REPORT OF INDEPENDENT PANEL

ON PUBLIC CONSULTATIONS
AND
SECTION 20B CONFERENCE

HELD IN REGARD TO

MELBOURNE WATER'S

WORKS APPROVAL APPLICATION

FOR REDEVELOPMENT OF THE EASTERN TREATMENT PLANT
CARRUM

Public Consultations: Sept 2001 – March 2002
Date of Section 20B Conference: 15 April 2002
Date of report: 24 May 2002

Chairperson:
Assoc Prof T. J. Laidler.
Members:
Dr J Langford
Assoc Prof J Sherwood

Hearing venue:
Dandenong Workers Club
15 April 2002

CHAIRPERSON and MEMBERS DECLARATION

The Chairperson and members appointed under Section 20B(3) of the Environment Protection Act to convene a Section 20B conference in regard to Melbourne Water's Works Approval Application and to report on submissions made in public consultations and at such conference hereby submit to the Chairperson of the Environment Protection Authority this report and associated recommendations as set out herein.

Dated the 24th day of May 2002.

Terry Laidler, Chairperson.

John Langford, Member.

John Sherwood, Member.

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SUMMARY OF RECOMMENDATIONS

1. The Panel recommends that the significant ambiguities between the requirements of the 1988 SEPP (Waters of Victoria) and current licensing arrangements for the Boags Rocks outfall be resolved immediately. This should be done by incorporating into the works for which a permit is sought solutions that remove the need for any part of the mixing zones to be located in protected beneficial use areas. This is entirely consistent with the need for immediate action to address the environmental impact of the outfall identified in all public consultations. *(p.27)*

2. The Panel recommends to the EPA that the Works Approval Application submitted by Melbourne Water in relation to the Eastern Treatment Plant be approved subject to the conditions detailed below being applied to that approval or, if more binding, to any subsequent amendments made to the discharge licence for the Boags Rocks outfall. *(p.29)*

3. The EPA should impose as a condition of its Works Approval for Melbourne Water's proposed changes to the Eastern Treatment Plant the requirement to proceed immediately to produce Class A effluent as part of the first stage of the upgrade. *(p.29)*

4. Melbourne Water should be required to develop and implement a quality assurance programme for the operation of ETP to ensure that:

- ***Any gross litter problem at the outfall is addressed, and***
- ***The variation in ammonia concentration around the median, and any spikes in concentration, are minimized.*** *(p.30)*

5. The other three Sewerage Treatment plants discharging into the outfall should be upgraded to the same water quality standards as the upgraded ETP. *(p.30)*

6. The Panel recommends that an independent audit of current trade waste policies and their management be undertaken immediately. In the light of its results, the EPA should work with Melbourne's water utilities and other parties to develop a strategy to eliminate any harmful trade and industrial waste from the sewerage system by 2012. The strategy should also target the reduction of heavy metals. *(p.31)*

7. The Panel recommends to the EPA that a condition of any Works Approval for the ETP should require that Melbourne Water have in place by 2007 a demonstrably feasible strategy to use the annual production of biosolids beneficially and to have eliminated the biosolids stockpile by 2017.*(p.32)*

8. The EPA should require Melbourne Water to prepare within one year of Works Approval being granted a detailed strategy for achieving the conservation and reuse targets set. *(p.34)*

9. A coordinated strategy involving Melbourne Water, the three water retailers, the EPA, the Department of Human Services, Department of Natural Resources and Environment, the Department of Infrastructure and the urban development industry should be developed so that a substantial proportion of green field developments (including high density apartments and the like) are built to water sensitive designs, reducing demand for fresh water and generating less waste water. *(p.35)*

10. The Panel recommends that a set of staged targets for inflow reduction and effluent reuse be inserted in the Works Approval or licensing conditions related to the ETP. The Panel concluded that initial targets of 12% ETP inflow reduction (on a 2002 base) and 20% ETP effluent reuse, both by 2012, are aggressive, stretching targets. *(p.35)*

11. The EPA, Melbourne Water, and the retail water companies should undertake a strategic review of the provision of waste water services to regional communities potentially draining to the ETP. *(p.36)*

12. The Panel is of the view that the EPA should require an extension of the Boags Rocks outfall to at least 2km to proceed immediately as part of the upgrade so that both the treatment plant upgrade and the extension of the outfall are completed no later than 2010. *(p.38)*

13. The Panel recommends that the ETP testing and monitoring programme overseen by the EPA should include direct interagency and community input and mechanisms for the dynamic reporting of results to the wider community. *(p.39)*

14. The testing and monitoring programme should include significant original research that assesses the health risks associated with exposure to the effluent plume and the health outcomes for those who swim and surf in its proximity relative to those who do so in Victorian surf beaches distant from outfalls. *(p.39)*

15. A TIE, consistent with the requirements of the SEPP, or Toxicity Identification Evaluation should be implemented using all the appropriate animal species for which protocols are available, and any further toxicants identified (after removal of ammonia). *(p.39)*

16. Melbourne Water should establish a targeted strategy to honestly and objectively inform the community about the ETP, its proposed upgrade and effects of the effluent stream. *(p.40)*

17. The "public good" may require Government to forgo some financial returns to allow Melbourne's water companies to plan over the medium term to meet sustainability obligations, by allowing them to invest in sustainability initiatives before returning dividends.*(p.40)*

BACKGROUND

Terms of Reference

Prior to Melbourne Water submitting a proposed Works Approval Application in relation to the upgrading of its Eastern Sewage Treatment Plant (ETP) at Carrum, the Environment Protection Authority in Victoria (EPA) appointed Associate Professor Terry Laidler from the Centre for International Research on Communication and Information Technologies (CIRCIT) at RMIT to chair an independent panel to advise it in regard to the pending application. The Panel was given the following terms of reference:

> "To assist the Authority in making a decision on any works approval application to upgrade the Eastern Treatment Plant and to ensure that a wide range of community views are taken into account in reaching a conclusion, the Authority has determined to co-opt a panel pursuant to Section 13 1(h) of the Environment Protection Act 1970, to advise it on key issues related to the upgrading of the Eastern Treatment Plant. These include the acceptability of various levels of treatment and discharge conditions, and options to optimise reuse.
>
> **Prior to the receipt of any works approval to upgrade the Eastern Treatment Plant, the panel will:**
>
> 1. inform itself of the environmental issues arising from the Melbourne Water Eastern Treatment Plant outfall discharging at Boags Rocks
> 2. consult with a wide range of community interests in relation to the outfall and upgrade options
> 3. consider studies and reports on the effects of the outfall discharge on public health and the environment in the context of international practice
> 4. advise the Authority on community views and aspirations in relation to the ocean discharge of treated effluent and attitudes to its alternative use and
> 5. provide advice to the Authority on an appropriate public consultation process to optimise input from the full range of affected stakeholders.
>
> **After receipt of a Works Approval Application to upgrade the Eastern Treatment Plant, the panel will:**
>
> 1. conduct a stakeholder consultation programme on the works approval application as agreed by the Authority
> 2. if so appointed by the Authority, conduct a conference pursuant to Section 20B of the Environment Protection Act 1970
> 3. advise the Authority on the outcome of the consultation programme and, if appropriate, the 20B conference

4. advise the Authority on the options and scheduling needed to achieve best practice and sustainable upgrading of the plant and outfall in relation to the issues identified in the Effluent Management Strategy (CSIRO)
5. advise the Authority on infrastructure implications and likely benefits, costings and time scales for programmes to achieve reuse targets of 10, 20, 50 and 100% for Melbourne, including community acceptance of potable reuse.

Preliminary Consultations

From September 2001 to January 2002, the Chair held discussions with a range of authorities, individuals and groups with a view to informing himself on the process that had led to the development of the Works Approval Application, and the key issues of community concern that the Panel would need to address in formulating its initial advice according to its Terms of Reference. Those consulted included:

- EPA officers
- Melbourne Water executives, officers and consultants
- Officers from South East Water
- Yarra Valley Water's Community Consultative Group
- The Council of the Shire of Mornington Peninsula
- Local government officers from the Shire of Mornington Peninsula and the City of Greater Dandenong
- Office bearers, members and legal representatives of the Clean Ocean Foundation
- Office bearers and members of the Surfriders Association, Mornington Peninsula Branch
- The Chair of the Water Resources Strategy Committee (Watersmart)
- Officers of the Department of Infrastructure and the Department of Natural Resources and Environment
- Executives of water industry peak bodies
- Researchers from the Cooperative Research Centre for Water Quality and Treatment
- Representatives of the Mornington Peninsula and Western Port Biosphere project
- Researchers from the CSIRO
- Members of the Interdepartmental Committee on Water Recycling
- Representatives of various businesses interested in water treatment.

The Chair visited the Boags Rocks outfall and the Eastern Treatment Plant and had discussions in the process with EPA regional officers and Melbourne Water operations officers at the Eastern Treatment Plant. South East Water's sewage treatment plant was also visited to provide some scale for understanding storage needs for reuse schemes.

The Panel also established a website, electronic and physical mailing list and an email "list server" or online discussion group to further increase public access to the consultation process (cf. http://www.epa.vic.gov.au/etp). The list server attracted some 80 contributions throughout the consultations.

Works Approval Application

A Works Approval Application was prepared by Melbourne Water and submitted formally to the EPA in December 2001. A summary of the application and importantly its appendices which provide detailed technical specifications and scientific studies on which the application is based are available at http://www.epa.vic.gov.au/Waste/ETP/ETP_WA_APP.asp and should be consulted to gain a general perspective of the application.

In summary, the application is for a $170 million upgrade to the plant that was opened in 1975. At the time of its construction, the ETP was considered a world leader in sewage treatment and improvements have continued to be made to the plant since then.

However, Melbourne Water, after extensive negotiations with the EPA throughout the 1990s about the terms of its discharge licence and a series of health, environmental impact and dispersion studies resulting from those negotiations, proposed these major changes to the operations of the plant "to ensure effluent is managed in a sustainable manner for the long-term". In summary the main proposals include:

1. reduction in inflows to the Carrum plant and improving their quality
2. introduction of tertiary filtration and enhanced disinfection to improve the quality of effluent and reduce the ammonia content by more than 75%
3. strategies for increased recycling of the treated effluent
4. continuation of the major environmental monitoring programme
5. sustainable biosolid management
6. improved energy management at the plant, and
7. appropriate management of odour at the plant and outfall.

Chair's Advice after Preliminary Consultations

The EPA received the Works Approval Application in December 2001 and on the advice of this Panel sought and negotiated agreement from Melbourne Water to an extension of the statutory period for its response to the application to allow adequate time for further community consultation by the Panel once the details of the actual application were known.

The Panel advised that a series of public meetings and a formal conference under section 20B of the Environment Protection Act be held and agreed to finalise its deliberations by the beginning of May 2002 to allow a formal response by the EPA by the end of June 2002.

Request for Further Information

The EPA also formally required Melbourne Water to supply it with further and better particulars of its application under section 22(1)(a) of the Act. The full text of the request for further particulars can be viewed at http://www.epa.vic.gov.au/Waste/ETP/Docs/22notice.pdf. In summary, the EPA sought:

1. a better alignment of the proposals in the summary application with the scientific studies on which they were based
2. more details of the likely environmental risk associated with the proposed reduced ammonia levels in the effluent
3. an assessment of the likely environmental impact of continuing high nutrient load in the effluent
4. management plans for addressing freshwater toxicity of the effluent
5. more details of an effluent reuse strategy and further explanation of the likely quality of the effluent in terms of Victorian reuse standards
6. an explanation of the treatment options considered for the plant and their potential impacts on both effluent and accumulating biosolids
7. further details of ongoing attempts to improve the aesthetics of the effluent, proposed monitoring programmes, outfall design, mixing zone requirements and trade waste reduction and biosolid management strategies

Melbourne Water's Responses

Melbourne Water's responses addressing these issues were not available to the Panel prior to the public meetings, but were examined before the Section 20B Conference. They can be viewed online at the Panel's website: http://www.epa.vic.gov.au/Waste/ETP/Sec22_Response.asp

Public Consultations

Subsequent to the preparation and lodgment of the Works Approval Application and the preliminary consultation process, the Chair of the Panel advised the Chairman of the EPA that it would be appropriate to conduct a series of public meetings prior to a section 20B conference to allow formal assessment of the application. Three public meetings were held on 14 March 2002 at Rosebud, on 19 March 2002 at the EPA's Southbank office and on 21 March 2002 in Dandenong with the following objectives:

- to assist any persons or groups with an interest in the proposal in gaining an overview of the project and to aid in any review that they may wish to make of the exhibited application documentation
- to enable the Panel to give an insight into the manner in which the application would be assessed and submissions considered and to form an agenda for the formal section 20B conference
- to provide an opportunity for questioning or raising any matters of immediate concern, recognizing that the formal submission process

provided the opportunity for more detailed commentary or expression of any concerns.

On the advice of the Chair of the Panel, two additional members were appointed to the Panel with expertise in water systems engineering and marine science respectively: Dr John Langford and Associate Professor John Sherwood.

The Panel was also able to take advantage of a full day's discussion with officers of the EPA and scientists involved in the work the CSIRO had done between 1997 and 1999 to explore their oceanography modeling and toxicity testing reports in some depth.

ISSUES IDENTIFIED IN PUBLIC CONSULTATIONS & MEETINGS

Throughout the process of the pre-application consultations and the public meetings, a summary statement of the main issues of public concern was developed iteratively and published for consideration. This summary, as concluded after the final public meeting, appears below:

The main issues of public concern identified in the consultation process were:

The sheer volume of effluent discharged to the ocean outfall at Boags Rocks

An average of about 380 million litres a day of non-saline water is discharged into the marine environment onto the beach at Gunnamatta daily. Public consultations indicated that strategies for reducing this amount and ameliorating its impact should be considered including:

- reduction of the inflow to Carrum through greater water efficiency, prevention of infiltration, and upstream treatment and reuse
- better treatment at Carrum to ensure that the effluent is suitable for the broadest possible range of reuse options within the water cycle. The reuse of such a quantity of water would almost necessarily involve recycling some of it into the freshwater cycle, at least by the replenishment of aquifers, and environmental flow in streams, but also by exploring the viability of its indirect reintroduction into the drinking water system
- consideration of whether discharge at the beachfront provides the best mixing zone for the outfall, coupled with a very substantial target for effluent reduction to avoid any perception of trying to "hide the problem". There is substantial local community opposition to extension of the outfall

The sustainable management of the biosolids (dried sludge) extracted at the Carrum plant

Between 200,000 and 250,000 tonnes of biosolid is currently stored at Carrum and an additional 27,000 tonnes is produced each year. Odour management at the plant relates to the modes of treatment and biosolid management. As with the effluent from the plant, strategies for managing the biosolids will involve a conceptual shift that values them as an asset rather than treats them as a waste.

The public health impacts of discharge of the effluent into the marine environment on shore at Gunnamatta

Consultations identified a strong community interest in reducing the volume of effluent and improving its microbiological quality for public health and potential reuse reasons, including eliminating any viruses, bacteria, protozoan pathogens and pharmaco-active substances

The quality of any effluent, albeit a significantly reduced volume, that is discharged to the marine environment

Improving the quality of the discharge at Gunnamatta and the plume it creates involves strategies that also allow the widest possible range of reuse options and are in three related areas:

- substantially reducing its ammonia content, hence lessening its potential for adverse environmental impact
- significantly lowering the nutrient load of the effluent with implications for the range of possible reuse options and the possibility of it contributing to algal blooms at discharge

- enhancing its aesthetic quality with reliable litter removal, and reduction in dissolved fats, oils and greases, dissolved colorants, and foam forming organisms

Reducing the quantity and improving the quality of any discharge from the outfall was seen as important to:

- protecting the natural heritage of the area around the outfall with special reference to its indigenous cultural significance
- enhancing the economic strength of the southern peninsula as a surfing and recreational destination

Public confidence in the independence and integrity of testing and monitoring programmes

There was a view consistently expressed during the consultations that the results of present monitoring arrangements, while technically available to the public, were not presented in an easy to scrutinise or accessible way. Perceived problems with existing programmes identified in the consultations included:

- the lack of plant input and output "inventory" testing
- the dissonance between the results of existing public health impact studies and consistently reported anecdotal evidence of illness associated with swimming and surfing at Gunnamatta
- concerns about the methodology of those public health studies
- lack of public input to and scrutiny of the monitoring programme
- instances of apparent lack of enforcement of breaches of discharge licences

It was strongly argued that future monitoring arrangement should involve:

- direct public consultation in establishing and benchmarking outcome standards for the plant
- the establishment of an on-going panel responsible for the oversight of testing and monitoring that included representatives of community groups
- engagement of an independent person or office to oversee the monitoring regime and process

Public accountability and enforcement

There was some sentiment expressed during the consultations and public meetings that Melbourne Water and the EPA had not acted strongly enough to address perceived or actual breakdowns in plant performance or breaches of the licensing conditions. Concerns ranged from the timeliness of response to critical incidents and the forthrightness of disclosure to a lack of community capacity to scrutinise performance and the adequacy of penalties under current legislation.

An advocacy role for Parks Victoria as the manager of the Mornington Peninsula National Park, through which there is an easement for the outfall pipeline and which includes the coastal areas directly adjacent to the outfall was raised in this context. There was also reference to the Department of Planning and Infrastructure's responsibilities for the Archaeological and Aboriginal Relics Preservation Act 1972 in relation to aboriginal middens throughout the park, and the need to consult representatives of indigenous communities in further processes.

Timeliness and aggressive goals

Especially in discussions with stakeholders, interested parties and community groups on the Mornington Peninsula, but more generally also, a strong view was expressed that addressing issues associated with the environmental impact of the plant and outfall and the perceived wastage of the natural resource associated with ocean discharge had been delayed too long already. The objectives for effluent reuse outlined in Melbourne Water's Works Approval Application were often criticised in this context. The strategies identified for achieving more aggressive goals for reuse and, in many of the

submissions received by and representations made to the Panel, the closure of the outfall itself, included:

- immediate steps to treat effluent to potable standards to achieve the greatest potential for reuse.
- nonetheless, there was only a small measure of support expressed in the consultations for immediate consideration of direct re-introduction of treated effluent into the drinking water system
- the fast tracking of inflow reduction strategies
- establishment of a target of 100% reuse of the treated effluent within various timeframes, the most common of which was 10 years

This last objective was supported by the presentation of a petition containing almost 2,000 signatures firstly to the public meeting in Rosebud, with supplementary signatures added and the more aggressive goal included prior to the section 20B conference.

Three additional issues, relevant to environmental concerns specific to the management of the Eastern Treatment Plant, but more general in their implications, arose consistently in the EPA Panel's preliminary discussions with interested parties and stakeholders:

Government policy for sustainable management of the whole water cycle

There was much discussion during the consultations about need to locate decision making about the future of the Eastern Treatment Plant in the context of whole-of-Government policy for sustainable management of the complete water cycle.

Several processes have been put in train in 2001 and 2002 by the Government to develop its overall strategy for water resource management in the greater metropolitan area, including the establishment of an interdepartmental committee charged with investigating options and strategies for effluent reuse.

Many stakeholders consulted believe it should be possible at this time to set the total reuse of Melbourne's waste water as a viable objective for the sustainable use of this scarce and valuable resource and that the Eastern Treatment Plant upgrade should be a clear first step in this process.

The desirability of finding partners for the development and management of the sewage assets currently treated by the Eastern Treatment Plant

This will, of course, include industries, businesses, developers and community groups interested in:

- innovative schemes for upstream treatment and reuse of the sewage asset, and
- reuse of a better treated effluent, but also
- those interested in alternative, innovative treatments of the materials presently managed at Carrum by "activated sludge" technologies

There was a clear view expressed among many of those consulted that such an approach could lead to innovative, "green" industries, and even some critical mass in their concentration in Victoria, with genuine prospects for economic development.

Encouraging community engagement in water cycle management issues

The Panel believes that it attracted significant input to its process from Mornington Peninsula residents and groups and individuals with specific interest in issues associated with the marine environment. There was some difficulty in broadening the discussion into other parts of the community or engaging in the debate in Greater Melbourne. The limited amount of metropolitan or national media coverage achieved was focused on re-introduction of treated effluent into the freshwater system, although that was sidetracked once water industry spokespersons introduced a "toilet to tap" slant to the public discourse.

The Panel acknowledges that there is wide ranging interest in Mornington Peninsula communities and, to some extent, beyond in decisions to be made about the ETP, and that individuals' views as represented to the Panel start from very diverse premises. Accordingly, any attempt at summarizing these views will necessarily emphasise and de-emphasise various components of them as expressed during the consultation and public meeting process. A summary of all submissions received by the Panel (including through its online discussion list) appears as Appendix 1 to this report (p.41)

The Panel concluded that its summary fairly represents that diversity of opinion and the major concerns that underpinned submissions made, and, as such, formed a reasonable basis for examination of Melbourne Water's Works Approval Application in its formal section 20B conference.

The Panel noted throughout the consultation a strong and broad community desire to address the environmental issues associated with the ETP's operation and discharge at the outfall as a matter of immediate concern.

SECTION 20B CONFERENCE

A list of persons who made submissions to the Section 20B Conference convened in Dandenong on 15 April 2002 is included as Appendix 2 to this report in the format of the Conference Agenda (p.94) While the actual times available for presentation were extended to allow people making submissions adequate time fully canvass matters they wished to raise, the agenda still represents a fair summary of the business of the Conference. Appendix 3 contains written submissions put to the Panel (p.96). Full transcripts of the Conference are available in electronic format from the Secretary to the Panel (cf. http://www.epa.vic.gov.au/etp).

What follows is a summary of the main points made in the various submissions and subsequent question and discussion sessions:

Melbourne Water's Presentation

Mr Peter Scott – Outline of the proposal

- First, there will be an outline of the proposal in the Application: then, David Fox from CSIRO will cover environmental issues; Martha Sinclair from the Monash Study will look at health issues; and, Mick Arbon will talk about recycling initiatives
- Secondary treatment and offshore outfall has been the most common disposal regime in similar circumstances, nationally and internationally
- Best practice is moving toward tertiary treatment, with additional filtration and UV disinfection
- This Application is based on the findings of the 1997/99 CSIRO studies, especially the recommendations for an expanded monitoring programme and a 75% reduction in the ammonia content of the effluent
- Extensive community consultation and market research conducted rejected simple outfall extension as a solution
- A systematic, professional review of the consultation process found it to be very satisfactory
- Reduction of inflows to the plant is the first vital component of the proposal: this includes conservation measures and infiltration reduction
- Changes to the treatment process to reduce the ammonia concentration of the effluent to below 5mg/litre as recommended by the CSIRO study will address the major environmental impact at Boags Rocks within 3½ years
- Treatment so that the effluent is Class A standard will provide effluent capable of being reused in a less restricted way, including for all irrigation purposes within 4 years
- Strategies will be developed to achieve total beneficial reuse of the biosolids generated annually by the plant within 5 years. Strategies will be developed for elimination of the stockpile within 10 years
- A major programme to reduce greenhouse gas emissions and manage energy efficiently at the ETP will use methane to generate 55% of the plant's energy needs
- Monitoring and community consultation will continue
- Extension of the outfall will be considered when the other measures have been implemented

Dr David Fox – CSIRO studies underpinning the proposal

- CSIRO comes to the process as an honest broker of good scientific information about the current system and better alternatives
- The two main toxicity problems associated with the effluent derive from its ammonia and freshwater content

- The oceanography model developed allows us to understand the significant degradation that has occurred at Boags Rocks, on the nearby rock platforms and within some 600m of the outfall. We do not predict toxicity effects further afield
- The studies have identified the main effects of this toxicity on the local ecology, and on specific species formerly present or now superabundant
- The models suggest a low risk of algal blooms
- Effective ongoing monitoring, including monitoring of the processes themselves at the ETP, is essential to further refining the treatment and disposal options
- A good model for that monitoring of dispersion within the mixing zone has been developed
- Similarly, we have processes for monitoring contaminant accumulation which we believe are robust
- All this, possibly coupled with some experimental aerial monitoring that has begun, will allow us to see what recovery occurs as the ammonia content of the effluent reduces

Dr Martha Sinclair – Monash University health studies and risk assessment

- Associate Professor Christopher Fairlie and I were asked by Melbourne Water to look at the microbiological water quality data from Gunnamatta beach and to compare that to published studies of the health risks of swimming, and make some comment on whether we thought there were public health risks associated with swimming at Gunnamatta
- Health studies of swimming are basically done by looking at illness rates in people who swim and comparing them to people who haven't swum and measuring the water quality by looking at faecal indicator bacteria in the water
- Generally those who swim in water with faecal contamination have higher rates of gastrointestinal illness
- The water at Gunnamatta generally had less faecal contamination than the “clean” beaches in reported studies
- We concluded there was little increased risk of illness
- Using new WHO standards which give added weight to bacterial contamination from human sources, the water at the beach at Gunnamatta is “very good” all year round, and slips one level to “good” in the surf zone only in winter
- Published studies so far have only looked at swimmers, not surfers

Mr Michael Arbon – Recycling initiatives

- Community education is a key to better water recycling initiatives
- The two targets of 20% reuse by 2010 and 50% by 2020 are estimated to have infrastructure costs of $250mil and $1bil associated with them respectively
- The 20% target may be achievable in summer; winter will be more difficult
- Melbourne Water is working with and seeking partners to achieve the targets
- Market research and pricing and regulatory change will be needed to achieve the targets
- The reuse must not caused environmental damage itself, and it will only be efficient if it reduces demand on the potable supply
- An Eastern Irrigation Scheme proposal would see 14,000ML/year of water piped 35km for agricultural purposes to the Koo Wee Rup area
- Third pipe systems for reuse of grey water in new developments and for horticultural use close to the plant and the proposed pipeline are being developed
- It is believed that 8,000ML/year could be used in the Moorooduc and Boneo areas on the peninsula for agricultural purposes
- Significant sewer mining schemes upstream of the plant are also being considered
- Aquifer recharge is also being investigated

Questions to Melbourne Water and General Discussion

- What have been described as “strategies” for biosolid management and recycling and reuse and not really such, but optative statements of intent
- 6,000 tonnes of the 24,000 tonnes of biosolid generated annually is presently being bought for soil conditioning, and the use of 90,000 tonnes of it as landfill at the

Woodlands development should allow a significant reduction in the 340,000 tonne stockpile. Freeway landscaping is also being explored for biosolid use. While EPAs in the USA are keen on agricultural uses for biosolids, the Europeans after the BSE incidents are looking to thermal treatment before reuse. The economics of this do not seem plausible to Melbourne Water

- Using toxic biosolids for groundfill as proposed does not seem to accord with the principles of product stewardship or integrated environmental planning in the most recent amendments to the Environment Protection Act (cf. p.23)
- A Trades Waste Acceptance Advisory Committee is currently examining these issues. The biosolid reuse targets mentioned are indicative only, and will be set in future Melbourne Water business plans
- Regeneration of the previous ecosystem at Boags Rocks in the absence of effluent is possible, but there is insufficient scientific information available to say whether or not it is probable. It may require some reintroduction of species
- The ecological effect of endocrine disruptors and other pharmaco-active components of the treated effluent is not a topic which has attracted much direct scientific study as yet. It should be a part of any proposed testing and monitoring regime
- The health risk assessment commissioned was based on a survey of published literature, not direct study of individuals
- Many of the international studies are not directly comparable because they do not involved secondarily treated effluent
- It would be useful to have published, dynamically measured indicators of the actual inflows to and outflows from the ETP
- Melbourne Water expects an 8% increase in inflow to the ETP over the period of the Application's proposed works

Submissions Presented

Mr Marc Perri

- Previous consultation processes had not been of high quality
- The indigenous cultural values of the area should be a prime consideration
- Melbourne Water should engage in the restoration of the Boags Rocks environment not just no further degradation. Historical studies should be used in baselining
- The principles of the Environment Protection (Liveable Neighbourhoods) Act 2001 (cf. p.23) should guide the decision making process
- Proposals for sludge management do not conform with this Act
- Melbourne Water's proposal does not treat disposal as a last option as the Act requires
- Users of the sewerage system are not meeting the real costs of the ecologically sustainable management of their sewage

Proponent's responses and discussion

- Melbourne Water expects treated effluent to be a product that is commercially viable
- Such a commercial imperative may put Melbourne Water in conflict with the Act

Ms Patricia Hosking

- Environmental concerns are ethical and spiritual issues to many people
- Ethical and intergenerational equity principles should be central to considerations
- "Wisdom" requires a more far reaching examination of better options than these

Mr Chris Wren QC, for the Clean Ocean Foundation

- The Clean Ocean Foundation represents some 700 members, with much wider community support, personal and financial, for the campaign
- The Boags Rocks outfall is in a national park, adjacent to the surf life saving club of Gunnamatta and the patrolled beach and, within the mixing zone, there are swimming and surfing areas, horse riding, walking and other recreational uses, such as bird observation and surf fishing
- Our fundamental proposition is simple: discharging treated effluent in an area which supports beneficial uses, and which is adjacent to a primary recreation zone, does not

satisfy the requirements of the State Environment Protection Policy (Water of Victoria) 1998 (SEPP)

- The then MMBW was obliged to apply for a licence pursuant to the Environment Protection Act 1970 to discharge the waste into the ocean at Boags Rocks. This licence was first granted in August 1975 and it was transferred to Melbourne Water on 26 June 1992
- On 15 March 1998, the SEPP came into effect. This policy requires of the EPA that it shall ensure that any Works Approval, Licence or Licence Amendment which is granted is consistent with the policy
- On 11 June 1993, the Boags Rocks Licence was revoked and under Section 29B of the Environment Protection Act, new conditions were imposed by Sub Part C, including a requirement that strategies be developed for reducing the quantities and toxicity of the waste
- Melbourne Water and the EPA have been continuously negotiating the Boags Rocks Licence ever since
- This pressure has lead to the commissioning of many reports and in particular a Camp, Scott and Furfey Report of November 1992, the Andrew Dunn Report of July 1995, the Lord Report of March 1996 and culminated in the latest report of the CSIRO in June 1999
- Since the 1992 report, it has been known that the Boags Rocks discharge causes elevated concentration of nitrate and ammonia beyond Cape Shanck to Simmons Bay, and Bushranger Bay respectively
- Similarly, the impact on the beaches in the primary recreation area has been known since 1992
- The 1995 report, in its executive summary, says:

  > "The issue of effluent disposal at Boags Rocks has long been a contentious issue within the community. Nationally sewerage effluent disposal is developing into a political issue. In addition the Victorian EPA has included clauses in the recently amended Eastern Treatment Plant Discharge Licence to ensure Melbourne Water examines future effluent management options, undertakes community consultation and *implementation of options by 2002*"

- Melbourne Water itself has known that its discharge breaches the requirements of the SEPP since at least April 1995. An internal report at that time states:

  > "The only area where Melbourne Water does not comply with the existing licence and State Environment Protection Policy requirements is the presence of floatable solids such as cotton bud sticks, and grease balls, which wash up onto the adjoining beaches … Major improvements have been made to trapping debris, mainly at local treatment plants, resulting in a significant reduction of floatable solids. However, total reduction of floatable solids, particularly cotton bud sticks maybe difficult to achieve … Melbourne Water complies with all organic toxicant and trace metal licence limits. Occasional licence breaches are recorded with organic nitrogen and e-coli. When this occurs Melbourne Water promptly notifies the EPA. To date the EPA have elected not to take enforcement action against Melbourne Water … Reefs near Cape Shanck are beginning to show changes in communities. The causes of these changes are unknown. Whilst there are many environmentalists who would argue that these changes are undesirable, it can also be argued that the changes are not unexpected"

- The lack of enforcement action is unusual in relation to a commercial undertaking
- We see an ongoing history of continual breaches of Melbourne Water's licence, and a failure to comply with the time limits that have been set in the licence of 1995
- Rather than address these issues in a timely way, Melbourne Water has embarked on a reactive PR campaign
- The Panel process itself is unusual, and better public input would have been had through an EES process, as was recommended by Dunn in 1995
- In Clean Ocean's submission, the Panel should have primary regard to the environmental impact of the plant and its outfall
- The Panel should advise the EPA to insert a sunset clause in the licence to require Melbourne Water to cease outfall by the 31 December 2010
- To achieve this, treatment of the effluent to potable standard should be undertaken in the current works

- Extension of the outfall, once the preferred option of the EPA, is inconsistent with trends in international and national best practice towards the elimination of ocean outfalls
- The major impediment to achieving treatment to potable level, and outfall closure appears to be commercial: CSIRO estimates suggest it would double the cost of the capital works proposed
- The Environment Protection Act, however, is designed to protect the environment. The micro and macro flora and fauna that can't speak for itself and can't take action in court to protect itself. It is also to protect the environment in which humans, live, breathe and recreate, and so that it is safe and fit for its purpose. This Panel has an important role in that protection and advocacy regime
- In 1997 the Victorian Coastal Strategy was endorsed under part 3 of the Coastal Management Act of 1995. It sets out the vision for the coast of Victoria to be a pleasure to experience by both present and future generations, respected by all and recognised as one of the nation's icons
- Section 17 of the National Parks Act also requires that the Mornington Peninsula National Park is controlled and managed in a manner that will preserve and protect the park in its natural condition for the use, enjoyment and education of the public
- The Dunn report goes on to conclude that the licence requirements are being met except in two regards. One is the exceeding of the permitted ammonia outside the allowed mixing zones. The other is the failure to determine whether the impact of the treated waste discharge on the sandy and inter-tidal biological assemblages of Bass Strait is increasing or decreasing
- The Clean Ocean Foundation considers this conclusion is an understatement because clause .1.5 of the Licence Prohibition on Visible Litter and Objectionable Odours is continually breached
- The Boags Rocks dissolvable solids mixing zone is a 4km (1.7km to the west and 2.3km to the east) long by 900m wide mixing zone
- This is proximate to residential areas where rainwater tanks are polluted by atomized waste
- Most cogently, in Clean Ocean's submission, the Gunnamatta surf beach and with all those recreational uses which are protected beneficial uses cannot, under the terms of the SEPP, be part of a dissolved solids mixing zone
- Further, the Eastern Zone Rock Lobster Association believes that the ocean area within the dissolved solid mixing zone is a recognised spawning and nursery area for the commercial rock lobster industry. It is a mandatory requirement of the SEPP, that a recognised spawning and nursery area for aquatic species should not be designated as a mixing zone
- The Foundation submits that the beach survey and the medical response form show, moreover, that there is a significant adverse effect on protected beneficial uses. The SEPP requires that there be no adverse effect; it does not say no *unreasonable* adverse effect
- Clause 1.7 of EPA Licence itself provides direct evidence of the allowed mixing zone not complying with the SEPP: " … the following mixing zones are applicable for the specified water quality indicators within the designated areas of the water of Bass Strait, *where the protection of beneficial uses cannot be guaranteed due to the licensed discharge of treated waste water* …"
- The High Court determined in The Phosphate Co-operative Co. of Australia Ltd v EPA (1977) that in granting or not granting licences under the Act, the EPA must concern itself with regulation and control of the extent to which wastes are discharged which may adversely affect the environment and not with the economic consequences of preventing or restricting their discharge
- Nor does the Act allow the continued discharge of pollution merely because the polluter says it intends to pollute less at some undefined point in the future
- In the Foundation's submission, the current licence is itself inconsistent with the SEPP, the less onerous licence requirements are themselves not being met, and the pollution of this area of coastal water is not being controlled in the manner required by the Act

- Treatment of the effluent to potable standard, and strategies for indirect potable reuse are the best options identified by the CSIRO study and yet they have not been further considered by Melbourne Water
- A broader view of potable reuse should be canvassed, the licence should be staged to achieve progressive reduction of the volume discharged to allow closure of the outfall by 31 December 2010
- The licence should require that the level of monitoring include toxicants, pathogens and protozoa and that this be done by an independent environmental auditor because there is no monitoring or testing required in the licence at the moment

Proponent's responses and discussion

- Mixing zone issues are scientifically and legally complex and the SEPP is under review at the moment
- Potable reuse does not yet attract public support, and jeopardises the safety of the freshwater system by compromising the boundary between the two systems
- CSIRO identified 14 reuse options, with reintroduction to the Cardinia Reservoir as one of them
- A better understanding of the hydrodynamics of the area should allow for better approaches to licensing diffusion and mixing
- " Mixing" in the pipe is not a preferred solution; sustainable reuse is
- Managing a brine stream remains a problem
- The are major remaining public health issues with potable reuse: what we should be talking about is replacing potable use

Mr Terry Anderson, South East Water

- SE Water has extensive experience in trying to convert plants smaller than ETP to 100% reuse operations
- Our customers provide about 60% of ETP's inflow
- A key issue is effluent reuse in this geographic area and its cost
- Broadacre reuse is most easily implemented but requires storage of a magnitude which is impractical
- Aquifer recharge is an option for storage, but discharge standards would require reverse osmosis treatment and there is still the question of disposal of the brine stream generated. A realistic estimate of effluent reuse in this regime is 25%
- Broadacre reuse requires of the order of 2 – 2.5ha/ML per year: that means irrigating 180km² to achieve 25% ETP effluent reuse and a pipe network covering >100km². These figures are doubled with current buffer zone requirements. The cost of this and the relative prices of other types of water makes uptake unlikely
- Likely reuses of the effluent in the area would not in the most probable scenarios replace potable sources
- Another option is "third pipe schemes": retrofitting is prohibitively expensive; forward fitting should be encouraged
- Infiltration and inflow reduction are more expensive than Melbourne Water's estimates suggest because they do not include the costs to the retail water companies and to individual consumers
- Outfall extension is a preferred option because it addresses major problems that cannot be addressed by better screening and ammonia reduction
- There are really only three things you can do in some combination to reduce environmental impacts:
    - improve the quality of the discharge,
    - reduce the quantity of the discharge, or
    - change the location of the discharge.
- Improving the quality by ammonia reduction, filtration and UV disinfection would fix the litter and ammonia problem, but it wouldn't fix the freshwater problem, or the grease, foam, odour, colour and health problems
- The issue of trade waste in the sewers is also of concern to us because we have some 4000 commercial customers and about 3000 industrial customers whose trade waste we accept and handle under the terms of our operating licence with the government

- Our operating licence actually says that if the customer has a waste management plan, the level of waste minimisation technology on site that is described in the EPA Waste Minimisation Policy and the waste is safe to accept, then we are obligated to accept it. This directly impacts on the quality of biosolid extracted at Melbourne Water's plants and ours

Mr Roger Lee

- Melbourne Water's proposal lacks a commitment to substantial reuse
- Pricing options for treated effluent will not lead to significant replacement of use of the potable supply
- Anything short of reintroduction of properly treated water into the potable supply is unlikely to achieve reuse targets as stated
- Public education is needed to achieve this
- Piping the treated effluent into the Latrobe catchment area is viable
- What is needed is long term vision to stop Melbourne's needs further encroaching on the State's water systems

Proponent's responses and discussion

- The proposed Eastern Irrigation Scheme is simply the beginning of the reuse strategy

Mr Craig Cinquegrana and Ms Vanessa Petrie, the Shire of Mornington Peninsula

- Melbourne Water's application represents a positive start to the broader task of managing our water resources in an environmentally sustainable manner
- Reducing the volume of water flowing into the sewer really is the most environmentally efficient way of managing waste
- The local community opposes extension of the outfall and supports "upstream" solutions
- Current compartmentalised management of our environmental problems is part of the reuse problem
- Much work needs to be done to restore local community trust in Melbourne Water and the EPA
- Water pricing policies need general review

Proponent's responses and discussion

- Further epidemiological studies are needed
- Involve local governments in the broader community consultation and education that will be needed to achieve better waste reduction and more extensive reuse
- Project should be renamed the Melbourne Project, not the Peninsula Project

Mr Arthur O'Bryan, Surf Riders Association, Mornington Peninsula Branch

- Beaches are of immense cultural significance to Australians, and Gunnamatta is no exception
- Melbourne Water's target should be 0% outfall discharge by 2010
- This is achievable through Melbourne Water complying with the Environmental Management Systems envisaged in ISO14001
- There are major community concerns about the health impacts of the outfall
- 34 per cent of some 800 respondents to a Surf Rider Association survey reported nose, ear and throat infections, colds, vomiting, nausea and diarrhoea, all as a result of surfing the contaminated water
- A full toxic discharge inventory report is needed in order to begin to assess microbiological health risks
- Melbourne Water is out of step with the countless individuals, family groups, local communities, government at all levels, and the international community who are all striving to lessen the environmental impact of modern life
- Beach signage, for example, indicates that Melbourne Water is more interested in good public relations than addressing the real environmental issues
- Future monitoring, reporting and implementation needs to be facilitated by an independent EPA accredited auditor, and the results need to be available to the community directly and not through a diluted delivery from Melbourne Water spin doctoring

Proponent's responses and discussion

- A better way of engaging independent research providers and the community in scientific monitoring is to have a centrally administered fund with an agency such as the office of the supervising scientist or whoever to preside over the administration of that fund rather than the authority being monitored

Mr Jack Read

- There is no mention in the application of the elimination of prions which are implicated in the etiology of animal and human spongiform diseases
- We need to explore local systems of human waste treatment that do not involve water borne carriage
- This is especially true in newly developing areas

Ms Marta Marot, St Andrew's Beach Preservation Society

- The pollution from the outfall is not localised to Gunnamatta and Boags Rocks: it is evident along the shoreline, for example, to the north at Portsea, to the Heads at Point Nepean National Park, to the south at Cape Shanck and towards Western Point Bay
- There is need to immediately upgrade of the quality of the existing outflow to substantially reduce its ammonia content, reduce its dissolved fats, oils and grease, and foam forming organisms
- The present pipes should be extended as the sheer volume of 380MLof non saline water hitting the immediate shores hasn't got the slightest chance of adequately mixing with salt water

Proponent's responses and discussion

- There is substantial impact on the shoreline and rocks to the west of the outfall
- Algal blooms are not often reported
- Incident reports need more timely attention

Ms Gidja Walker

- For traditional owners, Boags Rocks was just not part of the southern peninsula coastline; it was the jewel in the crown
- There have already been significant biosystem effects from the "river" of effluent that has destroyed the ecology of Boags Rocks and beyond
- Putting the pipe further out may compound this problem, and it will have an as yet unknown effect on the deep marine systems of Bass Strait
- "The Community on the Mornington Peninsula are making it quite clear that they no longer want an outfall. And it is not just a 'not in my backyard' attitude, we want the problem solved and not just passed on to some other animal or human community or left as a legacy for our children to have to deal with"
- It seems that the community finds direct potable reuse unacceptable, but indirect potable reuse is considered all right. This is not without merit. Biological systems have dealt with huge levels of biological wastes for all time, e.g. visit an ibis rookery
- A broader range of biological treatment systems should be trialled, with more emphasis on local treatment, and 'plumbing health" certification on property disposal
- An approach needs to be developed whereby all new sub-divisions or buildings should only be given approval if based around on site purification systems
- A toxic waste inventory for inputs to the plant is needed. It should contain a summary of who holds licences to dispose of what into the sewers to understand how they could be better managed

Proponent's responses and discussion

- There has not, to date, been any significant attempt to engage in discussion with representatives of the Bunurong people in relation to Melbourne Water's proposals

Mr Jim Kerin

- There has been no appreciable attempt to engage the people of Greater Melbourne in a discussion of the best possible outcomes for this process or to assess what they would be prepared to pay for better treatment of their sewage

- There are structural and economic impediments to achieving the best resolution of these issues: the fragmentation of responsibility for water system management, and water pricing policies
- The opportunity to raise these issues in the Metropolitan Planning Strategy appears to have been missed
- We must move beyond "glossy hype" to serious community discussion of the issues involved
- The Victorian Treasury, the sole "shareholder" in Melbourne Water, is not represented in these proceedings
- There is a need to escape current technological paradigms

Proponent's responses and discussion

- Melbourne Water has not costed treating effluent to potable standards
- The relationship between Melbourne Water's annual "profit" and dividend to the government and its ability to invest in sustainability was raised
- Further testing of Melburnians preparedness to pay with this information before them is required
- The Essential Services Commission is the place to address some these concerns
- Melbourne Water does not borrow and has a capital works budget of approximately $105mil/year

Ms Julie Star & Mr Noel Cogger, Community Members Against Ocean Outfall

- The outfall impacts directly on the tourist potential of beautiful beaches in a unique ecosystem
- The outfall should not be extended; instead, effluent should be treated to highest standards. The technology exists here today to close ocean outfalls, reuse water and perhaps never build another city dam
- Present unrealistic pricing policies encourage ecologically unsustainable water use
- Proactive, innovative thinking is needed so that the effluent is treated to potable standards now
- Potable treatment should involve the removal of all pathogens

Proponent's responses and discussion

- Estimates suggest that the use of reverse osmosis would cost about five times currently proposed treatment
- The current proposal would allow the Carrum plant to generate 55% of its energy needs
- WHO standards are too low for this project
- Melbourne Water proposes letting demand drive any significant additional treatment

Ms Vicki Randell

A petition was presented to the Panel, asking for the closure of the Boags Rocks outfall in these terms:

> "We the undersigned agree with the statement that, due to Melbourne Water's past conduct and the future of water use generally, we require that Melbourne Water upgrade its Eastern Treatment Plant facility as soon as possible to produce tertiary grade, Class A water, and cease ocean outfall entirely within a ten year period."

The petition had originally stipulated a twenty year time frame for its closure, and had attracted about 700 signatures in that format. After the Rosebud public meeting, the organizers had thought that a ten year time frame was more in accord with public sentiment, and had collected a further 1200 or so signatures in that format. Signatures had been collected all over the Mornington Peninsula, but nearly 14% of them were from people who were not resident on the peninsula.

- Those who collected the petition signatures summarized the four main points made by signatories in conversations with them as:
    - ill health is suffered at various times after people have swum or surfed at Gunnamatta beach
    - long term users of the beach at Gunnamatta report the decimation that has occurred along the coast line only since the pipeline has been installed

- there is a basic mistrust that if Melbourne Water is allowed to continue ocean outfall, there will still be accidents and extraordinary circumstances, which will allow them to continue to work outside of their licence
- people do want closure of this outfall, and it definitely must happen within a ten year period

Mr Henry Kelsall, Australian Greens

- Effluent should be treated to potable standard to eliminate pathogens and allow the greatest range of possible reuse options, especially its use for growing export agricultural products
- It should be used to establish two new industries in South Gippsland: sugar beet (for ethanol production) and papyrus (for fibre). Winter containment lakes could also serve recreational purposes
- The proposal has wide ranging expert and industry support and has attracted the interest of Senator Bob Brown of the Australian Greens, the Member for Flinders, Greg Hunt, and Gippsland Independent, Susan Davies
- What is needed are concrete proposals for economically viable, sustainable reuse trials

Concluding questions and discussion

- The plan is for a 75% reduction of the ammonia content of the effluent
- There is a 5 year target for 100% beneficial use of the sludge generated annually by the plant. This does not include the current stockpile
- The target of 20% effluent reuse by 2010 and 50% by 2020 is a metropolitan wide target. Achieving it at the ETP will be contingent on the success of the Eastern pipeline proposal, and some other potential reuse projects
- The three Mornington Peninsula treatment plants will be upgraded to the same level as the ETP
- Concerns about community trust in Melbourne Water and regulatory and testing agencies will be addressed in the monitoring arrangements put in place
- Very public and accessible monitoring results reporting is an essential component of trust in such systems
- The monitoring process should include a clear, agreed “health” indicator and should include testing of the plume itself
- It was pointed out that the majority of those who had made submissions to the Section 20B Conference object to Melbourne Water’s proposal in its current format

LEGISLATIVE AND POLICY BACKGROUND

In formulating its advice, the Panel took notice of the legislative, regulatory and policy context in which the Works Approval Application was to be assessed. It gave significant weight to the ethical principles enshrined in the Environment Protection Act by amendments made by the Parliament in 2001.

Principles of Environment Protection

Section 1A of the Act, inserted by the Environment Protection (Liveable Neighbourhoods) Act 2001, requires that:

> in the administration of the Act, regard should be given to the principles of environment protection (namely:)
>
> **1B. The principle of integration of economic, social and environmental considerations**
>
> (1) Sound environmental practices and procedures should be adopted as a basis for ecologically sustainable development for the benefit of all human beings and the environment.
> (2) This requires the effective integration of economic, social and environmental considerations in decision making processes with the need to improve community well-being and the benefit of future generations.
> (3) The measures adopted should be cost-effective and in proportion to the significance of the environmental problems being addressed.
>
> **1C. The precautionary principle**
>
> (1) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
> (2) Decision making should be guided by-
>
> (a) a careful evaluation to avoid serious or irreversible damage to the environment wherever practicable; and
> (b) an assessment of the risk-weighted consequences of various options.
>
> **1D. The principle of intergenerational equity**
>
> The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
>
> **1E. The principle of conservation of biological diversity and ecological integrity**
>
> The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making.
>
> **1F. The principle of improved valuation, pricing and incentive mechanisms**
>
> (1) Environmental factors should be included in the valuation of assets and services.
> (2) Persons who generate pollution and waste should bear the cost of containment, avoidance and abatement.

(3) Users of goods and services should pay prices based on the full life cycle costs of providing the goods and services, including costs relating to the use of natural resources and the ultimate disposal of wastes.
(4) Established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, which enable persons best placed to maximise benefits or minimise costs to develop solutions and responses to environmental problems.

1G. The principle of shared responsibility

(1) Protection of the environment is a responsibility shared by all levels of Government and industry, business, communities and the people of Victoria.
(2) Producers of goods and services should produce competitively priced goods and services that satisfy human needs and improve quality of life while progressively reducing ecological degradation and resource intensity throughout the full life cycle of the goods and services to a level consistent with the sustainability of biodiversity and ecological systems.

1H. The principle of product stewardship

Producers and users of goods and services have a shared responsibility with Government to manage the environmental impacts throughout the life cycle of the goods and services, including the ultimate disposal of any wastes.

1I. The principle of wastes hierarchy

Wastes should be managed in accordance with the following order of preference--
(a) avoidance;
(b) reuse;
(c) re-cycling;
(d) recovery of energy;
(e) treatment;
(f) containment;
(g) disposal.

1J. The principle of integrated environmental management

If approaches to managing environmental impacts on one segment of the environment have potential impacts on another segment, the best practicable environmental outcome should be sought.

1K. The principle of enforcement

Enforcement of environmental requirements should be undertaken for the purpose of-
(a) better protecting the environment and its economic and social uses;
(b) ensuring that no commercial advantage is obtained by any person who fails to comply with environmental requirements;
(c) influencing the attitude and behaviour of persons whose actions may have adverse environmental impacts or who develop, invest in, purchase or use goods and services which may have adverse environmental impacts.

1L. The principle of accountability

(1) The aspirations of the people of Victoria for environmental quality should drive environmental improvement.
(2) Members of the public should therefore be given-
(a) access to reliable and relevant information in appropriate forms to facilitate a good understanding of environmental issues;
(b) opportunities to participate in policy and programme development.

The principles formed a fundamental component of the Panel's deliberations about the application, not just as legally they ought to have done, but also because in many ways they so closely reflected the concerns expressed by a wide range of interested parties in the preliminary consultations.

State Environment Protection Policy (Waters of Victoria) 1988

The Panel also examined the provisions of the State Environmental Protection Policy (Waters of Victoria) 1988 (SEPP) that provides the policy framework within which the EPA licenses the discharge from the Boags Rocks outfall. Various representations in the consultation process and in the formal section 20B conference directed the Panel's attention to these same matters. The specific provisions of the SEPP that were seen as being of most relevant relate to:

- **protected beneficial uses** (§7, Part III)
  notably primary recreation such as swimming, and aesthetic enjoyment, in coastal zones and general surface waters
- **mixing zones** (§16, Part V)
  and the requirements that:
  - they may be designated only if there is no adverse effect on any protected beneficial use as a result of the presence of the mixing zone
  - they may not be designated in areas important for primary contact recreation
  - the "within mixing zone" requirements that discharges not cause (among other things) objectionable odours, discolouration or deposits that affect beneficial use, or visible floating foam, oils, grease, or scum
- **acute toxicity** (§17, Part V)
  and the testing requirements prior to approval of discharge or discharge into specified mixing zones
- **marine outfalls** (§18, Part V)
  and the requirement that, if they discharge pathogens or viruses, they be located as far as possible from primary contact recreation areas, and
- **the exemption from policy provisions** (§21, Part V)
  that relates to the total environmental "footprint" of compliance, developing innovative treatments, the absence of control technology, and general water quality objectives.

Complying with changes in policy

The Panel noted that the SEPP had come into effect after the original licensing of the effluent discharge at Boags Rocks, and considered the provisions in section 20C of the Environment Protection Act which relate to such situations:

> (4) Where a policy is declared or varied the Authority shall within such period of time as is reasonably practicable amend any licence which is in force so that the licence and any conditions to which the licence is subject are consistent with the policy.
> (5) If the Authority amends a licence for the purposes of sub-section (4) the Authority must if requested allow the holder of the licence as a condition of the licence a reasonable time within which to comply with the amendments.

The Panel formed the view that, while allowance needed to be made for the scope of any works required, the fourteen years that had passed since the

publication of the SEPP represented a reasonable time for the EPA to now move to ensure complete compliance with the policy amendments. There was a strong feeling expressed repeatedly in public consultations that timely action and more aggressive goals for implementation were needed in relation to addressing the impact and wastage concerns at the outfall (cf. Recommendation 1, p.27).

Department of Human Services

Section 19B(4) of the Environment Protection Act 1970 allows that:

> The Secretary to the Department of Human Services and any protection agency to which a copy of an application for a works approval has been referred under sub-section (3)(a) may within 21 days from the day upon which the copy was sent submit a written report to the Authority which may include any objections or recommendations in relation to the application.

The Department, by letter to the EPA of 3 April 2002, and after contacting the environmental health and planning sections of the Mornington Peninsula Shire and Greater Dandenong City Councils, accepted the conclusion of the 2000/1 ETP Annual Monitoring Report to the EPA that there are "no health implications regarding the current status of the effluent" and supported "in principle, the improvements to the effluent quality" proposed. It noted that the proposed reuse of Class A effluent would require further application to it, that such effluent would need to contain <5mg/L of suspended solids and that the application had not addressed the effect the proposed upgrade might have on odour and noise in the vicinity of the Carrum plant.

The Panel felt there may be a further role for the Department of Human Services, and the Department itself may have a public health interest, in developing and authenticating further research aimed at addressing the health concerns expressed by those who swim and surf near the outfall (cf. p.36).

Parks Victoria

The Panel noted that there had been no formal intervention in its processes by Parks Victoria. While the outfall pipe and its easement are excised from the Mornington Peninsula National Park, the impact of the effluent on the coastal zone from St Andrews Beach to Cape Schanck is of direct interest to the park manager which is legislatively bound to protect and advocate for the park's conservation values. It was, therefore, surprising that there was no such intervention.

PANEL FINDINGS

Policy Issues

There are significant ambiguities between the requirements of the 1988 SEPP (Waters of Victoria) and current licensing arrangements for the Boags Rocks outfall. These ambiguities should be resolved immediately.

Recommendation 1
The Panel recommends that the significant ambiguities between the requirements of the 1988 SEPP (Waters of Victoria) and current licensing arrangements for the Boags Rocks outfall be resolved immediately. This should be done by incorporating into the works for which a permit is sought solutions that remove the need for any part of the mixing zones to be located in protected beneficial use areas. This is entirely consistent with the need for immediate action to address the environmental impact of the outfall identified in all public consultations.

Environmental Impact at Boags Rocks

The Panel concludes that the environment, principally the rock platform in the immediate vicinity of Boags Rocks, has suffered considerable damage from the discharge of treated effluent.

While no acute toxicity has been detected in the effluent, chronic toxicity has been detected. The chronic toxicity of the effluent is primarily due to three components:

- Ammonia
- Freshwater and
- An unidentified source – one or more compounds. Preliminary testing of scallop larvae by CSIRO suggests a non-polar organic compound may be involved.

Ammonia consistently demonstrates 50-100% of the toxicity to a variety of plant and animal species in tests where salinity is held constant at seawater values. Only one animal (scallop larvae) has been tested so far. Other toxicants than ammonia have been implicated in toxicity tests for this organism. There should be additional animal species included in future toxicity testing.

Freshwater is a toxicant to many marine organisms that have a low tolerance of salinity change (they are stenohaline). The toxicity of effluent was greater in effluent/seawater mixtures for two or three macroalgae tested. The effect was greater than simple additivity or ammonia and freshwater effects suggesting a synergistic relationship.

The laboratory test species are surrogates for the broad range of organisms found in the near shore environments of Boags Rocks.

Reduction in ammonia alone will not reduce toxic effects of the effluent at Boags Rocks. Further, episodic events where ammonia concentration limits are exceeded or episodic increases of other (unidentified) toxicants in the effluent stream may have damaging effects on ecosystems tolerant of the mean chemical composition of the effluent. The effects of such episodic, short-term exposures on marine ecosystems are not known.

In summary, the combined effect of ammonia toxicity and the freshwater impact has severely degraded if not eliminated the Hormosira (Neptune's Necklace) communities on the rock platform at Boags Rocks. As distance from the outfall increases, the environmental effects diminish. There is a pronounced effect within 600m of the outfall, and subtle changes in the ecosystems can be detected between 600m and 1300m although it is difficult to distinguish the effect on the reef some 800m away from the background natural variability.

The recreational amenity at Gunnamatta and McKay's Beaches is also significantly reduced by the discharge or effluent, principally, by the brown scum generated by suspended solids, gross litter and concerns about the effects on the health of surfers, summers and paddlers.

There is no doubt that action needs to be taken to improve the environment and recreational amenity of the area, and that there are environmental and recreational benefits to be gained.

The Panel believes that any initiatives and investments to improve management of the effluent from the Eastern Treatment Plant (ETP) should be judged on their ability to achieve significant environmental, recreational or amenity benefits in the most cost effective way. In reviewing these initiatives the benefits, environmental implications and costs throughout the whole urban water lifecycle must be considered to avoid unintended environmental effects and costs. The ETP and its effluent discharge cannot be considered in isolation otherwise 'local sub optimization' will result.

Waste water is generated by every person in Melbourne and the whole community will eventually have to pay for any investment. The whole community should be kept well informed of the initiatives, their benefits and cost effectiveness.

Enhanced Treatment to Improve the Quality of the Effluent

Application for Works Approval for ETP

The Works Approval sought by Melbourne Water is designed to improve the quality of the effluent discharge by installing alternate aerobic and anoxic zones, reducing the concentration of ammonia, the principal toxicant in the effluent by greater than 75% to a median value of less than 5mg N per litre of ammonia.

Filtration is also proposed to reduce the concentration of suspended solids to a median of 5mg/L (over 12 months) and a median turbidity of less than 2 (over 24 hours). The low turbidities are designed to allow enhanced disinfection to meet the microbiological requirements for Class A[1] effluent. Filtration should also ensure that no gross litter can enter the effluent stream unless the screens and filters are by passed.

The upgrade must maintain Melbourne Water's capacity to hold and properly treat extreme peak flows as at present. If this requires additional reservoir capacity, this should be installed.

Providing the proposed works are constructed, and operated effectively at all times, the Panel concludes that there will be substantial benefits to the environment, recreation, and amenity of the area influenced by the current discharge.

Recommendation 2
The Panel recommends to the EPA that the Works Approval Application submitted by Melbourne Water in relation to the Eastern Treatment Plant be approved subject to the conditions detailed below being applied to that approval or, if more binding, to any subsequent amendments made to the discharge licence for the Boags Rocks outfall.

Enhancing Potential for Reuse

The Panel believes that to reduce immediately the impact of the effluent on the Boags Rocks platform and the adjacent coastal zone, and to allow the greatest range of reuse options to be explored in the target timeframe proposed, the ETP process should be upgraded immediately to produce effluent that meets the requirements for Class A effluent.

Recommendation 3
The EPA should impose as a condition of its Works Approval for Melbourne Water's proposed changes to the Eastern Treatment Plant the requirement to proceed immediately to produce Class A effluent as part of the first stage of the upgrade.

[1] For the reuse of reclaimed water, Class A effluent is defined by EPA's guidelines (published 1996 with an amended version about to be released). Class A refers to secondary treated sewage which has undergone advanced solids removal (<10 SS; turbidity <2 NTU median and <5 NTU max) and disinfection to <10 orgs/100ml E.coli + virus removal <1pfc/25L. Such effluent is suitable for a wide range of reuse including horticulture and irrigation with public exposure. Its not suitable for drinking nor is it suitable for discharge to waterways - the latter needs tertiary treatment to reduce nitrogen and phosphorus. Provided helminth (ie worm) reduction is also done (via filtration or detention ponds) Class A effluent can be used for all the purposes that Classes B-D can be used (crop or pasture irrigation, woodlots, flowers, golf courses etc). Melbourne Water is proposing to upgrade its Carrum treatment plant to produce Class A effluent. This will be done via filtration to reduce suspended solids to the above figures. This effluent will be suitable for land irrigation projects and will allow for public exposure during irrigation and the watering of sensitive crops like salad vegetables. It will not be suitable for projects that involve partial discharges to waterways (e.g. uncontrolled runoff from irrigation areas, third pipe systems to residential areas, water storage ponds that are on-line hence overflow to streams, or groundwater recharge proposals) - these will require nutrient reduction as added treatment. Reducing phosphorous is straight forward and not much extra cost, but nitrogen reduction is extremely hard as an add-on (and doubles the price) - it really needs to be done at the start (i.e. at Carrum) if this form of reuse is desired.

Quality Assurance Programme for Plant Operation

The ETP should be managed to achieve ammonia reduction (minimisation). Appropriate monitoring systems should be installed throughout the plant and the outfall to allow operators dynamically to monitor performance and to intervene promptly when tolerance levels are jeopardized.

Testing and monitoring of the performance of the ETP and of the quality of the effluent should be undertaken not merely for regulatory compliance reasons, but also as a key component of the management of the plant.

Ammonia, turbidity and gross slitter could be monitored continuously at the lower end of the outfall. The median concentration for ammonia, the principal chronic toxicant, is to be set at 5mg/L. A quality assurance programme should be put in place at the ETP to reduce the variation and peaks in ammonia concentration (concentrations integrated over a day could be used to monitor performance and provide the goal for quality assurance). The effectiveness of the quality assurance programme should be evident from the monitoring programme.

The quality assurance programme should also address gross litter to ensure that none gets into the final effluent stream. The gross litter, for example, could be measured by diverting a proportion of the flow through a fine filter screen, and measuring the pressure drop continuously and periodically checking the filter. Any contribution of upgraded effluent to litter on the beach would then be known immediately.

Recommendation 4
Melbourne Water should be required to develop and implement a quality assurance programme for the operation of ETP to ensure that:

- ***Any gross litter problem at the outfall is addressed, and***
- ***The variation in ammonia concentration around the median, and any spikes in concentration, are minimized.***

Upgrade of Other Sewage Treatment Plants

Three sewage treatment plants operated by South East Water Ltd also discharge into the outfall. These three plants should be upgraded to produce the same effluent quality as ETP.

Recommendation 5
The other three Sewerage Treatment plants discharging into the outfall should be upgraded to the same water quality standards as the upgraded ETP.

Management of Trade Wastes

Effective implementation of sound trade waste policies is essential to protecting both the biological treatment processes at ETP and the downstream environment. The potential uses of both treated effluent and biosolids are compromised by introducing inappropriate trade wastes into the sewerage system. Consistent with the principle of product stewardship (p.24), action needs to be taken now to eliminate any residual toxicants identified by a Toxicity Implementation Evaluation (cf. Recommendation 15, p.39) and substantially reduce heavy metals.

Recommendation 6
The Panel recommends that an independent audit of current trade waste policies and their management be undertaken immediately. In the light of its results, the EPA should work with Melbourne's water utilities and other parties to develop a strategy to eliminate any harmful trade and industrial waste from the sewerage system by 2012. The strategy should also target the reduction of heavy metals.

Strategies for Biosolid Management

A total of 25,000 tonnes of biosolids are generated each year at the ETP. The increased level of treatment envisaged in the Works Approval will increase this annual load. In addition to the annual load there is some 270,000 tonnes of biosolids currently stockpiled at the ETP. This is an unsatisfactory and unsustainable situation and must be addressed. Care must also be taken to ensure beneficial use does not have unforeseen environmental impacts (cf. the principle of integrated environmental management, p9).

At present Melbourne Water does not have a clear management plan for biosolids generated as a result of sewage treatment. Material is stockpiled and the expressed short-term objective of Melbourne Water is to find a sustainable use for the annual production to stabilise the size of the stockpile.

The Panel believes Melbourne Water must give a high priority to resolving the issue of Biosolids reuse. Literature provided to the Panel by both Melbourne Water and community representatives outlines a number of possible reuse options:

- as a soil conditioner/fertilizer
- incineration and
- pyrolysis to produce a liquid fuel.

Each of these has its own suite of social, environmental and economic issues. For example trace metal contamination of the biosolids may prejudice its use in agriculture and incineration may produce air pollutants.

Recommendation 7

The Panel recommends to the EPA that a condition of any Works Approval for the ETP should require that Melbourne Water have in place by 2007 a demonstrably feasible strategy to use the annual production of biosolids beneficially and to have eliminated the biosolids stockpile by 2017.

Sustainable Water Resource Management

Strategies for Achieving Conservation and Reuse Targets

In order to properly address the concerns raised during the public consultations about the volume of effluent discharged into Bass Strait and to assess the potential benefits of recycling water from the Eastern Treatment Plant the whole urban water lifecycle of Melbourne must be considered. Consideration of the whole water cycle allows identification of the most cost effective solutions, for example introduction of dual flush toilets reduces both the demand for fresh water and the volume of waste water in a highly cost effective way. Focusing solely on recycling does not allow proper consideration of all the choices available to the community.

An Independent Panel reviewing a Works Approval Application for the Eastern Treatment Plant alone is not in a good position to consider the whole urban water cycle for Melbourne, because it is considering only one aspect of the water cycle. However a comprehensive strategy for the sustainable management of water for Melbourne is being prepared by an independent committee lead by Emeritus Professor Nancy Millis. The strategy, entitled *'21st Century Melbourne: A Water Smart City – Strategy Directions Report*' is not yet available. The issue of sustainable water resource management should be revisited after the findings of this strategy are available for review.

Melbourne Water should support the establishment of large-scale projects to encourage water reuse and conservation. The projects should be on a scale that allows evaluation of their feasibility from technical, social, environmental and economic perspectives. In this regard, the Panel recognizes Melbourne Water's existing initiatives such as the third pipe development at the Sandhurst Estate and the King's Domain sewer mining project.

Melbourne Water would also be well advised to consult widely to ensure the full range of options available to it is explored, and to find government, commercial and community partners for its initiatives.

During the course of consultations the Panel has had put to it some novel suggestions for water conservation and reuse, for example

- reduction of storm and groundwater infiltration into the sewerage system from private house drains by the introduction of a system of 'Certificates of Plumbing Compliance' to apply as properties were sold in the Melbourne Water area

- installation of dry composting toilets in public spaces
- pipelining treated effluent to supply water to LaTrobe Valley industries
- use of treated water to irrigate a sugar beet industry set up to supply ethanol as a petrol additive and
- use of treated water to irrigate aquatic plants (phragmites or papyrus) for the production of paper fibre.

Irrigation is a potential beneficial use of treated effluent. While Werribee provides the greatest opportunity for growth in the use of effluent for irrigation, and for aquifer storage and recovery, there are some modest opportunities for irrigation development within a reasonable distance of the Eastern Treatment Plant.

Currently irrigation using effluent is being severely restricted by the under pricing of available surface and ground waters. Unless this water allocation and under pricing issue is addressed by the State Government, or the usage of those waters for irrigation is regulated, then large scale irrigation schemes using effluent on a commercial basis are unlikely to succeed. An assessment of the environmental effects, including management of drainage from the irrigation areas will also be required.

However important demonstration projects and specific initiatives such as these may be, they need to be situated in the context of a strategy to achieve the objectives already recommended.

A strategy is a general method for achieving specific objectives. Among other things a strategy:

- describes the essential resources that are to be committed to achieving those objectives
- details the policies that will apply for the management and use of those resources
- quantifies how much of those resources will be allocated according to what priorities
- ranks the options in terms of cost effectiveness
- describes how resources will be organized, and
- identifies partnerships that will be formed to leverage the opportunities.

The CSIRO Final Report of its investigations into the ETP system, for example, identified and costed 14 potential inflow reduction and reuse options as a beginning to such a strategy:

Effluent re-use and influent flow reduction and re-use options investigated and costed (Gomboso et al.1998).

Option	Cost ($/kL)	Volume reduction (%)
Water demand management	0.10	1-12
Industrial use of reclaimed water	0.16	< 1
Land Irrigation	0.20	8-10
Aquifer storage (Bridgewater)	0.31	10-20
Diversion to Western Treatment Plant	0.34	1-12
Indirect potable re-use (Cardinia Reservoir)	0.39	≈95 or approx.
Woodlots irrigation	0.42	2
Constructed wetlands	0.59	2-2.5
Detention/sewer mining with local re-use	0.66	0.2
Untreated greywater use	0.72	< 1
Non-potable new lots (third pipe)	0.99	5
Sewer inflow/infiltration reduction	1.93	6
Non-potable retrofit (third pipe)	1.99	5
Treated greywater use	9.86	< 1

Various uses require different standards of water quality. A long-term aim (Melbourne Water's "Vision") should be to achieve a very high degree of reuse, and this most probably involves consideration ***now*** of treating some parts of the output of the plant to potable standards.

Nothing put before the Panel by Melbourne Water would qualify as a conservation, recycling or reuse strategy in the terms set out above.

Recommendation 8

The EPA should require Melbourne Water to prepare within one year of Works Approval being granted a detailed strategy for achieving the conservation and reuse targets set.

Water Sensitive Urban Design

Innovation in the way urban subdivisions are provided with urban water services offers considerable potential for reducing long-term growth both in demand for fresh water and the generation of waste water flows. Such innovations will have to be carefully evaluated so that the experience gained can be built into future innovations.

Innovation to develop new water sensitive urban designs for new subdivisions, is a vital initiative that will require close cooperation between Melbourne Water and the retailers, the EPA, the health authorities, planning authorities and the urban development industry.

Recommendation 9

A coordinated strategy involving Melbourne Water, the three water retailers, the EPA, the Department of Human Services, Department of Natural Resources and Environment, the Department of Infrastructure and the urban development industry should be developed so that a substantial proportion of green field developments (including high density apartments and the like) are built to water sensitive designs, reducing demand for fresh water and generating less waste water.

Targets for Reuse

There was a strong consensus expressed to the Panel in its consultations that there is a need to change both Melbourne Water and community views of ETP effluent from "waste water" to "useful raw material". Melbourne Water itself should set stretching targets here and make it clear that this is core business. Community consultations often supported this view with reference to "aggressive conservation and reuse targets". The Panel is persuaded that this should be so.

Ideally, upstream sewage and treated effluent should be used in ways to protect existing stressed freshwater resources, for example:

- Appropriate replacement of potable use in domestic and industrial supplies
- Restoration of environmental flows in rivers
- Irrigation water for horticulture, viticulture, agriculture
- Watering of public parks, gardens, golf courses
- Recharging aquifers

Melbourne Water already plans to reduce inflows to ETP by water conservation measures (dual flush toilets and low-flow shower roses) and the reduction of infiltration to sewer pipes. Each of these is estimated to reduce water inflows by 6%. The Panel supports this.

The Panel also notes that Melbourne Water expects to achieve a 20% re-use of effluent from all its operations by 2010 and predicts that 50% re-use can be achieved for the ETP by 2020. Currently ETP discharges 140,000ML annually; reusing 20% of this volume approximates to reusing a volume equivalent to a Silvan Reservoir each year.

The Panel accepts the community view that "stretching" targets should be set for re-use.

Recommendation 10

The Panel recommends that a set of staged targets for inflow reduction and effluent reuse be inserted in the Works Approval or licensing conditions related to the ETP. The Panel concluded that initial targets of 12% ETP inflow reduction (on a 2002 base) and 20% ETP effluent reuse, both by 2012, are aggressive, stretching targets.

Avoiding Connection of Regional Communities to ETP

During the course of the consultation concern was expressed about the growth of inflows to the ETP resulting from connection of regional communities such as Gembrook or Pakenham to the trunk sewers leading to the ETP. Extension of the trunk sewers to these communities is costly and there are potentially more cost effective options that can achieve satisfactory environmental outcomes. Distributed sources of highly treated effluent also allow greater opportunities for recycling than concentration of the flows at the ETP. A strategic review of the strategies for providing waste water services to the regional communities potentially draining to the ETP should be undertaken. The review should consider options for regional treatment of effluent to a high standard including comprehensive study of the ecology of the local waterways and the effects of any discharge of highly treated effluent.

The review should identify potentially more cost effective and environmentally sustainable options involving regional treatment creating more dispersed sources of treated effluent and greater opportunities for reuse.

Recommendation 11
The EPA, Melbourne Water, and the retail water companies should undertake a strategic review of the provision of waste water services to regional communities potentially draining to the ETP.

Outfall Extension

In public meetings there was widespread, strongly expressed opposition to an outfall extension. This was based on a number of factors:

- a view that Melbourne Water should plan for a total cessation of water flows from ETP within a short period (7-15 years) rendering the outfall unnecessary;
- a view that extension would remove pressure on Melbourne Water to improve the quality of its effluent as the immediate visual and ecological impacts were shifted off shore (an “out of sight, out of mind” argument); and
- suggestions that international practice was moving towards the elimination of ocean discharge as a water system management strategy.

Notwithstanding the greatly reduced suspended solid load in the effluent as a result of the improved filtration proposed, mixing of the effluent with seawater will generate foams and solid materials. The physico-chemical processes involved are:

- the flocculation of colloidal (non-filterable) material due to the increase in ionic strength accompanying mixing;

- formation of insoluble compounds such as calcium and magnesium stearates when the soluble sodium and potassium stearates (soaps) mix with seawater; and
- surface-active, dissolved organic compounds will stabilise foams formed by turbulent entrainment of air at the air-ocean interface;

In summary, there is likely to be a continuing unacceptable adverse impact of the effluent and its plume at the point of discharge and on the residential, recreational, cultural and commercial zones adjacent the current shoreline outfall at Boags Rocks.

An outfall extension with a diffuser is estimated to cost $26 million for a 1.3km extension, and $46 million for a 3.1km extension (CSIRO report). The level of environmental improvement at the shoreline and the rate of recovery are likely to be proportional to the increased length.

Melbourne Water's view is that consideration of an outfall extension should be delayed by about 5 years until the effects of the proposed ETP upgrades are clear. The Panel acknowledges both the integrity of the arguments put by those who oppose an extension to the outfall, and the genuineness of the concerns that underpin them. Nonetheless, it feels compelled to take a different view. The Panel adopted this view unanimously despite both public and Melbourne Water views to the contrary.

The Panel believes that the scientific and engineering evidence put before it strongly support the need for an outfall extension:

- in the immediate term, it is the only strategy that will allow the recovery of the Boags Rocks ecosystem and compliance with SEPP requirements for mixing zones;
- the extended outfall is necessary to ensure the recreational amenity of swimmers and surfers enjoying sea water by moving the mixing zone offshore;
- in the medium term, even as the quality of the effluent is improved with its treatment to Class A standard, it is unlikely that complete reuse of the effluent stream can be achieved in the short-to-medium term (say 5 to 15 years) thus an outfall will be required for some time not least of all to manage freshwater toxicity;
- in the long term, as treatment of components of the effluent stream to potable standards becomes viable, engineering evidence suggests that of the order of 10 – 15% of the treated water would need to be "bled" from the system in processes such as reverse osmosis or micro-filtration. This stream containing dissolved mineral salts, colorants and the like (known as the "brine stream") would still need to be disposed of. The Panel considers ocean disposal of the brine stream preferable to on-land options such as evaporating basins; and
- an outfall on the shoreline does not accord with international best practice.

Disposal of the waste stream off-shore will reduce near shore environmental impacts. The buoyancy of the effluent plume will make it rise to the ocean surface where mixing with surrounding seawater will dilute any toxicants. CSIRO modeling indicates that the dispersal of the plume will be such that the diluted plume will episodically impact on the shoreline even if the outfall is extended. These modeled incursions are linked to wind direction and strength and tide conditions. An extension of at least 2km is recommended because of CSIRO's modeling of these incursions which gives mean effluent dilutions of between 1:250 and 1:300 for shoreline sites 2km either side of the outfall. Other CSIRO studies suggest there should be little chronic toxicity at such dilutions.

While some sea surface organisms may still be affected by the plume, the mobility of larger organisms and the effluent's relatively rapid dilution and dispersion in a more turbulent environment should have much less ecological impact than the current outfall. Importantly preliminary modeling by CSIRO indicates that algal blooms may not have sufficient time to develop in the plume before it is diluted, and the high energy waters of Bass Strait would quickly disperse any bloom that formed.

Recommendation 12
The Panel is of the view that the EPA should require an extension of the Boags Rocks outfall to at least 2km to proceed immediately as part of the upgrade so that both the treatment plant upgrade and the extension of the outfall are completed no later than 2010.

Testing and Monitoring Programme

Community Input to Monitoring

Throughout the Panel hearings it has become obvious that there is widespread community distrust of the monitoring and research programmes conducted by Melbourne Water. The Panel is concerned at this public perception and believes that future monitoring programmes must be designed and implemented with community input.

A model put to the Panel by the community is for an independent advocate to oversee the future programme, perhaps similar to the role of the Office of the Chief Scientist for uranium mining in the Northern Territory.

The Panel believes the EPA should act as this independent advocate and in this capacity should implement a transparent process for the design of monitoring programmes and the subsequent reporting of results. A suitable model may be provided by community committee associated with the Gippsland sewerage outfall. Community involvement should be integral to the overview of monitoring and research with a clear strategy established for the reporting of findings to the wider community.

Recommendation 13
The Panel recommends that the ETP testing and monitoring programme overseen by the EPA should include direct interagency and community input and mechanisms for the dynamic reporting of results to the wider community.

Health of Surfers, Swimmers and Paddlers

Notwithstanding the enhanced disinfection of the upgraded effluent an important component of a future monitoring plan should be the assessment of health risks to surfers and other swimmers within the outfall plume. This would require a disciplined epidemiological study of volunteers who surfed at Gunnamatta, and at beaches remote from the outfall. The Panel accepts community arguments that previous research has not been designed to answer this question.

Recommendation 14
The testing and monitoring programme should include significant original research that assesses the health risks associated with exposure to the effluent plume and the health outcomes for those who swim and surf in its proximity relative to those who do so in Victorian surf beaches distant from outfalls.

Toxicity Identification and Evaluation

A disciplined hierarchy of toxicity testing (TIE or Toxicity Implementation Evaluation) allows identification of toxic components in the effluent using test plants and animals to identify specific chemicals responsible for the toxicity. The range of plants and animal species used in the TIE should be extended having regards to the species for which protocols are available.

Recommendation 15
A TIE, consistent with the requirements of the SEPP, or Toxicity Identification Evaluation should be implemented using all the appropriate animal species for which protocols are available, and any further toxicants identified (after removal of ammonia).

Informing the Community

Over one million people in Melbourne's Eastern suburbs generate the input stream for ETP. It was thus with considerable disappointment that the Panel noted the lack of input by these communities to Public meetings held at Southbank and Dandenong. In stark contrast the Mornington Peninsula community made many (and in some cases repeated) well-argued and researched submissions.

Responsibility for waste water treatment and its disposal or reuse must be embraced by the whole community. It is not acceptable for those generating the

major proportion of the waste to ignore its effects on other communities and environments.

Recommendation 16
Melbourne Water should establish a targeted strategy to honestly and objectively inform the community about the ETP, its proposed upgrade and effects of the effluent stream.

The Price of Water Sustainability

The Panel accepts the view put to it in the Section 20B conference that the prime responsibility of the EPA through its approval and licensing processes is the protection of the environment, and that commercial considerations must be weighed in a subsidiary manner in its deliberations. Nonetheless, the principle of integration of economic, social and environmental considerations (p.24) requires that in Melbourne's total water management system economic issues must be considered. Melbourne Water is a publicly owned utility. It must accept a wider social and environmental charter than a simple "bottom line" of profitability.

Recommendation 17
The "public good" may require Government to forgo some financial returns to allow Melbourne's water companies to plan over the medium term to meet sustainability obligations, by allowing them to invest in sustainability initiatives before returning dividends.

APPENDIX 1 – SUMMARY OF SUBMISSIONS TO THE ETP PANEL

SUMMARY OF SUBMISSIONS TO THE ETP PANEL

Submissions received via Discussion Forum

Date	Author	Subject	Comments Summary
27/9/01	ETP Panel	Welcome to the discussion forum	Welcome and posting rules
6/10/01	J/B Lewis	East Melbourne Treatment	I am a surfer in the Gunnamatta area, since before and after establishment of the pipe. I have seen a shift in the coastal area from an exquisite environment to an ecological disaster. Outcomes of the pipes operation are: destruction of sea life, health risks, environmental compromises. Flow-on effects for the wider Victorian community are: depletion of scarce freshwater reserves, postponed introduction of wastewater use technologies, tourism. Should be a complete overhaul of the sewage treatment plant, close down pipe, stop treating sewage as a waste, further reuse and treatment of the issues more seriously.
6/10/01	Arthur O'Bryan, SFMP	Swells not Smells	Would be beneficial for the panel to be provided with a random selection of previous complaints and public comments made to EPA and MW. Dr Martha Sinclair's study has been ineffective in alleviating local surfers' concerns about health impacts of outfall. Gunnamatta surfing community uncomfortable about GSLC collecting samples as they are financially supported by MW. For full—upgrade to Class A tertiary water, the MW draft recommendation report is sketchy in relation to recycled and potable water.
6/10/01	Alan Duke, Duke Marketing	Sew Outfall Sulitions (sic)	Wish to discuss solutions to the outfall with the panel.
7/10/01	Alan Duke, Duke Marketing	No subject	Can fix the outfall.
16/10/01	Verhardt	No subject	Un readable email
30/10/01	Terry Laidler	Welcome to discussion forum	Meetings to date fall into main categories of: reducing quantity and improving quality of effluent, adopting best practice in sludge management, timeliness of forthcoming proposal.
19/11/01	Clean Ocean Foundation	No subject	Closing the outfall by 2010 should be possible by reducing inflow over time and treating outflow to potable standard. All that is needed is to amend MW licence to ensure this solution is understood as the best long-term outcome for the environment and the Mornington Peninsula.
20/11/01	Jillian Verhardt	No subject	Invite to Sally (COF) to discuss water cycle issues with Craig Ingram.
20/12/01	Clean Ocean	Letter to Premier Bracks	Open letter to Premier on behalf of COForum – community members concerned about sewage discharged at Boags Rock. CO Forum's aims are to end the discharge into the

Date	Author	Subject	Comments Summary
	Foundation		sewage discharged at Boags Rock. CO Forum's aims are to end the discharge into the marine environment; support the adoption of economically and environmentally sound, land based, waste management technologies; and create new jobs and investment. MW's approach to the review of the ETP is at odds with the goals of the Government's valuable 'Growing Victoria Together' policy framework. MW should be committed to a broader range of options including bio-recovery and integrated treatment systems. Need Premier's support to achieve long term goal of full recycling, partnerships and to end the outfall by 2010. Medium term goals of increased recycling to 50% of treated water by 2005, adoption of private-public partnerships and biorecovery programs. Immediate goals of decrease of grease, fats and oils at Gunnamatta by June 2004 and inclusion of the COF and COForum in the design and conduct of environmental testing at Gunnamatta and the design of the MW WA.
24/12/01	Terry Laidler	Melbourne Water ETP Works Application	MW WA application for the ETP received and extension of time for consideration by EPA likely. Application availability, consultation by the panel announced.
31/12/01	Jillian Verhardt	Media coverage ETP	We face an opportunity to investigate possibilities for better water and waste management practices, and it is important to consider all options available. Public announcements that Melbourne will be drinking its own sewerage in the future are misleading and a balanced reportage, including technologies and processes which may be of interest to the public, are essential. Demand for reused water can be reduced immediately without too much difficulty. Need to consider the possibilities for waste treatment according to its qualities and not add this to freshwater and stormwater going to ocean outfall.
1/1/02	Terry Laidler	Response to Jillian Verhardt	One cannot always control the way the media choose to report things. Nonetheless, I was glad the matter got a public airing.
15/1/02	Peter K Smith	WA Appendice	Please make the appendices to the WA available – this is a serious exclusion.
16/1/02	Peter Smith	The revolving door of government	The response to the CO Forum's letter to the Premier attached. Is the response a 'pass off' to the Minister for Environment and Conservation (Minister for both EPA and MW)? Response notes concerns raised in the letter and that Acting Premier will write to the responsible Minister and request that she meet with to discuss your concerns.
16/1/02	Terry Laidler	Pharmaceutically active chemicals in the water cycle	Article "Medicating our environment" attached – Dr Peter Fisher is an environment industry consultant. Caution should be exercised before further expanding the domain of pharmaceutical compounds through recycling treated sewage effluent back into the drinking water supply. Partially degraded drugs and ointments can convert back into their active form through chemical reactions and these 'pharmaceutically active chemicals' (PACHs) end up in soils, groundwater and streams. The author calls for a preventative strategy of natural product medication, higher use of vaccinations and more rigorous environmental impact assessment for new and high-volume existing drugs.
16/1/02	Terry Laidler	2 more pieces by Dr Peter Fisher	1. Chlorine acquires rogue status. There is a growing concern that byproducts formed during the chemical disinfection of drinking water could pose serious health risks. Countries such as the Netherlands are delivering high quality drinking water without chlorine residuals based on best practice treatment systems (activated carbon, pulsed

Date	Author	Subject	Comments Summary
			UV, ozone), distribution and monitoring. 2. Giardia lambia, cryptosporidium snatch the limelight after slipping through treatment plants. These water-residing microbes can cause debilitating intestinal diseases and are now included in drinking water standards. Any drinking water treatment system needs to be accompanied by a microbial preventative strategy such as closing (or restricting access) to catchments, elimination of cross connections and implementation of systematic monitoring to prevent public exposure.
16/1/02	Terry Laidler	US Online EPA discussion evaluation	Link to the report: 'Democracy online: an evaluation of the National Dialogue on Public Involvement in EPA Decisions'.
16/1/02	Terry Laidler	Re: Works Application Appendices	Link to a copy of the form required with a WA application (through EPA website). Details of water/land discharge in the supporting information to the WA can be found at the EPA Information Centre or obtained from MW. Will post the supporting information on the website today.
17/1/02	Duke Marketing	Working Sewer replacement - no outfall required!	We are installing a worm farm waste system to service 7 apartments and 5 townhouses. All liquid from the wormfarms will stay on site in lined transpiration beds. We are testing a site at Gembrook to put whole towns on wormfarms.
17/1/02	Wayne Chamley	No subject	I have received ETPpanel digests #20 and 21, request the first 19.
17/1/02	Jillian Verhardt	Intensification of loads/water issues	Reiterate the need to step back and consider all possibilities. I am alarmed by statements by MW regarding their performance and plans to upgrade the ETP as there is far more to consider than just ammonia, tertiary treatment and extension of the outfall. I am equally alarmed by statements from EPA and MW that categorically foreshadow a long term future for the Gunnamatta outfall. Dr Lyndsay Nielson talks of firms or cities being 'locked in' to complex systems of current technology that make shifts to more efficient, competitive alternatives difficult if not impossible to make. Right now we are in grave peril of being 'locked in'. The best possible technical solutions lie with the broadest possible input into the process and that its output be considered by those with a vision for the future. It is vital that these considerations be not monopolised by those with an investment in an entirely and demonstrably unsustainable past.
17/1/02	Jillian Verhardt	Australian cities - technology and change http://cities.canberra.edu/au/public	Article 'Australian cities – technology and change' by Lyndsay Neilson. For Australian cities, adoption of or impacts of technological changes may mean we become less rather than more competitive, face further structural and hence spatial changes in the Australian economy and see significant transformations in the competitiveness of our cities. This is discussed in the context of emerging economic theories of innovation-based evolutionary systems and the need for strategic planning.
17/1/02	Jillian Verhardt	No subject	Unreadable email. Weblink www.parliament.vic.gov.au/enrc/water_alloc/report/ is to the report: "Inquiry into the Allocation of Water Resources for Agricultural and Environmental Purposes"
18/1/02	Terry Laidler	Response to Wayne Chamley	Direction to where full archives of ETP Panel list are posted on the web.
21/1/02	Wayne Chamley	What are the rules for putting forward data?	I realise that you (Terry Laidler) have great faith in this approach to conducting the panel's 'consultation' process. I remain a little circumspect as I don't know what rules

Date	Author	Subject	Comments Summary
		data?	have been established. In particular, ensuring that material posted on the web is not misleading, unfounded or false. I suggest that when articles, opinions etc are posted that references are cited and information sourced. Uses an example of a calculation in P. Fisher's article with different assumptions and subsequent change in result.
22/1/02	Clean Ocean Foundation	Health data collected	Clean Ocean Foundation has been collecting health information from beach users at Gunnamatta and St Andrews since December 2000. Respondents advise of ear, nose and throat, gastro-intestinal, infections and viral cases, and many respondents note that the GP has commented that "polluted water" at Gunnamatta is the "most likely" cause of the complaint.
23/1/02	Steve Newnham	Health data collected Clean Ocean Foundation	I got a coral cut on the top of my foot while in Indo which turned into a sea ulcer. Had various treatments which appeared to work until surfing at Gunna again one day when the water was a tea colour and that tang taste it gets was rather bad, and the cut reappeared. Don't know if this will help your fight against the outfall – can fill in a medical form if you want (details included).
24/1/02	Patricia Hosking	No subject	I propose to place before you several ethical arguments. The first is for all residents of the Mornington Peninsula to collect their waste and deposit it around significant sites of Melbourne. Second, if I was given a priceless Van Gogh masterpiece I would preserve it for all to ensure they all enjoy this pleasure, like we should preserve and restore the ocean instead of smothering it in filth. Finally, visualise other natural panoramas and sweep 400 million litres of effluent over it for 25 years and compare this to the same place in the future. What future do we have unless ethical problems outlined above are resolved.
24/1/02	Adam Creed	Alternatives	Had a chronic earache since swimming and surfing at Gunnamatta on one of 'those days' where the water had a foul odour, taste and bubbling, oily texture. I am trying to learn about alternatives that are out there but seems obvious that it is unacceptable for this to be anywhere near one of Victoria's most popular ocean beaches and national park. I am embarrassed that European visitors I had will take back an image of our beaches with pollution, illness and stench.
29/1/02	Terry Laidler	Response to Wayne Chamley	The purpose of the list is to encourage discussion of a broad range of issues related to the ETP upgrade. List moderators are not censoring contributions for 'credibility' – surely this is a task for all readers and contributors. I found helpful your reflections on P. Fisher's article, I thought it brought this issue of PACH's onto the agenda.
1/2/02	Terry Laidler	Reclaimed water irrigation and effluent quality improvement - article from Max Thomas	Article by Max Thomas – "Some effects of the State environment protection policy (Waters of Victoria) on Reclaimed Water Irrigation". SEPP requires that wastewater should be discharged to land wherever practicable and environmentally beneficial. It also requires irrigation systems to be designed to contain all wastewater in at least the 90th percentile wet year.
5/2/02	Wayne Chamley	Reply to Terry Laidler	I consider it important to point out that there should be a preparedness to put data in some context when citing facts and figures. If there are chemical/loads going into the water system, are there broad biological expressions evident that would suggest the material(s) is active? Re: article in Vol#30, additional points are: one would not expect to see any impact where the release of large volumes of water and P from point sources where the release is at the time of a flood situation. Note a 'find' of the Port

Date	Author	Subject	Comments Summary
			Phillip Bay study was that N not P is the big driver of algal biomass
7/2/02	Jack Samson	No subject	Can anyone comment on the following: Will the treatment process upgrade change the visual impact of the outfall? Currently highly visible – is 'visible pollution' addressed as part of the WA process?
14/2/02	Jack Samson	ETP Panel digest Vol 1#32	No opinions! I thought is was a reasonable question and would have promoted some worthwhile discussion. Get enthusiastic, contribute, put in!
15/2/02	Jim Kerin	ETP Process	Re: community consultation commissioned by MW and undertaken by Irving Saulwick and Dennis Muller. The findings are unequivocal: -'no' to the outfall extension, -'yes' to recycling, -'yes' to recycling and return to the domestic water cycle, -'no' $500m is not too much to pay. The way forward is clear: (a) review of MW licence should be suspended as proponent's solutions are unacceptable to broader community, (b) Saulwick and Muller should conduct further research (not funded by MW), (c) Minister should direct EPA and MW to desist from attempts to influence the course of the debate (d) An all party Parliamentary Committee be established to consider Melbourne's present and future needs for water supply, storm water, sewerage and trade waste.
15/2/02	Terry Laidler	Response to Jillian Verhardt's post of 17/1/2001	Reposting of Jillian Verhardt's 17/1/02 post.
15/2/02	Terry Laidler	Response to Jack Samson of 7/2/02	Att Jack Samson: Refer to EPA's section 22(1) notice for further information on aesthetics (requirement #16).
15/2/02	Jill Leisegang	Urban sewerage, stormater (sic), grey water	Commendable article by Verhardt. Seems that the panel has little information re: new technology to address these issues. Potable water ought never be polluted by human waste and only recycled water be used for flushing. Extensive list of websites included.
17/2/02	Patricia Hosking	No subject	Re-posting of Pamela Hosking's letter, plus additional ideas that may be of interest: 1. Satellite water treatment plants, 2. replacement of dangerous substances with harmless ones, 3. recycle water more broadly, 4. raise quality of wastewater to highest level to maximise possibilities, 5. Treat wastewater as a commodity, 6. large tax for industries with toxic substances, 7. tax concessions for industry using recycled water, 8. education for the broader community. We should appreciate the privilege of being decision-makers for generations to come.
19/2/02	Jim Kerin	Need for further study of community attitudes	Re: Saulwick and Muller's work: what is the possibility of focus groups being recalled to undertake more extensive work on whether the views on what cost is or isn't acceptable to the broader community are actually the views of the broader community?
20/2/02	J/B Lewis	Need for further study of community attitudes	Re: water quality at Gunnamatta last weekend. Peninsula Surf Club had to move its competition due to foul condition of the water, which was brown and foul smelling with solid waste materials being cast up on the shoreline. Clearly MW is not telling the truth, creating health issues.
21/2/02	Lynda Lim	Quality of water at Gunnamatta last weekend	Adding our confirmation of state of the water on the weekend. Also experienced the same at Cape Schanck. Should get EPA/MW to investigate the water quality from the water itself. Someone is not telling the truth.
22/2/02	Peter Diprose, CDS Pty Ltd	No subject	There is no single panacea for the problems we face and a major sustained and integrated program of education and capital works is required to even put a dent in the scale of environmental problems we are causing. Contrast to Libya; depositing waste

Date	Author	Subject	Comments Summary
			into areas of non-voters/minorities. Broad community is concerned about impact on and deterioration of the environment, but have a feeling of helplessness because the political system doesn't lend itself to swift, vital action or sustainability. Public attention span is short so hope this is an opportunity to effect change. My concerns are: - brown plume due to fecal content which can be reduced through technology but limited by how much we are prepared to spend, - reuse of grey water also do-able but mostly greenfields at present but could be impacted on by using subsurface drip irrigation – reuse applications are often turned down because of heath risks but subsurface irrigation is an alternative, - combine with sewer mining close to the source, - consider localised treatment plants, - multiple supply lines for residential areas (potable and recycled). The technology exists, all we need is the will and wherewithal to implement it.
25/2/02	Brian Barrett	ETP Application Submission	The US legislated to prevent all ocean dumping of sewage and have devised suitable methods to recycle the bulk of these biosolids back to their topsoils. Australia has poor soils combined with European use of agricultural land. We should recycle biosolids back into topsoils through composting, which closes the circle and makes primary production sustainable.
26/2/02	Jillian Verhardt	No subject	Enviro 2002 is being hosted by Melbourne in April and is one of many access points for information and technology. We have an opportunity to rethink micro and macro re: the water issues.
27/2/02	Vicky Garner	Pharmaceutically active chemicals in the water cycle - FAO Dr Peter Fisher	Att Peter Fisher: I am campaign director at UK based group Surfers Against Sewage. Pathogens in sewage effluents were our main point of concern; now there are others (eg. Endocrine disruptors). You mention microfiltration may be a way of removing some of these substances, but are end of pipe solutions the answer? Or should we be looking at product consumption, disposal, creation in the first place? We are trying to raise public awareness on this. In the short term, what do we do? Costly microfiltration, or wait for the long term solution. We have a newsletter – we would appreciate if you could write an article.
28/2/02	Terry Laidler	Summary matters	Summary matters: - posting format, - thanks for website links provided, - Lynda Lim re: 16/17th February information passed on to EPA directly, - Appointment of two final panel members Drs John Langford and John Sherwood.
27/2/02	Jeff Lewis	Summary matters	Re: contacting EPA – reporting to EPA results in basically dismissive response – heard it all before. Response polite and reassuring but never any follow up, never a sense in which action will be taken. Don't think EPA has resources or legislative capacity to do anything of value.
1/3/02	Peter Kingshott, Mt Martha Golf Club	Melbourne Water's plan to upgrade the Carrum ETP	Writing in the capacity of President of Mt Martha Golf Club and representing its members. Members applaud any environmental measures which reduce the quantity and improve the quality of waste water discharge. The golf course could be a wonderful asset for the council and community but it is in desperate need of water. We urge the panel to consider the golf club as an outlet for treated water. [Signed by Peter Kingshott.]
1/3/02	Jillian Verhardt	Water & the Australian Economy - Are today's water-use patterns	Weblink to the ATSE website report "Water and the Australian Economy – Community Summary – April 1999 – Are today's water use patterns sustainable?".

Date	Author	Subject	Comments Summary
		sustainable? (web link)	
3/3/02	Jim Kerin	No subject	Further to others' complaints regarding smell and colour of water at Gunnamatta, I visited and took samples at Gunnamatta and St Andrews on 3/3/02. Samples tested by a professional and results included. I also collected the carcase of a dead penguin on the high water mark. I will be reporting this to EPA on Monday.
4/3/02	Vivienne Verney	Marine Park Farce	The Marine National Parks Bill is a political window dressing that does not address the real issues that threaten our marine environment, which is pollution rather than fishermen and recreational users. The government has 'green-wrapped' misleading information. The fact is that regulated fishing has made very little impact on the environment compared to pollution. Fishermen rather than researchers have the greatest hands-on knowledge and vested interest in maintaining ecologically sound coastal waters. They achieve this through highly principled, sustainable fishing methods. Coastal protection cannot stop at the high tide mark. We don't know the full extent of effluent impact on the marine environment. How can we justify the development of Marine National Parks when millions of litres of toxic effluent is being discharged into coastal waters daily? We need to address the real issues rather than political spin-doctoring and policies with no substance, and address the problem of pollutants entering the five marine reserves we have already.
10/3/02	J B Lewis	Viability of fishing industry	Fishing industry viability is imbricated in all aspects of sustainable ecologies. I'm amazed that the fishing industry aren't welcoming marine parks and controls on fishing. I have deep sympathy for people whose personal economies are threatened, and care must be taken to ensure minimum harm to people who are most directly affected by these changes.
12/3/02	Brian Barrett, Kyneton Kompost	Further to submission dated 25/2/02	I wish to draw attention of the panel to the EPA Draft 'Environmental Guidelines for Biosolids Management' (23/11/00). These were prepared with a wide range of stakeholder input across industry, government. The Foreword states that "Biosolids should be viewed as a valuable resource". I add that aerobic composting forms one of the major recommended methods of stabilising biosolids of chemical and treatment grades.
16/3/02	Clean Ocean Foundation	Water company financial figures for the year ending 30/6/01	Comments on water company financial figures (MW, YVW, SEW, CWW): The Victorian government's water monopolies principal aim is about maximising profits not about conservation or sustainability. Arrangements between MW and retailers is often 'commercial in confidence' and trade waste agreements are not public documents. Financially the water authorities are responsible to the Victorian Treasury and management is the responsibility to the Minister for Environment and Conservation. EPA (licencing and policing for the enviroment) is also the responsibility of the Minister for Environment and Conservation. How can we ever get a solution when such a conflict of interest exists? REVENUE vs ENVIRONMENT. Lack of forward thinking is inherent in mangement of our environment. You have the opportunity now to come up with 'worlds best practice' – do not loose it!
17/3/02	Jim Kerin	Media release from the Office of the Treasurer	Is it appropriate that this process continues when the Essential Services Commision will be at the helm in 9 months? (Media release: ESC – an independent economic regulator of key utility services is to be established, which will also regulate water and

Date	Author	Subject	Comments Summary
			sewage services from 1 January 2003).
18/3/02	Jane Searle	Response to Water Company Financial Figures	Rich on water poor on conscience and integrity! MW/Victorian government make a huge amount of money/profit from selling industry the rights to pollute our magnificent ocean. It is not acceptable, ethical, intelligent. MW have the money and the technology to treat to potable standard and effluent not dumped in the ocean.
18/3/02	Jill Leisegang	Pharmaceutical and personal care pollutants in US waterways (PPCPs)	Blood thinners, antidepressants, blood pressure medicines, painkillers, anibiotics and hormones were among some of the PPCPs found in US waterways. Compounds analysed in the study are common products. Little is known about the possible health and environmental effects PPCBs could have, and 81 of the 95 compounds have no drinking water standard, human health advisory recommendations or aquatic life protection measures. While concentrations were extremely low, past studies have shown levels lower still to have the potential to cause harm to aquatic species. Promising wastewater technology that can break down many PPCPs through biological or UV exposure are being developed.
19/3/02	Clean Ocean Foundation	Southbank Forum	Short summary of statement to panel at Rosebud meeting: Social cost survey; Closure plan business study; Critique of Monash health study; Risk assessment analysis; Testing and sampling – biomedical strategy; Contaminated site analysis; Toxin release inventory; Water pricing – aquifer sell offs; Broken promises. Statement by Sally Mitchell to panel at Rosebud meeting: Closing the Gunnamatta outfall; Spin-doctoring by Melbourne Water.
Undated	H. Ferguson	Concerns with the proposed development of the ETP	Concerns are: The ETP has significant ongoing offensive odour problems in the residential areas surrounding the plant; the plant does not comply with EPA licence agreements regarding odour and the boundaries fo the plant and its reporting requirements; the proposed development does not include imroved measures to seriously address the above issues.
19/3/02	Clean Ocean Foundation	Short Written Statement by Ms S.A. Mitchell	I have reviewed the CSIRO Effluent flow reduction (reuse) study for the ETP report, which concluded that the technically viable and cost effective option is indirect potable reuse. The review of this option was limited to using the treated effluent as drinking water by pumping it to Cardinia Reservior. I agree with the CSIRO however there is no need whatsoever to limit the use of the reclaimed water to use for drinking purposes. We support potable reuse as the only option with realistic value to future generations, call for more rigorous assessment of the creation of a viable industry in Victoria based on environmental regeneration and fixing of a market price for reuseable water. I recommend that a furhter study be undertaken to determine exactly how the Victorian community will benefit through the distribution of the reclaimed potable water.
22/2/03	Ms Gidja Walker	Comments to Panel	Southern Peninsula Flora and Fauna Association Inc. (SPIFFA): Two areas of concern to our members are: the toxic waste component of the ETP process (toxics in the sludge as a result of trade waste agreement inputs into the ETP), and the effect of sewerage pipelines on the Bass Strait system as a whole (many pipelines pumping into Bass Strait and the perception that biodiversity only near the coastal zone). We should be aiming for a system that uses water and sewerage as valuable resources which respects the marine environment. The technology is available and the community wants it – zero outfall as soon as possible.

Date	Author	Subject	Comments Summary
22/3/02	Clean Ocean Foundation	Pharmaceutical and personal care pollutants	Does the proposed tertiary treatment by MW completely (100%) remove these items (PPCPs) in the treatment process? If not, how is MW going to deal with this 'next big question in environmental contamination' and advise the public?
22/3/02	Jack Samson	Is UV disinfection safe?	I am wondering if a public health issue has been overlooked with the proposal to go to UV disinfection at the ETP? Have heard that chlorine provides a safer disinfection method as residual chlorine prevents regrowth of bacteria in the long pipeline. Can someone enlighten me on this?
22/3/02	Gidja Walker	Submission to Panel posted on behalf of Ms Gidja Walker, SPIFFA	I have acted as a community representative on the Boags Rock outfall consultative committee for many years. We all do it because we care and are passionate about trying to make a difference. The usual response we have had from MW has been defensive, information misleading or contradictory, and we seem to be being led in circles in the hope we will wear out. The name the 'Peninsula Project' symbolises to us MW's view that it is not Melbourne's problem. You have a difficult job representing all the community views and I trust you will listen and hear what we sya and represent our perspectives strongly, clearly and independently. Boags Rock was not just a part of the Southern Peninsula coastline – it was the 'Jewel in the Crown', with evidence of high biodiversity and niche communities. We know life on the reef has declined. Simply monitoring its decline is futile – adaptive management is required. Putting the pipe out further may only compound the problem and have an unknown effect on deeper marine communities. All changes take place within a context and this is not just another NIMBY attitude – we want the problem solved not handed on to another community. The first step is to get the ethics right with ANZAAS guidleines as a basis. Secondly to purify effluent to potable quality (and aim for outfall closure) through microfiltration and ozonation – two additional preferred methods would be magnetization and biological systems (reed beds). Improved quality then increases options for storage or use and can be developed over time. The responsibility for achieving a sustainable solution lies with MW, State Government and us.
22/3/02	Gidja Walker	Received from Gidja Walker, SPIFFA	Two areas of concern for our members are (1) the toxic waste component of the ETP process and (2) the effect of sewerage pipelines on the Bass Strait system as a whole. (1) Trade waste agreements are not part of any waste inventory and if toxins are not released at the outfall as the CSIRO report infers, then they must be retained in the sludge. Mixing toxic waste in with sewerage turns a valuable resource into a long-term increasing liability. (2) Discussion of the Gunnamatta outfall happens in isolation from other outfalls and with the false perception that marine biodiversity is concentrated in the narrow coastal zone. The Bass Strait system needs to be looked at as a whole and we are not meeting criteria under the Precautionary Principle in the Environment Protection and Biodiversity Act.
25/3/02	Dr Peter Fisher	Gauging the pharmaceutical burden in Sydney's environment: A preventative response	Abstract: Metabolised and/or unmetabolised fractions of pharmaceuticals can undergo complex chemical reactions, and once they have entered the sewerage system may react with other synthetic chemicals. Most sewerage plants fail to remove a sizeable proportion of these compounds. The environmental impact of these compounds when released as treated effluent remains a matter for conjecture. However, there a growing body of work on the effects of antibiotics on insects. Author noted also the relation

Date	Author	Subject	Comments Summary
			between suspect compounds and endocrine disruption. To draw attention to the problem a gross estimate of the annual Sydney drug load was made using statistics from the Australian Government Prescribed Benefits and Repatriation Benefit Scheme. Estimate was 17 tonnes pa, although taking into account hospitals and clinics, OTC and illicit drugs, overall figure probably closer to 30 tonnes. Recommended a two pronged impact reduction strategy involving curbing existing medication discharge and longer term solution involving natural product pharmaceuticals and gene therapy.
26/3/02	Jim Kerin	Florida Reuse strategy email address and pdf file	Attached is the Florida reuse strategy.
26/3/02	Patricia Hosking	Tribal Ethics	Comparison of tribes from 500 years ago to modern "tribes". The role of the ETP panel is like that of the elders of a tribe who consult and are consulted by tribal members. Elders draw on wisdom, education and experiences to enhance common good, security and spiritual well-being. Elders also protect wisdom, common sense, statesmanship and act as negotiators. In a tribal situation pollution is the act of an enemy who seeks to destroy shelter, food source and morale. For a tribe to create this problem for itself is the sign of a tribe in decay. It makes no sense to rob new generations of a safe place, food, shelter and security, and leave to them a polluted environment as a result of greed. Such a situation is a product of ignorance. As elders we have started to act as thieves, squandering our inheritance, polluting and over consuming. Financial institutions will be the new battle grounds for the elders. The size of the tribe is growing. Natural resources have been replaced by information, finance and technology. Melbourne Water can choose to use these resources, but it depends on their willingness to do so. Comparison of the environment to a mother's body. Would you place known pollutants in your mother's body and wonder why she has contracted cancer? She has given you compassion, shelter, food and protection, but we do not show such compassion for our own children. We know the importance of the mind and the role it plays in healing a sick body. We can rebuild a healthy society through hope and the correction of mistakes.
27/3/02	Jim Kerin	Email address for Florida department of Environmental Protection – Florida water reuse strategy	Website for Florida reuse strategy.
27/3/02	Rohan Ash	Pharmaceuticals, hormones, and other organic wastewater contaminants	US Geological Survey (USGS) study of pharmaceuticals, hormones and other organic contaminants in streams across the USA. Study showed: 1) compounds have been detected in low levels. 2) Drinking water standards do not exist for 81 of the 95 chemicals detected. 3) Little is know about the environmental occurrence of many of these chemicals. 4) Household, agricultural and industrial chemicals can enter the environment in a number of ways. The USGS "Pharmaceuticals, Hormones and Other Organic Wastewater Contaminants in US Stream, 1999-2000" can be found in the March 15 issue of Environmental Science and Technology, or at http://www.toxicx.usgs.gov/regional/emc.html See also the National Biosolids Partnership at http://biosolids.policy.net

Date	Author	Subject	Comments Summary
27/02/02	Roger Lee	Submission regarding the reuse of ETP effluent	References to effluent recycling in the WA application blur the focus on the long term probability that extension of the outfall will be necessary as the volume of effluent grows. There is no commitment to implementing a policy for recycling embodying world's best practice, instead MW embraces a parochial philosophy inadequate for the resolution of long term issues. MW's targets of 20% recycling by 2010 does not appear achievable as only the Koo wee Rup and Mornington Racecourse options cited in the WA application have any substance – 10% of the effluent cited as recycled re-enter the effluent stream for discharge at the Boags Rock outfall. The total amount of recycling which would appear to be acheiveable within the 2010 timeframe is more realistically some 12.5%. Consequently it is difficult to believe MW comittment to substantial recycling initiatives. Parochial policy provides reason for MW ignoring the CSIRO report on recycling suitable treated effluent to Cardinia reservior and reflects the limited responsibility of the MW charter to provide water supply and sewerage services to the metropolis, but is inexplicable given the claim that MW is a key member of the Victorian Government recycling committee, charged with a 'whole of government' approach to effluent recycling.

Emails sent directly to Vas Djanevic

Date	Author	Subject	Comments Summary
17/1/01	Kate Glenie	Mornington Peninsula Western Port Biosphere	Attached a file on the Mornington Peninsula Biosphere and links to the Mornington Peninsula Shire website and the UNESCO Biosphere website.
28/12/01	Charlie Sorel	Reticulated, non-potable Water	I suggest we start laying piping for non-potable water in parallel with the normal drinking supply. Costs will be reduced if this is done whenever new pipes are being laid, and eventually (20-30 years?) all reticulated properties will have potable and non-potable supplies.
29/12/01	Gordon Davies	ETP & Water Conservation in Melbourne	Re: comments by Brian Bayley on 3LO today (28/12/01). I hope you were able to pick up on the negative comments by Brian about water conservation and effluent reuse. Melbournians think we have plenty and unlimited supplies of water. Wrong. The debate about ETP should start at the beginning ie. How Melbournians use water. Conservations measures will save on the volumetric load on the sewers as well as the ETP. The ETP and outfall pipe system was designed for 287 ML/day and was designed to be doubled in capacity by now. I was involved in some of the original ETP design works. I would suggest that you be aware of the management culture at MW, including public image of MW.
3/1/02	Wayne Chamley	Membership of the ETP Panel	Depending on the timetable for the working of the ETP Panel, I would be interested in the environmental position on the Panel. I have extensive experience. (Brief qualifications outlined).
16/1/02	Jillian Verhardt		[copy of Jillian Verhardt's posting of 17/1/02]

Date	Author	Subject	Comments Summary
18/2/02	John & Lorna Reid	Melbourne Water Discharge of Effluent to Gunnamatta	MW are not adopting world's best practice and have clearly not respected the community. This must change ASAP.
22/2/02	Bruce Reid, Mt Martha Golf Club	Eastern Treatment Plan Advisory Panel	[copy of Peter Kingshott's posting of 1/3/02]
23/1/02	John & Tonya Hackett	Gunnamatta	We are concerned about the harm done to the ocean at Gunnamatta by the effluent, and its effects on ocean flora and fauna as well as people who enter the water, and the waste of water that if better treated could be reused inland. We believe the application should be refused and MW should have to present an improved plan including higher grade of treatment, cessation of ocean discharge within 10 years and options for recycling.
27/02/02	Roger Lee	Reuse of ETP effluent	Reference to effluent recycling in the ETP WA blurs the focus on the long term probability that extension of the outfall at Boags Rocks will be necessary to handle the growing amount of effluent. There is no commitment to implementing a world's best practice for recycling, instead Melbourne Water has embraced a philosophy that is not adequate to resolve long term water resource issues. MW claims a focus on 20% recycling of overall ETP effluent by 2010, and 50% by 2050. Having looked at the figures they cite, in reality the total amount to recycling which would appear to be achievable within the 2010 timeframe is more like 12%. This makes it difficult to believe the stated commitment to substantial recycling initiatives. Claims that there is little public support for using recycled water does not excuse the unwillingness of MW to face the reality of the finite nature of Victoria's water supply. Neither does it excuse the proposition that continuing and increasing discharge at Boags Rock should be facilitated by the extension of the outfall. MW has also ignored the CSIRO report on recycling suitably treated effluent to Cardinia reservoir. Although MW has limited responsibility to provide water and sewerage services, MW is still a key member of the Victorian Government recycling committee. Best practice should have prevented MW citing experiences elsewhere for not considering recycled water as a potable resource. Given overseas experiences, the policy should include the need to demonstrate the acceptability of supplementing water supply. MW should use the term "recycled water" rather that "recycled effluent". A prime need is for commitment to the principle of recycling effluent for more than irrigation, such as feedstock in the supply of potable water. The continuing development of the South East region will place already stressed water resources at risk. Recycled ETP water is one way of supplementing existing water resources. May need a substantial sewage treatment plant near Garfield in the longer term, which could provide irrigation and feedstock. Recycling at least 8000MLA of ETP effluent to the Thomson reservoir should be considered. A separate submission has been prepared on this solution. Perhaps one result of the panel's efforts will be that MW apply world's best practice to recycling effluent, as done overseas where water resources are supported with well tested technology and methodology.

Correspondence received

Date		Author	Subject	Comments Summary
C1	28/12/01	Robert Gourley	Bio-solid Waste Utilization	One use for bio-solid waste from treatment plants is being tried out by Energy Developments Ltd in Wollongong. I recall seeing a large methane digester at the Carrum Treatment plant and the gas being used to fuel engines which were driving the generators. EDL specialises in this and is a candidate for Carrum for the same. The environment would gain great benefit and achieved at little or no cost to MW.
C2	3/1/02	David J Power	Beneficial Recycling of Sewage Effluent	I agree with your (T.Laidler) comments made in the Age but saddened that response by Brian Bayley (MW) was largely dismissive of the concept of recycled water role in an overall water resources strategy. The underlying attitude of MW towards recycling has not fundamentally changed and while the current MW-run Water Resources Strategy Review does look at some recycling opportunities, in personal discussions with several members of the review team I get the distinct impression that they have no enthusiasm for promoting this concept. Sooner or later the hard decision has to be taken and band-aid solutions till next time are cowardly. Community education is required in order that debate can proceed – yet MW don't seem to be interested in improving rational debate. There are examples of indirect potable and direct potable reuse demonstrating that technology is not the issue. Cost need not be a major factor either. I support you in attempting to open the issues to rational and constructive debate. I have extensive background in the water reuse debate and can be of further assistance to the panel if required.
C3	7/1/02	Geraldine Bagwell		Despite the hype about 'recycling', useful, practical information and advice is hard to obtain. Recent article in 'The Age' about building improved energy efficient houses is great, but the legislation needs to include active as well as passive solutions (ie. Waste water diverter, low energy globes, solar hot water etc). If these were automatically included in each new home people will automatically learn to conserve power, water etc.
C4	10/1/02	Campbell Jeffery	Recycled Water Commercial Opportunities	I have been consulting with a consortium comprising Western Water, City of Hume, Shire of Melton on developing commercial opportunities for once waste water. Landowners have welcomed access to the water. The Victorian Government has supported the project. The project validates the real commercial opportunities and associated benefits that exist for recycled water. Look forward to discussing EPA priorities in this area.
C5	10/2/02	Roger Lee	Proposal to Recycle 80000MLA of Treated Effluent	I enclose a proposal to utilise at least 80000ML of the annual discharge from the ETP. This is based on my response to the *Discussion Starter* for the 'Planning for the future of our water resources' sent to Craig Ingram, my local MP. I see as a solution the substitution of adequately treated effluent for environmental flow releases from dams (to the LaTrobe and Thompson Rivers). Proposal summary and resume attached.
C6	5/2/02	Patricia Hosking		[copy of email of 24/1/02]
C7	20/2/02	Jack Read	Waterless toilets	Tabeela Pty Ltd (my company) holds two patents relating to waterless toilets – the toilets replace water carried sewerage systems with air flush. The system is less

Date	Author	Subject	Comments Summary
			wasteful of water and more hygienic than traditional systems.

Abbreviations:

EPA	Environment Protection Authority (EPA Victoria)
MW	Melbourne Water
GSLC	Gunnamatta Surf Lifesaving Club
COF	Clean Ocean Foundation
COForum	Clean Ocean Forum
ETP	Eastern Treatment Plant
SEPP	State environment protection policy

Response to works approval received by EPA

Date	Author	Subject	Comments Summary
23/2/02	Marta Marot, Secretary St Andrew's Beach Preservation Society		
28/2/02	South East Water		
28/2/02	Yarra Valley Water		
28/2/02	Yarra Valley Water, Environmental Consultative Committee		
28/2/02	Anne Lee - Westernport Port Phillip Coastal Watch Assn		
1/3/02	Ms Julie Black, Community Members Against Ocean Outfall		
6/3/02	Ms Vicki Randell		
11/3/02	Mornington Peninsula Shire		

APPENDIX 2 - PRESENTATIONS AT THE SECTION 20B CONFERENCE

Chairperson : Associate Professor Terry Laidler
Members: Dr John Langford
Associate Professor John Sherwood
Date : 15 April 2002
Place : Dandenong Workers Social Club
48 Wedge Street, Dandenong, Victoria

SESSION 1 : 15 April 2002, 10.00am – 12.00pm	
Time	**Presenter**
10.00am – 10.05am	Environment Protection Authority (EPA)
10.05am – 10.15am	Chairman – Associate Professor Terry Laidler
10.15am – 11.15am	Melbourne Water
11.15am – 11.30am	Public comments
11.30am – 11.45am	Presenter 1 – Mr Marc Perri Proponent's response
11.45am – 12.00pm	Ms Ann Lee, Western Port Phillip Coastal Watch Assoc. Proponent's response
12.05 pm – 12.15pm	Presenter 2 – Ms Patricia Hosking Proponent's response

SESSION 2 : 15 April 2002, 1.30pm – 5.45pm	
Time	**Presenter**
	Public Comments
1.30pm – 2.30pm	Presenter 3 – Mr Chris Wren, Barrister for Clean Ocean Foundation Proponent's response
2.35pm – 2.50pm	Presenter 4 – Mr Terry Anderson, South East Water Proponent's response
2.55pm – 3.10pm	Presenter 5 – Mr Roger Lee Proponent's response
3.15pm – 3.30pm	Presenter 6 – Mr Craig Cinquegrana & Ms Vanessa Petrie, Mornington Shire Proponent's response
3.35pm – 4.00pm	Tea / Coffee Break
4.00pm – 4.15pm	Presenter 7 – Mr Arthur O'Bryan & Mr Murray Turner, Surf Riders Proponent's response
4.20pm – 4.35pm	Presenter 8 – Ms Gidja Walker, SPIFFA Proponent's response
4.40pm – 4.55pm	Presenter 9 – Mr Jim Kerin Proponent's response
5.00pm – 5.15pm	Presenter 10 – Ms Marta Marot, St. Andrews Beach

	Preservation Society Proponent's response
5.20pm – 5.35pm	Presenter 11 – Mr Jack Read Proponent's response
5.40pm – 5.45pm	Chair Close – Associate Professor Terry Laidler

SESSION 3 : 15 April 2002, 7.00pm – 10.00pm	
Time	**Presenter**
7.00pm – 7.05pm	Environment Protection Authority (EPA)
7.05pm – 7.15pm	Chairman – Associate Professor Terry Laidler
7.15pm – 8.15pm	Melbourne Water
8.15pm – 8.30pm	Question Time
	Public Comments
8.30pm – 8.45pm	Presenter 12 – Mr Henry Kesall Proponent's response
8.50pm – 9.05pm	Presenter 13 – Ms Julie Star, Community Members Against Ocean Outfall Proponent's response
9.10pm – 9.25pm	Presenter 14 – Ms Vicki Randell, Community Members Against Ocean Outfall Proponent's response
9.30pm – 9.40pm	Chair Close – Associate Professor Terry Laidler

APPENDIX 3 – WRITTEN SUBMISSIONS TO THE SECTION 20B CONFERENCE