The Goulburn River with its flood plain and wetlands at the northern end;
- The Yea River with its flood plain and wetlands where the pipeline crosses south of the Goulburn Valley Highway (start Section B) and in Section E to the south near Castella;
- Dixons Creek to the south of the major catchment divide in Sections F and G; and
- Steels Creek to the south in Section G.

(i) Goulburn River off-take

Three potential sites have been evaluated at a qualitative level for the establishment of the Goulburn River Pumping Station off-take. The sites included properties which front stable river channel reaches at Killingworth, Molesworth, and at a site recommended/suggested by the local community at Ghin Ghin Bridge to the west. Of these, the Killingworth Reserve off-take site was selected as having the optimum conditions.

The Goulburn River Pump Station will involve the construction of a river outlet to a pump well located at some distance back from the river edge. The pump station is described in the PIA report in Appendix A to house pumps, valves and pipework which will be established on a 15 – 20 square metre concrete slab. Details of how the engineered facility will be established have been developed and was presented as a photo mock up and in plans (TOC-WP254-C-SK004 and SK011 and WP255-C-SK007). These show a large sloping intake to the river covered below the normal river off-take level by boulder rip rap. This is then backed up at a distance some tens of metres from the river by the pump house which has a pump well connected to the off-take structure by large pipes.

(ii) Yea River

The hydrology of the Yea River is reported by the Alliance to be known from two stream gauges in its catchment, both of which have significant records. These reveal that the stream is quite seasonally affected in its flow, but that it exhibits a high proportion of its annual flow as base flow (50%). Little work has been done by the Alliance to analyse the significance of these flows at more than monthly and annual flow frequencies. In Appendix B of the PIA it was noted that there was *“high risk of major erosion occurring in the event of high intensity storms”*. It further noted that *“disturbances to bed and banks can lead to erosion and sedimentation”* during construction and to down stream water quality issues. These types of problems were confirmed by Mr Spencer, who showed photographs of stream bank damage alleged to have been caused by trenching to install communication infrastructure in a tributary to the Yea River.

The Alliance has proposed that crossings of the Yea River can be completed within three weeks using Aquadam protected open trenching, if done during the period late February to early April (three crossings each of 3 weeks duration). The Committee is of the opinion that even using 3 and 5 day weather forecasts for the precise timing of operations, this approach may still represent significant risks of creating serious and protracted downstream water quality issues. To resolve this matter, it is considered that rigorous risk assessment and analyses of both the Alliance preferred construction techniques and of alternatives should be undertaken in the presence of an independent auditor. On the basis of this work, a choice can then be made between the Alliance preferred trenching approaches and alternatives including pipe bridging and or trenchless or other methods at each of the three major sites. Such work will require further and better hydrological analysis than is evident to date and much better definition of the characteristics of the substrate to be excavated. (The Committee makes recommendations about the appointment of an independent auditor in Chapter 9.3 when it discusses Environmental Management.)

Crossings of particular concern include the downstream flood plains near to O’Connors Flat (the Yea River Wetlands), near Devlin Bridge and near Castella. It is clear that considerable work remains to be done in planning the methods best suited to minimising down stream risk to water quality in the Yea River. This is certainly true of the down stream crossing of the Yea River which is prone to severe flooding as identified in the Plug the Pipe submission. In each case, the construction technique needs to be considered very carefully against the consequences of flash flooding, and the ability of construction technique alternatives to manage such events during construction as well as create a stable post construction environment both at the crossing point and down stream.

All three sites are quite different in that they have very contrasting catchment topography above them, which will respond in very different ways to rainfall and run off creating events.

(iii) Yea River Tributaries

All the waterways north of the Divide have been classified into different categories with respect to their topography and the presence or otherwise of recognisable stream channels and their form. Presumably, this has been done to allow the magnitude of hydrological risk they may represent to their crossing to be evaluated using standard hydrological techniques. The risks can then be assessed against the preferred open trench crossing method. This has not been reported as yet but using data from the gauge station on Island Creek at Glenburn may be useful in determining how the smaller catchments behave. The methods of Australian Rainfall and Runoff can then be calibrated against flows related to local rain gauge records from the area. Some of these may be available from local landholders.

The Alliance has presented a Construction Timing Schedule (see Appendix 5) which has crossings of the “*minor rivers*” variously between November and April with between 4 and 7 days allowed for each, presuming the use of open trenching. The Committee note that the Alliance has reported that seismic traversing has indicated a deep alluvial channel on the lower Yea River crossing. Similar, if less deep channels, can be expected in even these smaller rivers. To date no additional work has been done to determine the degree to which such conditions may prove a control upon the appropriate construction techniques and especially what risks dewatering may have on groundwater dependent ecosystems (GDE) in proximity to these streams.

The Committee would expect that further work is undertaken as a prelude to a comprehensive risk analysis to determine the feasibility and timing of individual crossings. Important crossings to be considered north of the Divide would include those which have many steep short sub-catchments, such as Tea Tree, Rellimeigam, Ewing, Caraman, Island Creeks and similar streams.

(iv) Dixons and Steels Creek

Records from the Alliance do not show gauge data to exist for Dixons Creek but its similarity to Steels Creek which has a short but useful record should allow reasonable evaluations of catchment reactions to high intensity rainfall events. Notably, the Alliance report that similarities exist in catchment yield between the Steels and Island Creek catchments. This strengthens the database substantially in respect to evaluating the risks which may occur during and post construction in the Dixons and Steels Creek catchments.

Ms Warnock, a resident of Gulf Road, gave a very good picture of serious flooding on Steels Creek along Gulf Road where the G6 southern pipeline route is proposed. She noted that it had flooded in the same area four times in five years including in early summer. Clearly, this area could suffer construction risks from flash flooding. These conditions will need to be taken into account in respect to construction technique selection at waterway crossings within a comprehensive risk analysis as discussed earlier.

(v) Water Resources and Waterway Crossings

There are 187 waterway crossings to be completed along the preferred pipeline route and it is recognised by the Alliance that much of the study done to date has occurred when the region both north and south of the Divide has suffered an extended period of rainfall deficit. This has made the observation of ground water and surface water interactions difficult. This situation was noted by submitters such as Mr Masters and others, who commented on the very poor capacity of the land to carry vehicular traffic when it is wet. This observation is consistent with the descriptions given of low density soils in Appendix E of the PIA. It derives from the soils soaking up and holding water after rain. It follows that determining the most risk free and practicable construction issues are yet to be finalised. These characteristics also impact upon the ability of the Alliance to be able to remain within the 30 metre wide construction easement and the costs involved in rehabilitating the easement to a stable state consistent with landholder agreements post construction. Both of these issues were concerns for many landholder submitters (including Mr Scott, Ms Warnock, Ms and Mr Towt, Ms Abbott-Smith, Ms Tan and others).

The Alliance has expressed a preference for open trench excavation as being inexpensive, quick and manageable, but this may not prove to be the case when subjected to rigorous risk evaluation. Certainly, in the case of the Devlins Bridge crossing, a number of quite different options would appear to be viable and each would have a different risk profile. As data comes to hand on other stream crossings, other risks are likely to emerge which will bear upon the approach which is best suited to accommodating the risks. This will certainly be important where those risks relate to longer term impacts such as may apply where groundwater diversion or damming effects may arise as a consequence of the pipeline placement without specific design elements being incorporated.

Issues such as the trafficability of land also need to be considered. The soils are reported to have been managed for agricultural purposes such that compaction is minimised. Hence roads developed for construction purposes will need to be treated with gravel fill to give it bearing capacity for construction equipment and

vehicles.

The above situation is likely to become more serious where the proposed pipeline will cross the lower slopes where shallow water tables and/or high soil moisture contents develop which will further aggravate impacts from traffic movement. A consequence of this will be that a much greater degree of construction easement rehabilitation may be necessary to both undo any excessive soil compaction consequent upon construction traffic, and to remove the heavy gravel pushed into the soil profile that may reduce soil productivity.

The Alliance advised in their Construction Report that discharges of water will occur from time to time from scour valves and this may be a source of water quality impact in downstream waters from both sedimentation and potentially translocation of biological material. If this water could be discharged to existing or new dams provided on affected properties, the impacts might be substantially reduced.

Other discharges may occur as a consequence of pipe leakage from time to time during the commissioning and testing of the pipeline and possibly in the future as the pipeline and its welds age. Other discharges may occur through diverted interflow or groundwater moving unimpeded along the pipeline annular fill. These discharges are expected to be apparent as new springs and/or boggy ground down gradient along the pipeline route.

The Advisory Committee urges the Alliance to note the issues raised above, but it makes no specific recommendations arising from this discussion.

5.2 Hydrogeology

Appendix D of the PIA is based upon existing data in the form of geological and hydrogeological maps and the Government Groundwater Data Base and similar records. From this information, the Alliance has used professional judgement to develop maps which are consistent with such data as they had, as a guide to the areas where significant hydrogeological issues might represent issues requiring management during both construction and post construction. Subsequently they have undertaken further investigations to confirm the conceptual models that they used to create the maps of water table depth, salinity and geology and to obtain data of value to the geomorphic and geotechnical evaluations running concurrently. These investigations have included seismic surveys across the Yea River flood plains to determine the alluvial depth and drilling and hydrological testing to evaluate hydraulic parameters. None of this data was presented to the Committee.

The fundamental model used is that the geological basement of the area is

comprised of Silurian Devonian aged quartz sandstones and mudstones which have been compressed and folded around a north-south axis. Some faulting is also identified such as the Yarra Fault which is related to the escarpment which separates the Sugarloaf catchment from the Steels Creek valley near Yarra Glen. The basement material is a fractured rock aquifer. At some locations a low permeability weathered layer (referred to as regolith) act as a barrier between the basement rocks and much younger (Quaternary) alluvium (stream laid sediments) and colluvium (hillwash). Except where regolith material is present, hydraulic continuity is presumed to exist between the basement and the younger sediments, albeit that this may not be a direct relationship at all locations.

Groundwater flows are from recharge via rainfall infiltration and possibly some stream flow infiltration in the elevated and up catchment areas. Thereafter flows are down gradient to emerge as base flow into the stream network of the area. Notably, 50% of the annual stream flow from the Yea River is reported by the Alliance to be as base flow.

Groundwater usage data is very limited and no locational data is presented in the PIA. The predominant use is for stock and domestic water supply from the basement, though some irrigation use is recorded. These may represent uses around Kinglake from localised aquifers in this area which are not related to the Sugarloaf Pipeline project area.

Groundwater salinities are mostly low and suitable for most beneficial uses (Segments A1 and 2 of the beneficial use table in the SEPP Groundwaters of Victoria), with the only exception being in the basement near Gulf Road at the most south-eastern extremity of the project area.

The importance of groundwater in the project area and along the preferred pipeline route is threefold. Firstly, the natural flows will be the support to Groundwater Dependent Ecosystems (GDE) such as flood plain wetlands. The second is as support to spring fed environments and dams. Thirdly, in areas of shallow water table, groundwater inflow potential to excavations extending below water table will represent an issue to be managed in construction.

Construction may involve dewatering using techniques such as sump pumping, water inflow exclusion or desaturation pumping at external locations. Such operations will have the capacity to substantially lower the water table, at least locally for some period, as well as requiring disposal of any water in a manner which is not detrimental to the environment.

Of longer term importance is the possibility that the buried pipeline may modify the

groundwater systems. This may occur by it acting as a barrier to natural flow where it blocks off aquifers; or by causing redistribution of flow via the pipeline bedding material, acting as the preferred conduit leading groundwater from one path laterally to an altered outflow regime at lower elevation along the pipeline route.

Where the pipeline is excavated in areas which are above the permanent water table, impacts on groundwater would not be expected. However, if the excavation intersects even ephemeral soil moisture flow paths (interflow) at the top of the regolith and/or if it fully penetrates the regolith to intersect the more permeable fractured basement below, then both the pipeline backfill and the excavated trench can act to divert the interflow. This phenomenon will act to reduce soil moisture distribution from depth into down gradient soils and stream or waterway channels.

The above issues have been identified at least in part by submitters. Through Plug the Pipe, Ms Beer commented upon the lack of certainty in data in the PIA in respect to *“altered groundwater regimes (specifically water level and chemistry), both during and post construction, on base-flow from groundwater into surface systems and related GDE”*. Similar concerns are expressed inter alia by other submitters, including the Shire of Yarra Ranges, 3717 Watch Inc, Murrindindi Shire and others.

Mr Barber for the Alliance indicated that hydrological tests are to be performed across Section B where it crosses the Yea River flood plain to assess the magnitude of groundwater issues in this area. He stated that the seismic survey had indicated a paleo channel in this flood plain extending to 15 metres below ground level even though most of the flood plain had only about 2 metres of alluvial thickness. This is one of the areas where GDE are identified. Similar areas are reported by submitters to exist along some of the larger tributaries to the Yea River and potentially along Dixons Creek and perhaps Steels Creek. These will need to be closely examined to determine the potential for impacts during and post construction.

Mr White for the Alliance stated that the pipeline design would include trench stops (sand bagging) to prevent water movement through the pipe bedding from being washed out. These operate to minimise water movement through the pipe bedding. He described how the fill across the upper levels of the pipe could be selected to allow water to pass over the pipe after construction.

It appears to the Committee there are a number of investigations to be completed before the final elements of the pipeline construction, and design in the form of WAPs, can be issued. For the community, and in particular the affected property owners to be assured that these processes take into account the real issues which will affect their property productivity and protect the natural environment, there is a need for the processes to be subject to close audit by an appropriate expert team.

This team would have the role of ensuring that inter alia, all the issues relating to groundwater system modification including material soil moisture redistribution and impacts on GDE are addressed and that the agreed actions are implemented during construction including any subsequent monitoring and rehabilitation programs.

5.3 Geomorphology

The Geomorphological Assessment presented in the PIA describes the land systems which the preferred pipeline route will traverse, and the risks of erosion which are associated with these landforms and the soil types which typify them. The forms of erosion which could be stimulated by the construction activity are summarised as including:

- Landslip, especially across the escarpment of the Yarra Ridge;
- Gully and tunnel erosion, on poorly vegetated slopes with deeper soils;
- Bed and bank erosion where trenching takes place across waterways which have active channels, especially where the construction activity disturbs natural channel armouring; and
- Gully erosion where vegetation is lost on steep slopes.

In particular, the soils are noted to be dispersive, weakly acidic and of low density. At the time of mapping, they were qualitatively determined to have low moisture contents which increased with depth through the A and B horizons down to the surface of the regolith (upper weathered surface of the basement). Mr Barber for the Alliance stated that soil dispersivity mapping was being carried out as part of the basis for a risk assessment of the potential for tunnelling erosion to develop along the pipeline route post construction. This was seen as a significant risk where steeper slopes exist both north and south of the Divide.

Bed and bank erosion was seen as a significant risk when crossing waterways which have limited or fragmented vegetation cover. These issues would be exacerbated were there to be any potential for significant diversion of groundwater flows such as to cause local water logging or boggy areas which inhibit revegetation.

Nothing more than generic risk mitigation techniques are proposed, but a need for a risk assessment program is later recommended (see Chapter 9). The Committee believes that this recommendation is consistent with, and should be incorporated in the risk assessment processes mentioned by Mr White for the Alliance in his presentation. The Committee recommends later in Chapter 9 that an independent auditor should be part of the risk assessment evaluation process so as to ensure that all the risks are appropriately considered and rationally provided for in the design,

construction and post construction rehabilitation and monitoring programs.

5.4 Geotechnical

The Geotechnical Assessment presented in the PIA identifies two areas in which geotechnical issues will require significant further studies. Further, it identifies issues related to shallow water tables and ground water inflow as potential problems to be addressed when considering constructability along the pipeline route. Finally it identifies spoil management as an issue and considers the potential for acid sulphate soils to exist.

Studies ongoing since the completion of the PIA have failed to find any evidence of acid sulphate soil and hence they need not be considered further. Equally, the issues of spoil stability will be addressed on site by the usual EPA guidelines on construction sites and elsewhere. The Alliance informed the Committee that spoil disposal is likely to be to an abandoned quarry which should ensure that containment of the spoil could be easily accommodated.

Studies to date indicate that the trenching will be 40% through low strength colluvium and alluvium and then into low to medium strength deeply weathered regolith, except where the pipeline route is across the Goulburn River floodplain in Section A and over a short section of the deeper paleo-channel in Section B across the Yea River floodplain. Less than 5% of the preferred pipeline route will be in shallow fresh to high strength rocks.

Landslip risks occur where the pipeline traverses the Yarra ridge escarpment to the west of Yarra Glen, and possibly through Section E and F where the pipeline traverses short sections which will need to be benched because of the steep side slopes. Excavatability is identified as a major issue to be resolved and the geotechnical issues associated with alternative construction techniques are addressed. These are expanded upon in documents released since the PIA was prepared and as referenced earlier. Clearly there is need for a thorough and comprehensive construction risk assessment task to be completed to bring together all the risk elements which derive from the physical environment along with the potential environmental and social consequences that can arise from the alternatives.

Geotechnical issues *per se* have not been raised specifically by submitters, but many expressed concerns about issues of erosion and loss of vegetation associated with the construction and post construction easements. These issues, especially the necessary width of the easements, need to be addressed as part of constructability reviews.

Issues associated with the construction of the Goulburn River off-take works relate

very much to the approaches that will need to be taken to excavating the pump wells to depths of up to 5 metres below normal river operating (release) level. Mr White for the Alliance outlined in his submission and subsequently in the Construction Techniques Report (April 2008) an approach using interlocking secant piles to create a water tight barrier within which excavation can take place. This will involve the production of a significant volume of wet spoil but it should substantially reduce the magnitude of any dewatering requirement.

Similar approaches for the use of sheet piling with spear point dewatering may be necessary where the pipeline crosses the Yea River flood plains, dependant upon the distribution of permeable material with respect to the pipeline excavation.

Again at Devlin Bridge and with the more northern Dixon Creek crossings, the construction approach has yet to be finalised. At these locations, trenching may prove impractical, and under boring and pipe jacking may entail more disturbance and risk of environmental damage than the alternative of constructing a pipe bridge. Decisions on the best approach will need to consider not only constructability risks but also the implications and likelihood of redevelopment of adjacent existing infrastructure. This could include the possibility of road and bridge realignment, the costs and risks associated with relocating and/or avoiding other services within or close to the road reserve of the Melba Highway.

Geotechnical problems with shallow water tables may also exist on the Steels Creek crossing on Section G. This is identified in the PIA but what is not considered is the potential for the pipeline trench to interconnect deeper brackish water in the basement with low salinity water in shallow alluvium. The risk of such interconnections was recognized albeit generically by Ms Warnock when referring to this area, which she described as having *“hard rocky ground or the influx of water as the water table was intercepted”*. She went on to question what might happen to the movement of underground water. The answer to her question will arise from the necessary risk assessment and from the selection of an appropriate construction technique and trench design, which in this case may need to avoid having significant permeability retained in the pipe bedding material.

Clearly, geotechnical issues will be a significant element in the selection of construction techniques and in the designing of the trenching and/or trenchless technologies chosen. The decisions however, need to be made on the basis of consideration of all the elements of the environment which need to be protected and on the basis of weightings allocated to reflect the real costs and probabilities of the risks occurring either during construction and/or post construction, and the costs of remediating any consequent damage.

The Committee is of the opinion that an independently audited constructability risk assessment needs to incorporate all the physical environmental factors and the consequences of the presence of the pipeline as constructed as a permanent and maintainable element of the environment. Issues such as those raised by the Shire of Yarra Ranges with respect to the depth of burial beneath or near roads to allow for effective road underdrainage should also be included as these could be significant in creating groundwater interconnection issues which should be avoided.

5.5 Contaminated Land

Contaminated land has been considered by the Alliance as an issue in determining the preferred route. A wide range of facilities which could have had sources of contaminants were reviewed or visited and were classified with respect to their potential to be a source of contamination. Arising from this work, soil and/or groundwater sampling was undertaken adjacent to them on the preferred pipeline route. No evidence of contamination was identified. As a consequence, this aspect of the physical environment need no longer be considered. This is of course not to say that the potential for contamination deriving from construction activity should be ignored and environmental management plans developed to handle any such incidents should they occur.

5.6 Greenhouse Gas

The greenhouse gas (carbon dioxide, methane and nitrous oxide) assessment for the project was addressed in Appendix Q of the PIA report. The PIA identified a number of project components and stages where greenhouse gases will be emitted including:

- Design phase – office based activities;
- Material phase – processing of raw materials and manufacturing of pipe sections;
- Vegetation clearance – loss of carbon dioxide processing from vegetation (temporary and permanent);
- Construction phase – primarily construction vehicle emissions; and
- Operation phase – primarily electricity consumption from pumping operations.

The calculations for greenhouse gas emissions suggest that without offsetting, the project emissions including pumping operations over a 100 year project lifespan, would be a calculated 13,346,289 tonnes of carbon dioxide equivalent (CO₂-e).

However, Melbourne Water, as operator of the pipeline post-construction has

committed to using renewable energy for pumping in the low-lift and high-lift pump stations. This would be undertaken via either direct purchasing of green energy via an energy retailer; purchase of renewable energy certificates; or enhancement of the Melbourne Water renewable energy system such as the use of bio-gas for electricity generation at the Western Treatment Plant.

If renewable energy is used for pumping, the greenhouse gas emissions for the project fall to an estimated 263,768 tonnes of CO₂-e. Of this, approximately 74% is generated in the manufacture of the pipeline sections and approximately 23% in the construction process itself. For comparison, Melbourne Water is currently one of the 15 largest consumers of energy in Victoria and in 2005/2006 produced approximately 304,000 tonnes of greenhouse gas emissions across its operations. It is worth noting that Melbourne Water has an existing commitment to be carbon neutral in its broader operations by 2018.

The PIA notes that the greenhouse gas assessment is preliminary and the final greenhouse gas emissions will depend upon the final alignment and detailed construction methods. The PIA outlines the various State and Commonwealth legislation and policies that have guided its assessment of greenhouse gas emissions.

The mitigation and management measures for greenhouse gas emissions are outlined in Section 6 of Appendix Q of the PIA. In summary they include:

- Use of renewable energy for pumping operation as described above; and
- Minimising the generation of greenhouse gas emissions in other stages of the project and the consideration of offsets for these project components.

A number of submitters raised concerns relating to greenhouse gas emissions from the project including Ms McGrath, Mr and Ms Murray, Ms Chandler, Healesville Environment Watch Inc., Yea River Catchment and Landcare Group, Communities Combating Climate Crisis (C4), Plug the Pipe, Acheron Valley Watch, 3717 Watch and Ms Shannon. The Goulburn Broken Catchment Management Authority submitted that the greenhouse gas emissions from soil disturbance did not appear to have been included in calculations.

Melbourne Water indicated that a micro hydro power station may be installed at the pipeline outlet into the Sugarloaf Reservoir to capture remaining energy in the water as it is discharged and offset some of the greenhouse gas emissions from pumping. This project is not part of the project covered by the PIA.

The Committee considers the use of renewable energy to power the pumping operations of the project is an appropriate response to both State policy and

Melbourne Water's own 'carbon neutral' targets. The Committee does not have a particular view on whether this should be achieved by the purchase of renewable energy certificates, a direct supply agreement with a retailer or by some other method. Indeed over time it may be achieved by a mix of several measures depending on renewable energy supply and market conditions.

Whatever approach is used, this should be independently audited and reported upon as part of Melbourne Water's normal operations. The Committee considers that in principle a micro hydro power station at the Sugarloaf discharge point appears to make sense but acknowledges that it is outside the scope of its investigations.

The Committee notes that by using renewable energy for pumping operations, only 2% of project greenhouse gas emissions remain when the project is viewed over its 100 year life. These residual emissions related to construction should be considered for offsets, perhaps in conjunction with native vegetation offsets required under the native vegetation management framework.

Conclusions and Recommendations

Greenhouse gas emissions primarily stem from the operational pumping of water and renewable energy will be used for this aspect of the project (this is committed to on page 135 of the draft Environmental Management Strategy). Minimisation and offsetting of greenhouse gas emissions from construction and materials manufacturing should be considered in the detailed design and implementation of the project.

The Advisory Committee recommends that the Alliance:

- **Review the greenhouse gas emissions for the project and recalculate these when the final alignment and construction methodology is determined.**
- **Modify dot point 1 in the Greenhouse Gas Management Plan (referenced in Appendix Y of the Environmental Management Strategy) to read *"Monitoring and public reporting of greenhouse gas emissions on an ongoing basis"*.**
- **Add a new dot point in relation to the Greenhouse Gas Management Plan; *"Suitable offsets for residual project greenhouse gas emissions (design, construction and materials) should be explored and implemented where practical"*.**

6. ECOLOGY

6.1 Flora and Fauna

It is clear that in an ecological sense there is great natural diversity and many unknowns about the presence or absence of species in the preferred pipeline alignment. Alliance investigations for the PIA have confirmed the presence of a number of rare or endangered flora and fauna species, including *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Flora and Fauna Guarantee Act 1988* (FFG Act) listed species, and there is a potential for more to be recorded.

The Federal Minister has determined that sections of the pipeline construction corridor may impact on matters of national environmental significance and the proposal is therefore a controlled action under the EPBC Act. He found that the construction of the pipeline will have varying levels of impacts on listed species and these impacts will need more detailed assessment, particularly in the micro-design of the final alignment.

Of the area disturbed by the pipeline alignment, approximately 155 hectares will be in grassland. This will generally be pasture or areas of exotic grasses. It is unlikely that there will be extensive areas of native grassland, however some unrecorded, intact remnants may exist. Approximately 121 hectares of other native vegetation will be impacted and these areas will be subject to offsets.

The Matted Flax Lily and the Striped Legless Lizard are two species listed under the EPBC Act that have been confirmed to exist within the preferred alignment. The surveys by the Alliance detected the presence of the lizard within the Yea Rise Unit through which the pipeline alignment passes. Under the National Recovery Plan for the lizard, this is considered to be an area of important population.

The preferred alignment also contains suitable habitat for several other EPBC listed species, that have so far not been detected. These include River Swamp Wallaby Grass, Little Pink Spider-orchid, Purple Clover Glycine, Growling Grass Frog, Spotted Tail Quoll, Southern Brown Bandicoot and Smoky Mouse. It is possible that they do occur and if so may be significantly impacted without appropriate mitigation measures. The Growling Grass Frog in particular is highly likely to occur in the vicinity of the alignment. The Alliance reported in its response to DEWHA (Document 56) that further targeted surveys focussing on the flora species above, will be undertaken at appropriate times from August 2008.

The Federal Ministers' decision concluded that the alignment corridor will traverse existing habitat, and construction is likely to disturb existing habitat for a number of other listed species. The decision further concluded that their populations are unlikely to be significantly impacted due to superior habitat existing outside the pipeline alignment or the existence of larger extent of habitat in wider local areas.

EPBC listed migratory species, including the Great Egret, Cattle Egret, Satin Flycatcher and Rufous Fantail have been recorded in the vicinity of the pipeline alignment, and other unrecorded species may be present at different times. The PIA states that these species may be temporarily disturbed by construction activities, but significant impact is unlikely. It states that timing of construction outside the seasonal presence of species would be the most effective mitigation measure. Impacts on migratory species downstream from the off-take at the Goulburn River to the Goulburn Weir are considered to be very unlikely as there will be minimal change in the magnitude or timing of water flows in this reach of the Goulburn River.

Investigations are incomplete and will continue in parallel with construction.

During the hearings, Mr Wills for the Alliance stated that 71 percent of the preferred alignment had been covered by flora and fauna survey, and to date this included 15% of the State's flora species. He reported that since publication of the PIA, no additional listed species had been recorded, but five new locations were identified. These new recordings did not alter any management implications raised in the PIA. Mr Barlow of the Goulburn Broken CMA stated that there was insufficient information, and further work was required to comply with the EPBC Act and the FFG Act.

Ms Wormald and Mr Meacher specifically questioned the flora and fauna survey methodology. Ms Wormald considered time sequence surveys were needed to cover a range of seasons to provide an accurate account of species present. Both submitters highlighted examples such as the Golden Sun Moth and the Little Pink Spider-orchid, each of which is recordable for a limited period and very difficult to observe. Ms Clarke added to these opinions by proposing the need for at least two years of surveys, particularly considering the recent abnormally dry seasons. She added that the statements in the PIA indicating presence or absence of target species in surveys were no indication of extent of populations.

Ms Dripps from DSE stated that there will be unavoidable vegetation and habitat loss and fragmentation, and post construction rehabilitation will not result in a return to the original state. She stated that the final alignment would require justification in formal documentation to the Department. The Committee believes

the lack of available information for planning has serious implications for protection and management of ecological values along the pipeline route, and further surveys should be completed prior to construction.

The area of native vegetation to be removed, calculated at 121 hectares, includes 10 hectares in the north, 65 hectares in the central area (including a 30 metre wide strip through Toolangi State Forest) and 45 hectares in the south. DSE native vegetation mapping used by the Alliance indicates the need to achieve 200 habitat hectares of offsets across three bio-regions.

A number of submitters including the Shire of Yarra Ranges requested that offsets be identified in Shires where the clearing occurs. Ms Dripps stated that this is not a requirement of the Native Vegetation Management Framework, but the offsets must be within the same bio-regions. The Committee recognises and accept that view. Ms Jelinek stated that providing for offsets elsewhere would not solve local fragmentation, connectivity or diversity loss. She considered it essential to focus on biodiversity as a whole and not just endangered species. Her opinion was that a *"critical network of corridors"* must be maintained for habitat connectivity and species diversity. Other submitters supported this view, exemplified in particular with reference to the sugar glider. In this context, Mr Barlow reported that the GBCMA required greater assurance on Net Gain.

In the north, the Grassy Woodlands EVC has been severely impacted by agriculture and only remnants remain, most often on roadsides or as single trees in paddocks. Mr Barlow expressed concern about the condition of this EVC, stating the scattered remnants are a resource for the future and site specific decisions will determine their fate. He requested very strict decision processes to minimise impacts. With regard to vegetation remnants in general, Mr Sheffield of the Yarra Valley Tree Group emphasised the ecological and community importance of small local vegetation stands, and stated that their loss would be very significant to actual sites.

Mr Delacretaz and Mr Scott objected to the need for a 30 metre wide construction corridor, and considered the Alliance has not provided sufficient justification for this width. The Committee concurs that further justification is needed and preferably a narrower easement should be used. The Shire of Yarra Ranges submitted that the construction width should be reduced to 10 metres and the final easement to six to ten metres to mitigate loss of connectivity for native species. In their response to the Shire of Yarra Ranges, the Alliance confirmed that *"A 30 metres wide construction zone is required to effectively build the pipeline, taking into account the need to strip and stockpile soil, excavate the trench and stockpile excavated material, layout and install pipes and provide for sediment management"*. However they also acknowledged that the 15 metre width of the final easement required for future maintenance is reduced from

Melbourne Water's normal 20 metres for other projects.

The EMS draft provided by the Alliance does not demonstrate an integrated approach to environmental risk management with respect to fauna and flora. It is generalised about environmental risks, stating they "*will be identified during all phases of the project*" and a risk register will be continually updated to reflect project developments. The Committee believes this is a somewhat reactionary approach to risk that does not encourage anticipation of risk to flora and fauna at the local or bio-regional scale. Ms Jelinek submitted that the PIA has not determined the magnitude of the specific environmental impacts and the risks associated with these impacts because of lack of baseline data. Ms Knorr added to this thesis by stating the short timeframe for the process of continuous ecological investigation in parallel with pipeline construction is not a quality process. Mr Wealands spoke of the lack of hydrological and geomorphic research on "*threatening processes*" to wetlands ecology, using the specific example of the pipeline construction impacts on the Yea Wetlands.

The PIA report and matters raised by submitters identify a number of potential adverse ecological impacts related to pipeline construction activities. These impacts relate to areas of native vegetation and the habitat of threatened flora and fauna species located within the preferred pipeline alignment.

The impacts have been further reviewed below section-by-section along the pipeline alignment, based on the data presented in the PIA and the information presented through the hearing process. In particular, the Committee recognise and appreciate the body of local knowledge that has contributed to its understanding of the ecological values, and suggests that the Alliance decisions would benefit by the incorporation of this knowledge.

There are two common themes regarding ecology in various pipeline sections. Firstly, the movement of all construction site vehicles poses the risk of disease transfer and the PIA flags the risk of spreading the disease of amphibians, Chytrid fungus (a key threatening process under the EPBC Act), particularly in damp areas such as the Yea wetlands and waterway crossings. This is relevant for Sections B, C, D, E, F, G and H. Secondly, there will be a greatly increased risk of erosion, sedimentation and turbid water from construction sites at the waterway crossings in Sections B, D, E, F, G and H. If this eventuates there may be adverse impacts on riparian vegetation and fauna. Other impacts are further discussed for each section of the proposed pipeline alignments.

(i) Section A

The pump station at the off-take at the Goulburn River is located on the Goulburn River alluvial plain. South of the alluvial plain the land rises and becomes generally undulating with one section of steep side slope approximately two kilometres south of the pump station. The pipeline route in Section A commences at the pump station and runs parallel to Killingworth Road, south to the Goulburn Valley Highway.

The PIA confirms the presence of the EPBC listed species, Matted Flax Lily and the Striped Legless Lizard on this section of the pipeline alignment. The Matted Flax Lily is present in an erosion hazard area of steep side slopes approximately 2.5 kilometres south of the Goulburn River, and the Striped Legless Lizard was identified at two sites approximately three kilometres south of the Goulburn River. It indicates that suitable habitat exists for the listed species, Golden Sun Moth (EPBC listed) and Great Egret (FFG listed) and concludes that they are likely to occur.

Important remnants of the Grassy Woodland EVC are generally located in the Killingworth Road reserve. Construction adjacent or within the road reserves or intersecting with paddock remnants will cause adverse impacts both to this limited remnant flora and its function as fauna habitat, including hollow bearing trees and connecting corridors. This EVC provides habitat for the Golden Sun Moth and further fragmentation will impact on the Moth due to its limited mobility. The construction corridor will directly impact the Matted Flax Lily in this section and without mitigation or protection the plants are likely to be destroyed. The Alliance has developed an EMP for this species. Specific WAPs will be required for mitigation measures at this site.

There will be permanent loss of tussock grass habitat suited to the Striped Legless Lizard in this section of the alignment. Mr Timewell for the Alliance considers this will have only a slight impact on the lizard due to its mobility.

The PIA states that the removal of remnant vegetation on farmland in this section may result in loss of “stepping stone” corridor habitat and hollow bearing trees.

A patch of 10 plants of Slender Tick-trefoil (*Desmodium varians*), a species poorly known in Victoria, is located near the Goulburn River off take and may be at risk.

(ii) Section B

This Section of the alignment comprises undulating grazing land to the west and Yea River floodplain to the east. The pipeline route runs parallel to the Melba Highway from the Goulburn Valley Highway, south to Murrindindi Road. It traverses the Yea

Wetlands, (which are highly valued by the Yea community) and crosses three major waterways including the Yea River. The route is primarily located above the floodplain on the west side of the Highway.

There is the likely occurrence of the following listed species: Golden Sun Moth (EPBC listed), Great Egret (FFG listed), Broad-shelled Tortoise (FFG listed) and the River Swamp Wallaby Grass (EPBC listed).

There are a number of impact risks to flora and fauna in this Section. Further fragmentation of remnant grassy woodland vegetation habitat will impact on the Golden Sun Moth due to its limited mobility.

Construction operations within the Yea River Floodplain may have a major impact on the water quality and quantity of wetlands unless construction is sensitive to the geomorphic influences on the wetland ecology and is accomplished in dry weather.

River Swamp Wallaby Grass grows mostly in permanent wetlands. This species needs wetlands that have some bare ground conditions produced by seasonally fluctuating water levels. Construction operations could indirectly destroy plants through alteration of the hydrogeology.

The Grassy Woodland EVC was mostly cleared for farming and the important remnants are generally located in the road reserve of the Melba Highway. Construction adjacent or within the road reserves or intersecting with paddock remnants will cause adverse impacts both to this limited remnant flora and its function as fauna habitat, including hollow bearing trees and connecting corridors. According to the PIA, the removal of remnants of this EVC on farmland would create loss of “stepping stone” corridor habitat.

(iii) Section C

Section C is located in open undulating grazing land. The pipeline has three major waterway crossings including the Yea River at Devlin Bridge. This section runs parallel to the Melba Highway, south from Murrindindi Road to the Yea River at Devlin Bridge. It traverses undulating to steep grazing land with high erosion hazard, generally about one kilometre west of the Yea River.

The PIA predicts the likely occurrence of the following listed fauna: Golden Sun Moth (EPBC listed), Striped Legless Lizard (EPBC listed), Growling Grass Frog (EPBC listed) and the Azure Kingfisher (FFG listed). However investigations to date have not confirmed the presence of any listed species.

The Grassy Woodland EVC would have predominated, but was mostly cleared for farming. The important remnants are generally located in the road reserve of the Melba Highway. Construction adjacent or within the road reserves or intersecting with paddock remnants will cause adverse impacts both to this limited remnant flora and its function as fauna habitat, including hollow bearing trees and connecting corridors. Its further removal from farmland would create loss of “*stepping stone*” corridor habitat for any fauna with low mobility. There may also be impacts from construction to specific fauna habitat, including that of the Striped Legless Lizard.

Ms Beer submitted that the riparian zone on the Yea River at Devlin Bridge has taken many years to recover from earlier clearing and that regrowth of tea tree plants located at the pipeline-crossing site are likely to be destroyed again. This site is highly valued environmentally by local people.

There will be a greatly increased risk of erosion, sedimentation and polluted water from construction sites at the waterway crossings. If this eventuates there will be adverse impacts on riparian vegetation and fauna.

(iv) Section D

Section D comprises gently undulating open grazing land and includes two major waterway crossings. It runs south from the Yea River at Devlins Bridge to the northern boundary of the Toolangi State Forest and traverses open grazing land, parallel to the Melba Highway for the full length.

The PIA reports the likely occurrence of the following listed fauna: Regent Honeyeater (EPBC listed), Growling Grass Frog (EPBC listed), Powerful Owl (FFG listed) and Turquoise Parrot (FFG listed). PIA surveys have not confirmed the presence of any listed species.

The Grassy Woodland EVC was mostly cleared for farming and the important remnants are generally located in the road reserves, in this instance the Melba Highway. Construction adjacent or within the road reserve or intersecting with paddock remnants will cause adverse impacts both to the remnant flora and its function as fauna habitat and corridor. In this Section removal of remnant vegetation on farmland would create loss of “*stepping stone*” corridor habitat, or the loss of hollow bearing trees that are critical for the Powerful Owl. Further fragmentation of the remnant woodland will impact on the Regent Honeyeater due to its limited mobility.

The PIA identifies the potential for damage from construction disturbance or clearing to local fauna or populations of migratory birds within this agricultural

section. Migratory birds use low-lying areas on farms and the remnant habitat within road reserves.

(v) Section E

The alignment traverses rolling to steep terrain in this Section and includes the proposed tunnelling and major clearing of high value vegetation within the Toolangi State Forest. It has one major waterway crossing at Campbells Creek and runs south from the power line easement, parallel to the Melba Highway to the Healesville Kinglake Road and traverses the Toolangi State Forest and private land at Castella. Much of the alignment is subject to steep cross-falls and a section of tunnel is proposed near Castella. Major vegetation clearance will occur through this Section.

The PIA reports there is no confirmed presence of any listed species, but likely occurrence of the following listed fauna: Swift Parrot (EPBC listed), Regent Honeyeater (EPBC listed), Spot-tailed Quoll (EPBC listed), Southern Brown Bandicoot (EPBC listed), Smoky Mouse (EPBC listed), Powerful Owl (FFG listed) and Diamond Firetail (FFG listed). A population of the endangered EVC, Swampy Riparian Woodland exists at the Campbell Creek crossing.

The PIA identifies a number of impacts and environmental risks associated with the construction.

There will be extensive impact on a large tract of Heathy Dry Forest, Herb Rich Foothill Forest, Damp Forest and Shrubby Foothill Forest EVCs with clearing of the construction corridor in the southern part of the Toolangi State Forest. This will impact on the EPBC and FFG listed species above. In particular the Smoky Mouse may be significantly impacted by removal and fragmentation of habitat, including nesting habitat and the increased predation by feral pests, and specific mitigation measures are yet to be defined.

The corridor through the State Forest will compound the existing fragmentation created by the Melba Highway and consequently further limit fauna movement between the State Forest and the National Park.

Further fragmentation of remnant woodland vegetation habitat within the State Forest or the agricultural landscape will impact on the Swift Parrot and the Regent Honeyeater and reduce the movement of the ground dwelling Spot-tailed Quoll and Southern Brown Bandicoot.

There is potentially a construction impact on the endangered EVC Swampy Riparian Woodland located adjacent to Campbells Creek and the proposed major waterway

crossing. There may be damage from construction disturbance or clearing to populations of migratory birds within this section, particularly populations using low lying areas on farms and the remnant habitat in the Castella area.

Reduction in ground cover will both decrease shelter for native ground dwelling fauna and improve mobility of feral predators such as foxes and cats, thus increasing the incidence of predation.

(vi) Section F

In this Section the alignment traverses rolling terrain in Toolangi State Forest and undulating terrain in the open grazing land. Construction includes major clearing of high value vegetation in State Forest. The pipeline corridor crosses one major waterway (Dixons Creek) where it emerges from State Forest. The Section extends south from the Healesville - Kinglake Road to Hunts Lane, running parallel to Dixons Creek.

The PIA reports there is no confirmed presence of any listed species, but the likely occurrence of the following listed fauna: Swift Parrot (EPBC listed), Regent Honeyeater (EPBC listed), Spot-tailed Quoll (EPBC listed), Southern Brown Bandicoot (EPDC listed), Powerful Owl (FFG listed), and Diamond Firetail (FFG listed). The endangered EVC, Gully Woodland is present and is traversed by the corridor 500 metres south of the proposed Dixons Creek crossing.

There will be an extensive impact on a large tract of Heathy Dry Forest, Herb Rich Foothill Forest, Damp Forest and Shrubby Foothill Forest EVCs, with clearing of the construction corridor in the southern part of the Toolangi State Forest. This is likely to impact on FFG listed species. In particular the Smoky Mouse may be significantly impacted by removal and fragmentation of habitat, including nesting habitat and the increased predation by feral pests, and specific mitigation measures are yet to be defined.

The corridor through the State Forest will compound the existing fragmentation caused by the Melba Highway and consequently limit fauna movement between the State Forest and the National Park.

Further fragmentation of remnant woodland vegetation habitat will impact on the Swift Parrot and the Regent Honeyeater and reduce the movement of the ground dwelling Spotted-tailed Quoll and Southern Brown Bandicoot.

There is likely to be clearing impact to the endangered EVC Gully Woodland located adjacent to Dixons Creek. This is a small remnant of narrow width, which provides

continuity from the riparian environment on Dixons Creek to the Kinglake National Park. Further fragmentation to this EVC is likely to have a significant impact on the mobility of fauna. On the farmland, the removal of fauna habitat will create loss of *“stepping stone”* corridor habitat, or the loss of hollow bearing trees, which are critical habitat for Powerful Owl. There may be damage from construction disturbance or clearing to populations of migratory birds within this section, particularly populations using low lying areas on farms and remnant habitat within road reserves.

Reduction in ground cover within the cleared corridor through the forest will both decrease shelter for native ground dwelling fauna and improve mobility of feral predators such as foxes and cats, thus increasing the incidence of predation.

(vii) Section G

This Section traverses an undulating farming landscape of interspersed vineyards and grazing land. From Hunts Lane, the pipeline will be located in cleared farmland and run parallel to the Melba Highway until it follows west along Gulf Road to the intersection with the Maroondah Aqueduct Reserve. It then follows the Aqueduct easement and turns south along Steels Creek Road to Section H. There are four major waterway crossings proposed on Dixons and Steels Creeks.

The PIA confirms the presence of four Matted Flax Lily (EPBC listed) sites at Hunts Lane, Gulf Road and the Maroondah Aqueduct, and the likely occurrence of the following listed fauna, Growling Grass Frog (EPBC listed), Little Egret (FFG listed), Intermediate Egret (FFG listed) and Great Egret (FFG listed).

The construction corridor is likely to directly impact the Matted Flax Lily at these sites and without mitigation or protection the plants are likely to be destroyed. The Alliance has developed an EMP for this species. Specific WAPs will be required for mitigation measures at this site.

The pipeline corridor traverses cleared farmland in Section G and the Alliance prefers to run it as close to property boundaries with the road reserve as possible. However there is significant remnant vegetation along the road reserves. Any habitat loss, fragmentation or disturbance in or near the road reserve is likely to affect populations of fauna within the road reserve, pipeline corridor or nearby habitat such as dams or riparian environments on private land. This includes any of the species listed above. The less mobile Growling Grass Frog would be significantly affected by such fragmentation of habitat.

There may be damage from construction disturbance to populations of migratory

birds within this section, particularly populations using low lying areas on farms and the remnant habitat within road reserves.

(viii) Section H

Section H traverses an undulating farming landscape with vineyards and grazing interspersed along Steels Creek Road and Glenview Road, then rising to very steep grazing or partly forested land where the pipeline will cross the escarpment to enter the Sugarloaf reservoir. The pipeline route follows Steels Creek and Glenview Roads, then west along the Gas Pipeline easement to the Sugarloaf Reserve and on to the Reservoir.

The PIA confirms the presence of the Matted Flax Lily (EPBC listed) near the corner of Glenview Road and the gas pipeline easement and the likely occurrence of the following listed fauna: Powerful Owl (FFG listed), Intermediate Egret (FFG listed), Brush-tailed Phascogale (FFG listed), and Brown Toadlet (FFG listed).

With regard to the listed fauna, the key potential impacts are removal of habitat, fragmentation of habitat and disturbance, particularly through the Christmas Hills escarpment and waterway crossings. Such impacts would be more intense for a less mobile species such as the Brown Toadlet, which would be susceptible to deterioration of water quality in Steels Creek. Injury and mortality to native species due to construction are likely through the Christmas Hills and Sugarloaf Reservoir reserve. The Powerful Owl may abandon the habitat and reduce breeding activity due to clearing and construction disturbance.

The construction works are likely to directly impact the Matted Flax Lily and without mitigation or protection the plants are likely to be destroyed. The Alliance has developed an EMP for this species. Specific WAPs will be required for mitigation measures at this site.

The clearing of intact vegetation at the escarpment and disturbance in the Sugarloaf reserve could pose a risk of invasion from environmental weeds and machinery could spread existing environmental weeds.

Reduction in ground cover through the Christmas Hills and the Sugarloaf Reserve will both decrease shelter for native ground dwelling fauna and improve mobility of feral predators such as foxes and cats, thus increasing the incidence of predation.

(ix) Conclusions and Recommendations

It is clear that the pipeline construction and maintenance easement will have a significant impact on flora and fauna both along the alignment and wider through habitat fragmentation and disturbance. Habitat destruction and fragmentation will reduce range and movement of species, reduce breeding structures (such as tree hollows) and could ultimately impact on species diversity.

In an ecological sense there is great natural diversity and many unknowns about the presence or absence of species in the pipeline alignment. The presence has also been confirmed of a number of rare or endangered ecological communities, EPBC and FFG listed species and there is a likely occurrence of more. The current status of investigations is incomplete and inadequate for sound planning for protection and management of ecological values along the pipeline route. At this stage significantly more investigation is needed to provide adequate advice under the EPBC Act.

The reasons for this are twofold. Firstly, the PIA has not provided any form of environmental risk assessment that considers the likelihood, magnitude or implications of particular impacts on flora and fauna. Secondly, as construction of the pipeline is to proceed in parallel with continuing ecological surveys and investigations, the only way to protect listed species is to invoke the “*precautionary principle*” and assume their presence.

It is intended by the Alliance to develop specific WAPs for environmental protection and mitigation measures to be implemented by works crews at each construction site. It is important that works crews are clearly schooled in the importance of these measures and that they are not treated lightly. In this situation of high risk to listed species and diminished ecological communities, sound process must underpin mitigation measures in the field. The Alliance must invoke the precautionary principle site by site, in each reach of the final preferred pipeline alignment.

The Advisory Committee recommends that the Alliance:

- **Undertake detailed assessment of impacts on State and Commonwealth listed species in the micro-design of the final alignment to inform the development of EMPs and WAPs.**
- **Finalise investigations and surveys of flora and fauna, and ensure an ecologist is in continuous and close contact with construction crews to oversee mitigation measures.**

- **Apply the precautionary principle for mitigation measures wherever there is suitable habitat for listed State and Commonwealth species, and assume their presence for planning and construction purposes.**
- **Reinstate habitat at each construction site immediately after construction and closely monitor structures (and provide timely repair as appropriate) or other measures to manage processes threatening to the environment.**

6.2 Aquatic Ecology

Appendix I to the PIA contains the Aquatic Ecology Impact Assessment. This presented baseline data on the wetlands, instream habitat, macroinvertebrates, water quality and fish within the waterways that could potentially be impacted by construction of the project. The investigations included a desktop study, as well as some further survey field work. A fish survey was conducted at Sugarloaf Reservoir to *“gain an understanding of the resident fish populations and assess the potential risks of translocation of noxious species from the Goulburn River catchment to Sugarloaf Reservoir.”*

The PIA states that data within the assessment was sourced from a range of stakeholders, including Melbourne Water, the Goulburn-Broken CMA, Victorian Water Quality Data Warehouse website, DSE, EPA and Fisheries Victoria. Sites were selected along the pipeline corridor and were determined based on the potential crossing of the pipeline with the waterways.

(i) Desktop Study

Instream Habitats and Water Quality

The overarching legislative requirement for instream habitat in Victoria is the SEPP (Waters of Victoria). A desktop study was undertaken of the instream habitat within the waterways that would potentially be impacted by the project. The PIA states that this formed a component of the environment assessment required to assist in selecting the final pipeline alignment. In addition, waterway engineers conducted a visual assessment of instream habitat conditions of the Yea River and relevant tributaries within the study corridor, while aquatic ecologists assessed conditions during the fish and macroinvertebrate surveys as part of the habitat description. Additional information was sourced from relevant reports, such as the recent environmental flows study and Index of Stream Condition Assessments.

A desktop review of water quality was undertaken based on data provided by Melbourne Water, the Goulburn-Broken CMA and the Victorian Water Quality Data Warehouse website and *“information from relevant reports and other documents.”* In

addition, in situ data was collected using a calibrated TPS 90FLT water quality meter during fish and macroinvertebrate surveys for the current assessment. The SEPP (WoV) and the SEPP (WoV) Schedule 7 provide the indicators and water quality objectives relevant for waterways covered by surface water segments within the SEPP.

The PIA identifies the main threat to instream habitat and water quality as being construction activities such as trenching the streambed and access to the banks by heavy machinery. Impacts are listed as possibly including *“destruction of instream habitat, erosion of banks leading to increased sedimentation and degradation of water quality”*. The PIA notes that waterways can be subject to heavy sedimentation as a result of other sources, including runoff from unsealed roads adjacent to waterways and storm events.

The PIA expresses confidence that the impacts of the pipeline on instream habitats and water quality can be minimised and mitigated by appropriate measures, stating that the risks *“can be reduced through utilising Best Management Practices during the project as detailed in the Environment Management Plan.”*

Fish

Aquatic fauna in Victoria is protected by national and state legislation. The EPBC Act is the Federal Government’s principle environmental legislation and it seeks to protect Australia’s native species and ecological communities. Once a species is listed under the EPBC Act, its recovery is promoted using conservation advice, recovery plans, and the EPBC Act’s assessment and approval provisions. At the state level, the *Flora and Fauna Guarantee Act 1988* aims to protect Victoria’s communities of flora and fauna and to manage potentially threatening processes, while the *Fisheries Act 1995* provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitat.

The PIA states that fish distribution data has been collected from the following sources:

- Aquatic Fauna Database (DSE 2007);
- DPI Freshwater Fisheries Database;
- Snobs Creek (DPI, 2007);
- Ad hoc sampling undertaken as part of the Steels, Pauls and Dixons Creeks Environmental Flow Determination (SPDEFTP 2003); and
- Surveys undertaken by DSE in Steels, Pauls and Dixons Creeks (Raddik 2005).

The table from the PIA below shows the fish species recorded from the north and south side of the Great Dividing Range indicating date of most recent record. Data comprises those species recorded inside the study area of the pipeline corridor and those recorded outside the study area but “*within the broader catchment*”.

Table 1: Recorded Fish Species

Common name	Species name	North		South	
		Inside	Outside	Inside	Outside
Native					
Australian Smelt	<i>Retropinna semoni</i>	19/01/1997			
Barred Galaxias	<i>Galaxias fuscus</i>		17/10/2000		
Common Jollytail	<i>Galaxias maculatus</i>			Undated 2005	28/5/2000
Flathead Gudgeon	<i>Philypnodon grandiceps</i>			Undated 2003	
Macquarie Perch	<i>Macquaria australasica</i>	26/12/1995	30/04/1992	1/12/1917	
Mountain Galaxias	<i>Galaxias olidus</i>	24/10/2007	13/10/1999	Undated 2005	
River Blackfish	<i>Gadopsis marmoratus</i>	9/04/1997	30/04/1992		
Shortfinned Eel	<i>Anguilla australis</i>			Undated 2005	Undated 2005
Southern Pygmy Perch	<i>Nannoperca australis</i>	16/11/1991		Undated 2005	Undated 2005
Two-spined Blackfish	<i>Gadopsis bispinosus</i>	24/10/2007	9/09/1998		
Western Carp Gudgeon	<i>Hypseleotris klunzingeri</i>	24/10/2007 19/01/1997		Undated 2005	
Exotic					
Brown Trout	<i>Salmo trutta</i>	24/10/2007 15/10/1999	24/09/1998		
Carp	<i>Cyprinus carpio</i>	7/05/1990		Undated 2005	Undated 2005
Mosquitofish	<i>Gambusia holbrooki</i>	19/01/1997		Undated 2005	Undated 2005
Goldfish	<i>Carassius auratus</i>	16/11/1991	4/05/1990	Undated 2005	Undated 2005
Oriental Weatherloach	<i>Misgurnus anguillicaudatus</i>			Undated 2005	Undated 2005
Roach	<i>Rutilus rutilus</i>			Undated 2005	
Rainbow Trout	<i>Oncorhynchus mykiss</i>		15/10/1999		
Redfin	<i>Perca fluviatilis</i>	19/01/1997	30/04/1992	Undated 2005	Undated 2005

Source: Project Impact Assessment Report

Field investigations confirmed the presence of a number of fish species at every sampled location along the pipeline corridor. The EPBC listed species Barred Galaxias (*Galaxias fuscus*) and Macquarie Perch (*Macquaria australasica*), previously identified in the Yea River, were not identified in the recent survey. The PIA states that Barred Galaxias were not expected to be identified as “*their distribution is outside of the pipeline corridor and is restricted to the headwaters of the Yea River*”.

The PIA states that the pipeline poses threats to fish species “*through the construction of waterway crossings as well as the potential increase in turbidity resulting from runoff from cleared land*”, but again states these threats can be managed through the EMP.

Macroinvertebrates

The DSE search of the Atlas of Victorian Wildlife found that within the study area, several aquatic invertebrates were of concern, including:

- Murray Spiny Cray (*Euastacus armatus*);
- Caddisfly species (*Archaeophylax canarus*); and
- Ancient Greenling (*Hemiphlebia mirabilis*) damselfly.

Historically, the Murray Spiny Cray was reportedly widespread throughout the entire Murray-Darling Basin, but is now less common and less widespread due to overfishing and habitat degradation. The PIA states that the Murray Spiny Cray has previously been found from the junction of the Yea and Murrindindi Rivers, near the high voltage power lines. During survey work, Murray Spiny Cray was observed at Devlin Bridge and in the Yea River near the Yea Wetlands.

A number of species of burrowing crayfish (*Engaeus spp*) are listed as occurring on the pipeline corridor, of which some are FFG listed. The PIA stated that while a target survey failed to locate live specimens, “*a number of exoskeletons were collected during the field investigation, and a substantial amount of evidence (eg burrows) suggests that one or more species of the genus are present within the pipeline corridor.*”

Neither the caddisfly species of *Archaneophylax* or the Ancient Greenling (*Hemiphlebia mirabilis*) damselfly were found during survey work, although no targeted species searches were conducted as part of this investigation. However, the *Archaeophylax camarus* has previously been found at the junction of the Yea and Murrindindi Rivers. This species is listed as rare under the FFG Act, and is known to occur in foothills and in lowland streams, including temporary streams and farm dams. The Ancient Greenling (*Hemiphlebia mirabilis*) Damselfly is listed as vulnerable under the FFG Act. It is believed that this species may be present within the study area, and the PIA states that targeted surveys are highly recommended for this species.

(ii) Wetlands

The PIA states that *"State significant wetlands are listed in the Flora and Fauna Guarantee Act 1988. No wetlands of state significance were identified in the study site."* The submission from DSE pointed out there was no schedule to the FFG Act that lists wetlands of significance, and the above statement in the PIA should be deleted.

The Alliance stated that approval is being negotiated with the Goulburn Broken CMA and Melbourne Water for works on waterways for all locations where the pipeline intersects a 'designated waterway'.

Mr and Mrs Warnock were concerned about the impact on aquatic ecology from biological material being transported from the Goulburn River to Sugarloaf Reservoir, including *"chemicals, pathogens, heavy metals, seeds and viruses."* The Alliance responded to this issue by stating that a biosecurity management protocol was being prepared with the Department of Primary Industries (DPI), and that DPI guidelines would be employed as a minimum requirement.

Mr Masters felt that the mitigation measures aimed at preventing sediment flow into river systems were *"very vague"* and was concerned about the potential impact on aquatic ecology that may result. The Alliance responded by noting that actions to limit sediment transport to waterways would include *"silt fences, minimal vegetation clearance and rapid reinstatement of disturbed areas."*

Plug the Pipe argued that while the PIA addressed the existence of each of the aquatic species sufficiently, it *"did not address the impact of disturbance at all"*.

The submission from DSE identified what it considered were a number of omissions and errors within the PIA, including a report on the Ancient Greenling Damselfly. The Alliance responded by stating that the Damselfly report would be completed, with mitigation measures included in the EMP.

In their response to submissions, including those from Plug the Pipe and Ms Hogan, the Alliance stated that the greatest potential impact for aquatic ecology will arise from *"increased turbidity as a result of the construction process and potential impacts on habitat if trenching is used to cross waterways."*

(iii) Conclusions and Recommendations

The Committee concurs with the Alliance that the most significant threat to aquatic ecology will be turbidity and sedimentation arising from the construction process within or adjacent to waterways. It considers there is a potential risk of sediment contamination in waterways generated by off site soil erosion in the construction zone.

The Advisory Committee recommends that the Alliance:

- **Finalise investigations and surveys of aquatic ecology and ensure an ecologist is in continuous and close contact with construction crews to oversee mitigation measures.**
- **Apply the precautionary principle for mitigation measures wherever there is suitable habitat for listed State and Commonwealth species, and assume their presence for planning and construction purposes.**
- **Rehabilitate each waterway and adjacent construction site immediately after construction, and closely monitor structures (and provide timely repair as appropriate) or other measures to manage processes threatening to the environment.**

6.3 Implications of Transferring Water

The Environmental Implications of Transferring Water is discussed in Appendix C of the PIA. This was prepared in response to the list of conditions made by the Minister for Planning in his decision that an Environment Effects Statement was not required for the project. As part of these conditions, there was a request for additional studies assessing the environmental implications of transferring water from the Goulburn River (between the off-take and Goulburn Weir) as described in condition 1(ii) of the Minister's decision.

The PIA states that a substantial amount of water that would otherwise be lost will be saved by the Food Bowl Modernisation Project, with the savings allocated equally in one third shares between the environment, irrigators and Melbourne Water. Water from the Goulburn River to supply Melbourne will be extracted at 300 ML/d, mainly during the irrigation season when regulated releases to the Goulburn River from Eildon Weir are usually between 5,000 – 10,000 ML/d. Under these circumstances, the PIA concluded that there would be *"an estimated reduction in river level of around 5cm downstream of the extraction point"*.

According to the PIA, the Goulburn River in the vicinity of the extraction point at Yea and downstream to the Goulburn Weir is “*in a relatively degraded state*” as it:

- Scores poor to very poor on the Index of Stream Condition Assessment due to changed flow regimes, riparian vegetation degradation and loss of in stream habitat;
- Has degraded native fish fauna and the river is no longer suitable habitat for the EPBC and FFG Act listed species the Murray cod, Trout cod and Macquarie perch; and
- Is dominated by alien fish, particularly trout.

Despite its degraded state, the Goulburn River is listed in the *Heritage Rivers Act* 1992 and it provides significant social and economic values. Schedule 3 of the *Heritage Rivers Act* requires that new water diversions must not significantly impair the attributes of the area.

Overall, the PIA report made the following conclusions in relation to environmental implications of transferring water:

- While extraction of water from the Goulburn River is not likely to have any detrimental effect on environmental values, extractions during the non-irrigation period need to ensure that “*existing or future Bulk Entitlement requirements are met.*” To compensate for extractions at Yea and to maintain downstream flows, specific releases need to be made from Lake Eildon;
- Water should be extracted during higher flow periods when the volume of extracted water would represent a small proportion of the total flow. This would ensure the quality of the water transferred to Sugarloaf Reservoir would not threaten water quality in the reservoir;
- The availability of habitat for fishes species still present in the river would not be impacted by the predicted change in river height of 5 centimetres;
- Fish entrained by the pumps would be unlikely to survive completely unharmed as a result of the rapid and sustained pressure increases they would be exposed to. Any fish that did survive through the pipes would be very unlikely to make it into the Yarra River as Sugarloaf Reservoir is a closed system;
- The Killingworth inlet site is located on a stable section of the Goulburn River, and water level changes associated with pumping will not impact on the geomorphic stability of the Goulburn River; and
- Variation in floods may lead to minor adjustments to channel form. In order clarify bed level changes during flood events, and to aid in the selection of a suitable sign design for the inlet, the PIA proposes that further detailed site investigations and modelling be undertaken.

The main issues of concern raised by submitters included:

- Impact of pipeline on Yea/Killingworth wetlands;
- Impact of pipeline on environmental values, water quality and habitat availability; and
- The need for an independent assessment of the potential impacts of water extraction.

Submitters such as Ms Devereaux and Mc McGrath were concerned that the pipeline would affect wetlands in the Yea/Killingworth area. In the refinement report, the Alliance responded by stating that the pipeline would not cross the Yea/Killingworth wetland, and that the preferred corridor crosses the Yea River upstream of the wetlands. They commented that other factors such as unrestricted stock access, vegetation removal and seasonal reversal of flow regimes due to current irrigation releases would all have a greater impact on floodplain and wetland health. However, the Alliance did state there is potential along some parts of the pipeline corridor, such as the Yea/Killingworth wetlands, where *“the construction of a pipeline may require the control of groundwater ingress”*. This could be achieved through trenching methodology or dewatering.

Mr Cassell was critical of the PIA, as he felt that it did not provide sufficient detail of the impact on the Goulburn River nor on the effect of *“removing 75GL of water between Yea and Shepparton will have on the environment and the animals and plants that use to inhabit the water.”* He questioned how the *“Melbourne unused 75GL”* could be stored in Lake Eildon. The Alliance responded by stating that with the high flow periods that typically occur during the irrigation season, the resulting reduction in water levels of approximately 5cm from extractions is *“unlikely to have any detrimental effect on environmental values and will not significantly reduce habitat availability”*. However, specific releases may need to be made from Lake Eildon if extractions occur at other times of the year and will be subject to a Bulk Entitlement.

Mr McPherson was concerned that the assessment only deals with the natural environmental implications, as *“environment includes both the built and natural environment and the liveability of one’s surroundings”*. He noted that except for the benefits to trout fishers, there is *“no reference to the impact of communities along the Goulburn River”*.

The Acheron Valley Watch Inc made a detailed submission on the potential environmental implications and put forward the following conclusions:

- The current poor health of the mid Goulburn River should not be taken as

standard against which the impacts of the extraction via the pipeline are compared and qualified as insignificant. Instead, the assessment should anticipate the future rehabilitated state of this section of the river after a successful implementation of the Goulburn Broken River Health Strategy 2005 – 2015. Potential environmental impacts from the pipeline should be assessed in view of this *“future healthier state of the river”*;

- The environmental water reserve in Eildon Weir should not be used should the pipeline begin operating in 2010, on the basis of water savings claimed to have been achieved by earlier projects of the Food Bowl Modernisation Project. Taking environmental water reserves for purposes other than the environment does not conform with the *Water (Resource Management) Act 2005*;
- The environmental water reserve should not be taken from the Eildon Weir during non-irrigation periods when low daily flows as experienced during recent drought periods;
- No water should be taken from the carry-over water of past water saving projects in the Shepparton irrigation area or downstream of the Goulburn Weir. Instead, these savings should be used for the irrigation sector and the environment in the catchment where these savings were saved;
- Because of the nature of the water cycle and the interconnectivity of surface and ground water, it should be recognised that the water ‘savings’ for irrigation due to the Food Bowl Modernisation Project signify in reality contributions of water to the environment. As a consequence, *“the environmental impacts of these ‘losses’ should be taken into account and a higher share should be attributed to the environment first in order to implement the Regional River Health Strategy”*;
- Minimum environmental flow levels should be determined without tapping into environmental water reserves, below which no extraction via the pipeline would be permitted. The corresponding operating rules should be applied in situations of low inflows and low storage levels of Lake Eildon and during flow regimes below 2,000 ML/d;
- The PIA should quantify operating rules for different scenarios, including the forecasts of an increase in climate change or a continuation of the severe drought conditions experienced in the past years. It should also *“explicitly recognise that water ‘savings’ achieved in the Food Bowl Modernisation Project will vary from year to year subject to climatic conditions.”*; and
- An independent auditing process should assess the magnitude of inflows into Lake Eildon, the storage levels and the daily flow regimes from the Eildon Weir downstream and should also *“verify how much ‘savings’ are really achieved per time unit in the Food Bowl Modernisation Project area.”*

The Advisory Committee notes that the Alliance did not specifically respond to the

above points in their refinement report.

A number of submitters requested that there be some form of 'independent' assessment of the environmental impacts of extraction. Ms Burton was one such submitter, stating that such an assessment should be undertaken annually *"by research scientists with expertise in such analysis from the major Melbourne-based universities, such as the University of Melbourne."* The Alliance responded by saying that they have agreed for an independent survey of environmental impacts of the Goulburn River to be undertaken. However there was no mention of who would carry out these surveys, what they would consider or how often they would be done.

Another concern for submitters was the effect the pipeline would have on water quality in the Goulburn River. Mr Reid submitted that the Goulburn River water would *"be threatened by the proposed use of the environmental reserves in the Eildon Reservoir for use in Melbourne and Geelong"*, and that this would place townships downstream from the proposed pumping station at risk should there be a toxic blue green algae outbreak. The submission by the Healesville Environment Watch Inc raised similar concerns, and was critical of the PIA's *"false and most damaging supposition"* that the Goulburn River downstream is already degraded, so that *"additional degradation caused by removing more water would have no further detrimental effect"*. They believed that the State Government has a responsibility to rehabilitate the previously degraded areas and to ensure that no future action is taken that threatens to cause further degradation. The Alliance downplayed these concerns, making the comment that the PIA indicated that flow and river level changes downstream of the extraction point would be minimal and *"would not represent a risk to environmental values, threatened species or water quality."* They also refuted the risk of algal blooms, arguing that flow in the Goulburn River would be sufficient to prevent blooms from forming.

The Acheron Valley's submission noted that the impact of the pipeline on environmental values such as water quality and habitat availability needs to be tied in with flora and fauna, hydrology and aquatic ecology. The community would be more comfortable with the project if there was an independent assessment of the potential impacts of water extraction and other hydrological impacts.

In relation to the potential impact of the pipeline on the Yea/Killingworth wetlands, the Committee notes that the Alliance's preferred 'blue line' route crosses the Yea River upstream of the wetlands, thus any direct effect on them will be minimal. However, the Committee would expect the Environmental Management Strategy to include provisions protecting the wetlands from any groundwater flow inhibition or other potentially detrimental effects.

The Committee recognises that the pipeline crossing of the Yea River flood plain upstream of the Yea Wetlands has the capacity to have detrimental impacts through lowering the water table down stream. However, this potential impact can be offset by appropriate design at the crossing. This would involve including a groundwater shunt at depth in permeable alluvium below the pipe to allow the water table to equilibrate across the barrier created by the pipe. The water table thereafter should move within the usual range and avoid any perturbations consequent on the presence of the pipeline crossing.

In relation to the Goulburn River, the capacity of the river flow to permit the diversion of up to 75GL per annum is underpinned by regulated releases from Eildon Weir. These will only take place so long as the reservoir has the capacity to sustain irrigation water releases. These releases are generally at a rate in excess of 5,000 ML/d up to 10,000 ML/d which renders the off-take to the Sugarloaf Interconnector Pipeline as being between 3 and 6% of the downstream flow passing the off-take.

Many submissions expressed concern at the possibility that off-takes could be a much larger proportion of the passing flow than that given above. Their concerns were that this could have detrimental effects on the down stream river environment. Examples are discussed in the section above.

Community fear that the Sugarloaf Pipeline off-take pumping could render the down stream reach substantially diminished in flow could be allayed were an operational agreement to be incorporated that the Sugarloaf Pipeline off-take should never exceed a rate which exceeds say 7.5% of the passing flow at the off-take, nor be at a rate that would deliver more than 75 GL/a.

Were such an agreement to have applied across the extreme low release periods from October 2006 to March 2007 (the data provided by Plug the Pipe), the diversion to the Sugarloaf Pipeline would have been less than half that set as the maximum allowable off-take. Such an agreement needs to be assessed in terms of the impact on the down stream river levels at low regulated release rates (say less than 2,000 ML/d) but it seems unlikely that they would represent a significant issue. If the river levels were to be unacceptably affected, an operational limit on the lowest flow at which any diversion to the Sugarloaf Pipeline could be obtained would need to be set. Given that the releases from Eildon Weir are regulated, it is expected that the release rate rules would remain unchanged, since the Sugarloaf Pipeline off-takes are related to the savings created in the demand deriving from the Goulburn Murray Irrigation District through the Food Bowl Modernisation Program.

A rule as outlined above would ensure that the downstream river stage (level)

would not be materially affected. Were such a rule not to apply then it is probable that at times the down stream river stage could be substantially lowered and this could have adverse effects on the aquatic ecosystems and on the stability of the river banks. In addition, any long term water level decline could give rise to brackish water inflows to the river along some reaches with significance for the water quality both for use in irrigation and with respect to the in-river fauna and flora.

This rule would not unreasonably restrict extractions to the Sugarloaf Pipeline, but would rather demonstrate equity to downstream water users at times when releases from Eildon Weir are necessarily constrained by low storage levels in the Weir.

In respect to the proposed diversion of 75GL from the Goulburn River based around regulated releases in the first year of operations, the Committee understands that this is based upon water already saved by early projects in the Goulburn Irrigation District. This water is stated to be stored in Eildon and should thus be available for diversion. However if this water volume is supported either wholly or in part by the environmental reserve storage held in Eildon Weir, then the Committee believes that this water should not be available for diversion to the Sugarloaf pipeline. Such releases seem likely to be governed by the operating rules for the storage. They have a specific objective which is the preservation of an already degraded stream below the Weir. Should this reserve be diverted, it could represent a risk to the down stream environment which might have serious and lasting consequences such as brackish to saline groundwater inflows discussed elsewhere in this report. These should not be countenanced unless sufficient data is available to demonstrate that the risks are not unacceptable. Further study of this situation needs to be carried out and any releases negotiated on a basis of knowledge with the authority responsible for the timing and magnitude of regulated releases.

The Committee does not accept the proposition put by Acheron Valley Watch that the savings derived from the Food Bowl Modernization Project should not be available to the Sugarloaf Interconnector Pipeline because a portion of them contribute to the downstream environment. The Committee accept that many of the losses from the irrigation system contribute to groundwater recharge and to runoff. But, the consequences of these are not necessarily positive for the environment. Rather, losses to evaporation and evapotranspiration are incurred; the waters mobilise salinity and cause water tables to rise. The latter, in particular, are a cause of waterlogged ground and salinised soils. The raised water tables also displace saline waters towards the streams. Except in areas where intensive groundwater is used for productive purposes, it is necessary to actively intercept groundwater by pumping and disposal in order to offset these adverse effects on land and water productivity.

Conclusions and Recommendations

The Committee concludes that the Environmental Management Strategy adopted for the Pipeline should include provisions protecting the wetlands from water table declines and other potentially detrimental effects.

The implications of the diversions the Goulburn River Pumping Station should not be adverse on the contiguous environment of the river or the flood plain if rational operating rules and design elements are initiated from the outset.

The rules should limit the proportion of the river flow which can be diverted at any time to such a level that the downstream river stage heights are materially unaffected. Similarly, the groundwater flow gradient from the Yea River alluvium should not be impeded.

The Advisory Committee recommends that the Alliance:

- **Design the pipeline crossing of the Yea River flood plain to include a groundwater shunt within the deep channel to permit the water tables to equilibrate post construction across the pipeline.**
- **Restrict the Melbourne Water off-take to the Sugarloaf Pipeline to be:**
 - **not more than 7.5% of the riverflow at the time as measured at the nearest upstream river flow gauge station;**
 - **not more than 75GL in any one year (as is proposed);**
 - **zero if the necessary regulated releases are for the maintenance of environmental flows or materially deplete water stored in Eildon Weir that is designated as being an environmental reserve.**

7. SOCIAL AND CULTURAL ENVIRONMENT

The PIA examined four key elements that have been grouped into social and cultural environment issues. Due to the nature of these analyses, there is inevitably, some overlap in the discussion, particularly between social impact and socio-economics and tourism. Ms Cramphorn and Mr Cotterill, both of SKM presented on social impact and socio-economics and tourism respectively, Ms Edmonds and Mr Costello (SKM) presented on cultural heritage, and Mr Graham (GHD) presented on landscape and visual issues.

7.1 Social Impact

The Social Impact Assessment was set out in Appendix J of the PIA. It provided information on the existing conditions, through analysis of the social context, social climate and the social profile. It assessed potential impacts for each of the eight sections from A to H, and then provided a brief commentary on mitigation and management measures.

(i) Direct and Indirect Social Impacts

The PIA noted the broad range of social impacts include the following:

- Potential impacts on private property owners and occupiers;
- Access;
- Traffic and safety;
- Noise and vibration;
- Air quality, particularly dust during construction;
- Landscape and visual impacts;
- Recreation and tourism/education;
- Flora and fauna; and
- Local communities and their values.

The potential impacts and their assessment criteria are outlined in Table 3 of Appendix J of the PIA.

Ms Cramphorn advised that the social impacts cross over a broad spectrum, and she acknowledged people (the local community) were “*anxious and upset*”. She said there will be widespread community impacts. Mitigation measures would have to be undertaken on a property by property basis, but other measures could include post construction counselling and advice.

She noted that this project was unique, because the pipeline would be passing through a community, where the affected community would not get any tangible benefits from this work. The beneficiaries, according to Ms Cramphorn, would be the Melbourne community, and it makes it more difficult to justify from that perspective.

Ms Cramphorn acknowledged that these issues are very difficult to reconcile, and conceded *"maybe if we started all over again, we would run the consultation differently"*. Given the short time frames for this project, and the clear objectives to be met, she said it is little wonder that the community is well divided (with the proponent) on this matter. She did note however, that she was not involved in the consultation phase of the project.

The Committee inquired whether a net community benefit analysis had been undertaken, and Ms Cramphorn responded by commenting that she did not think it was appropriate for this case. The Committee disagrees. Such an analysis might have been able to clearly demonstrate the different types of benefits and disbenefits that accrue and result from this project – on a local, regional and statewide basis. It might also have served to try and balance some of the competing objectives with various mitigation measures to help demonstrate longer term benefits. Further, it might have provided the opportunity for the Alliance to offer tangible benefits to the local community that might off set some of the disbenefits, to at least make the project better understood.

(ii) Communities of Interest

The study area extends between the Goulburn River and the Sugarloaf Reservoir, and lies predominantly in the Shire of Murrindindi (north of the Great Divide) and Yarra Ranges to the south. The study area is book-ended by two towns - Yea in the north and Yarra Glen in the south - with the Melba Highway connecting the two.

The predominant Pipeline community comprises people north and south of the Divide, and includes farmers, viticulturalists, horticulturalists, and town residents (Yea, through to Glenburn, through to Yarra Glen). Some of these are long standing residents, many are third and fourth generation – particularly some of the farmers. In the Yarra Valley wine country, many are newer – people who may have a rural property, vineyard or other horticultural pursuit.

Almost without exception, those who made a written submission, and those who appeared at the hearing – were united in their strong objection to the proposal. What is different about this proposal and the way in which people made their

submissions, is that no one was really willing to concede that if certain mitigation measures were put in place, the resistance or objection or concerns might be allayed.

The PIA and submitters spoke of the social climate of the region being one of hardship, due to drought and fire, and the resultant social and economic stresses associated with this. Income from farming is low, and for those who have some economic gain from the snow and alpine business, that too has suffered.

Many submitters considered that the impact of the pipeline will result in irreconcilable stress and strain. Many spoke of sleepless nights, the psychological impact of burden, and raised stress levels.

The PIA provides a social profile for the region and includes information on population, projected population change, age profile and income.

(iii) Mitigation and Management of Impacts

Section 5 of the PIA provides an assessment of potential impacts for each of the sections A to H, and sets these out in tabular form. It identifies the key social and community features of each section of the proposed route and highlights activities and events particular to each of the eight sections. This is outlined in some detail, and essentially the key measures can be summarised as follows:

- Communication and information;
- Provision of counselling services;
- Maintenance of access to private property;
- Minimising impacts on flora and fauna;
- Access to public facilities and along Melba Highway; and
- Establishing local community committees.

These types of measures did not sit well with the submitters, who found it difficult to accept that any mitigation measure might assist them to come to terms with this project. This was expressed in the conclusions of the PIA report when it noted:

People are seriously concerned about the broader concept of diverting water from north of the divide to Melbourne. For a community already under significant pressure, the introduction of a new perceived threat in the form of the Sugarloaf Pipeline Project, further adds to the strain on the community.

As per its Terms of Reference, a key role of the Advisory Committee is to provide advice on the preferred route, and associated mitigation measures. This presented some difficulties, as submitters were generally reluctant to acknowledge this and to

delve down the path of mitigation. Suggestions from community submitters on mitigation measures were not forthcoming.

The submission from Yarra Ranges Shire Council, however, was interesting in this regard. It put forward numerous suggestions for compensatory benefits to its community should the project proceed. Some of these included:

- Establishment of a Regional Benefits program;
- Provision of a grant of \$100,000 per annum (including 12 months after the completion of the project to meet Council's resource needs);
- Re-surfacing of recently constructed roads (three), and construction of unmade roads (another three);
- Specific funding for appropriate local counselling, medical and allied health services;
- Compensation fund, that is spelt out in clear concise terms for the whole community; and
- Funding to be provided to local groups (eg Yarra Ranges Regional Marketing) for media campaign to promote tourism.

Like Yarra Ranges, Murrindindi Shire made it clear that it was opposed to the project, but unlike Yarra Ranges, Murrindindi did not propose any mitigation measures. It did however, note that it had ongoing discussions with the Alliance, and these were undertaken in a most professional way.

The Advisory Committee was somewhat surprised when during week 3 of the hearing, it read in the print media that the Alliance announced a "\$5 million *Regional Benefits Program*". This was not formally brought to the attention of the Advisory Committee until it was referred to in Ms Quigley's closing submissions. A Regional Benefits Program was not discussed during the opening two day presentation of the Alliance, nor was it alluded to by the Alliance and its representatives during discussion on social impacts (or the social – economic and tourism impacts).

The Committee commends the submissions and suggestions made by both Councils that presented, and considers that the role played by these municipalities will be integral in assisting the lines of communication between the community and the Alliance to be open and accessible for the duration of this project.

(iv) Conclusions and Recommendations

As discussed in Chapter 4 of this report, the project is now at the negotiation and reconciliation stage, more so than broad based community consultation. It is apparent that the Alliance is probably not in a position to reconcile the project at the broad community level, and it now needs to focus on reconciliation at the local and individual level. Additionally, the Alliance will need to work as closely as possible with the local community to see the project through, and the Advisory Committee acknowledges that this will be challenging for all involved.

The Committee is confident that the project will not realise the full range of impacts and fears expected by the community, and the wider benefits will become better understood. The ongoing work of the Alliance and the adoption of the recommendations below might assist in this. For these reasons, the Advisory Committee has recommended the formation of a high level Project Advisory Group (which can pick up elements of the Agency Reference Group) and two geographically based Community Liaison Groups to act as a focal point for the communities.

The Advisory Committee recommends that the Alliance:

- **Establish a Project Advisory Group, comprising members of the local Councils, industry, business, tourism and community, to act as a formal conduit for referral of issues, complaints and other matters. Employ an Executive Officer to support the Group, independent of the Alliance and other representatives.**
- **Provide a shared community officer, to work with both Yarra Ranges and Murrindindi Shire Offices, to liaise with the community, the Councils and the Alliance for the duration of the project.**
- **Establish two Community Liaison Groups, one on each side of the Divide, comprising various representative members of the community, to act as a focal point before, during, and for two years after construction of the pipeline.**
- **Provide a community support fund, to assist individuals who face or experience physical or social hardship due to the project. Funding proposals should be allocated by the Community Liaison Group, and endorsed by the Project Advisory Group. These funds are separate from any compensation program.**

- **Ensure that affected land owners are provided with at least a months advance direct notification of any works to be conducted on, or within 500 metres of their property.**
- **Establish a public complaints reporting process to report on possible breaches of project environmental performance criteria (for example noise, dust, traffic, erosion/sedimentation, water quality impacts, vegetation clearing, other construction breaches) to the independent auditor.**

7.2 Socio-Economics and Tourism

The Social Economic and Tourism Impact assessment is set out in Appendix K of the PIA. This assessment identifies economic and tourism facilities within each section of the pipeline route, and discuss their strategic implications in the local and regional context. It assesses potential impacts, and again, discusses mitigation and management measures. It concludes that there will be direct and indirect impacts on tourism and business, agriculture and viticulture. Issues of perception of impact on tourism and key events are also a major consideration.

The assessment acknowledges there will be disruption to a range of activities and these should be minimised. Additionally, impacts of construction such as dust and noise need to be carefully monitored. The PIA acknowledges *“a key strategic issue will be the potential impact of the project on the wineries and tourism attractions in the Dixons Creek district”*. This is the crux of many concerns raised by submitters and loss of business potential raises real concern by submitters. Mr Forrester of Balgownie advised the Committee that his winery/conference centre has the potential to be severely impacted, with significant loss of business. He said his clientele would not like to look over a construction site for weeks on end, and some conferences may have to be cancelled during the peak construction period.

The Advisory Committee can understand Mr Forrester’s point of view, but development and construction is ongoing in numerous areas, whether it be a road, a building, extensions to existing works, or other infrastructure. However, the Advisory Committee notes his concern that potentially, he might be impacted on two fronts, and the Alliance needs to carefully manage this, due to Balgownie’s dual frontage to Melba Highway and Gulf View Road.

The impact assessment provided information in the form of a regional profile, including population, education, employment, labour market data, income and internet access data. Of some relevance was the information on tourism expenditure, number of domestic day trippers, domestic visitor nights, international visitors, tourism activities for international and domestic visitors, tourism

employment. In this context the summary noted that:

Tourism is a significant and growing industry in the region. The project has the potential to affect a significant part of the regional tourism industry directly and indirectly in terms of possible restrictions on access to both individual properties and to key access of the region and through perceptions of access difficulties and an incompatible use. This impact is likely to be of limited duration given the timing of the project residual affects may need to be addressed.

The Advisory Committee notes that the Alliance will be dealing directly with property owners and businesses on compensation matters.

The potential concerns and the potential economic tourism effects are set out in Tables 22 and 23 of Appendix K, and these are well detailed. The effects are assessed per section of the pipeline, and it represents a fair appraisal, with good detail included. However, the management and mitigation measures have less detail and focus on impacts on:

- Business/property owners and operators;
- Access;
- Traffic and safety;
- Noise and vibration;
- Air quality;
- Visual;
- Tourism and recreational;
- Natural heritage; and
- Cultural heritage.

The submission from the Sugarloaf Sailing Club expressed concern that its sailing club and the variety of activities it undertakes might be impacted, however, the Alliance re-assured the club that they will still be able to continue to operate in much the same manner post construction and operation.

Agriculture is noted as a significant regional industry, and the project is recognised as having the potential to affect agricultural production through the temporary disruption of farming activity during construction. The PIA notes the extent of impact will vary from property to property, but says *“it is unlikely to be significant from a regional perspective. Individual operations, particularly on smaller properties with intensive land use, could be significantly affected”*.

A number of submitters raised bio-security as an issue of concern, including the Mullens, Mr Miles from Gauri International and Mr Forrester.

Spread of the grapevine root disease Phylloxera is a significant bio-security issue for the wine industry. Many grapevines do not have the grafted resistant rootstock and are therefore susceptible to the disease. The Phylloxera aphid can be spread by the transfer of contaminated soil or vine material to non – infected areas. Spread commonly occurs through infected soil being transported by vehicle movements and people. Parts of the Yarra Valley have been declared as a Phylloxera Infested Zone by DPI. This places regulatory controls on the movement of material between rural properties.

Strict bio-security protocols that meet industry standards are essential. A Bio-security Protocol Fact Sheet was tabled by the Alliance during the hearing (Part Document 29). This covers Phylloxera and a number of other bio-security risks including *Phytophthora* (cinnamon fungus), animal borne diseases (Ovine Johnes Disease, Bovine Johnes Disease, Equine Influenza and Anthrax) and weed control.

The Chytrid fungal disease of amphibians appears not to be included in the protocol fact sheet and is a matter of national environmental significance (threatening process) under the EPBC Act.

Conclusions and Recommendations

As with the social impact assessment, the key mitigation measures proposed to deal with socio-economic and tourism issues are similar, and argue for communication, accessibility, seasonal issues, refinement of the easement and the like. The PIA does not provide much in the way of definitive and tangible management measures, however it did attempt to outline effects that might result in benefits. The major effects will be on individual agricultural operators, tourism and vineyards. Benefits included participation in construction (presumably employment opportunities) and services (food and accommodation). However, these have not been quantified and it is difficult to make a judgement of how the benefits might off-set the disbenefits.

With regard to bio-security, the Committee considers management of these issues during project delivery is important to reduce the risk of a bio-security incident. The proposed Weed, Vermin and Bio-security Program within the EMP is an acceptable approach but the detail must be endorsed by the appropriate regulatory agencies and industry groups. The program should be expanded to include the Chytrid fungal disease of amphibians.

The Advisory Committee recommends that the Alliance:

- **Prepare and adopt bio-security protocols in consultation with relevant Government regulatory agencies and industry groups.**
- **Prepare and adopt a bio-security protocol for the Chytrid fungal disease of amphibians through the project environmental management framework.**

7.3 Cultural Heritage

The Cultural Heritage Assessment was set out in Appendix L of the PIA, and discussed indigenous and non – indigenous cultural heritage. Both assessments are preliminary, and further work is being conducted. Both indigenous and non-indigenous heritage is covered by Commonwealth and State legislation (as noted in Chapter 3 of this report).

(i) Indigenous Cultural Heritage

With regard to indigenous cultural heritage, the *Aboriginal Heritage Act* 2006 came into operation in May 2007 and established the ability to make the Aboriginal Heritage Regulations 2007. These regulations specify that a Culture Heritage Management Plan (CHMP) may be required; especially if an activity area has cultural heritage sensitivity, or is a high impact activity. As the PIA notes *“construction of the Sugarloaf Pipeline involves trench excavation for the majority of the 70km pipeline length and construction of pump stations and associated infrastructure, thus falling within the definition of a **high impact activity**”*. The CHMP is approved separately to other planning approvals.

The Committee was advised no Registered Aboriginal Parties (RAP) have been appointed for the project area, but there are three RAP applications pending a ruling by the Aboriginal Heritage Council (Taungurung, Wurundjeri and Wandoon). These groups have been consulted during field work and investigations, and the final CHMP will be made available to these groups for their input upon completion.

The CHMP and associated work is currently being prepared by SKM, and the Committee was advised this is proposed to be submitted to Aboriginal Affairs Victoria by the end of April. This will then take 30 days to evaluate and once approved, the construction can proceed. Any recommendations emerging will need to be incorporated in future management plans.

The Committee sought a response from the Alliance on 5 May about the timing of this Plan and in its response on 7 May, the Alliance advised that the CHMP was being finalised ready for lodgement in May 2008 (no specific date included). The response letter further said:

The Alliance has engaged in ongoing dialogue with AAV and the aboriginal communities in the region since the inception of the project. This has included formal presentations, informal advice and discussion on technical matters (for example, the curation of aboriginal artefacts). Furthermore, representatives of the aboriginal communities have also participated in active advisory roles during the project through their attendance and advice at each of the field surveys undertaken by the Alliance.

(Uncle) Roy Patterson, a Taungurung Elder presented to the Committee as part of the Plug the Pipe submissions and advised that his people *"were put on the earth as caretakers and custodians, not as destroyers"*. He expressed concern about the effect the pipeline might have on animals and birds, but especially the wedge tail eagle, which he said was a very special animal. He argued that the land does not belong to the Government, it belongs to the people. He urged that the money spent on this should be put into water tanks, and noted that *"people in the country live on water tanks and they learn to respect the water"*. The Committee considers that his opinions and views should be noted in the preparation of the CHMP, and through any discussions with the RAP process, and especially through the Taungurung Heritage Council. Further, the Advisory Committee considers that the various Aboriginal communities should be represented on the Community Liaison Groups as recommended in Chapter 7.1 of this report.

(ii) Non-Indigenous Heritage

With regard to non-indigenous heritage, the assessment identified that while there are numerous registered heritage sites within the pipeline corridor options, none are directly on or immediately adjacent to the preferred or non preferred routes. There are a small number of non-indigenous or historical sites which lay on or close to the current preferred alignment, and the Committee was advised the management strategy for these is currently being developed, with a strong emphasis on avoidance of these sites. These sites include the Drysdale Homestead near Yea, the Killingworth Ruins Complex and the Murrindindi Station.

The Committee accepts that it is highly unlikely that any non-indigenous heritage sites will be impacted by this proposal.

(iii) Conclusions and Recommendations

The Advisory Committee considers that the work undertaken to ensure that Indigenous and Non-Indigenous cultural heritage is appropriate to the project. There are various statutory processes and safeguards in place to ensure that heritage is properly recorded and managed. The Cultural Heritage Management Plans will

ensure that Indigenous heritage is well understood and managed during the construction of the pipeline.

The Advisory Committee recommends that the Alliance:

- **Include the relevant Aboriginal communities on the Community Liaison Groups to be established for the Project.**

7.4 Landscape and Visual

The PIA and subsequent documents indicate that there will be permanent and short term landscape and visual impacts. The methodology used for this assessment in the PIA report makes a clear distinction between landscape impacts and visual impacts. The Report describes landscape impacts as deriving from changes in the physical landscape, which may give rise to changes in its character and how it is experienced. Visual impacts relate to the changes that arise in the composition of available views as a result of changes in the landscape, to peoples' responses to the changes and to the overall effects with respect to visual amenity.

Some of the impact issues raised through submissions and during the hearing include:

- Visual damage to a highly scenic landscape;
- Easement is too wide;
- Visual impacts from more signs and powerlines;
- Property of Mr Scott has a boundary less than 200 metres from the Sheoak property and will overlook the high lift pump station and associated structures;
- Air and scour valves will be permanent landscape fixtures; and
- Approach and surrounds to vineyards will be impacted depending on reinstatement standards and timing.

(i) Construction impacts in the landscape

In considering landscape and visual impacts, it was assumed that all vegetation within the thirty metres construction corridor would be removed and would result in some permanent changes in vegetated landscapes, reducing scenic quality. In areas where the slope of the land is greater than 20% any pipeline construction will permanently alter the existing topography, and the permanent pipeline infrastructure such as pump stations, balancing storage and scour valves are likely to create permanent landscape impacts. The cleared ten metre wide pipeline easement through the Toolangi State Forest will permanently change the landscape. Ms

Abbott-Smith voiced the concern of several submitters regarding change to the landscape character along tourist routes and described the corridor as likely to be a permanent “scar” in the landscape.

There will be many temporary landscape impacts in the alignment during the construction and maintenance period. These will include trenching, spoil heaps, haul roads, presence of heavy vehicles, dust, temporary structures such as security fences, signage, earthworks for diverting water, corridors denuded of vegetation along forested or treed sections and extensive reaches of bare earth after trenching is back-filled. There is also potential for soil erosion in the construction corridor and sedimentation of water bodies.

(ii) Visual Impacts due to Construction

The assessment of visual impact is subjective and dependent on a number of factors, including the relationship of the viewer to the visibility, for example, whether the viewer was a traveller, permanent resident or worker. The intensity of the visual impact is related to the time of exposure to the view, the number of viewers, distance from a vantage point, the sensitivity of the viewer and consistency of the view with the surrounding landscape, including vegetation cover and topography.

Those most impacted are likely to be local residents, particularly those residing and working within sight of the alignment. The permanently cleared ten metres wide pipeline easement through the Toolangi State Forest will be highly visible when encountered by people using the forest for recreation purposes. The cleared easement rising to the escarpment and into the Christmas Hills will be highly visible from the adjacent valley.

(iii) Landscape and Visual Impacts in the Pipeline Alignment – Sections A to H

Within Section A there will be construction impacts at Goulburn River and Killingworth Road. These will include pipeline construction, pipes and machinery, removal of vegetation, earthworks and stockpiles of topsoil and spoil, the excavated trench and localised visual impacts related to the pump station and other structures.

Construction impacts along Sections B and C will be particularly noticed in the Yea River wetlands reserve, which is a scenic, recreational and ecologically sensitive area, highly valued by the local community. Construction impacts will include removal of native vegetation, potential sedimentation, pipeline construction activity including pipes and machinery, earthworks and stockpiles of topsoil and spoil and the excavated trench. A localised visual impact will be the high lift pump station site on the Sheoaks property of Melbourne Water. The dwelling of the neighbouring

property owned by Mr Scott has a boundary less than 200 metres from the Sheoaks property. Mr Scott stated in his submission that he will overlook the high lift pump station and associated structures from his dwelling.

Through Section D the construction alignment passes to the east of the Glenburn Hall and will have localised and temporary visual impacts on the township through pipeline construction activity including dust, pipes and machinery, earthworks and stockpiles of topsoil and spoil and the excavated trench.

Sections E and F will include construction impacts in Toolangi State Forest. There will be a negative landscape and visual effect on the existing landscape condition and character through the clearing of dense forest. This will include excavation in part, on steep side slopes and permanent clearance of the ten metres easement. Excavation on steep side-slopes will result in significant permanent batters on the high side of the trench and the clearance of the easement will have impacts on sensitive viewers involved in outdoor activity focussing on scenic values. There will be temporary impacts from the presence of windrows of bulldozed native vegetation, pipes and machinery, earthworks, stockpiles of topsoil and spoil and the excavated trench during construction.

In Section G, the construction alignment passes through areas of land used intensively for vineyards and wineries. This area has major scenic values and relies heavily on wine tourism and visitor accommodation. The pipeline construction and maintenance phase will have a temporary adverse visual impact for local residents and tourists. In this Section the alignment also passes to the north west of Yarra Glen. There may be impacts on local residents and visitors from dust, pipes and machinery, earthworks and stockpiles of topsoil and spoil and the excavated trench.

Similar to Section G, construction of the pipeline in Section H will have temporary adverse visual impacts on local residents from dust, pipes and machinery, earthworks and stockpiles of topsoil and spoil and the excavated trench. This section also has major scenic values and businesses rely heavily on wine tourism and visitor accommodation. However the strongest impact is likely to be the long-term visual change to the landscape from the pipeline easement traversing the escarpment of Christmas Hills and the associated clearing of vegetation. The adjacent valley is likely to have views of construction activities and the permanent landscape change. Permanent clearance of the easement through Christmas Hills and the Sugarloaf Reserve may result in permanent change in landscape character and visual quality.

(iv) Conclusions and Recommendations

There will be unavoidable change in the visual appearance of the landscape for the full length of the pipeline during the construction phase. In areas that are of particular sensitivity to landowners and residents, manipulation of the alignment could minimise concerns.

The sensitivity and rate of the reconstitution and maintenance of the alignment after construction will assist in reducing adverse visual impacts. Through consultation with landowners and the community there may be opportunity for landscape enhancement in nearby areas to offset adverse permanent impacts of the pipeline easement.

The permanent changes to local landscape character will be clearing of the easement through native forest, pipeline batters on steep side slopes, permanent structures such as pump stations, air and scour valves, powerlines and signage.

The Advisory Committee recommends that the Alliance:

- **Liaise and negotiate with landowners, the Shires of Yarra Ranges and Murrindindi and local affected communities to finalise appropriate landscape and visual impact mitigation.**
- **Revegetate and maintain the alignment post construction consistent with the agreed mitigation measures, and negotiate opportunities for adjacent landscape enhancement.**
- **Actively seek to reduce the width of the permanent easement in all areas to the absolute minimum, and particularly in areas of high visual impact such as the Christmas Hills escarpment and the Toolangi State Forest.**

8. AMENITY AND INFRASTRUCTURE

Three key amenity and infrastructure issues emerged both through the PIA and the hearings – these relate to construction dust, environmental noise and traffic impacts.

8.1 Construction Dust

The Construction Dust Assessment report is included as Appendix M in the Project Impact Assessment (PIA) document. The assessment identifies the two major sources of dust as:

- mechanical disturbance from construction vehicles and activities; and
- wind erosion from soil stockpiles under dry and windy conditions.

These are discussed in more detail in Section 5.1.2.4 of Appendix M. Mechanical disturbance will include active soil movement by graders, excavators and bulldozers, as well as vehicle movements both on site alongside the pipe trench and entering/exiting work sites.

There are extensive areas along the pipeline where the potential for dust generation is high due to the nature of the soils. These include the river and creek flats (fine silts) and other areas of dispersive soils.

The PIA identifies relevant guidelines and policies as the EPA's *Environmental Guidelines for Major Construction Sites* and the draft *Protocol for Environmental Management for Mining and Extractive Industries* prepared under the State Environment Protection Policy – Air Quality Management.

Under this draft protocol, intervention levels are identified for PM₁₀ particles (particulate matter with an aerodynamic diameter of less than 10 micrometers) and PM_{2.5} (particulate matter with an aerodynamic diameter of less than 2.5) when readings are averaged over a 24 hour period.

The Alliance is proposing to modify this approach as a 24 hour time frame is not conducive to real time reactive management of dust. The Alliance has characterised the micro-climate along the pipeline route to better predict the likely incidence and direction of travel of dust generated from the project.

Sensitive receptors that may be adversely affected by dust are identified by the Alliance in Table 3 of Appendix M, and include:

- residences (isolated and townships such as Yea);
- a caravan park;
- vineyards;
- olive groves;
- a primary school; and
- a childcare centre.

The impact of dust on sensitive receptors may include nuisance (unpleasant, dirty, etc) poor visibility, health effects (eg for those with respiratory problems) and primary production impacts (vineyards, olive groves, other vegetation such as pasture).

The Alliance is proposing a number of mitigation and management measures in Section 6 of Appendix M. These are expanded upon in Appendix U of the draft Environmental Management Strategy tabled during the hearing. This in turn refers to the preparation of an Air Quality Management Plan (AQMP) that will include specific control and management measures for dust.

These measures are a combination of operational controls (eg watering and dust suppressants combined with minimising exposed areas) and reference to the meteorological conditions at the particular time and place.

When within 100 metres of a sensitive area, *'high level control'* is envisaged which will include dust monitoring devices between activities and the sensitive location tied to an alarm system to provide an additional level of response and management for these locations.

Many submissions to the PIA raised concerns in relation to dust from both amenity and impact on primary productions perspectives. For example Mr Miles of Gauri International Corporation submitted in relation to dust on vines that:

- dust on leaves blocks photosynthesis;
- dust on flowers will inhibit pollination;
- dust and debris on berries can create a moisture sink which fosters botrytis powdery mildew; and
- excessive dust on grapes at harvest can devalue the crop for winemaking.

Mr Forrester from Balgownie expressed concern about dust from an amenity perspective on their large tourist, wine making and conference business and in later correspondence also expressed concern in relation to the impact on vines. On a related issue, Mr Mullens of Mulbryn Poll Herefords submitted that dust on pasture

makes it unpalatable to cattle, and thus impacts on the productive capacity of the land. Mr Ridd for Plug the Pipe raised the issue of dust combining with fog and creating a hazard.

The Committee considers that dust from the project will be of considerable concern given the size of the construction area (70km x 30m at least), the level of traffic and earth moving that can create dust, and the propensity of many soils along the pipeline to be 'dusty' due to fine materials present.

Dust is one of the impacts that will create concern beyond the immediate pipeline corridor if not managed well. In a situation where many people are opposed to the pipeline and in some cases deeply distressed by it, it may be that some receptors are 'hyper-sensitive' to such an impact.

The general control measures proposed in the draft Environmental Management Strategy that are to be transposed into the AQMP are appropriate in principle, but the actual impact on the ground will depend heavily on the effectiveness of the implementation of the measures and controls proposed. In addition, even with highly efficient dust control, there are circumstances where dust generation is difficult or impossible to prevent, for example tipping or excavating dry soil where dust sprays may not be able to be applied at a suitable rate to avoid dust generation.

The general approach of identifying sensitive receptors is supported, but this may be difficult to apply in practice over extensive areas (eg near vineyards). A highly technical approach based on meteorological conditions and dust measurement may place significant constraints on the ability of the project to be delivered in the expected project timelines and lead to pressure for excavation and transport in less than ideal conditions.

The Committee has some doubt as to the effectiveness and robustness of measuring dust fall using PM_{2.5} and PM₁₀ criteria on the short time frames applying for construction across sensitive areas. If the Alliance can achieve this, then the Committee's concerns are abated.

Finding a suitable water supply for dust suppression may also be difficult if drought conditions persist. Recycled or non-potable water should be used for this purpose where possible.

Conclusions and Recommendations

The management and control of dust is a common element in major industrial projects. Given the scale and location of the proposed pipeline, the Advisory Committee considers dust control will be a major technical challenge for the Alliance, albeit a challenge that is not new on construction projects.

In addition to the approach proposed in the draft Environmental Management Strategy, the Advisory Committee recommends that the Alliance:

- **Develop a list of sensitive receptors along the final pipeline route in consultation with property owners.**
- **Invite community input into the Air Quality Management Plan.**
- **Include standards for dust control (visual and other appropriate methods) in individual landowner agreements, which must contain a methodology for landowners to report breaches and the agreed actions that will be taken in response.**

8.2 Noise and Vibration

An assessment of noise and vibration is included in Appendix N of the PIA. The sources of noise identified included operation of the high and low lift pump stations and noise from construction vehicles. Vibration was identified as a possible impact from construction vehicles. In the hearing, the possibility of noise and vibration from the operation of the pipeline itself was raised and this is discussed below.

The Alliance identified the Environment Protection Authority document *Noise Control Guidelines* for construction noise, as there is no regulatory control over such noise, for example via a State Environment Protection Policy (SEPP). These guidelines provide criteria for allowable construction noise during certain hours of the day, night, and days of the week, in addition to best practice guidance on maintaining equipment and operational practices for noise minimisation.

The Alliance has undertaken background noise monitoring at eight sites along the pipeline route and are shown in Section 4 of Appendix N. These measurements are shown in the accompanying figures in an 'as measured' form. If they are to be useful in guiding appropriate noise monitoring during construction, then they will require further assessment and analysis to provide a base point for monitoring.

The Alliance suggests that pipeline construction noise impacts will be transitory and last in the order of 7-10 days as the pipe-laying operation proceeds past a particular point (for example a residence). Construction of the pumping stations will generate noise at the one point over a longer period of time.

The general approach to construction noise management by the Alliance is to keep operations as quiet as practicable at all times, and if evening operations are planned (ie outside normal operating hours) then the criteria in the EPA Guidelines should be applied.

For the pump station operation (high and low lift), the Alliance identified the Draft State Environment Protection Policy N-3 *Noise from Industry in Regional Victoria – Draft Recommended Maximum Community Noise Levels for Commerce, Industry and Trade Premises in Regional Victoria* as the appropriate controlling regulation. The draft SEPP sets noise limits for day, evening and night.

The pumps themselves and associated facilities may be operating 24 hours a day at pumping times and therefore will need to meet the night time noise level of 33dBA. The Alliance plans to achieve this through the design of the pump stations themselves and equipment selection. The Alliance identified the nearest residences as 450 metres away (low lift) and 1550 metres away (high lift).

The noise from air release valves along the pipeline was raised by a number of submitters but was not addressed in the PIA.

A number of submitters were concerned about construction and operation noise including Cr Pleash, Ms Birchall, Ms Hauser, Mr McGregor and Mr Forrester. Some submitters (for example Mrs Cassell) raised the issue of noise and vibration from the operation of the pipeline itself (ie from water rushing through the pipe). Mr Cook from SKM for the Alliance submitted that any noise and vibration from the pipeline would be minor due to the mostly laminar flow of the water and the depth of the pipe. He suggested it would be less than heavy vehicles on roads in the vicinity.

The Alliance submitted that beyond 40 metres from the construction site, the British Standard (6472-1992) for Human Comfort would be met and there are no structural building criteria issues related to vibration.

The issue of blasting for pipeline construction was also raised at the hearing. Whilst it is considered unlikely to be used, the Alliance did not rule it out. Mr Cook submitted that if it was required it would be undertaken in accordance with the Australian Standard AS2187.2.

In general the Committee considers that noise and vibration from the project can be managed, and is not a significant impediment to the project proceeding. That is not to say that noise, in particular, will not be an impact and a nuisance to some people at particular times, but rather that the project can be satisfactorily undertaken within the Victorian noise regulatory regime.

Having said that, the Committee sees a number of key risks from noise, being firstly, operations in proximity to residences and other sensitive uses, and secondly, operations in the evening or over night.

The Alliance indicated that in some circumstances work may continue on a 24 hour basis although it is not clear exactly where, for how long, or how often this may occur. If it does, the Alliance will need to meet the EPA Guidelines of 'no audibility' at night for such works.

The Committee notes that the Alliance intends to meet the EPA Guidelines criteria in the evening (and presumably overnight) but not during the daytime, at this time relying on the works being 'as quiet as practicable'. Given that the pipeline route is mostly a sparsely populated rural area this is considered reasonable.

The Committee is cognisant that a number of sensitive uses occur along the pipeline route. These include residences but also noise sensitive uses such as a primary school, conference centres and restaurants. The Committee considers the Alliance should map such sensitive uses in conjunction with the owners and operators and program works in those vicinities to minimise impacts on residents and businesses from noise.

If evening and night works are planned, this will require real time noise monitoring at sensitive receptors and response protocols based on the background noise monitoring already undertaken and using the criteria in the EPA Guidelines. Given that noise can travel a long way in still night conditions, this may include residences and other sensitive uses at some considerable distance from the work site.

The Committee considers the noise from the pump station can be acceptably managed within the criteria in SEPP N-3. In relation to air relief valves on the pipeline, the Committee considers further investigation into noise impacts is required. If the valves discharge at irregular intervals close to sensitive receptors then some form of mitigation may be required to ensure any noise falls within the criteria in SEPP N-3.

The Committee does not share the concerns of submitters in relation to noise and vibration from the pipeline operation and believes these impacts, if any, will be minor.

Conclusions and Recommendations

The Committee considers the impacts of noise and vibration from the project can be managed subject to compliance with the appropriate EPA Guidelines, the draft SEPP N-3 and relevant Standards.

The Committee notes that the EPA *Noise Control Guidelines* and the SEPP N-3 are included in the Environmental Management Strategy for the project.

The methodology for compliance must be written in to the Environmental Management Plans as appropriate.

The Advisory Committee recommends that the Alliance:

- **Identify sensitive receptors for noise from construction and operation along the pipeline route in consultation with property owners, and develop appropriate noise management and monitoring responses.**

8.3 Traffic Impact

Appendix H to the PIA contains the Traffic Impact Assessment, which considered the impacts of the traffic expected to be generated during both the construction and operations phase of the Project. The assessment focuses on those corridors that are classified as preferred in the PIA, and it included:

- A review of the existing road network conditions;
- An assessment of the expected traffic impacts generated by the project;
- A summary of the key mitigation measures required to minimise the impact on the community and the adjoining road network;
- The identification of any knowledge gaps; and
- Establishing a set of conclusions about the net traffic impacts of the pipeline development, taking into account the likely effectiveness of identified mitigation measures for each of the preferred pipeline options.

(i) Background

Table 1 in Appendix H summarises the existing roads within each section of the pipeline corridor. One of the main concerns raised by submitters, and one of the

main focuses of the Traffic Impact Assessment, was the Melba Highway and how traffic impacts along it would be managed. The Melba Highway is a VicRoads Declared Arterial Road (Route Number B300), described in the PIA as “a typical two-lane two-way sealed road with a width of 7.0m and 2.0m sealed shoulders.” The table below highlights traffic volume data for the Highway.

Table 2: – Existing Traffic Volume data for Melba Highway

Location on Melba Highway	Date of Survey	Two-Way Average Daily Volume (Weekday)	Two-way Peak Hour Volume (Weekday)	% Heavy Vehicle (7-day)
1.4km Nth of Langs Rd (Murrindindi)	2003	2,790	245	14.2% (1997)
Nth of Glenburn Rd	2004	2,680	239	12.7% (1996)
1.4km Nth of Kinglake Rd (Murrindindi)	2003	3,260	273	8.9% (1996)
Nth of Old Healesville Rd (Yarra Ranges)	2004	5,090	472	N/A

(Source: Table 1 in Appendix H, PIA)

The Traffic Impact Assessment refers to an email from VicRoads on 10 September 2007 which stated that the Melba Highway is estimated to carry the following traffic volumes:

- 5,500 vehicles per day for Dixons Creek to the Yarra Ranges/Murrindindi LGA boundary, 8% of which are ‘heavy vehicles’;
- 4,000 vehicles per day for the Yarra Ranges/Murrindindi LGA boundary to Glenburn; and
- 4,500 vehicles per day for Glenburn to Yea.

The PIA states that the above volumes estimated by VicRoads are “slightly more conservative than the recorded traffic volume data”. Other existing roads potentially impacted within the pipeline corridor include the following:

- Goulburn Valley Highway;
- Healesville-Kinglake Road;
- Yarraview Road;
- Glenview Road;
- Steels Creek Road;
- Gulf Road; and

- Killingworth Road.

(ii) Traffic Impacts

In recognising its importance as a major roadway, the PIA stated that at least one traffic lane of the Melba Highway would remain open at all times during construction. The impact assessment concluded that if a 500 metre length of the Melba Highway were to be reduced to one traffic lane during the peak hour, then queues up to 13 cars long may be expected (equating to approximately a 4 minute delay) or up to 18 vehicles long (6 minute 30 second delay) in a worse case scenario. In this regard, the PIA concluded that:

- Melba Highway has sufficient capacity to accommodate expected construction traffic;
- Construction traffic is not expected to cause any significant detrimental impacts to the operation or safety of the adjoining road network;
- The majority of construction traffic will have an origin or destination from the south (ie Melbourne);
- The key impact will be on the safety and operation of intersections that construction traffic uses to directly access the construction corridor; and
- It is inappropriate for large construction vehicles to use Hunts Lane and other similar local roads with narrow carriageways, steep grades and tight curves.

In the Alliances' concluding comments, the Advisory Committee notes that the time delays could be in the order of 10 minutes. This was not raised verbally at the hearing but was included in the written response to the Shire of Yarra Ranges (Document 58). Under Issue 6.4 – Community Support, Strengthening and Rebuilding, the Alliance response reads *"Delays to traffic along the length of the Melba Highway are unlikely to exceed 10 minutes between Yarra Glen and Yea"*. The Committee is unsure whether this means for each stop, or in totality. This needs to be clarified.

Overall, the PIA acknowledged that the most significant traffic impact generated by the project is associated with construction, and that the most significant construction traffic impacts were predicted to occur at the following locations:

- Intersections of the Melba Highway with construction access roads (particularly where there is a long distance between access connections); and
- Intersections of the arterial road network with local roads, where access to construction is via the local road, potentially including the intersection of:
 - Eltham-Yarra Glen Road and Glenview Road;
 - Gulf Road and Melba Highway; and
 - Goulburn Valley Highway and Killingworth Road.

While acknowledging that there would be some impacts on traffic resulting from the project, the PIA concluded that all of these could be managed. The Alliance stated that a Traffic Management Strategy (TMS) will be the overarching strategy that will set the framework, within which the Traffic Management Plans (TMP) for specific sites/works will be established. The TMS will likely contain:

- Traffic management objectives;
- Staging details of the works and traffic management;
- A communication strategy;
- General principles for the preparation of site specific traffic management plans;
- An Incident Management Strategy;
- A schedule for obtaining independent road safety audits of the TMPs; and
- A list of the site and traffic management contacts including the site managers, contact from VicRoads etc.

Specific TMPs will then be used to implement the traffic management for the specific works and sites.

To minimise the impact of the works on the Melba Highway, the PIA states that an access strategy (for access between the arterial road network and the construction corridor) would be developed to *“ensure the most appropriate locations for access to the Melba Highway along the final corridor are established.”*

(iii) Issues

The issues raised in relation to traffic impacts can be summarised as follows:

- Construction traffic impact on local road networks;
- Traffic safety;
- Lack of a detailed Traffic Management Plan; and
- Lack of recent traffic surveys in the PIA.

The Shire of Yarra Ranges raised a number of concerns relating to traffic management in relation to the impact of construction traffic on local road networks. Council regarded the development of an overall traffic management strategy and detailed section by section strategy as *“critical”*, particularly given the likely duration of the project and the fact that multiple sections of the pipeline construction would be occurring at the same time. They estimated that there would be *“in excess of 40,000 heavy vehicle movements generated from project works within the Shire of Yarra Ranges”* and *“tens of thousands of other related traffic movements associated with*

contractor's vehicle movements between depots and construction areas". Their main concern was that a reasonable percentage of these heavy vehicle movements would impact on the Yarra Ranges community by causing the degradation of Council assets including roads, drains, culverts and similar infrastructure. Specific examples are listed in Table 5 of Council's submission.

To offset these potential impacts, Council was of the view that all vehicle movements associated with the project should be restricted to the Maroondah and Melba Highways, unless prior approval was received from the respective municipalities as part of the Traffic Management Plan. Council proposed a number of additional specific strategies to assist with road reinstatement, including:

- Before and after surveys along pipeline to capture the existing condition of Council's assets;
- Maintenance of the disturbed road formations, table drains and open drains for a 10 year period;
- Construction roads to be regularly swept of any debris;
- Dust suppressant used on unmade roads during the period of November to April; and
- Spray seal the unmade sections of Glenview Road (Yarra View Road to Kings Street) and Gulf Roads (Steels Creek Road to existing seal).

At the direction of the Committee, the Alliance responded to these issues and tabled a document in reply, which stated:

- Reinstatement works would be undertaken to return infrastructure back to pre-existing conditions where damage has occurred as a result of the project;
- Melbourne Water would not enter into a ten year maintenance agreement as this is not industry practice for road and pipeline projects. The Alliance would be responsible for maintenance of the asset for 2 years after completion of the project;
- Constructed roads would be regularly swept to remove material deposited on them by the project; and
- Gravel roads would not be spray sealed unless this is an agreed component of the broader community benefits program associated with the project.

Murrindindi Shire Council raised matters relating to local impacts resulting from construction traffic. Council expressed concern about trucks and school buses sharing Killingworth Road during construction of the pipeline, and also the impact that trucks travelling through Yea would have on the township.

Traffic safety was another issue raised by submitters, with many expressing concern about the combination of construction traffic and factors such as community traffic (including school buses), local weather conditions, through truck traffic, and so on. Several submitters raised concerns about local conditions such as fog and black ice and how it could affect safety. Submitters were concerned that the effect of local conditions such as fog and black ice combined with other factors such as construction vehicles, snow field traffic and winter weather would cause serious safety concerns. Glenburn Hall and Progress Association summed up the feelings of a number of local submitters when they made the comment that *"the impact of fog and the safety aspects that this has on traffic flow is widely known by most persons of knowledge, but seemingly escapes the authors of this PIA."*

Another issue of concern was the impact construction traffic would have on access to local town centres. Ms Devereaux raised concerns about how the traffic would impact on the residents of Yea and their social activities which include *"large cattle sales, an Autumn feast, markets, race days and local sport teams"*. A number of submitters, including the Glenburn Hall and Progress Association Inc and Murrindindi Council, criticised the PIA traffic impact study for failing to provide an up-to-date assessment, instead relying on data that was several years old. They expressed concern that the PIA fails to mention heavy vehicle movements (apart from a figure of 15% Heavy Vehicle proportion) and fails to mention increased traffic flows.

In response to the above issues, a detailed response from Mr Gregor was attached to the Alliance's reply on the last day of the hearing, where he:

- reiterated his confidence that the figures he used in the assessment were conservative;
- confirmed his belief that the traffic on the Melba Highway (and other Council roads) could be *"appropriately managed"*; and
- referred the Committee to the detailed management of traffic related issues via the use of the Traffic Management Plans which will be *"prepared in consultation with stakeholders and will be independently audited by a Senior Road Safety Auditor."*

The Melba Highway between Yea and Yarra Glen is widely recognised as a very important roadway. It is a *"high order priority road"* with no alternate detour routes. As a result, the Committee strongly endorses the Alliance's commitment to ensure that at least one lane is open at all times on the Highway during construction of the pipeline.

However, the Committee considers that several criticisms of the PIA Traffic Impact Assessment raised by submitters are warranted. The Committee shares the concern of submitters such as the Glenburn Hall and Progress Association that the traffic impact study was based on data that was several years old. The PIA states that the traffic volume data used was *“provided by VicRoads for the Melba Highway”*, with the surveys cited being conducted between 2002 and 2004 for general vehicle movements, and 1996 – 1997 for heavy vehicle movements. Given the cost of the project and the importance of a workable traffic management strategy, the Committee was surprised that traffic counts were not undertaken by the Alliance’s own consultants in carrying out the traffic impact assessment. There is little doubt that traffic would have increased for general vehicle movements since 2004, and that current data would have provided a more accurate understanding of likely traffic impacts and assist in enabling a more effective traffic management strategy.

The Committee notes the Yarra Ranges Shire Council request that all construction traffic should be kept on the Melba and Maroondah Highways unless consent is given by Council to use the local road network. The Alliance have stated that local traffic movements will be kept to a minimum, with one of the mitigation measures in the Traffic Impact Assessment stating that, where possible, construction traffic would *“travel within the construction corridor rather than the adjoining road network”*. However, given the preferred route of the pipeline, it is inevitable that construction traffic will need to access local road networks, and so it is important there is effective communication between the Alliance, local Councils, VicRoads and other authorities in this regard in order to ensure that traffic impacts on these roads are minimised. The development of a Communications Strategy within the TMS is important in ensuring that relevant stakeholders and authorities are involved in co-ordinating construction traffic movements that are required off the major roadways.

In relation to the strategies proposed by Yarra Ranges Shire Council in order to ensure road reinstatement and maintenance, the Committee feels that there would be some benefit in the Alliance and the Council sitting down and working out an agreement on how the Shire’s local roads will be reinstated and maintained. The Committee feels that a two to three year long maintenance agreement would be a suitable period to ensure that Council’s infrastructure is protected.

In relation to their concerns regarding traffic movements along unmade sections of roads, Yarra Ranges stated that construction of the unmade section of Glenview Road (Yarraview Road to Kings Street) and Gulf Road (Steels Creek Road to existing seal) could be undertaken at minimal cost. They pointed out that considerable truck movements would occur associated with the pipeline project, and that these would require reinstatement of these types of roads. In their response to this request, the Alliance confirmed their original view that gravel roads would not be spray sealed

unless this was an *“agreed component of the broader community benefits program associated with the project”*.

The Committee believes that given the (relatively) small costs involved, and the disruption the project may cause to abutting landowners, these roads should be spray sealed immediately after the conclusion of the project in those affected areas. This would ensure that these roads were not left in a degraded state, and would also be a gesture of goodwill to some of the locals that will be most disrupted by the additional construction traffic.

The Committee shares the concerns of submitters that local factors such as fog and black ice were not considered in the traffic impact assessment. On one of the hearings days in Yarra Glen, the Advisory Committee witnessed first hand the fog that can occur in the region and was advised that what it experienced that day was mild compared to what generally occurs. The fog season apparently runs from April through to October each year.

In response to concerns regarding traffic safety, the Alliance repeatedly stated their confidence that the TMS and the locally focused TMPs would be able to satisfactorily resolve any traffic safety issues that exist. This will include temporary worksite speed zones being set in accordance with the *Road Management Act 2004*, AS1742.3-2002 and the relevant VicRoads guidelines. The Alliance stated that given for the majority of the length of the Melba Highway *“the pipeline construction corridor is away from the main traffic carriageway, it is anticipated that the only locations where speed zone reductions are required are at the isolated locations and lengths where traffic management is in place.”* As they were on the reference group, VicRoads would be aware of the potential safety issues that may arise, and the Committee takes some comfort from this.

(iv) Conclusions and Recommendations:

While there have been a number of concerns raised by submitters, quite a few of which the Committee agrees with, the Committee acknowledged that VicRoads has been a member of the Agency Reference Group throughout the Project development, and they have not raised any specific issues of concern nor did it make a submission to the Committee on the PIA. The Committee takes some comfort from that fact, and believes that this is an indication that the majority of traffic related issues can be effectively managed through further survey work and the implementation of a traffic management strategy.

The Advisory Committee recommends that the Alliance:

- Undertake a baseline traffic survey along the Melba Highway and major secondary roads, and incorporate the findings into the Traffic Management Strategy (including allowances for any increases in traffic consequent upon the opening of Eastlink).
- Develop Traffic Management Plans (detailed and/or site specific) in consultation with VicRoads and local councils, taking account of construction scheduling, updated traffic figures, movements within the local road network, road and/or lane closures, local weather conditions and the need to provide for emergency vehicle transit.
- Spray seal the unmade section of Glenview Road (Yarraview Road to Kings Street) and Gulf Road (Steels Creek Road to existing seal) immediately upon the conclusion of the project in those areas.

9. RISK AND ENVIRONMENTAL MANAGEMENT

9.1 Sustainability Framework

The Sustainability Framework used in the PIA report is set out in Section 4.5 of the report and in Appendix S. It clearly states that the framework used by the Alliance derives from the published commitment of Melbourne Water to Sustainability and to Triple Bottom Line (TBL) assessment (Melbourne Water (2007) *Triple Bottom Line Assessment Guidelines*). These mirror government policies in relation to the same issues. Thus, the Sugarloaf Interconnector Pipeline Project is claimed to have been developed in a manner consistent with government principles and goals which set out to minimise social, environmental and economic impacts associated with the project.

The Sustainability Framework has been applied through a TBL assessment of Key Results Areas (KRA). This identifies the options available and the impacts of the options using a holistic view of the KRA using sustainability principles. It then compares and ranks the options by giving sustainability scores to the KRA within multi criteria analyses to derive scores to indicate the preferred options for each element of the project. Within the PIA report, the analyses covered whether the project should proceed and the route it should follow. The criteria used are set out in Table 2 of Appendix S and the qualitative scoring criteria are given in Table 3. These elements are then combined and weighted in a manner exemplified in Table 4.

The Committee notes that the PIA covers all the social, environmental and economic criteria necessary to be considered in the TBL evaluation, but in respect to determining the preferred route, the KRA were based on readily available data only. Indeed, further data was coming to hand during the Committee's inquiry and the preferred pipe route was being re-evaluated and varied to achieve the optimum sustainable outcome. Notably, the specific route as it traverses private land has not been finally resolved because access was not readily available to Alliance personnel without recourse to legal demand for entry. The Alliance stated through Ms Quigley that the use of legal force (through the provisions of the *Water Act*) was their last (and least preferred) resort in dealings with directly affected landholders.

Document 34 provided by the Alliance during the hearing indicated that in total, design and construction discussions had only occurred with 71 landowners out of 140 along the preferred pipeline route.

Many submitters questioned the rationality of the whole project (especially Plug the

Pipe speakers such as Dr Chamley, Ms Abbott Smith, Mr Richardson, Mr Pattison, Ms Beer and others) and indeed the basis for determining the preferred route. The Committee believes that this is because the affected community were excluded from the initial project decisions. Also, many submitters questioned the weighting given to the fundamental elements of the TBL evaluation namely: Cost – 60%, Social – 20% and Environment – 20%, to equal 100%. But these were in practice imposed upon the Alliance by being government policy (Department of Treasury and Finance). It appears that this fact was not conveyed or appreciated by the community. The secondary criteria scoring and weighting was determined by the Alliance.

Finally, the project costing and benefits were strongly questioned by submitters, especially after the Auditor General (AG) – Mr Pearson's comments on (specifically) the Victorian Water Plan. Most of these comments however did not represent the balanced remarks made by the AG which centred around the very short time frame for development of project elements and a consequent lack of community consultation and information provision.

Conclusions and Recommendations

The Committee concludes that the process adopted by the Alliance to select the preferred route was thorough in respect to the criteria assessed as they knew them at the time. In particular, the Committee noted that the Alliance tested the sensitivity of the various sectional evaluations. However, it is clear that the evaluation by the Alliance was deprived of the detailed knowledge of the criteria held by the community. When this knowledge is included in the final analyses to determine the specific pipeline route through individual properties, the Committee is of the opinion that the optimum route will have been chosen for the pipeline.

Notwithstanding the foregoing discussion, the preferred pipeline route as shown as Figure 1 is acceptable, subject to minor realignment as agreed with the individual landholders affected by the preferred route. Such realignment as may be agreed is likely to be to protect environmental and social (land productivity and business) issues which arise and which are within the flexibility of the pipeline for minor realignment which is advised as being between 1 and 3 degrees.

The Advisory Committee recommends that the Alliance:

- **Negotiate with affected landholders along the preferred pipeline route in order to incorporate minor realignments and other engineering options to the benefit of the landowner or their land as are practicable within the pipeline design.**

- **Avoid, minimise or offset the consequences of the pipe placement on valued elements on individual land holdings.**

9.2 Risk Analysis and Assessment

The PIA report does not discuss risk in any consolidated manner, but the Committee was provided with Document 90 *'How the Alliance has Managed Risk in the Project to Date'* during the Alliance summation. In this, the Alliance commented that *'The Project risk register is continuing to be developed with issues drawn from a preliminary risk workshop'*. They go on to say that *'project teams will be required to review the Project Risk Register when preparing Work Activity Packs to check that all relevant issues have been addressed'*. The same document indicates that no risk management assessment has been done in relation to the construction phase.

The Committee recognises that risks arise to sensitive receptors whenever there is change in the contiguous environment. The magnitude of risk can be assessed in economic terms as the cost of offsetting or ameliorating the consequences of risk occurrence. Risk occurrence is normally expressed as a probability over some period of time. In the case of the Sugarloaf Interconnector Pipeline, the periods can be considered to be as a consequence of:

- design when the probability can be very high if risks are not, or are inadequately provided for;
- construction when the probability can be mitigated by the construction technique chosen and/or by contingency plans identified and implemented against specific warning signals; and
- post construction events not mitigated adequately by the design and/or construction practices applied.

The Committee accepts that the Alliance has considered risk consequences within the design but this has not extended to a formal risk identification and magnitude evaluation. Rather, the risks are considered within an avoid, minimise and offset concept. This approach essentially sees these risks as having a 100% probability and thus they must be accepted along the preferred pipeline route. Given the effort put into selecting between the alternative pipeline routes, this approach seems acceptable in this case, but it is not acceptable in respect to the selection of construction techniques as this selection includes the opportunity to manage and to mitigate risk of occurrence and risks arising post construction.

Mr White for the Alliance referred to the need for risk analyses to determine the best construction method for pipeline construction. The Committee accepted this to be applicable across all the pipeline sections and at various waterway crossings.

Specifically, he mentioned the Yea River at Devlin Bridge and Dixons Creek in Sections F and G; but the same applies at the Yea River at Castella, yet in the Construction Technique reports no evidence was presented of a rigorous risk evaluation process was apparent, much less there being a comprehensive identification of the potential risks arising from the presence of the pipeline including the construction phase.

The Committee note that with respect to construction, the risk of flash flooding occurring during waterway crossings is to be addressed by achieving the construction in the shortest time possible. The Alliance proposes to use 3 and 5 day weather forecasts in conjunction with EPA Guidelines for the Management of Construction Sites to ameliorate risk.

The above approach may prove to be successful, but with the scheduled construction periods extending, in the case of the major rivers, from three weeks to over one month, the Committee remain concerned that the proposed construction approaches may prove a source of unacceptable damage to the physical and biological environment. These concerns are exacerbated by there being no mention as to what contingency planning may be practicable to mitigate or ameliorate damage which arises as a consequence of risk occurrence.

The above concern especially applies to the Yea River crossing at Devlin Bridge where both the local and downstream environment are highly valued - socially and ecologically. It is equally a concern where the buried pipeline crosses the Yea River flood plain. Here the simple presence of the pipe, irrespective of how it is constructed, has the potential to act as a phreatic (subsurface) barrier with shallow water tables upstream and decreased water tables downstream. Additional design elements could ameliorate this risk but at present the risk appears not to have been recognised.

Similar issues may also occur at other waterway crossings and to a lesser extent where interflow (shallow ephemeral moisture movement across the top of the regolith) is blocked or diverted in flow down gradient. These issues alone demand that a rigorous identification of risks and an evaluation of their magnitude and probability is carried out in respect to both design and construction issues.

Further, the Committee note that several submitters (including Plug the Pipe and Ms Warnock) commented upon experience of flooding occurring across major waterways (Yea River and Steels Creek) that occurred at times of the year when construction is scheduled.

Conclusions and Recommendations

The Committee conclude that while the Alliance has done as good a job as possible in the time available of selecting the preferred pipeline route, there has been no serious evaluation of the risk profiles applying to alternative construction methods and designs. Arising from this, the Alliance is not well prepared to manage adverse conditions should they arise during construction. Rather, they are depending on the reliability of weather forecasts and their adherence to EPA generic guidelines to allow management of issues if they arise. This is not an acceptable or responsible approach on a project of this size.

The Advisory Committee recommends that the Alliance:

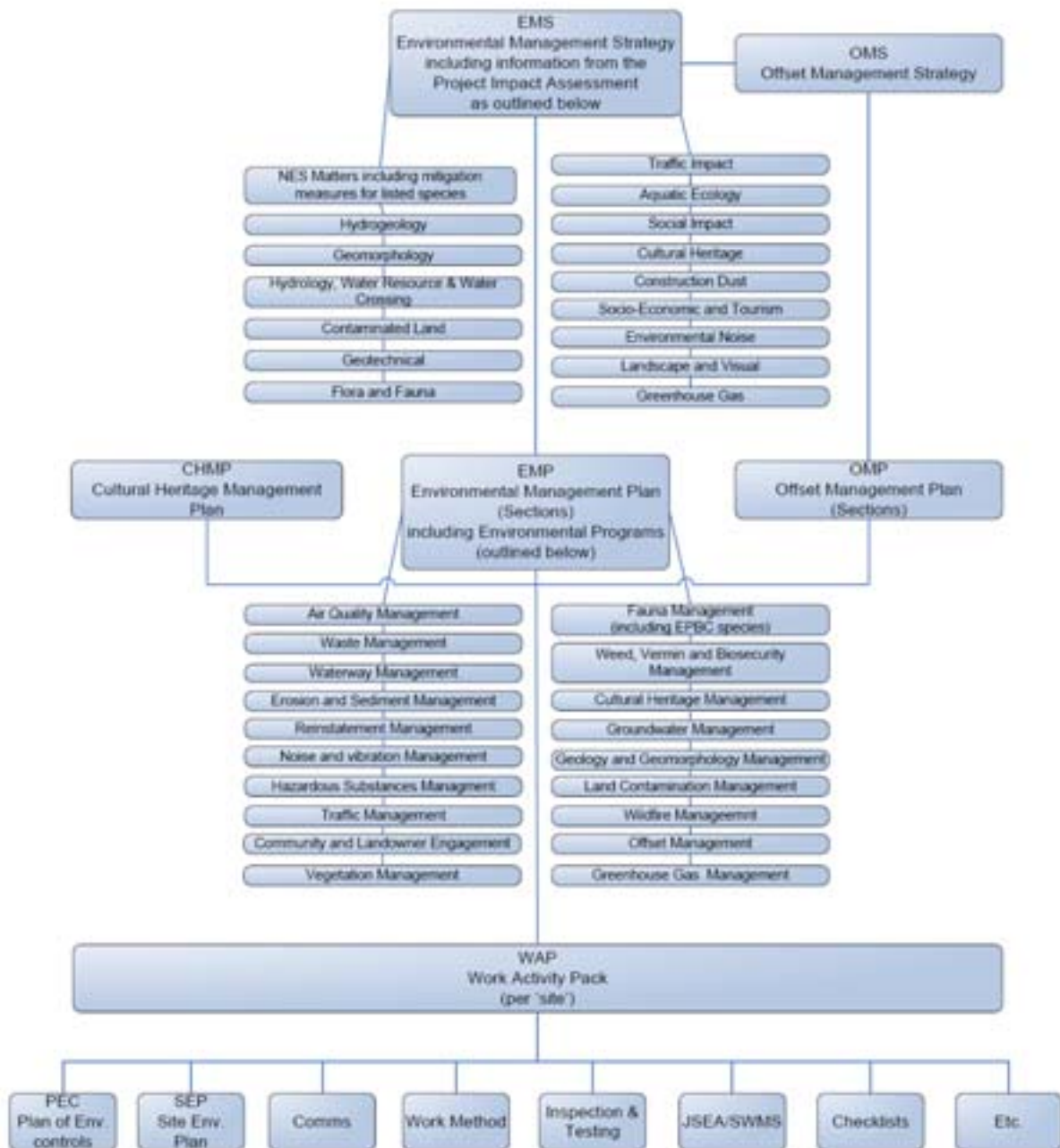
- **Carry out a comprehensive risk identification, magnitude and probability evaluation before construction commences at any location.**
- **Determine the most practical and least risk construction technique and pipeline design using multi criteria evaluation on the basis of the risk identification and analysis.**
- **Include landowner representatives through the Project Advisory Group and/or Community Liaison Group to develop contingency plans for key project risks to be incorporated in WAPs and landholder agreements.**

9.3 Environmental Management Framework

The Committee considers in general that the environmental management framework for the project is sound. The key elements of this are an Environmental Management Strategy (EMS) for the whole project, Environmental Management Plans (EMP) for specific sections and Work Activity Packs (WAP) for particular sites requiring a high level of environmental management. In the hearing the Alliance tabled a draft EMS, a draft example EMP and a draft example WAP (Matted Flax Lily on Gulf Road).

An updated project environmental management framework was provided by the Alliance with correspondence dated 7 May 2008. This updated structure is provided in Figure 2. In the draft EMS tabled at the hearing, an earlier version of the structure was provided (at page 9) and this indicated that at the EMS level, the Minister for Planning would sign off on the document; at the EMP level DSE/DPCD would be responsible for approval; and at the WAP level the Alliance itself would sign it off.

Figure 2: Suggested Environmental Management Framework



Source: Alliance Correspondence – 7 May 2008

In the hearing there was discussion (initiated by submitters) of individual landholder agreements to encapsulate the Alliance approach to construction and rehabilitation on individual properties. The Alliance endorsed the use of individual landowner agreements in their closing comments.

As stated at the outset of this section, the Committee considers that the general structure of the environmental management framework is sound. However the Committee has three areas where it considers further work is needed.

Firstly the successful delivery of the project will be highly dependent on the effective operation and implementation of the environmental management framework. At this stage, due to the bulk of this work being a 'work in progress', it has not been sighted by the Committee. It has to take it on faith that the detail of the environmental management framework (particularly the EMPs and the WAPs) will be satisfactory for managing the project. Document 90 provided an outline of the Environmental Management Framework.

Secondly, and related to the above, the Committee considers that the structure as proposed does not contain an adequate level of independence of project oversight by a suitably qualified auditor. This was raised many times in the hearing as a possibility, both by the Committee and submitters. The Alliance submission (Document 97) refers to the engagement of a third party to undertake an audit role but they see this party being employed by MWC.

The Committee considers the appointment of an independent project auditor is essential. This person should be involved in and agree that the risk registers covering design, construction, operation and maintenance of the pipeline is complete and that the proposed mitigation actions are appropriate. The auditor would be responsible for ensuring adherence to the EMS, EMPs, WAPs and individual landholder agreements. They may appoint a team of specialised individuals to address specific technical issues as needs arise. This type of model is standard in large industrial construction projects (and indeed this approach has recently been used in Channel Deepening) and is particularly important in this case, given the scale, number of issues and speed with which the project is being developed and constructed.

Thirdly, the Committee considers the linking of environmental performance criteria to project contractual arrangements is essential. This may include performance criteria that are environmental, social and economic. Whilst contractual arrangements that require prompt project delivery are of course critical, and particularly for this project, the incorporation of other performance criteria is also important.

The Committee is not in a position to determine exactly what these criteria should be, but they should be developed in conjunction with the community liaison groups proposed in this report.

The Committee strongly considers individual negotiated landholder agreements must be signed for each property. These will include details of timing, the micro-

alignment, any impacts on infrastructure and the environment and the proposed rehabilitation that will be required in the short, medium and long term.

Conclusion and Recommendations

The basis of the environmental management framework proposed in the report is sound, but the Committee considers it can be enhanced by the introduction of an independent project auditor to ensure compliance with the environmental management framework. Contractual arrangements within the Alliance should include environmental and social performance criteria as well as cost and time criteria. Individual negotiated landholder agreements must be signed with each affected landowner to ensure there is contractual agreement between individual landowners and the Alliance.

The Advisory Committee strongly considers the engagement of an independent auditor would be particularly beneficial for this project given the timeframe for which it is proposed to be constructed and the range of community concerns raised about the overall project. It therefore recommends that the Victorian Government:

- **Appoint an independent project auditor (with the capacity to engage technical assistance) to:**
 - **oversee the risk assessment and construction technique evaluations;**
 - **oversee the pipeline construction and reinstatement;**
 - **act as a high level monitor to deal with major issues that arise during the project;**
 - **ensure that agreed standards are met in construction and in all rehabilitation programs through implementation of the EMS, EMPs, WAPs and landowner agreements;**
 - **provide independent reporting of project performance separate from the Alliance; and**
 - **investigate public complaints that have not been resolved through the Project Advisory Group or Community Liaison Groups.**

Additionally, the Advisory Committee recommends that the Alliance:

- **Include environmental and social performance criteria in contracts for project delivery (for example dust levels, noise, vegetation clearance, erosion/sedimentation levels, traffic, and protection of listed species).**
- **Negotiate individual property landowner agreements to ensure construction and rehabilitation requirements are agreed prior to works commencing, including compensation (for example infrastructure and primary production losses).**

PART 3: RESPONSE TO TERMS OF REFERENCE

10. LIKELY ENVIRONMENTAL IMPACTS

The first task of the Advisory Committee is to investigate and provide advice in relation to:

The likely environmental impacts (effects) of the Sugarloaf Interconnector Pipeline project, in relation to each of the 'preferred' and 'non-preferred' corridor alignment options, the siting and design of ancillary infrastructure, and pipeline and infrastructure construction techniques which are identified in the PIA Report, as well as, if relevant, any feasible variations to these options that could reduce adverse impacts. Relevant environmental impacts include:

- *those impacts associated with construction and operation of the pipeline;*
- *the downstream environmental impacts of the water off-take from the Goulburn River for transport through the pipeline; and*
- *relevant impacts with respect to the controlling provisions under the EPBC Act.*

As previously mentioned, the Committee has adopted the alignment of the route known as the blue line for its detailed evaluation and considerations.

(i) Impacts Associated with Construction and Operation

The Advisory Committee has identified a number of impacts associated with the construction and operation of the pipeline, and these are outlined as follows:

Land clearance

The Alliance has described in their report 'Construction Techniques' the manner in which the pipeline route will be initially cleared to remove the surface vegetation and then graded to remove the soil for stock piling for subsequent replacement. Thereafter, the Alliance proposed that the pipeline will be open trenched over most of its length to create the space necessary to accept the pipe and pipe bedding. Larger excavation will be necessarily associated with pipe joints, thrust blocks, isolation, air relief and scour valves. A range of other excavations will be necessary to cater for waterway crossings and pumping stations. These operations give rise to all the environmental impacts of the project.

While rehabilitation will seek to mitigate the impacts, the residual permanent structures will represent impacts in themselves. The ground disturbance will for many years remain an area of weakness in respect to erosion and other issues which

may restrict the former value of the area in respect to the natural, built and the developed environment.

Noise

The excavation machinery and the supporting construction and transport vehicles all will be a source of noise typical of major construction or extractive industry sites and will in most cases represent new and more noisy elements in what is at present a largely pastoral environment with a low ambient noise level, albeit also with a lower population. The construction noise will be transient in respect to any one location but periodic and repeated noise can be expected from scour valves and air relief valves post construction.

Dust

Dust will inevitably be generated by construction during dry and windy weather. Water applications and dust settlement agents can be used to minimise wind blown dust from stock piles and from roads. However much of the material which will be excavated have characteristics that will restrict the amount of water that can be applied. Soil carried on to roads will be a source of dust as it is removed and as a consequence of passing traffic, including the construction traffic involved in delivering materials to the construction sites and in removing unusable spoil.

Landscape and visual impacts

The consideration of landscape and visual impacts assumes that all vegetation within the 30 metre construction corridor would be removed. This would result in some permanent changes in landscapes and reduced scenic quality.

In areas where the longitudinal slope is greater than 20%, and in some sections of steep cross slopes, pipeline construction will result in a permanent linear feature in the landscape. Similarly, infrastructure such as pump stations, balancing storage and scour valves are likely to be permanent landscape impacts. In addition there will be many temporary landscape impacts in the alignment during the construction and maintenance period. These include trenching, spoil heaps, dust, haul roads, heavy vehicles, temporary structures such as fencing, signage, earthworks, denuded corridors and extensive reaches of bare earth after backfilling of trenching, soil erosion and sedimentation of water bodies.

Intensity of the visual impacts will be most keenly experienced by local residents, who have continuous visual exposure to change in the landscape.

Hydrological interference

Hydrological interference will occur as a consequence of the diversion of surface water runoff, groundwater and interflow. These will be due to sometimes minor changes in landslope consequent upon the trenching carried out or due to the pipeline acting as either a barrier to subsurface flow, or as a conduit for flow via backfill around the annulus of the pipe. These impacts will be minimised by rehabilitation work along the pipeline easement post construction and by the use of trench blocks and other features of the design as recommended by the Committee for consideration.

Habitat fragmentation

Habitat fragmentation will be a significant impact because of the extent of clearing of vegetation inherent in the project. This is despite the efforts of the Alliance to minimise the extent of clearing and the clearing of valued habitat. The impacts exacerbate the habitat fragmentation resulting from clearing of land already undertaken to create the pastoral and horticultural environment through which the pipeline passes and that undertaken to create the necessary infrastructure within the area.

Water quality

Water quality, especially turbidity in streams and in runoff water, can be expected to be affected down stream for some time and in some locations salinity may be an issue which will need to be mitigated. The latter is especially so to the south where trenching will be required in areas where brackish groundwater occurrence is indicated in the PIA.

Social disruption

Social disruption was identified by many landowners as an issue and will occur due to the stresses involved in construction supervision and assurance to ensure that WAPs as agreed are being adhered to by the work force.

Traffic

Traffic will be increased, and increased travel times and access delays in and out of properties (affecting deliveries and departures) will be experienced. Emergency traffic issues were identified by the community as being significant.

Discharges

Discharges of water will occur from time to time from the scour valves and this may be a source of water quality impact in downstream waters from both sedimentation and potentially translocation of biological material. If this water could be discharged to existing or new dams provided on affected properties, the impacts would be substantially reduced. Other discharges may occur as a consequence of pipe leakage and through diverted interflow or groundwater moving unimpeded along the pipeline annular fill.

Weed transfer and weed reinfestation

Weed transfer and weed reinfestation may occur as a consequence of the soil disturbance inherent in the excavation process. This will release those viable weed seeds stored in the soil for either growth in the soil profile when it is replaced or for growth at other sites where the spoil is placed. In addition, there will be potential for weed distribution through wind blown dust from stock piles or from truck spoil spillage and dirt transported on the tyres of vehicles moving around the construction areas and as they move from site to site.

Erosion and sedimentation

Issues will inevitably arise wherever soil and/or sediment disturbance takes place until such time as stable vegetated conditions are re-established by rehabilitation and waterway crossing engineering. Except where trenching is undertaken during dry weather and under dry conditions, water movement will at least stimulate a loss of water quality in respect to turbidity and more commonly significant suspended sediment movement. This issue is exacerbated along the pipeline route by the presence of dispersive, silty soils. These will prove very difficult to contain even using best practice such as silt fences and settlement retention dams. Where sediment is mobilised, either during construction or post initial rehabilitation, it is likely to settle in the low points in stream courses and on the flood plain.

The final location of sedimentation will depend upon the magnitude of the mobilising event. If heavy sediment releases were to occur these could clog wetland areas and disturb aquatic habitats. Releases from scour valves during the operational phases of the pipeline may also be a source of sediment which will need to be controlled. This could be done by arranging that the releases are to dams in a manner that will not give rise to erosion or aggravate existing erosion potential such as causing gully or piping erosion in waterways which are presently subject only to sheet wash or rill flow.

Spoil disposal

Spoil disposal will involve the loading and movement of trucks at the excavation and spoil pile sites, and these areas and the routes used to arrive at the ultimate disposal sites will receive spillage of spoil. This spillage will be readily available for mobilisation in any ensuing rainfall or runoff events. Under these circumstances, the spoil could potentially create safety issues on the roads and water quality issues to streams. The latter issues may not be very different from those which occur during natural runoff events but they will be additional to natural turbidity releases. As a result they may increase the impact, or increase the frequency of water quality degradation occurrences. These may be damaging to the existing ecology of the streams.

Finally, when the spoil is delivered to sites of disposal, such as the abandoned Castella quarry, it will be necessary to ensure that it is placed in a stable geotechnical manner. This means that it should not be subject to later slumping or erosion, or subject to be mobilised into the aqueous environment as either sediment load or persistent turbidity which may adversely effect downstream aquatic habitats or vegetation.

Feral predation on native species

Feral predation of native species is widespread in all landscapes encompassing the pipeline route. Predation by foxes and cats is of particular concern where intact native vegetation is removed. Native species within their intact habitat, to a degree are able to counter predation through their natural refuge. When intact native vegetation is removed there are two adverse changes that impact on native species.

Firstly, the refuge of ground dwelling fauna is fragmented and then movement across cleared areas makes them more susceptible to predation. Secondly, the cleared land allows predators much easier access, greater mobility and access to a longer front of bushland.

Impacts or threatening processes to listed species and communities

Two terrestrial and one aquatic species listed under the EPBC Act, the Matted Flax Lily and the Striped Legless Lizard are known to exist within the pipeline construction corridor. Another seven species have suitable habitat available and may be present but to date have not been detected in surveys. In addition five EPBC Act migratory species have been recorded in the vicinity of the alignment. Nine species listed under the FFG Act have been identified or recorded in the survey corridor and an additional 31 listed FFG Act species are predicted to use the corridor

where suitable habitat exists.

Any species within the construction alignment which are unable to be protected through the mitigation process of avoid, minimise or offset may be seriously impacted or destroyed. The threats and impacts may be direct or indirect, short or long term and temporary or permanent. These may include:

- loss or damage to native vegetation;
- removal of habitat;
- fragmentation of native vegetation and habitat;
- loss or damage to flora or fauna populations or communities;
- injury or mortality to native fauna;
- restricted movement of ground dwelling fauna;
- degradation of wetlands and streams;
- introduction and spread of environmental weeds;
- introduction and spread of *Phytophthora* and *Chytrid* fungi;
- increased feral predation of fauna;
- erosion and sedimentation;
- altered surface water runoff;
- inhibition of photosynthesis and reproductive capability due to dust; and
- altered hydrogeology and hydrogeology.

(ii) Downstream Environmental Impacts

The downstream environmental impacts of taking 75GL of water from the Goulburn River at Killingworth Reserve are considered in Chapter 6.3. Essentially the Committee considers that the environmental impact of the water off-take on downstream ecosystems will be minimal if the downstream river level is not materially affected. The flow in the Goulburn River is highly managed and maintaining the river level by controlling releases from Eildon Weir when pumping to Sugarloaf should be feasible. Recommendations for managing the off-take limits are provided in Chapter 6.3.

(iii) Controlling Provisions under the EPBC Act

The controlling provisions under the EPBC are covered in various chapters of this report, particularly Chapters 6.1 – Ecology and 6.2 Aquatic Ecology. However, a more complete summary and assessment is provided in Chapter 13 – Matters of Commonwealth Interest.

11. PREFERRED PIPELINE ALIGNMENT

The second task of the Advisory Committee is to investigate and provide advice in relation to:

Recommendation of a preferred pipeline alignment and key construction techniques for each section of the route (A to H) from the off-take at the Goulburn River to the Sugarloaf Reservoir, as well as for the siting and design of ancillary project infrastructure.

This can be broken down into nine key sections, which include the high lift pump station and balancing storage, and the sections A to H of the proposed pipeline.

The Advisory Committee has used the “blue line” preferred option, as presented by the Alliance at the commencement of the hearing, and as recommended in Chapter 5 of this report, as the basis for the following discussion.

11.1 Goulburn River Off-Take

The Goulburn River off-take facilities are described in Section 4 of the Construction Techniques Report (April 2008) and somewhat more fully in the most recently released plans as referenced in Chapter 5.2 of this report. These are brief descriptions only since details of the alluvial sequence which will need to be excavated are yet to be incorporated. It is clear however that the wet well will be completed at a depth about 5 metres below the water table which is likely to be about 11 metres below ground level. The means by which this will be connected to the river is as yet unresolved but may use secant piling or sheet piling. Many alternative construction techniques are available but this can only be decided when adequate ground data is available.

The wet well is to be connected to the low lift pump station by two 1700mm pipes. In addition, there will be an electrical control building containing switchboards, power supply connections and a transformer connection raised on piles directly above the pump wells so as to be above the 1:100 ARI flood level.

The pump station will house 5 - 8 submersible pumps extending about 3 metres below the adjacent river bed level. These will be gravity fed by the river inlet of the same depth with a protective screen at the outer edge to prevent the intrusion of debris. Pumping will be conducted only regulated releases for irrigation water are present in the river. The flows will be monitored as to volume by flow meters.

Pumping rates will be variable up to 265 ML/d and will apply mostly over the period of irrigation releases (240 – 280 days) dependant upon the storage level in Eildon Dam. The off-take rate is stated in the PIA to represent about 3 – 5% of the normal regulated irrigation water release rate.

Power supplies to the pump station will be at 22KV delivered by either underground or overhead transmission line. The Goulburn River pump station discharges will be connected via buried pipelines through Section A and B of the pipeline route to the High Lift Pumping Station.

The three sites - Killingworth Reserve (preferred), Molesworth (not preferred) and Ghin Ghin Bridge (rejected) are all located on the left bank of the Goulburn River floodplain. The sites are underlain locally by a substantial thickness of river alluvium, at least at the Killingworth Reserve.

The preferred pipeline route traverses the flood plain for several hundred metres close to the edge of the hills before rising on the hills and then meeting and thereafter running to Killingworth Road about 1.5 kilometres from the low level pump station site.

The Goulburn River pump station sites were assessed against the Sustainability Framework developed for the PIA. This included specifically taking account of the stability of the Goulburn River Channel alignment and channel shift in respect of long term operations. The impacts of construction on the physical, biological and social environment and economic resources associated with construction and operations of the engineered facility have been evaluated qualitatively and quantitatively (as to cost) and on this basis the preferred, non-preferred and rejected site differentiation was made.

The key issues with the preferred and non-preferred sites are associated with engineering. Specifically these appear to be:

- design of the river inlet;
- construction of the pump well through saturated river alluvium; and
- establishing a satisfactory filling base as alluvium on which to mount pump well and electrical facilities.

The pumping rate from the river is controllable as to timing and will be only conducted when the Goulburn River is subject to regulated releases to mostly satisfy downstream irrigation demand. The design is stated to seek an inlet velocity of less than 0.5 m/s which is considered to be too low to give rise to local bed erosion. This is an issue, which is however depth related, since the precise nature of the sediments

which form this base of the river channel are presently undetermined and at 0.5 m/s fine silts and clays will still be entrained in the flow.

The design of the inlet, as presently indicated, is such that it should not create damaging eddies likely to stimulate bed and bank erosion either during pumping or non-pumping periods. Similarly it seems likely to be benign during extreme flood events such as may occur should Eildon Weir overflow or extreme run-off events occur from the Goulburn Catchment downstream of Eildon Weir but above the Killingworth off-take.

11.2 Section A

The preferred route of pipeline section A now as recommended runs from the low lift pump station on the Goulburn River floodplain at the Killingworth Reserve approximately 6 kilometres to the edge of the Yea River flood plain at the end of Carey Road. The route initially traverses a short length of the Goulburn River flood plain before rising on to hills underlain by weathered regolith over the basement rocks. It then traverses to run parallel to the west of Killingworth Road which it will follow before realigning down Carey Road to the Yea River flood plain edge. Along this route few problems are envisaged with the physical environment with open trenching. It will be necessary to bench the excavation across 150m of Killingworth Ridge and again in Carey Road where these have elevated ridges. This is necessary in order to minimise excess head demands at the low lift pump station. In these latter areas some exceedance of the construction easement may be necessary.

Submitters have exhibited concerns that the pipeline route segment across the Goulburn River flood plain should avoid any damage to GDE in this area. Elsewhere along the route it is expected that the water table will be at depths beyond the pipe trench depth, and that the depth to the basement regolith surface will be shallow. Concerns here were expressed only in terms of avoiding important rural infrastructure if possible (Mr McGregor).

No data has been proffered by the Alliance on water table depths across the Goulburn River flood plain away from the low level pump station. These may rise towards the hills and will need to be investigated to ensure that the construction and presence of the pipe does not require such dewatering, or block groundwater movement that GDE are endangered. Similarly, the pipe trench will require trench cut-offs to be used where the pipeline falls across the terrain both for engineering maintenance purposes and to avoid interflow diversion where the pipeline falls towards the Yea River.

The specific property pipeline route layout has some flexibility to be able to be

diverted around specific structures. This derives from the ability to deviate by 1 degree per pipe length using the pipe elasticity or by 3 degrees using weld fillets without the need for putting in bends. The extent to which such techniques can be used economically is however limited, and should never be more than the cost of replacing rural infrastructure where this is practicable. If planned, it can be used to avoid GDE or other valuable wetland features.

The aspects of the specific pipeline route and design can be checked by an independent auditor as the data comes to hand, and then performance during construction can be confirmed by auditor inspection and analysis of monitoring data.

Pipeline design and construction through section A is considered feasible by the Committee using the Construction techniques and controls set out by the Alliance.

11.3 High Lift Pump Station and Balancing Storage

This element of associated infrastructure and facility is to be located on a property purchased on the west side of the Melba Highway approximately 2km south east of Yea. The property has an area of 177 hectares and is undulating pastoral land. The infrastructure required will include:

- a 5 hectare pump house with 6 – 10 pumps;
- balancing storages covering about 15 hectares with a capacity of 30 ML constructed as an earthen basin or steel roofed water tank;
- an earth lined scour dam with an overflow to accept sediment out of the balance tanks as well as supporting tracks, buried influent and discharge pipelines; and
- electricity supply transmission lines and switching equipment.

The precise design and lay out is yet to be completed but Preliminary Design drawings and photo mock ups were provided by the Alliance (TOC-WP255-A-SK021,SK004and SK004). The options include significant capacity to screen much of the facility from the road, as well as to use the terrain to minimise any material noise nuisance.

The key issues in relation to the layout of this site are essentially engineering related to the necessary water storage heights, ground vibrations and noise. Issues with the geotechnical characteristics of the substrate are yet to be evaluated, otherwise the issues are the same as those which relate to the ones discussed in relation to pipeline section B in this area.

Submitters expressed concern that the visual amenity of the area would be despoiled both from the road and from the adjacent property to the south. Concerns were expressed with regard to noise and ground vibration deriving from the operation of the pumps. Mr Scott, owner of the property immediately to the south, raised these issues amongst others. He queried the relevance of the EPA SEPP Noise in a rural setting, especially at night. He made particular mention of the noise which might arise from the operation of air relief valves and scour valves both at this site and along the route, as well as the traffic movements in and out of the High Level pumping station. The reality of these issues was supported by Ms Rathjen in commenting on her experiences with the Goldfield Pipeline now undergoing testing.

Mr Graham for the Alliance commented that planning for site revegetation had commenced, and the design of buildings would be consistent with common farm building designs - so as not to stand out. Decisions on the way in which power would be brought into the site were also said to be under consideration.

Mr White and Mr Barber for the Alliance commented that the potential of the ground to rapidly damp out ground vibration was high, and no impact would be expected to be noticeable within a few hundred metres of the source.

The design and construction of the High Lift Pumping Station, while yet to be detailed, should be able to take account of the topographic features and area of the site so that sources of noise can be shielded by burial or normal insulation processes to meet rational standards. Equally, appropriate planting of trees and shrubs around the site can be used to soften the image.

The issue of ground vibration affecting adjacent properties or the town from this site is considered by the Committee to be extremely unlikely.

It is noted that there will be two pipe corridors impacting on the eastern boundary of the property and that these will be oriented parallel to the slope of the land towards the Yea River flood plain. It is considered that it will be essential for these pipe trenches to include trench cut-offs in the backfill to ensure they do not give rise to interflow drainage with potential to destabilise the Melba Highway or the down gradient slopes.

Subject to consideration and acceptance of the final detailed design by an independent project auditor, it is considered that the High Lift Pump Station can be designed and constructed on the chosen site. The design should be such that the operation and visual aesthetics of the site are acceptable to the community and to the needs of the project. This is likely to be achieved by the preliminary design presented to the Committee.

11.4 Section B

Pipeline section B includes the crossing of the Yea River Flood Plain, the entry into and exit from the High Level Pump Station, and a major length parallel to the Melba Highway to the point where it is joined with Murrindindi Road. The overall length of this section is approximately 8 kilometres and it also includes the crossing of Ewing and Triangle Creeks along with numerous other less developed waterways.

The greatest single engineering issue along this route will be the crossing of the Yea River flood plain as has been discussed in Chapter 5 of this report.

Submissions were received in regard to this section which recognised the above issues generically (Ms Carvalho – Shire of Yarra Ranges; Mr O’Kane - GBCMA; Cr Gunter - Shire of Murrindindi; Mr Masters and others). The statutory bodies will have to approve the final proposal and will guarantee close scrutiny of these issues.

The approach to the Yea River crossing is preferred to be open trenching due to it being quick and manageable in the Alliance’s view. Site investigations are ongoing. The Shire of Murrindindi and the Goulburn Broken Catchment Management Authority prefer trenchless construction methods be used, while the Alliance proposes open trenching using Aquadams and diversion flumes or piping to achieve the same outcome.

The difference between these two construction approaches will in large part be dictated by the hydraulic properties of the alluvium and the distribution of the more permeable material across the width of the flood plain above the basement rock and above and below water table.

Determining which or what combination of construction approaches is preferred should involve consideration of the risks they generate during construction, and post construction to the downstream and local environment and to GDE in particular. Similar issues arise with the major creek crossings, and diversion of interflow by the pipe bedding fill is also an issue.

The pipeline route now preferred appears to represent the best general approach to resolving the issues which dictate the optimum alignment. The precise alignment of the route through the various different properties still needs to be resolved. Decisions on detailed WAPs and construction methods along the route and of the pipe design including bedding and trench cut-off frequency and characteristics will be determined as data comes to hand. Then comprehensive construction and post construction risks can be evaluated, with the magnitude and cost implications of

design features measured against the costs of rectifying any consequent damage due to risk occurrence. These processes should be subject to independent audit oversight, and oversight of construction performance and standards maintenance.

The Alliance preferred construction methods of open trenching the pipeline will, in the Committee's view, prove to be appropriate for much of the length of Section B, but this will need to be confirmed by additional data and by risk analysis.

In some cases, especially across the Yea River flood plain and perhaps across the other two major waterway crossings, alternative trenchless techniques may prove less risky. Subject to this work being completed, the Committee is of the opinion that the pipeline can be constructed along the preferred route in such a manner that the physical environment is not materially impaired. However, in order for the pipeline not to represent a subsurface barrier to groundwater flow, it will be necessary for the pipe trench across the Yea River flood plain to include high permeability underdrains (shunts) which will allow water table equilibration post construction upstream and downstream of the buried pipe alignment wherever significant permeability is encountered, be it in fractured basement or in the alluvium.

11.5 Section C

This pipeline section extends on from Section B at the Murrindindi Road intersection with Melba Highway to Devlins Bridge over the Yea River, a distance of about 12.5 kilometres. The preferred route now determined is aligned adjacent to the Melba Highway to the west to just north of Rellimeiggam Creek, then to the east from there to the section end just north of Devlins Bridge.

The key engineering issues along this section are related to the crossing of 14 water courses including Tea Tree, Rellimeiggam and Caraman Creeks. Excluding the three named creeks, the remainder are all ephemeral water ways classified as unchanneled hillslopes (5), gullied hillslopes (1), confined uplands (1), or as unchanneled valley fill waterways (1). These are not considered likely to represent major issues in construction using the preferred open trench techniques the Alliance propose; but the exacerbation of headwater erosion and possible piping of the down stream channels are identified as issues along with potential scouring and destabilization of bed and banks.

The three larger creeks that are normally perennial are all classified as meandering creeks. Of these, Caraman Creek is seen to be potentially down grading its bed while the other two appear stable. The Committee note that no seismic evaluations or other investigations of these crossings have been carried out, and hence

uncertainty remains as to the full range of risks which may be encountered in excavating across these creeks. The Alliance has proposed that between 4 and 6 days is all that will be required and that this can be done in November this year. This is reported to be a time when sudden high intensity storms can occur and no plan has been presented as to what management action (contingency plans) will be implemented to protect the environment both locally and downstream if meteorological warnings occur after construction has been entered upon. These are matters which need to be considered in risk analysis.

Shallow water tables will be an issue in excavating and creating engineering structures across all these waterway crossings, especially along the south bank of Rellimeiggam Creek where the weak geotechnical nature of the alluvial/colluvial material on the banks and terraces may be underlain by permeable fractured basement. This area requires further geotechnical assessment into the potential for uplift groundwater pressures to be present from fractured rock in this area.

As with pipelines Sections A and B, there appear to be a number of issues with respect to the engineering of this section of the pipeline which have not been addressed specifically in the PIA, or in subsequent documents presented to the Committee. These include issues such as:

- Constructability across open ground and across the less marked waterways due to the weak geotechnical character of the soil and colluvial cover on the bedrock, especially after or during wet weather;
- Avoidance of the potential for the pipeline bedding backfill to act as a preferred route for interflow and groundwater movement post construction giving rise to soil moisture and/or spring occurrence redistribution, and the potential for piping destabilisation of down slope soils and pipeline backfill materials to the detriment of the land form stability;
- The location of scour, air relief and isolation valves and the means by which they are rendered acceptable structures within the rural land;
- It is also possible that other specific engineering issues for this section may include:
 - The possibility of the need for dewatering and/or excavation within shields as crossings traverse Caraman, Rellimeiggam and Tea Tree Creeks.
 - Issues of water quality management may need to be addressed where interflow seepages are encountered. Certainly, issues of turbidity and settlement control will be an issue especially if geotechnical testing shows the shallow soils to be dispersive in low salinity water.

It is noted in Appendix A of the PIA that directional drilling is an option but such approaches are not universally applicable and have associated problems such as the size of the entrance and exit points, the removal and disposal of drilling fluids and with contaminated water and spoil which of themselves are significant and potentially costly elements in engineering. These issues have been raised generically at least by submitters, including the statutory authorities already mentioned in respect to earlier pipeline sections.

Irrespective of the forgoing concerns, it is concluded by the Committee that with information from more detailed site investigations, construction planning and with the timing of construction operations over drier weather periods, that construction techniques can be devised and implemented to achieve construction without creating unacceptable risks. It seems likely that construction techniques may need to include directional drilling and pipe jacking under some perennial streams and under the Melba Highway. Excavation within shields or within sheet piling with or without supplemental dewatering across the larger terraced waterways may also prove necessary. Whatever techniques are used, design will need to ensure that the presence of the pipe does not create an unacceptable barrier to natural groundwater movement towards GDE down gradient, or create local bog or erosion prone areas.

11.6 Section D

Pipeline Section D starts at and includes Devlin Bridge, and it follows the Melba Highway alignment to the point where the high voltage transmission line crosses the highway south of Glenburn township just to the north of the Toolangi State Forest. The full length of the preferred pipeline route is 10 kilometres.

The preferred route parallels the Melba Highway to the east from Devlin Bridge but crosses the highway to the west side as it approaches Kalatha Creek. This deviation is in order to take best advantage of lower slopes across the route. The route crosses back to the east side just south of Eaglenest Creek to avoid buildings and business premises at Glenburn. Thereafter it remains to the east of the highway to the end of the section.

The key issues within this section of the pipeline route are clearly the crossing of the Yea River adjacent to Devlins Bridge and the crossings of Katy, Eaglenest and Wee Creeks (PIA Figure 6). These crossings are mostly classified as meandering waterways (PIA, Appendix B, Table 13) with the minor ephemeral waterways classified as unchanneled hillslopes, confined uplands or as unchanneled valley fill waterways. The sections between the waterway crossings are mapped as being underlain by the Silurian aged Humevale Formation overlain by colluvium and possibly some poorly sorted alluvium near the larger streams.

The basement geology as depicted by the geological maps in Appendix D (Figure 3) does not seem significantly fractured across this pipeline section. This, coupled with the relatively low slopes applying across all but the most northern sections of the route, indicate that uplift groundwater pressures are unlikely away from the main waterways.

Notably, the geomorphology (Appendix E) comments that gullying is evident at the downstream end of the catchments and this may portend tunnel/piping erosion in the colluvium upstream of the gullies. At Devlins Bridge, the bedrock is exposed in the stream bed as lithified sandy siltstone with silty alluvium exposed in the steep banks.

Devlin Bridge appears to be at a nick point in the longitudinal profile (thalweg) of the Yea River and the base of the stream is clearly degrading. The stream course is entrenched within alluvium to about 5 – 6 metres. Pondages exist both above and below the bridge which are used for recreation and fishing. At this crossing it would seem quite practical to create a pipe bridge with the invert of the pipe held above the 1 in 100 year flood level. Subject to determining issues related to road realignment and the presence of other infrastructure, a pipe bridge to the east of the highway could avoid multiple road crossings and reduce their attendant risks. In particular such an approach would largely avoid water quality risks associated with the proposed water way crossing technology on down stream environments.

At other significant waterway crossings (Kalatha, Katy, Eaglenest and Wee Creeks), directional drilling or excavation within shields may be more practical and less risky than open trenching as proposed by the Alliance. It is noted that seismic investigation had been done on Kalatha Creek and that some drilling was to be done. No data from this work was provided by the Alliance on the findings of these investigations. As a consequence, the reality or otherwise of risks associated with different construction techniques cannot be assessed by the Committee. These issues need to be addressed so that decisions on construction techniques and designs can be made on a solid basis. Alternative approaches may also assist in preserving riparian vegetation and in minimising the magnitude of water quality risks that need to be addressed and managed.

The extent of the use of trenchless or similar techniques away from the immediate waterway confines will be determined in part by the sub surface conditions found to exist and by the soil and colluvium saturation applying at the time of construction.

Mostly the permanent water table will be greater than the necessary trenching depth away from the waterways but, under wet conditions, perched water tables carrying

interflow downslope should be expected. This situation, albeit ephemeral, represents longer term risks as mentioned earlier. The pipeline alignment can cause concentrated discharges or redistributed soil moisture and spring activity. In the soils of the 1.1Hs and RSP 7.2 and 7.4 respectively (Appendix B and E) mapped along this section, there is significant potential for such redistribution of interflow to feed incipient subsurface tunnelling down gradient and to stimulate gully erosion. These can be addressed by the use of trench cut-offs and by selective use of pipe bedding materials having different permeability characteristics.

Finally there is need for the positioning of sluice, air relief and isolation valves and for designs. Designs should also address the release of water in a safe (non erosive preferably productive) manner and which ensures that sediment released does not represent a risk of contamination to local rural activities or waterways.

Mr White for the Alliance indicated that the preferred construction technique for Devlins Bridge was open trenching within Aquadams, and using flumes to divert the flow. Silt release issues would be handled using silt fences and baled grass barriers as recommended in the EPA Guidelines for Construction Sites. The work is proposed to be done in March 2009 when the weather is expected to be dry. Weather forecasts would be used to guide construction activity which is estimated to require three weeks. Because of the hard rock base rock, sawing and rock breaking techniques would be needed to create the pipe trench, with the pipe section being prefabricated to be lowered into excavations created in the banks and the river bottom in one operation.

The Committee accepts that the construction technique proposed by the Alliances is potentially feasible, but it is uncertain as to whether it is the least risk technique for establishing this crossing. The confined nature of the stream channel at this site and the potential for short duration high flows to occur in response to high intensity rainfall events in the catchment is seen as significant across a three week period. The availability of weather forecasts does not seem to mitigate the risks which might arise in the absence of any protection plan.

Mr White for the Alliance and the statutory bodies (Murrindindi Shire, DSE and the Goulburn Broken CMA) all acknowledged that consideration of the least risk method of crossing the Yea River adjacent to Devlins Bridge is yet to be resolved.

There were many submissions that expressed concern over the Devlins Bridge crossing, in particular noting it as an important recreational feature with a highly sensitive reach of the river and important riparian vegetation adjacent to it and below it, including Mr McPherson, Ms Abbott Smith, Ms Taylor, and Ms Wormald. Others commented upon other issues such as the impact of scour valves which

might be located at points such as Devlins Bridge and other waterway crossings. Their concerns related also to the impact on down stream water quality as well as on erosion control (Ms Beer, Mr Masters and others).

The Committee concludes that based on the foregoing, the issues desirable for the Alliance to further consider include:

- whether a pipe bridge should be constructed adjacent to Devlins Bridge to carry the pipeline across the Yea River with it's invert above the 1 in 100 year flood level as a means of reducing the potential risk to downstream water quality;
- the best methods of construction across other waterways and saturated sections of associated alluvium on a risk basis. This should include consideration of open trenching, directional drilling and pipe jacking, excavation within shields or similar alternative construction methods;
- the use of variable character pipe bedding and/or trench stops around the pipe annulus to prevent ephemeral or perennial groundwater or interflow diversion along the pipeline alignment; and
- where it will be necessary to have scour valves and air relief valves, and to generate designs which ensure that these will not be causes of erosion or water quality degradation or sources of noise or amenity issues in the vicinity.

11.7 Section E

Pipeline Section E runs from where the High Voltage power easement crosses the Melba Highway, south approximately parallel to the eastern side of the Melba Highway for approximately 9.5 kilometres to the junction of the highway with the Healesville – Kinglake Road.

The preferred route is entirely to the east of the highway and traverses for much of its length within the Toolangi State Forest. Country in this section has steep slopes and high ridges before rising to a narrow plateau which exhibits low slopes across the pipe route. It is this area which forms the Divide between the Yea River to the north and the Yarra River catchment to the south.

To minimise the need for an expanded construction easement and longer term risk of leak stimulated landslip across the Melba Highway, the preferred route includes about 800 metres of tunnelling. This will be bored at a level approximately the same as the adjacent Melba Highway.

Some traversing of steep slopes will still be required, which may require an expanded construction easement with commensurate need for clearing of the existing forest.

The pipe route will cross the upper course of the Yea River near Castella and a number of smaller waterways. Only the Yea River is perennial. It has a highly armoured stream bed. The other waterways are classified as confined uplands or unchanneled hillslopes (Appendix B Tables 8 and 11). They can be sources of significant rill and sheet flow after intense rain fall because of the steep profiles. They appear to have bedrock controlled course alignments with limited soil or clayey soil cover in their upper catchments.

Geotechnically, the steep slopes have the potential for landslip (Appendix G - Appendix B – Map 5). This would be especially so if water concentrations were to occur as a result of construction elements or pipe leakage in the future. Some risk assessment in relation to this issue needs to be carried out. The outcome of such analysis may cause the pipe route to be laterally displaced further from the Melba Highway. This would move the route out of the Melba Highway reserve and could have further consequences in terms of forest clearing.

Ground water issues are not likely to be significant in open trenching as the depths to saturation of fractured rock is expected to be beyond pipe trench depths (Appendix D Figure 3). Groundwater inflows to the tunnel section are also unlikely to be a significant issue but it will drain any open fractures intersected. Specific investigations will be needed to evaluate tunnelling conditions.

Where open trenching is practiced, significant clearing of forest areas will have aesthetic and environmental issues. Pipe routes which avoid steep side slopes would reduce these impacts.

The crossing of the Yea River at Castella could be done by various techniques with potentially directional drilling beneath the bed being the least hydrologically and environmentally disturbing. Equally, a pipe bridge could be practical and less disturbing of the environment. These alternatives need to be further evaluated.

The majority of responses relating to this section of the pipeline route were concerned with the need for and extent of clearing of mature forest necessary and the consequences of this for the flora and fauna of the area. Other issues raised included viewscape degradation consequent on the clearing and the long term implications of the construction easement.

In respect to the physical environment, there is need for more data on the geological structure along the route so that construction and pipe operational risks can be assessed. The major risks are geotechnical and arise through the presence of faults or adverse dips toward the Melba Highway. These might be activated to failure by water pressures developing as a consequence of the pipe trench acting as a collector and conduit for intercepted water or through undetected pipe leakage.

The Committee concluded that the preferred pipe route selected with the microtunneled section is appropriate, but it might be better aligned in some sections to reduce the potential for forest clearance, and reduce the potential for geotechnical failure in the future.

Monitoring of the pipeline route post construction should include the usual environmental factors (vegetation regrowth, water quality, erosion, etc.) and include water evidence in the pipe bedding base.

11.8 Section F

Pipeline Section F commences with a break pressure tank close to the Healesville – Kinglake Road junction with the Melba Highway. The pipe route is in the catchment of Dixons Creek to the south of the Divide with the pipe falling in elevation over the entire length of 6.5 kilometres. It is proposed to be constructed using pipe having an outer diameter of only 1.404 metres. Because of the smaller diameter of the pipe, any trenching can be marginally narrower than for the larger pipe diameters to the north.

The preferred pipe route is shown on Figure 1. It traverses forested area to the east of the Melba Highway for about 2.4 kilometres before emerging into largely cleared land where it crosses to the east side of Dixons Creek for about 2 kilometres. It then crosses back over Dixons Creek to again follow the east side of the Melba Highway for another kilometre before crossing to the west side of the highway, and following this side until just before the section end at Hunts Lane.

The key issues are the two crossings of Dixons Creek and the two crossings of Melba Highway. Many environmental issues are associated with the route and these may be reduced and/or avoided by minor realignments agreed within individual landholdings.

Few responses were received in respect to this pipeline section relating to the physical environment. Rather concerns related to water quality and flora and fauna issues. Construction issues were seen as disturbing especially for landholders with sensitive animals and long lengths of the pipe line within their properties.

The Committee is of the opinion that the preferred route is acceptable. It seeks to avoid and minimise environmental degradation. It is considered that it will require the same level of auditor oversight risk assessment as other sections of the pipeline in order to determine the least risk construction methods along the route.

In particular, the diversion of interflow will be an issue to the east of Dixons Creek and the crossings of the creek will also present some difficulties as the creek channel is deeply incised and appears subject to rapid response to high intensity rainfall events. Such events would make water quality management very uncertain. Alternatives to standard trenching need to be considered including trenchless and/or pipe bridging approaches.

11.9 Section G

The preferred Pipeline Section G route extends from the corner of Hunts Lane and the Melba Highway and traverses the terrain parallel to the Melba Highway as far as Gulf Road. Along this section, the route swings initially from the east side of the highway to the west side and it includes two crossings of Dixons Creek, one of Steels Creek and one of the Maroondah Aqueduct. At Gulf Road the pipeline swings west initially parallel to Gulf Road for a few 100 metres before swinging south west down the Maroondah Aqueduct easement to meet Steels Creek Road. Thereafter, it follows Steels Creek Road to the intersection with the Yarra Glen Eltham Road. The total route length is 10.1 kilometres.

The Section G route traverses largely cleared land, much of which is in use as vineyards. The route is largely in private land, parallel and adjacent to the major roads of the region, however three sections are in road reserves in order to avoid high value land and valued natural vegetation remnants.

Apart from the matters mentioned above, the issues along the preferred route include:

- Deep trenching over a ridge line to the north of the Dixons Creek Primary School;
- Shallow water table areas near Dixons and Steels Creeks. These may require the use of sheet piling during excavation and/or dewatering by a variety of techniques dependant upon the nature and thickness of the alluvium found to exist over the Silurian mudstones of the Humevale Formation;
- Avoidance and or offsets for any damage to EPBC listed species such as Matted Flax Lily which has been mapped at several locations along the preferred routes; and

- Potential issues with management of brackish groundwater in excavations west of the Melba Highway.

Few significant construction issues are foreseen resulting from the physical environment along the preferred route; but due to the density of development in this area, it will be important to include effective dust and noise mitigation measures and for the siting of construction works where practicable, to minimise viewscape issues. The one issue of the physical environment which is significant is the potential for shallow brackish groundwaters to the south and south west. Management of construction will need to be sensitive in these areas.

Some modification of the pipe route alignment might be negotiable with the landholders where the pipe route traverses the Melba Highway/Gulf Road intersection. The objective here would be to minimise business disruption. A pipe route diverting to the north of this intersection then passing to the west of vines and buildings at the back of Balgownie Estate, for example, could be practicable as it would then join the preferred route where it passes down the Maroondah Aqueduct easement.

Numerous submissions were received in response to this section, including from Mr Forrester, Ms Fyffe, Ms and Mr Harper and Ms Warnock. These variously addressed business and lifestyle disruption that would ensue as a consequence of the construction. Ms Warnock in particular referred to the very wet ground that would be encountered as the pipe route is excavated into alluvium and deeply weathered regolith towards the southern end of the pipeline route as it traverses the Dixons and Steels Creek crossings in this area.

The Committee notes that a part of the proposed dust management system involves monitoring for dust remote from the construction site. If dust is found, operations would then cease until weather conditions or other actions could be assured of avoiding serious dust generation. It was noted by some submitters that many sources of dust will occur within the construction corridor, and that because the construction is sensitive to water use, it may be impossible to resolve this problem. They further noted that by the time dust monitoring signals that an issue exists, dust will already have become a nuisance or have potential to impact upon grape productivity or quality.

The Committee endorses the Alliance proposal to map the full preferred pipe route length for the most dispersive dust producing soils so that these areas can be planned for construction under favourable conditions.

The Shire of Yarra Ranges made a request that the depth of pipeline burial, especially where it lies close to roads, should be such that it would not represent an impediment to road drain excavation for existing or new roads. The Committee believes that this is reasonably provided for in the design, but it is a matter which could be audited. It is recognised that the construction of new roads could be impeded by any area where the pipe obvert level is only 1.0m below existing ground level.

The Committee notes that there have been significant issues between the Alliance and local land owners which have acted to restrict a rational exchange of views on many matters. Notwithstanding that many landholders may have in principle objection to the concepts which underlie the Sugarloaf Pipeline project, the Committee considers that it would be beneficial now for all parties to cooperate in exchanging information in a constructive manner so that the best outcome practicable can be achieved to the benefit of all parties. In this respect, the Committee concludes that if possible, the preferred pipe route should be modified in some areas by selecting alternative but compatible routes in discussion with the landholders. This may alleviate some landholder concerns, or at least reduce the time frame of any impacts. It also concludes that alternative trenching techniques may need to be considered where wet ground and/or ground subject to frequent flooding is traversed (Steels Creek). This could involve wet trenching, such as the use of dredging within shields.

Similarly, statutory authorities should identify those areas where current future planning indicates that significant road upgrading will occur, so that this can be taken into account in pipe trench excavation and pipe depth of burial.

The Committee considers that further work needs to be done to determine the extent to which brackish water exists along the pipe route to the south. Controls will have to be devised to prevent the pipe trench acting as an interconnection between groundwaters of different beneficial use classifications, either during or post construction. In addition, concerns expressed by submitters that the pipe trench could give rise to boggy ground with limited productivity or trafficability, need to be examined and avoided by the introduction of specific design measures. These assessments should, as with other pipe sections, be based around comprehensive multi-parameter risk assessments overseen and agreed to by an independent auditor.

The proposal to seal Gulf Road as part compensation for the inconvenience caused to the local residents is endorsed.

11.10 Section H

Pipeline Route H is proposed to be constructed within the road reserves of Glenview and Yarraview Roads. Thereafter it will rise across the Christmas Hills escarpment following the high pressure gas pipe easement. Beyond the easement, the preferred pipe route then follows a series of formed road reserves to enter the Sugarloaf Reservoir via an inlet on the northern side of the reservoir where it is indicated that water mixing will be best achieved. The length of this section is approximately 7 kilometres.

The key issues along this route include several road crossings and the crossing of the Maroondah Aqueduct at the western end of Yarraview Road, and most particularly the traversing of the Christmas Hills escarpment. The latter is both steep and is described as having conditions which are prone to landslip.

Groundwater should not be an issue in trenching along most of this route except possibly at the southern end of Glenview Road where wet conditions may exist in colluvium at depth. With respect to geotechnical conditions, it is notable that the route has been traversed by trenched pipe construction in the past and no evidence of failures have been reported in the PIA. Translational landslips and soil creep has been identified on the escarpment slopes and these could be exacerbated by moisture build-up should this occur in the future.

To the west of Skyline Road at the top of the escarpment, geotechnical conditions will be straight forward.

Submitters have indicated concerns in respect to the disruption of traffic during construction, and in relation to business specific matters including the impact of dust on vines. There have also been concerns expressed in regard the aesthetics of the trenching on the escarpment view, and with the dust and noise of construction.

Specific issues remain in respect to the precise route up Yarraview Road and as to the future of the Sugarloaf Reservoir Sailing Club. The latter is reported to have had its future and location assured by Melbourne Water. The former issue will be resolved when and if an agreement with the gas company is reached with regard to the use of their easement.

The Committee concludes that the preferred pipe route through Section H is acceptable, but notes that it remains subject to agreement being achieved with the current controller of the gas pipe easement.

There remain issues with respect to the least risk construction techniques, especially if brackish groundwater is found or where geotechnically unstable saturated ground is encountered at the southern end of the pipe route. These issues should be addressed by a comprehensive risk assessment to determine the best construction approach taking into account all the risks that could arise either during or post construction. This has been recommended for other sections and should be part of the same process.

Overall, for the pipeline sections A to H, the Advisory Committee recommends that the Alliance:

- **Prevent unacceptable damage to Groundwater Dependent Ecosystems and groundwater and interflow to ensure movements are not materially diverted and give rise to environmental detriment or unacceptable impacts on rural land productivity (Sections A, B, C, D, southern section of F, G, H).**
- **Re-evaluate the proposed waterway crossings of the Yea River at Devlins Bridge (Section D) and Castella (Section E), and the two crossings of Dixons Creek (Section F) in the light of the (recommended) risk assessment, to determine whether pipe bridge crossings are feasible and carry less risk than the preferred trench crossing.**
- **Establish minimum performance monitoring sites, including sites at which ground water levels are monitored and stream water quality (for example turbidity, electrical conductivity) can be evaluated, both during and post construction (All Sections).**
- **Pay particular attention to avoiding noise and dust (Sections G and H), and to the potential for the pipeline being a source of ground and water pollution due to brackish water inflow of groundwater or interflow (Section G).**

12. MITIGATION, OFF-SET, MONITORING & MANAGEMENT

The third task of the Advisory Committee is to investigate and provide advice in relation to:

The environmental mitigation, off-setting, monitoring and management measures needed to minimise adverse environmental effects of the project, including on matters of national environmental significance.

Matters of Commonwealth interest are addressed in the following chapter of this report.

In response to inquiries from the Committee and submitters during the hearing, the Alliance provided an update to Table 10 (Document 55) in the PIA Report titled “*Potential Environmental Interactions and Issues and Mitigations Measures.*” This table provides a section by section description of the management and mitigation measures proposed by the Alliance.

The Committee considers that this table and other responses to key issues requested and received by the Committee can be used effectively as a ‘Summary of Commitments’. The measures proposed in it can be used to inform the final Environmental Management Strategy, Environmental Management Plans and Work Activity Packs.

The commitments to management and mitigation in this table should be further refined over the next few months to incorporate relevant changes from this report and to include feedback from the community liaison groups as recommended in Chapter 7.

In general the Committee considers the management and mitigation measures proposed are reasonable subject to the specific comments on particular areas in this report. The Committee also wishes to highlight the issue of risk management.

As discussed in Chapter 9 of this report, a comprehensive risk management evaluation is needed for the pipeline route to help fine tune the alignment and to inform decisions carrying an element of ecological or socio-economic risk (for example the particular method of crossing the Yea River at Devlins Bridge). The outcome of this risk assessment may require that changes are needed with flow on effects for management and mitigation.

The Advisory Committee recommends that the Alliance:

- **Refine the management and monitoring commitments (as in the updated Table 10 from the PIA – Document 55), in consultation with stakeholders. Use this as the basis for a ‘Statement of Commitments’ to help guide project implementation.**

13. MATTERS OF COMMONWEALTH INTEREST

The Federal Minister for the Environment, Heritage and the Arts decided on the 13 February 2008 that the Sugarloaf Interconnector Pipeline was a controlled action and that the controlling provisions of the *Environment Protection and Biodiversity Conservation Act* 1999 are sections 18 and 18A (listed threatened species and communities). The Minister further decided on 13 February 2008 that the proposal would be assessed by an accredited process, in this case the Advisory Committee process under Section 151 of the Victorian *Planning and Environment Act* 1987.

The Terms of Reference provide that the Advisory Committee must prepare and submit a report to the Minister for Planning and the Australian Government Minister for the Environment, Heritage and the Arts that addresses six key matters, each of which are discussed and/or summarised in turn.

- (i) **A description of the project, places affected by the project and any significant environmental assets, including threatened species listed under the EPBC Act, that are affected or are likely to be affected by the project.**

The proposal is briefly outlined in Chapter 2 and the more specific route alignment discussed in detail in Chapter 11. Chapter 6 provides a detailed description and analysis of the ecology potentially affected along the pipeline route. The species listed in the EPBC Act controlled action reasons for decision are discussed in detail below in (ii).

- (ii) **A summary of the environmental impacts, including relevant impacts on threatened species listed under the EPBC Act, of the project options for the pipeline alignment and key construction techniques, as well as for the siting and design of ancillary project infrastructure, that are referred by the proponent.**

The Minister outlined in paragraphs 15 to 25 of his *Statement of Reasons for a Decision on Controlled Action under the Environment Protection and Biodiversity Conservation Act* 1999 the species likely to be impacted. These are:

- River Swamp Wallaby Grass
- Little Pink Spider Orchid
- Purple Clover
- Matted Flax Lily
- Striped Legless Lizard

- Growling Grass Frog
- Spotted Tail Quoll
- Southern Brown Bandicoot
- Smokey Mouse
- Murray Cod
- Macquarie Perch; and
- Trout Cod

The Advisory Committee has addressed each of these species below. The information is summarised from the flora and fauna assessment in the PIA (Appendix H), the notes provided with Document 29 from the flora and fauna specialists working for the Alliance and from the Attachment 1 and Attachment 2 documents provided with the letter from Melbourne Water dated 7 May 2008.

The Advisory Committee notes that for a large number of the EPBC listed species, further survey work is required. This makes it difficult to assess real impacts until these surveys are complete and the Advisory Committee is not categorically stating that the matters of national environmental significance will not be impacted. However, for most species the Committee does consider a range of avoidance or management options are available to minimise impacts on matters of national environmental significance.

Nevertheless, the Committee considers that until the absence of a species is categorically confirmed it should be considered to exist in likely habitats and construction proceeds in accordance with the 'precautionary principle'.

(i) River Swamp Wallaby Grass

EPBC Status	Presence	Potential Impacts	Mitigation
Vulnerable	Not recorded along preferred route to date. Potential habitat exists. Targeted surveys planned for late 2008/early 2009.	Destruction of individuals and communities due to construction activities. Loss of habitat due to changes in hydrology.	Avoid likely habitat. If presence is confirmed during survey work then strategy for avoiding, transplanting or offsetting will need to be developed.

Advisory Committee Response: The River Swamp Wallaby Grass has not been recorded to date but the presence of the species should be assumed pending further surveys in likely habitat. The parameters for further survey work should be determined in conjunction with the Federal Minister for the Environment, Heritage and the Arts. The Committee considers impacts on this species if present should be able to be avoided or managed.

(ii) *Little Pink Spider Orchid*

EPBC Status	Presence	Potential Impacts	Mitigation
Endangered	May occur in forest areas south of Toolangi State Forest. Targeted surveys proposed for August to September 2008.	Destruction of individuals and communities due to construction activities.	Avoid likely habitat. If the species is found in further surveys then a strategy for avoiding or offsetting will need to be developed.

Advisory Committee Response: The Little Pink Spider Orchid has not been recorded to date but the presence of the species should be assumed pending further surveys in likely habitat in forested areas. The parameters for further survey work should be determined in conjunction with the Federal Minister for the Environment, Heritage and the Arts. The Committee considers impacts on this species if present should be able to be avoided or managed.

(iii) *Clover Glycine*

EPBC Status	Presence	Potential Impacts	Mitigation
Vulnerable	Not recorded. Preferred pipeline route avoids most likely habitat in Sections A, B, C and D. Further targeted surveys planned in association with surveys for Matted Flax Lily.	Destruction of individuals and communities due to construction activities.	Avoid likely habitat. If the species is found in further surveys then a strategy for avoiding, transplanting or offsetting will need to be developed.

Advisory Committee Response: The Clover Glycine has not been recorded to date but the presence of the species should be assumed in suitable habitat pending further surveys. The parameters for further survey work should be determined in conjunction with the Federal Minister for the Environment, Heritage and the Arts. The Committee considers impacts on this species if present should be able to be avoided or managed.

(iv) *Matted Flax Lily*

EPBC Status	Presence	Potential Impacts	Mitigation
Endangered	Several patches exist in the preferred pipeline easement (Glenview Road and Maroondah Aqueduct	Destruction of individuals and communities due to construction activities.	Avoid likely habitat. A strategy for managing the species is being developed which may include propagation and

	easement). Further targeted surveys are to be undertaken.		transplanting.
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Advisory Committee Response: The Matted Flax Lily exists in several locations along the route and further surveys are needed to refine locations. The parameters for further survey work should be determined in conjunction with the Federal Minister for the Environment, Heritage and the Arts. The Committee considers impacts on this species if present should be able to be avoided or managed but a specific management strategy will need to be approved by the Federal Minister.

(v) Striped Legless Lizard

EPBC Status	Presence	Potential Impacts	Mitigation
Vulnerable	Lizard presence confirmed west of Killingworth Road and on the Sheoak property (not on the alignment). Lizard presence and potential habitat being mapped for use in the EMP.	Destruction of individuals, communities and habitat due to construction activities.	Avoid likely habitat. A strategy for the species has been developed with the Victorian Striped Legless Lizard Working Group.

Advisory Committee Response: A Striped Legless Lizard was recorded from Section A of the route and potential habitat exists in other sections. The Committee considers impacts on this species should be able to be avoided or managed.

(vi) Growling Grass Frog

EPBC Status	Presence	Potential Impacts	Mitigation
Vulnerable	No Growling Grass Frogs have been recorded. Targeted surveys have been undertaken in suitable habitat areas. Due to drought conditions further targeted surveys are planned for September-October.	Destruction of individuals, communities and habitat due to construction activities and hydrological changes.	Any impacts on habitat are expected not to be long term. Work methods are proposed to minimise impact on habitats/individuals if present.

Advisory Committee Response: Whilst no individuals were recorded the Committee is concerned that such species are likely to be in low abundance due to the sustained drought. The Alliance acknowledges that there are considerable areas of habitat

along the pipeline route. The parameters for further survey work should be determined in conjunction with the Federal Minister for the Environment, Heritage and the Arts. Depending on survey results, appropriate management responses and possibly habitat offsets may need to be created. The Committee considers that the impact on this species can be managed.

(vii) Spotted Tail Quoll and Southern Brown Bandicoot

EPBC Status	Presence	Potential Impacts	Mitigation
Endangered	No Quolls or Bandicoots were recorded in surveys but the species are likely to be present in the Toolangi Forest.	Destruction of habitat along the pipeline route.	Rehabilitation of pipeline areas (where possible outside the permanent easement) should be undertaken rapidly.

Advisory Committee Response: Pipeline construction is unlikely to impact on individual animals directly. Measures that minimise clearing and ensure prompt rehabilitation should be implemented. Priority for habitat rehabilitation should focus on the habitat of ground dwelling species to minimise feral predation.

(viii) Smoky Mouse

EPBC Status	Presence	Potential Impacts	Mitigation
Endangered	Not recorded and considered unlikely to occur along the pipeline route.	Destruction of habitat along the pipeline route.	Rehabilitation of pipeline areas (where possible outside the permanent easement) should be undertaken rapidly.

Advisory Committee Response: Pipeline construction is unlikely to impact on individual animals directly. Measures that minimise clearing and ensure prompt rehabilitation should be implemented. Priority for habitat rehabilitation should focus on the habitat of ground dwelling species to minimise feral predation.

(ix) Golden Sun Moth

EPBC Status	Presence	Potential Impacts	Mitigation
Critically Endangered	Not recorded but likely areas of habitat identified. Further surveys planned between October and December 2008.	Destruction of individual, communities and habitat along the pipeline route.	Management procedures will be developed based on the survey findings.

Advisory Committee Response: In the Statement of Reasons the Federal Minister for the Environment, Heritage and the Arts determined that there was unlikely to be an impact on this species. Due to the habitat found along the route the Alliance is undertaking further surveys to confirm the absence/presence of the species. The Committee considers impacts on this species, if present, can be managed.

(x) Fish Species

EPBC Status	Presence	Potential Impacts	Mitigation
Murray Cod (Vulnerable) Trout Cod (Endangered) Macquarie Perch (endangered)	Murray cod is not recorded. Macquarie Perch population below Devlins Bridge has been recorded in recent years.	Alteration to flow regime in the Goulburn River. Impacts on rivers and streams during construction from turbidity.	Maintain flow regime in the Goulburn River to ensure no material change. River and stream crossing designed to avoid stream disturbance from construction activities and turbidity generation.

Advisory Committee Response: Maintenance of the (artificial) flow regime in the Goulburn River should not increase the impact on native fish species and the project may provide opportunities to improve the flow regime (ie make it more natural). The Devlins Bridge Crossing of the Yea River will require particular attention to avoid impacts on the Macquarie Perch population downstream. This issue and others should be fed into the project risk management framework. The Advisory Committee considers these risks can be managed effectively.

(iii) A description of feasible mitigation measures, and any changes to the preferred project or procedures to prevent or minimise environmental impacts on threatened species listed under the EPBC Act and any other significant environmental assets, either proposed by the proponent or suggested in public submissions to the Advisory Committee.

The mitigation proposed for the project is discussed in Chapter 12. The mitigation measures were initially included in the exhibited PIA and then updated and tabled at the public hearing. The Advisory Committee is of the view that these mitigation measures should be further developed and finalised over the next few months in consultation with key stakeholders (government agencies, local government and via community liaison groups) and then used through project delivery as a 'Statement of Commitments'. These can be an agreed baseline for environmental and social performance of the project.

(iv) To the extent practicable, a description of any feasible alternatives for the pipeline alignments and ancillary project infrastructure that have been identified by the Advisory Committee and the impact on threatened species listed under the EPBC Act, as well as their likely environmental

implications in the context of State legislation.

The Advisory Committee considers that the 'blue line' preferred alignment adopted by the Alliance has been developed over time and modified to the maximum extent possible to minimise impacts on species. For example the Hunts Lane alignment in Section G was abandoned due to its ecological impact, a position that the Advisory Committee shares. Whilst there are undoubtedly technically feasible alternatives parts of the pipeline route (for example the long tunnel option through the Toolangi State Forest), the Committee considers the preferred route chosen strikes a reasonable balance between 'feasible' and 'practical'. The Committee considers the ecological values of State and National significance can be managed for the project, albeit requiring a high level of management and supervision.

- (v) Recommendations for a preferred pipeline alignment and key construction techniques for each section (A to H) of the pipeline route from the off-take at the Goulburn River to the Sugarloaf Reservoir, as well as for the siting and design of ancillary project infrastructure.**

The Advisory Committee has essentially adopted the preferred pipeline alignment as put forward by the Alliance, the so called 'blue line'. The Committee considers that the rationale put forward by the Alliance during the public hearings is sound. This position is qualified by relevant chapters of this report where at particular locations (for example Devlin Bridge), further investigative work and risk management assessments are needed to finalise the fine detail of the route and construction methods.

- (vi) Recommended conditions for environmental mitigation, off-setting and management measures, including monitoring, enforcement and review procedures, needed to minimise adverse environmental impacts of the project, including on threatened species listed under the EPBC Act.**

Mitigation, offset and management is discussed in section (iii) above. The project environmental management framework which will control and manage project delivery is discussed in Chapter 9.3. The Advisory Committee considers the project environmental management framework is generally sound with two major recommended changes. Firstly, a project auditor should be appointed independent of the Alliance to oversee the implementation of the environmental management framework. Secondly the contractual arrangements for the project delivery should include environmental (for both State and Federally listed species, communities and threatening processes) and social performance criteria in addition to financial and timing performance criteria.

PART 4: CONCLUSIONS AND RECOMMENDATIONS

14. CONCLUSIONS AND RECOMMENDATIONS

The Advisory Committee was required to consider a significant number of complex environmental, social and economic issues related to the project. In essence the Advisory Committee concludes that the environmental effects of the preferred pipeline route as put to it in hearings (the 'blue line') can be managed subject to improvements in the environmental management framework for the project, further detailed site investigations and a comprehensive risk assessment process being undertaken.

The Advisory Committee acknowledges this is a difficult and challenging project. To realise the project with minimal environmental effects will require a very high level of project control to manage the risk to matters of national environmental significance, ecological values of State significance, local and sub-regional land and water systems and impacts on the community along the pipeline.

The Advisory Committee has collated the recommendations from the preceding chapters and has grouped them into the specific subject issues. It therefore recommends that in relation to each, the Alliance:

Preferred Pipeline Alignment:

1. Adopt the preferred pipeline alignment as: A3 – B1c - C3 – D2 - E1 (including 800 metre tunnel) – F3 – G6 – H2.

Greenhouse Gas:

2. Review the greenhouse gas emissions for the project and recalculate these when the final alignment and construction methodology is determined.
3. Modify dot point 1 in the Greenhouse Gas Management Plan (referenced in Appendix Y of the Environmental Management Strategy) to read "*Monitoring and public reporting of greenhouse gas emissions on an ongoing basis*".
4. Add a new dot point in relation to the Greenhouse Gas Management Plan; "*Suitable offsets for residual project greenhouse gas emissions (design, construction and materials) should be explored and implemented where practical*".

Flora and Fauna:

5. Undertake detailed assessment of impacts on State and Commonwealth listed species in the micro-design of the final alignment to inform the development of EMPs and WAPs.
6. Finalise investigations and surveys of flora and fauna, and ensure an ecologist is in continuous and close contact with construction crews to oversee mitigation measures.
7. Apply the precautionary principle for mitigation measures wherever there is suitable habitat for listed State and Commonwealth species, and assume their presence for planning and construction purposes.
8. Reinstate habitat at each construction site immediately after construction and closely monitor structures (and provide timely repair as appropriate) or other measures to manage processes threatening to the environment.

Aquatic Ecology:

9. Finalise investigations and surveys of aquatic ecology and ensure an ecologist is in continuous and close contact with construction crews to oversee mitigation measures.
10. Apply the precautionary principle for mitigation measures wherever there is suitable habitat for listed State and Commonwealth species, and assume their presence for planning and construction purposes.
11. Rehabilitate each waterway and adjacent construction site immediately after construction, and closely monitor structures (and provide timely repair as appropriate) or other measures to manage processes threatening to the environment.

Implications of Transferring Water:

12. Design the pipeline crossing of the Yea River flood plain to include a groundwater shunt within the deep channel to permit the water tables to equilibrate post construction across the pipeline.
13. Restrict the Melbourne Water off-take to the Sugarloaf Pipeline to be:
 - (i) not more than 7.5% of the riverflow at the time as measured at the nearest upstream river flow gauge station;

- (ii) not more than 75GL in any one year (as is proposed); and
- (iii) zero if the necessary regulated releases are for the maintenance of environmental flows or materially deplete water stored in Eildon Weir that is designated as being an environmental reserve.

Social and Cultural:

- 14. Establish a Project Advisory Group, comprising members of the local Councils, industry, business, tourism and community, to act as a formal conduit for referral of issues, complaints and other matters. Employ an Executive Officer to support the Group, independent of the Alliance and other representatives.
- 15. Provide a shared community officer, to work with both Yarra Ranges and Murrindindi Shire Offices, to liaise with the community, the Councils and the Alliance for the duration of the project.
- 16. Establish two Community Liaison Groups, one on each side of the Divide, comprising various representative members of the community, to act as a focal point before, during, and for two years after construction of the pipeline.
- 17. Provide a community support fund, to assist individuals who face or experience physical or social hardship due to the project. Funding proposals should be allocated by the Community Liaison Group, and endorsed by the Project Advisory Group. These funds are separate from any compensation program.
- 18. Ensure that affected land owners are provided with at least a months advance direct notification of any works to be conducted on, or within 500 metres of their property.
- 19. Establish a public complaints reporting process to report on possible breaches of project environmental performance criteria (for example noise, dust, traffic, erosion/sedimentation, water quality impacts, vegetation clearing, other construction breaches) to the independent auditor.

Socio- Economic and Tourism:

- 20. Prepare and adopt bio-security protocols in consultation with relevant Government regulatory agencies and industry groups.

21. Prepare and adopt a bio-security protocol for the Chytrid fungal disease of amphibians through the project environmental management framework.

Cultural Heritage:

22. Include the relevant Aboriginal communities on the Community Liaison Groups to be established for the Project.

Landscape and Visual:

23. Liaise and negotiate with landowners, the Shires of Yarra Ranges and Murrindindi and local affected communities to finalise appropriate landscape and visual impact mitigation.
24. Revegetate and maintain the alignment post construction consistent with the agreed mitigation measures, and negotiate opportunities for adjacent landscape enhancement.
25. Actively seek to reduce the width of the permanent easement in all areas to the absolute minimum, and particularly in areas of high visual impact such as the Christmas Hills escarpment and the Toolangi State Forest.

Construction Dust:

26. Develop a list of sensitive receptors along the final pipeline route in consultation with property owners.
27. Invite community input into the Air Quality Management Plan.
28. Include standards for dust control (visual and other appropriate methods) in individual landowner agreements, which must contain a methodology for landowners to report breaches and the agreed actions that will be taken in response.

Noise and Vibration:

29. Identify sensitive receptors for noise from construction and operation along the pipeline route in consultation with property owners, and develop appropriate noise management and monitoring responses.

Traffic Impact:

30. Undertake a baseline traffic survey along the Melba Highway and major secondary roads, and incorporate the findings into the Traffic Management Strategy (including allowances for any increases in traffic consequent upon the opening of Eastlink).
31. Develop Traffic Management Plans (detailed and/or site specific) in consultation with VicRoads and local councils, taking account of construction scheduling, updated traffic figures, movements within the local road network, road and/or lane closures, local weather conditions and the need to provide for emergency vehicle transit.
32. Spray seal the unmade section of Glenview Road (Yarraview Road to Kings Street) and Gulf Road (Steels Creek Road to existing seal) immediately upon the conclusion of the project in those areas.

Sustainability Framework:

33. Negotiate with affected landholders along the preferred pipeline route in order to incorporate minor realignments and other engineering options to the benefit of the landowner or their land as are practicable within the pipeline design.
34. Avoid, minimise or offset the consequences of the pipe placement on valued elements on individual land holdings.

Risk Analysis and Assessment:

35. Carry out a comprehensive risk identification, magnitude and probability evaluation before construction commences at any location.
36. Determine the most practical and least risk construction technique and pipeline design using multi criteria evaluation on the basis of the risk identification and analysis.
37. Include landowner representatives through the Project Advisory Group and/or Community Liaison Group to develop contingency plans for key project risks to be incorporated in WAPs and landholder agreements.

Environmental Management Framework:

38. Include environmental and social performance criteria in contracts for project delivery (for example dust levels, noise, vegetation clearance, erosion/sedimentation levels, traffic, and protection of listed species).
39. Negotiate individual property landowner agreements to ensure construction and rehabilitation requirements are agreed prior to works commencing, including compensation (for example infrastructure and primary production losses).

Pipeline Sections:

40. Prevent unacceptable damage to Groundwater Dependent Ecosystems and groundwater and interflow to ensure movements are not materially diverted and give rise to environmental detriment or unacceptable impacts on rural land productivity (Sections A, B, C, D, southern section of F, G, H).
41. Re-evaluate the proposed waterway crossings of the Yea River at Devlins Bridge (Section D) and Castella (Section E), and the two crossings of Dixons Creek (Section F) in the light of the (recommended) risk assessment, to determine whether pipe bridge crossings are feasible and carry less risk than the preferred trench crossing.
42. Establish minimum performance monitoring sites, including sites at which ground water levels are monitored and stream water quality (for example turbidity, electrical conductivity) can be evaluated, both during and post construction (All Sections).
43. Pay particular attention to avoiding noise and dust (Sections G and H), and to the potential for the pipeline being a source of ground and water pollution due to brackish water inflow of groundwater or interflow (Section G).

Management and Monitoring:

44. Refine the management and monitoring commitments (as in the updated Table 10 from the PIA – Document 55), in consultation with stakeholders. Use this as the basis for a ‘Statement of Commitments’ to help guide project implementation.

Further, the Advisory Committee considers the engagement of an independent auditor to be particularly beneficial for this project given the timeframe for which it

is proposed to be constructed and the community concerns raised about the overall project. It therefore further recommends that the Victorian Government:

Independent Auditor:

45. Appoint an independent project auditor (with the capacity to engage technical assistance) to:
 - (i) oversee the risk assessment and construction technique evaluations;
 - (ii) oversee the pipeline construction and reinstatement;
 - (iii) act as a high level monitor to deal with major issues that arise during the project;
 - (iv) ensure that agreed standards are met in construction and in all rehabilitation programs through implementation of the EMS, EMPs, WAPs and landowner agreements;
 - (iv) provide independent reporting of project performance separate from the Alliance; and
 - (v) investigate public complaints that have not been resolved through the Project Advisory Group or Community Liaison Groups.

Kathryn Mitchell
16 May 2008

Darrel Brewin

Stephen Hancock

Nick Wimbush