Wonnich 1 petroleum exploration well, near Montebello Islands

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Ampolex Ltd

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 780
May 1995

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on **2 June, 1995**.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal from proponent	Time
27.2.95	Proponent Document Released for Public Comment	
27.3.95	Public Comment Period Closed	4 weeks
29.3.95	Issues Raised During Public Comment Period Summarised by DEP and Forwarded to the Proponent	2 days
21.4.95	Proponent response to the issues raised	1 week
18.5.95	EPA reported to the Minister for the Environment	4 weeks

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Summary

Ampolex Ltd proposes to drill an offshore exploration well ("Wonnich 1") for petroleum within its permit area TP/8. The well would be located approximately 8 km south-west of Hermite Island in the Montebellos Group, and approximately 3 km west of the Montebello Islands barrier reef.

The well location falls within an immediate protection zone and in an environmentally significant area as defined by government marine management agencies. Such areas are environmentally sensitive to oil spills and, accordingly, the proposal was subject to formal environmental assessment.

The Environmental Protection Authority identified six key issues requiring detailed consideration as follows:

- oil spills;
- rig placement and drilling discharges;
- domestic wastes;
- disturbance to seabirds;
- environmental monitoring; and
- disturbance to an historic shipwreck.

The EPA considers that these and other issues have been addressed by environmental management commitments given by the proponent. Subject to the rigorous implementation of these environmental management measures, the EPA concludes that the impacts of the project on the conservation values of the Montebellos area could be managed.

Recommendation Number	Summary of recommendations
1	**The proposal could proceed subject to the proponent's environmental management commitments.**

1. Introduction and background

On 7 November 1994, Ampolex Ltd, the proponent, applied to the Western Australian Department of Minerals and Energy (WADME) to drill the Wonnich 1 exploration well in state waters near the Montebello Islands. WADME referred the proposal to the Environmental Protection Authority (EPA) to determine the level of environmental assessment required.

The site of the proposed exploration well falls within an "immediate protection zone", as defined in Department of Conservation and Environment Bulletin 104 *Procedures for the Protection of the Western Australian Marine Environment from Oil Spills* (DCE, 1984), and within an "environmentally sensitive area" as defined in the draft EPA Bulletin 679 *Protecting the marine environment: guidelines for the petroleum industry* (EPA, 1993). In addition, the marine environments of the Montebello Islands are recognised as being both of exceptional conservation value and highly sensitive to oil spills (see section 4). The EPA therefore determined that the proposal should be formally assessed.

Ampolex prepared a Consultative Environmental Review (CER; Ampolex, 1995) following guidelines provided by the Department of Environmental Protection (DEP). The CER was released for a four week public review period ending 27 March 1995. Nine submissions were received, which included submissions from the Department of Conservation and Land Management, the Conservation Council of Western Australia Inc., the Western Australian Museum, and the Australian Institute of Marine Science.

2. Description of proposal

The following proposal description is based on information in the CER.

Ampolex Ltd is the operator for the participants in exploration permit TP/8, which is located in Western Australian state waters. Ampolex proposes to drill an exploration well at a site approximately 8 km south-west of Hermite Island in the Montebello Islands and approximately 3 km west of the Montebello Islands barrier reef.

The well would be drilled using the jack-up rig *Ron Tappmeyer*, in a water depth of approximately 27 m. Two support vessels would be used to tow and position the rig and to provision it. A helicopter operating from either Karratha or Onslow would be used for crew changes. Drilling would be carried out using low-toxicity, water-based drilling fluids. If approved, drilling would commence in June or July 1995 and be completed in 26 days.

3. Environmental impact assessment process

This assessment has been undertaken using currently available information. The information has been provided by the proponent in preparation of the CER (in response to guidelines issued by the DEP), by DEP officers utilising their expertise and reference material, by utilising expertise and information from other State Government agencies, and by contributions from EPA members.

In carrying out this assessment, the EPA has referred to the Independent Review of the Environmental Impacts of the Offshore Petroleum Exploration and Production Industry in Australia, (Swan *et al*, 1994), commissioned by the Australian Petroleum Exploration Association (APEA). This includes a detailed review of the frequency and environmental impacts of oil spills from offshore exploration and production (Volkman *et al*, 1994).

The environmental impact assessment process for this proposal followed the administrative procedures 1993, as shown in the flow chart in Appendix 1.

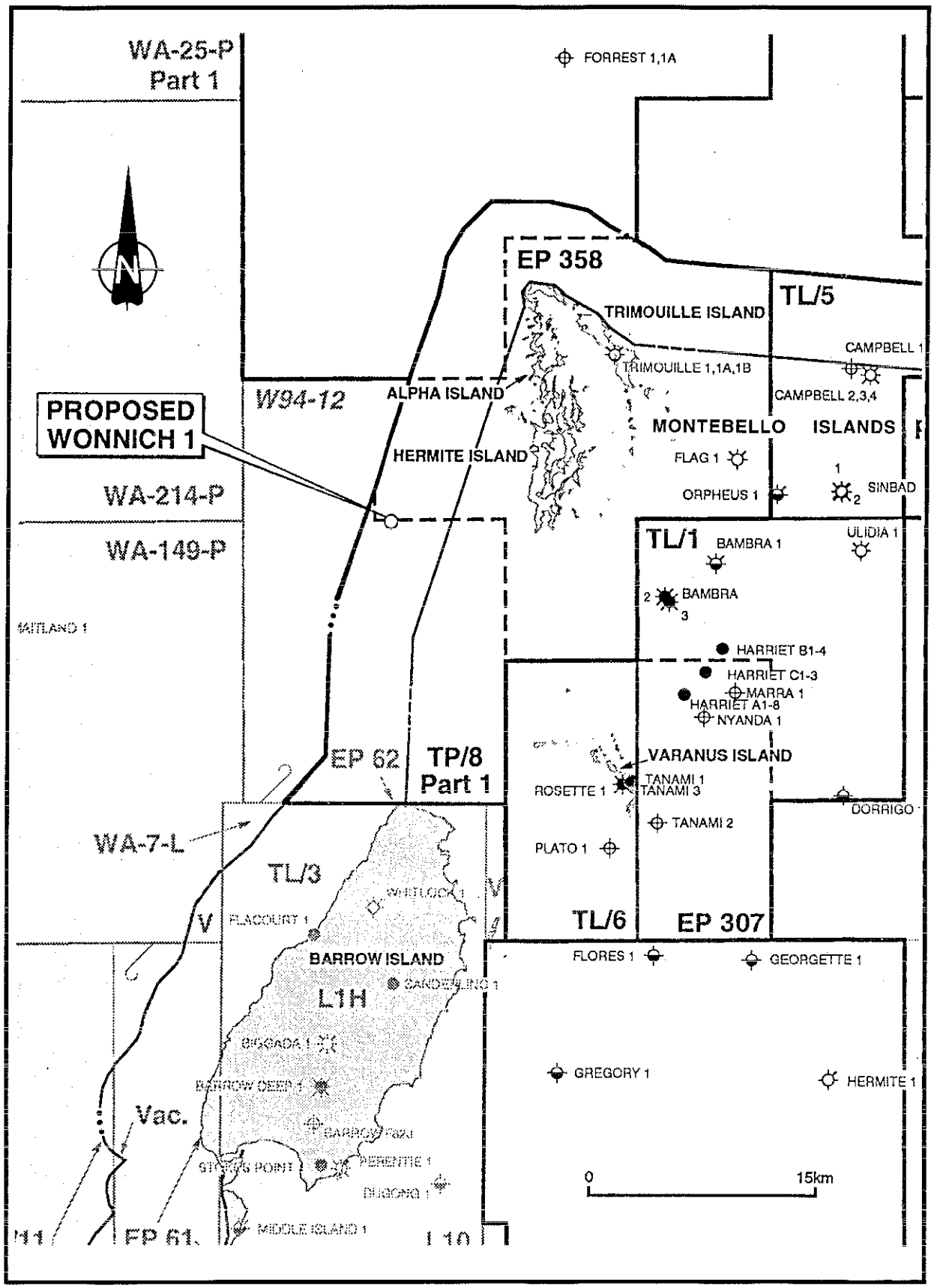

Figure 1. The Montebello Islands and the location of the proposed Wonnich 1 exploration well.

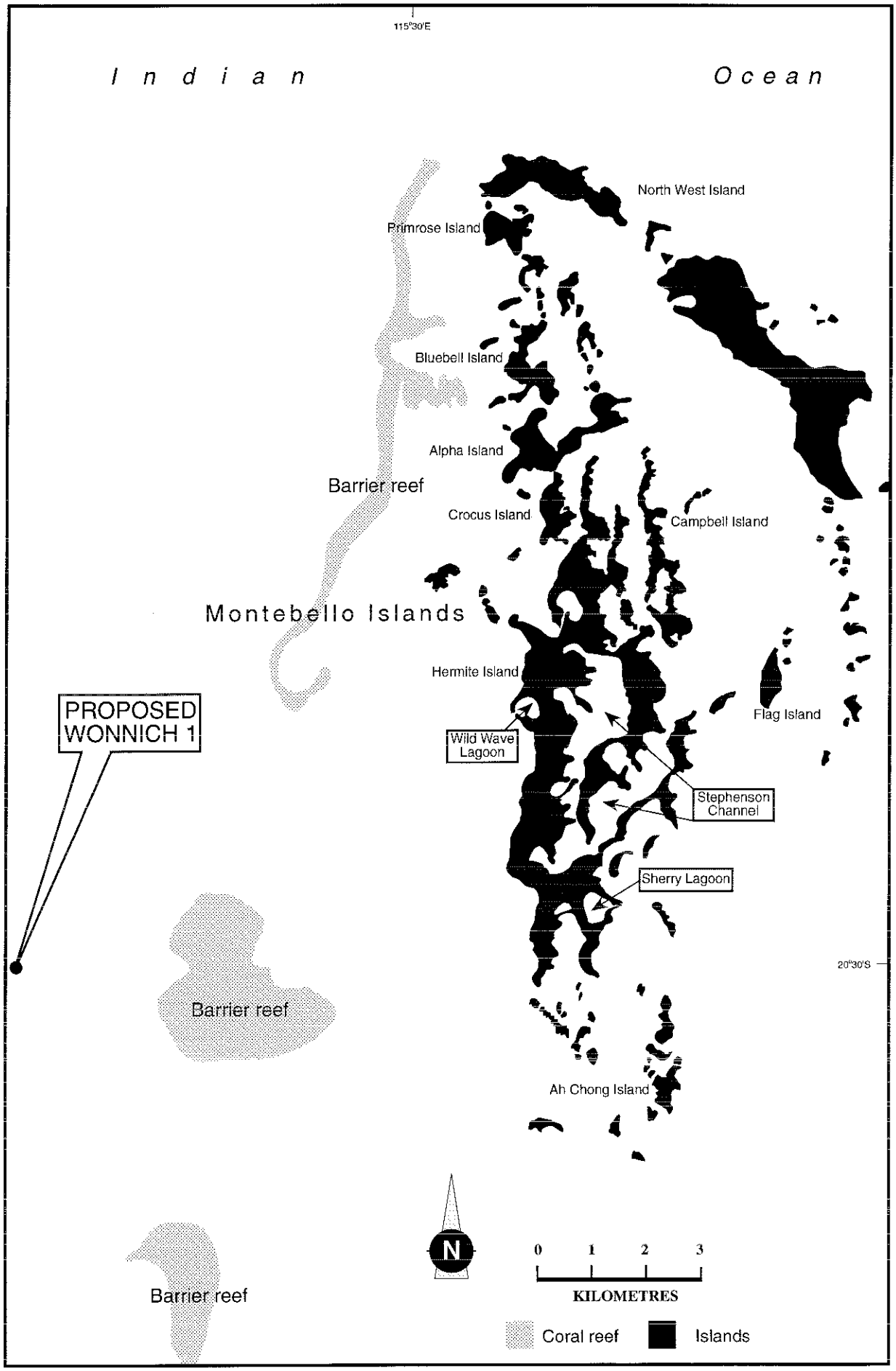

Figure 2. Environmentally sensitive areas of the Montebello Islands.

Other approvals required

In addition to approval under the *Environmental Protection Act 1986*, the proposal also requires approvals from the Department of Minerals and Energy under the *Petroleum (Submerged Lands) Act*. This includes requirements to gain approvals for the oil spill contingency plan and emergency procedures plan, and to pressure-test the blow-out preventers and well casings.

4. Marine conservation values [1]

The Montebello Islands (figure 1) comprise about 200 islands, most of which are rocky islets only a few metres in diameter, although some are larger, such as Trimouille Island with an area of 493 hectares (ha), and Hermite Island with an area of 939ha. The coastlines of the Montebello Islands are convoluted and contain large areas of shallow marine habitats, including extensive coral reef systems (Sheppard and Wells, 1987).

The marine environments of the Montebellos are particularly diverse and are recognised as being of exceptional conservation significance. The report of the Marine Parks and Reserves Selection Working Group (Marine Parks and Reserves Selection Working Group, 1994) notes:

'The extensive development of barrier reef, back reef, patch reef, pavement patch reef and lagoonal habitats in such close proximity is a feature of the Montebello Group without parallel in Western Australia.'

The report of a survey by the Western Australian Museum (Berry, 1993) characterises the marine fauna of the Montebello Islands as follows:

'The [marine] fauna of the Montebellos is dominated by widespread tropical Indo-Pacific species with a very low representation of west coast species which probably occur as irregular vagrants (eg: the Western Rock Lobsters). The Montebellos are located in the area where the Leeuwin Current is thought to originate. They may therefore serve as an important recruitment source for tropical species along the west coast.'

The same report goes on to recommend that:

'The waters encompassing the Montebello Islands, southward to the channel separating the group from the Barrow-Lowendal groups, be declared a Class-A marine reserve for public recreation and protection of flora and fauna, ideally with boundaries located at the limit of State territorial [*sic*] waters along the western and northern sides and following the sub-littoral fringe on the eastern side.'

Preliminary discussions are now taking place on the possibility of declaring a multiple-use marine management area to include the Montebello Islands, as provided for under the State Government's *New Horizons in Marine Management* policy statement (Government of Western Australia, 1994).

Oil spill sensitivity

The Western Australian Museum report (Berry, 1993) notes that the area is particularly sensitive to oil spills:

'The total shoreline of infratidal [*sic*] land within the Montebellos Group is approximately 210 km in length and significantly longer if the margins of intertidal areas, particularly the western barrier reef, are included. An extensive, shallow intertidal zone is therefore contained within a relatively small total area making it more vulnerable to cyclones or oil spills than the intertidal zone on a straighter coastline such as is typical of much of the Pilbara coast.

Because of the length of coastline and the area of intertidal habitat, the Montebellos would be particularly vulnerable to a major oil spill. Enclosed areas such as the embayments, many of which contain mangals, and Stephenson passage, would be likely to be worst affected because

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[1] *For more detailed information on the marine environments of the Montebello Islands, refer to the report of the Western Australian Museum survey (Berry, 1993). The report includes a colour-coded marine habitat map.*

of entrapment due to to the low exchange of water. Intertidal and shallow water communities are probably adapted to frequent perturbation by cyclones and could be expected to recover quickly in the event of an oil spill. However recruitment of mangal communities would be likely to be slow because of the distance of the Montebellos offshore.'

Impacts of oil spills on the conservation values of the area are considered further in section 7.1.

5. Social and commercial values

Present use of the Montebellos includes pearl cultivation leases and occasional recreational fishing and diving cruises (Ampolex, 1995). According to the pearl farm operators, Morgan & Co Pty Ltd commercial pearl farming is carried out in the Montebellos mainly concentrated between Crocus island and the northern tip of Hermite Island. The oysters are grown on sub-surface platforms and long-lines (Mr J Morgan, Morgan & Co Pty Ltd, *pers comm*).

The main commercial fishery in the area is a trap fishery for reef fish which occurs about 5 nautical miles from the Montebellos at depths of 30-100m. Currently the level of commercial line fishing is thought to be low, but it is subject to fluctuations in participation levels caused by viability of other fisheries and catches elsewhere (M. Moran and H. Brayford, WA Fisheries Dept, quoted in Berry, 1993). The Montebellos are also subject to both commercial and casual collecting for specimen shells (Berry, 1993).

There is no permanent population on the islands, although the pearling operation run by Morgan & Co Pty Ltd maintains an active presence around its leases (Ampolex, 1995).

No information is available on the commercial value of tourism, commercial fishing and specimen shells collecting in the Montebellos. However production from the Montebellos pearl leases is worth over 30 million dollars per year (Mr J Morgan, Morgan & Co Pty Ltd, *pers comm*).

The issue of insurance to cover oil spill impacts on commercial activities is discussed in section 7.1.3.

6. Submissions

A list of issues raised in submissions is given in Appendix 2 and the proponent's detailed responses are presented in Appendix 3. The list of submitters appears in Appendix 4. The proponent's consolidated list of environmental management commitments, which would be audited by the DEP, appears in Appendix 5.

A summary of submissions and the proponent's responses is given in Table 1.

Table 1: Main points in submissions and proponent's responses

Main points in submissions	Proponent's responses
(1) Impacts on conservation values • There should be no oil drilling because of the conservation significance of the area and because the area is proposed as a marine reserve. • there should be no drilling allowed until a management plan is developed for the whole area.	• Oil exploration and nature conservation are not incompatible. • Oil exploration in the area is consistent with State Government policy which states that, before a decision is made about setting an area aside as a marine reserve, an assessment of commercial values (including mineral resources) should be carried out. • Ampolex has legal obligations to carry out exploration in the area.
(2) Impacts on nesting sea birds • Nesting sea birds may be disturbed by helicopters or human intrusion onto the islands.	• Commitment that helicopters will fly no closer than 1 km to islands and that personnel will not be permitted to land on islands.
(3) Environmental monitoring • There should be a statistically rigorous environmental monitoring program including collection of baseline data.	• Impacts from drilling of a single well will be extremely localised and transitory, therefore a statistically rigorous sampling program is neither realistic nor necessary. • Commitment to carry out a remote operated vehicle (ROV) survey of seabed before and after drilling. • Commitment to take aerial photos to confirm that waste plume moves away from coral reef.
(4) Oil spill contingency plan • There should be a fully operational oil spill contingency plan in place before drilling.	• Ampolex is legally obliged to have an oil spill contingency plan approved before drilling commences. • Commitment to carry out a "desk-top" test of the plan before drilling commences. • Commitment that 3-D oil spill trajectory modelling will be carried out in addition to standard 2-D modelling. • Commitment to have satellite buoys on hand to track spills. • Ampolex will seek pre-approval for use of low-toxicity "third generation" dispersant.

(5) Oil spill containment booms • In the event of an oil spill, booms should be deployed to protect particularly sensitive areas.	• Containment booms are not effective in other than very calm conditions with currents no more than 0.8 knots. • The rig will be operating in open water, oceanic, conditions. It is therefore unlikely that booms would be effective around the rig. • It is likely that booms would also be ineffective around the coast of the islands because of the strong tidal currents. • Therefore, Ampolex's oil spill plan is based firstly, on prevention of spills, and secondly, should a spill occur, timely use of low-toxicity dispersant if sensitive areas are threatened. • However, Ampolex makes a commitment to use booms, if conditions allow, to protect the areas identified by the WA Museum, and other areas of high environmental priority.
(6) Rig refuelling • Rig refuelling procedures should follow those specified for the WAPET Roller Field Development.	• State-of-the-art refuelling procedures and equipment are in use on the drilling rig, and every precaution will be taken to prevent spillage. • Commitment that refuelling will only occur in daylight and under sufficiently calm conditions that the procedure can be carried out safely.
(7) Insurance • Ampolex must have adequate insurance to cover loss of profits to the local fishing and pearling industries in the event of an oil spill.	• Ampolex confirms it has comprehensive covers in Third Party Liability, Corporate Insurance and a special Oil Spill Insurance Cover.

7. Evaluation

The EPA identified six key issues as follows:

- oil spills;
- rig placement and drilling discharges;
- domestic wastes;
- disturbance to nesting seabirds;
- environmental monitoring; and
- disturbance to an historic shipwreck.

The EPA's assessment of each issue is given below.

7.1 Oil spills

As discussed in Section 4.1, the marine environments of the Montebello Islands are recognised as being of outstanding conservation value and as being worthy of marine reserve status. The complexity of the coastline and the diversity of shallow marine habitats means that the area is particularly vulnerable to impact from oil spills.

Ampolex's proposed oil spill prevention measures, oil spill contingency plan and insurance arrangements are discussed below.

7.1.1 Oil spill prevention

Oil spills from drilling rigs may arise from:

- a rig refuelling accident;
- incomplete combustion of liquids during production testing; or
- loss of well control.

Management measures to prevent each of these types of spill are discussed below.

Rig refuelling accident

The most common type of oil spill is a diesel spill of between 1 and 20 cubic metres arising from a rig refuelling accident (Volkman *et al*, 1994). Ampolex has advised that the drilling rig uses international best practice refuelling equipment and procedures (R Nunn, Ampolex, *pers comm*). In addition, Ampolex has made a commitment that rig refuelling would only be carried out in daylight, in suitable sea conditions, under the supervision of the Vessel Master and Drilling Rig Captain, and with dedicated crew constantly monitoring the operation.

The EPA understands that these are state-of-the-art procedures and technology which should minimise the risk of a rig refuelling accident.

Production testing accident

As noted above, another cause of small spills is incomplete combustion during production testing. The EPA notes that the proponent has made the following commitment on production testing:

- The testing of any hydrocarbons discovered by the well will be undertaken with the initiation of first hydrocarbons to surface during daylight hours. This will be carried out using the specialist contractor's (Schlumberger) latest technology, including "Green Burners."

The EPA again understands that this is state-of-the-art technology and concludes that using this equipment should minimise the chance of an oil spill from a production testing accident.

Loss of well control

Loss of well control (also called a "blowout") may release much larger quantities of oil. However, with currently available drilling technology, including use of blow-out preventers, such accidents are rare.

The EPA notes that only six offshore blowouts have occurred in Australia (none since 1984), and only one of these blowouts resulted in a small amount of spilt oil (Volkman *et al*, 1994). The EPA also notes that further safeguards against loss of well control are provided by safety regulations administered by the Department of Minerals and Energy. Blow-out preventers and well casings are subject to strict pressure testing requirements under the *Petroleum (Submerged Lands) Act* .

Based on the information above, the EPA concludes that Ampolex's proposed management measures should minimise the risk of an oil spill.

7.1.2 Oil spill contingency planning

Under the *Petroleum (Submerged Lands) Act*, an oil spill contingency plan (OSCP) is a mandatory requirement, which must be approved by the Department of Minerals and Energy, on advice of the EPA. As is standard practice, Ampolex has made a commitment to carry out a "desk top" simulated test of the OSCP prior to spudding-in the well.

Oil spill trajectory predictions

The EPA notes that, according to preliminary oil spill trajectory predictions (Ampolex, 1994, Appendix 6), if the well is drilled in winter as planned, the predominant winds are such that an oil spill would be carried away from sensitive areas.

However, Ampolex notes that, in winter:

> 'Westerly winds do occur a small percentage of the time at this site. The interaction of the resultant wind-driven currents and the tidal currents of the area will result in an oil spill encroaching on the Montebello shoals within 6 hours of a spill. However the frequency of such an event is estimated to be less than 1%. Within 12 hours of a spill at Wonnich 1, the coastline of the Montebello Islands, and in particular Hermite Island, will also be vulnerable to the oil spill. Again, the expected frequency of such events is less than 1.5%. After 48 hours, there is a small probability (less than 5%) that all coastlines in the area will be subject to contamination by the spilt oil.' (Ampolex, 1994, Appendix 6).

Ampolex has advised that the CER was produced on the assumption that, if approved, the project would go ahead in winter. It therefore contains oil spill trajectory predictions for winter (June to August) only. However the oil spill contingency plan will contain trajectory predictions for all four seasons (R Nunn, Ampolex, *pers comm*).

Should the project be approved, but delayed to the extent that it is implemented outside the winter months, different metocean conditions would prevail. In this region in summer (October to March) predominant winds would be from the west and south-west. April-May and September-October are transition periods during which both summer (west and south-west) and winter (south-east and east) airflows may occur (LeProvost Environmental Consultants, 1991). Therefore drilling the well in winter would minimise the probability that, should an oil spill occur, wind-induced currents would carry oil towards the Montebello Islands.

Type of oil expected

Ampolex notes that any oil discovered by the well is likely to be a typical Australian 'light crude', as distinct from the thick, heavy crudes from the Middle East and elsewhere. According to the Independent Scientific Review on the Environmental Impact of the Offshore Oil and Gas Industry in Australia, tests have shown that, under the warm ambient conditions off Northern Australia, up to two thirds of a spill of these lighter crudes may evaporate. Light crudes also tend to degrade more readily (through photodegradation and biodegradation) than

heavier grade crudes. Therefore, the environmental impacts from a spill of such a light crude may be less severe than those from heavier oils which are more resistant to evaporation and degradation (Volkman *et al*, 1994).

Oil spill booms and skimmers

The report of the WA Museum survey (Berry, 1993) makes the following recommendations on oil spill booms:

> 'In the event of an oil spill, contingency plans should allow for a floating boom, or other suitable equipment or procedure to be available to prevent oil entering Stephenson Passage, particularly the inner arm where there are four mangals. If this is not practical, one mangal has an entrance channel only about 8 m wide which should be easy to occlude. Occlusion should also be considered at Turtle Lagoon, Wild Wave Lagoon, and Sherry Lagoon.'

In responding to this issue, Ampolex states that it:

> '...considers that it is important to realise that the effectiveness of booms is limited by wave heights and current strength. In the latter case, they have little value in currents greater than 0.8 knots. Current strengths past the areas identified by the WA Museum often exceed this critical limit.'

The EPA notes that Ampolex has made the following commitment:

> 'In the event of an oil spill, Ampolex will take every action possible to protect the marine environmental resources of the Montebello Islands. This commitment includes the deployment of appropriate oil booms and skimmers to protect those areas identified by the WA Museum, and other areas of high environmental priority as determined by the environmental resources maps of the area. In this commitment, it must be acknowledged that boom efficiency may have limitations by the current, wind and sea state conditions prevailing at the time.'

The EPA notes that the proponent has made the additional following commitment:

- Satellite tracker buoys will be kept on the rig so that in the event of an oil spill they can be deployed into the spill to provide 24-hour location information.

The EPA understands that Ampolex is the first petroleum company in Australia to propose using satellite buoys for this purpose. If successful, the use of these buoys should assist in monitoring the movement of a spill, particularly at night.

Oil spill dispersants

Since it is likely that booms will be effective only in limited circumstances, the EPA notes that it may be necessary to apply dispersant to an oil spill to minimise oil spill impacts on sensitive coastal environments and/or to protect aggregations of feeding seabirds.

The report of the WA Museum survey (Berry, 1993), notes that:

> '... the extensive area of intertidal habitat, including the entire Western Barrier Reef, are vulnerable to an oil spill.'

The report recommends that, if possible, early action be taken to disperse a spill before it reaches the Montebellos.

The EPA notes that Ampolex intends to seek pre-approval for use of limited use of low-toxicity third-generation oil spill dispersant, in the unlikely event that a spill should occur under conditions where oil may reach sensitive marine environments. Trajectory predictions (see discussion above) indicate that, under westerly wind conditions, oil will encroach on the Montebello shoals within 6 hours of a spill. Pre-approval would allow chemical dispresant to be applied quickly if required. Any such pre-approval would be granted by the Department of Minerals and Energy under the *Petroleum (Submerged Lands) Act,* following consultation with the EPA.

In the event that a large, uncontrolled oil spill does threaten sensitive marine environments and/or seabird aggregations, it is important that dispersant be applied quickly, at the source of the spill, and while the spill is over water deeper than 10m. It is particularly important that, if dispersant is to be used, it is applied well before the spill drifts over coral reefs and shallows. In this way, the toxic oil-dispersant mixture should be considerably diluted before it comes into contact with shallow water biological communities, thereby minimising impacts on those communities. For smaller spills, it would be preferable to disperse the oil using the propeller wash from vessels rather than to apply chemical dispersant.

To ensure that dispersant can be applied quickly in an emergency if required, it is important that dispersant application equipment (spray booms, etc) be available for rapid deployment and that personnel be practiced in its use. Ampolex has advised that trial deployment of dispersant application equipment, including training of personnel, will be be carried out before spudding-in the well (Mr D Kratzing, Ampolex, *pers comm*).

7.1.3 Insurance

The regional industries potentially at risk from oil spills are pearl farming, commercial and recreational fishing, and tourism. Ampolex has made a commitment to be held fully responsible for any containment or clean-up costs or damages to which parties may be lawfully entitled as a result of an oil spill. This is a legal obligation under the *Petroleum (Submerged Lands) Act*. The EPA notes that Ampolex has made a commitment to continue to consult with the West Australian Fishing Industry Council and with the pearl farm operators, Morgan & Co Pty Ltd, on oil spill related matters.

7.2 Rig placement and drilling discharges

Ampolex notes that the impacts from putting the rig in place will be limited to disturbance to an area of sea bed of only a few square metres where the three legs of the platform rest. The EPA accepts that any disturbance to the sea bed from this source will not be significant.

Drilling for petroleum is carried out with the aid of commercial drilling fluids known as "drilling muds". Waste drilling mud is usually disposed of over the side of the rig. Depending on the local environment and the type of mud used, there can be some impact on the local environment (Swan *et al*, 1994). Muds used in Australia are almost exclusively low-toxicity types such as water-based muds, which have minimal environmental impact (Swan *et al*, 1994).

Ampolex estimates the project will discharge approximately 275 cubic metres of drilling mud and has made the following two commitments:

- The well will be drilled using water-based (low toxicity) fluids with additives selected so as to minimise the toxicity of the fluids.
- Releases of drilling fluids will only be permitted by the Ampolex representative when currents will move the resulting plume away from reefs and islands. A log of these discharges will also be kept.'

These commitments reflect current standard practice for projects of this type in Western Australia.

Drill cuttings (rock chips) are also produced from the drilling operation. Ampolex estimates the project will produce 267 cubic metres of cuttings. These will accumulate on the sea floor as a "cuttings pile". The EPA accepts that, while some marine life could be smothered under the pile, this effect will be very localised, and highly unlikely to be environmentally significant.

The EPA concludes that any impacts from release of drilling mud and cuttings are likely to be very localised and transitory. The EPA also notes that Ampolex has made a commitment to carry out aerial photography of the drilling platform and nearby reefs before, after and during drilling. The aerial photography will be used to confirm that the waste plume direction is away from the nearby coral reef.

7.3 Domestic wastes

Domestic wastes produced by drilling rigs comprise sewerage, oil and grease, and rubbish. Ampolex states that:

- sewerage and 'grey water' will be released into the ocean following digestion in the drilling unit's septic tanks;
- oils and grease from machine areas will be returned to shore for recycling or disposal; and
- rubbish will be brought ashore for disposal in authorised land-fill sites.

The proponent has made the following commitment:

- Solid wastes will be returned to shore for disposal in approved land-fill dumps. A log of these wastes (type, amount and disposal location) will be kept.

These management measures and the commitment regarding disposal of solid wastes are current standard practice for projects of this type.

7.4 Disturbance to nesting seabirds

Recent field surveys by Department of Conservation and Land Management biologists have shown that very large numbers of sea birds nest on several of the islands in the Montebellos group (Dr A Burbidge, CALM, *pers comm.*). The surveys have discovered nesting colonies of crested terns consisting of tens of thousands of individuals. These are the largest known crested tern colonies in Western Australia. Smaller colonies of roseate terns were also discovered.

The planned time for drilling the Wonnich 1 well falls within the breeding season for these seabirds. The birds could be affected either by an oil spill while they are feeding at sea (see section 7.1.2), or by disturbance by overflying helicopters, or intrusion by personnel. Dr Burbidge advises that, when disturbed by helicopters or similar loud noises, adult terns tend to take to the air, while fledgling birds tend to run around in panic. He further advises that, on the Montebello Islands, it is possible that fledglings might panic and fall over cliffs with resultant high mortality.

Ampolex has been made aware that the risk of bird strike is also a potential safety issue in regard to personnel in helicopters.

In response to these concerns, Ampolex has made the following commitment:

- So as not to disturb seabird colonies, helicopters will avoid flying within 1 km of islands at all times; and,
- No personnel will be permitted to land on any of the islands. All project personnel, including contractors, would be educated to the sensitive nature of the area, and of their individual responsibilities for its protection.

The EPA concludes that this commitment should be sufficient to avoid unacceptable disturbance to the nesting colonies of seabirds.

7.5 Environmental monitoring

The Australian Institute of Marine Science and the Western Australian Museum submitted that a detailed, statistically rigorous, environmental monitoring programme should be put in place to detect any environmental impacts resulting from the proposed project.

In its response, Ampolex notes that the proposed project will involve drilling a single exploration well at a distance of 3 km from the nearest reef and 8 km from the nearest island. Ampolex argues that experience has shown that the impacts from an operation of this type will be localised and transitory. Ampolex therefore submits that it is neither necessary nor realistic to attempt to carry out such a quantitative monitoring program.

The EPA concludes that, in view of the inherent variability in marine ecosystems, and the likely scale of impacts both in space and time, it would be difficult to design a monitoring programme to detect the likely impacts from the drilling of a single exploration well. In the event that petroleum is discovered, and approval given to move into the production phase, a monitoring programme designed to detect any long-term impacts would need to be considered.

The EPA notes that Ampolex now proposes to carry out the following qualitative survey work, over and above original commitments given in the CER:

- an ROV (remote operated vehicle) survey will be carried out pre- and post-drilling to check seabed condition and to check for debris; and,
- aerial photographs will be taken to confirm that the waste plume from the rig moves away from the barrier reef.

The EPA accepts that these measures are an appropriate way to monitor impacts from the Wonnich-1 project.

7.6 Disturbance to an historic shipwreck

The EPA notes that an unmarked historic shipwreck is located in shallow water approximately 3 km from the drill site. The EPA notes the proponent's commitment that vessels will not anchor near to the known shipwreck site. In view of the distance from the well site, and the proponent's commitment, the EPA concludes that the project should not disturb the shipwreck site.

8. Conclusions and recommendation

The Environmental Protection Authority concludes that:

- oil spill prevention measures and appropriate oil spill combat measures at current industry standards should minimise the risk of an oil spill and potential environmental impacts;
- impacts from disposal of drilling discharges and domestic wastes are localised and transitory and would highly unlikely to have a significant environmental impact;
- disturbance to seabirds should be minimised to an acceptable level;
- the scope of the environmental monitoring programme is acceptable; and
- the historic shipwreck site should be adequately protected.

The EPA notes that:

- the oil spill contingency plan must be approved by the WA Department of Minerals and Energy, in consultation with the EPA; and
- the proponent intends to apply for pre-approval for limited dispersant use under specified conditions; any such approval would be granted by the WA Department of Minerals and Energy, in consultation with the EPA.

The Environmental Protection Authority has reviewed the available information relating to the proposal described in the Public Environmental Review document. Following consideration and evaluation of this information, as discussed below, the Environmental Protection Authority recommends approval of the proposal:

Recommendation 1

The Environmental Protection Authority concludes that the proposal by Ampolex Ltd to drill a petroleum exploration well is environmentally acceptable, subject to the rigorous implementation of the proponent's commitments to environmental management. In reaching

this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- oil spills;
- rig placement and drilling discharges;
- domestic wastes;
- disturbance to seabirds;
- environmental monitoring; and
- disturbance to an historic shipwreck.

Accordingly, the EPA recommends that the proposal, as described in the Consultative Environmental Review, could proceed subject to:

- the proponent's environmental management commitments (Appendix 5).

This recommendation is reflected in the Recommended Environmental Conditions included in Section 9 of this report. Other environmental factors were considered to be adequately addressed by the proponent in the CER and supplementary documentation.

9 Recommended environmental conditions

Based on its assessment of this proposal, and on the recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate:

Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

1 In implementing the proposal, the proponent shall fulfil the relevant environmental management commitments in the Consultative Environmental Review and consolidated in Environmental Protection Authority Bulletin 780 as Appendix 5, provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. [A copy of the schedule of consolidated commitments is attached].

Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines, on the advice of the Department of Environmental Protection, is not substantial, those changes may be effected.

Proponent

The environmental conditions legally apply to the nominated proponent.

3 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister

shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

Time limit on approval

The environmental approval for the proposal is limited.

4 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority).

Procedures

1 The Department of Environmental Protection is responsible for verifying compliance with the conditions contained in this statement and for issuing formal clearance of conditions with the exception of conditions stating that the proponent shall meet the requriements of either the Minister for the Environment or any other government agency.

2 If the Department of Environmental Protection, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

10. References

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Sheppard, S. and Wells, R.K., 1987. Coral Reefs of the World, Volume 2 the Indian Ocean. United Nations Environment Program, Regional Seas Directories and Bibliographies. Nairobi, Kenya.

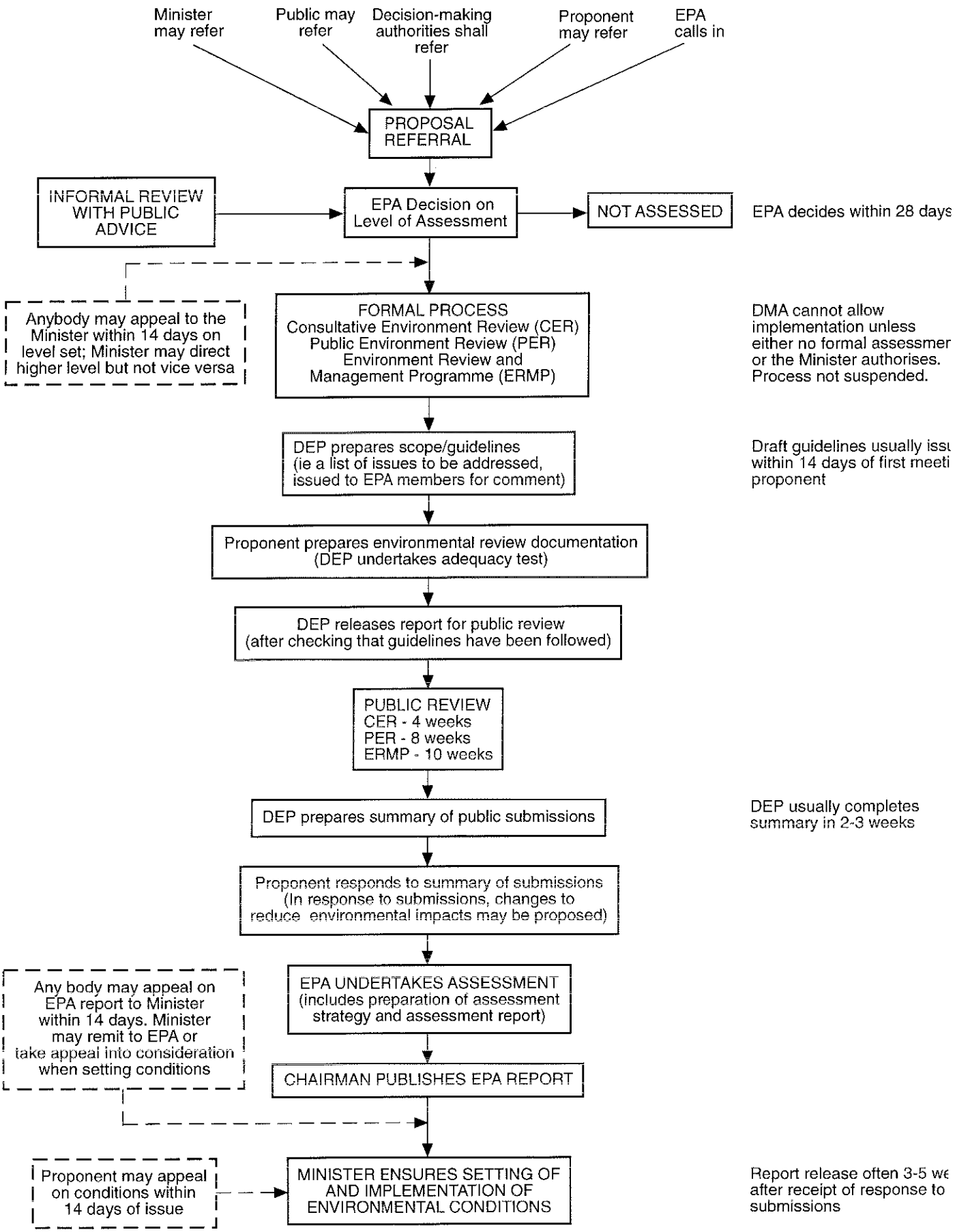
Swan, J.M., Neff, J.M. and Young, P.C., (Eds), 1994. Environmental implications of offshore oil and gas development in Australia - the findings of an independent scientific review. Australian Petroleum Exploration Association, Sydney, New South Wales.

Volkman, J.K., Miller, G.J., Revill, A.T. and Connell, D.W., 1994. Oil spills, in Environmental implications of offshore oil and gas development in Australia - the findings of an independent scientific review. Australian Petroleum Exploration Association, Sydney, New South Wales.

Appendix 1

Environmental impact assessment flow-chart

EIA PROCESS FLOW CHART



Appendix 2

Summary of submissions

Refuelling procedures	(1)	A submitter argued that the rig refuelling procedures need to be specified in more detail as follows (based on EPA Bulletin 732, WAPET Roller Development):
	(a)	rig transfer hoses should be fitted with dry break couplings
	(b)	a vacuum breaking system should be in place to drain the fuel left in the hose after the transfer back into the supply vessel tanks
	(c)	drip trays should be provided on the supply vessel and rig beneath refuelling hose connections
	(d)	suitable absorbent material should be held on the supply vessel and rig to mop up any small spills
	(e)	the entire refuelling operation should be visually monitored from the supply vessel and the rig
	(f)	transfer of fuel would take place only when the masters of the supply vessel and the rig agree that it is safe to do so, and would not take place:
	(i)	for deep water vessels, when winds are greater than 25 knots and swell in excess of one metres, and
	(ii)	for shallow water vessels, when winds are greater than 15 knots and swell in excess of 0.5 metres
		Provided that the vessel Master may postpone the transfer should he consider conditions unsuitable for its safe completion.
Suspended well	(1)	A submitter argued that, if petroleum is discovered, and the well is suspended pending further development, mariners should be notified of its location by a Notice to Mariners
Monitoring	(1)	The Western Australian Museum proposed that there should be monitoring of impacts on the Montebello barrier reef.
	(2)	Another submitter asked whether substances in suspension will impact significantly on the ecology of the Leeuwin Current and whether such impacts can be effectively monitored.
	(3)	The Australian Institute of Marine Science submitted that the environmental management plan should be more detailed as follows:
		(a) a statistically rigorous monitoring program to determine impacts on benthic marine life
		(b) ROV survey of the bottom should be carried out pre- and post-drilling
		(c) collection of baseline data on benthic fauna, such as coral reefs.
Insurance	(1)	The Fisheries Department submitted that Ampolex must have adequate insurance to cover loss of profits to the local fishing and pearling industries in the event of an oil spill.

Issue	Points raised in submissions
Conservation values	(1) The Conservation Council expressed opposition to oil drilling in the vicinity of the Montebello Islands because of the high conservation value of the area and because the area has been nominated as an A class marine reserve. (2) The Conservation Council also submitted that a management plan for the entire Montebellos area should be developed and that oil drilling should not be permitted until such a plan is finalised. (3) Another submitter noted that a key issue identified in the guidelines was the implication of the project for the proposed Montebello Islands marine reserve. The submitter expressed the opinion that: "The proponent's response to this issue falls far short of the expectation associated with such a public review exercise."
Oil spill contingency plan	(1) The Fisheries Department submitted that Ampolex must have a fully operational oil spill contingency plan in place before drilling. (2) The Conservation Council noted that the CER contains only preliminary oil spill trajectory predictions. The Council stated that it could not comment on the adequacy of the oil spill contingency plan without seeing the final trajectory predictions and that it therefore "reserves the right to comment on the contingency plan separately when it becomes available". (3) The Western Australian Museum in its report of its survey of the Montebello Islands made the following recommendations (Berry 1993, page 21, point 6): "In the event of an oil spill, contingency plans should allow for a floating boom, or other suitable equipment or procedure to be available to prevent oil entering Stephenson Passage, particularly the inner arm where there are four mangals. If this is not practical, one mangal has an entrance channel only about 8 m wide which should be easy to occlude. Occlusion should also be considered at Turtle Lagoon, Wild Wave Lagoon and Sherry Lagoon." The CER does not mention these recommendations. Could Ampolex comment on the practicalities of deploying booms to protect these sensitive areas ?
Reporting oil spills	(1) A submitter asked whether any spills of oil will be reported and whether the public will be notified of spills.

Public disclosure	(1)	A submitter argued that Ampolex's corporate environmental policy should include a public disclosure mechanism so that the company's environmental performance can be monitored by regulators and the wider community.
Wastes	(1)	Will drill cuttings and waste mud be sufficiently diluted [sic] to avoid significant environmental impacts?
	(2)	Will the waste management program be monitored by an independent authority and will results be made public?
	(3)	Will Ampolex use a conduction pipe to convey drilling wastes to the sea floor and thereby reduce turbidity ?
Environmental impact and management sections of the CER	(1)	A submitter expressed the view that "...the environmental impact and management section is treated rather casually. In the main, the ecological discussion is limited to a listing of species likely to be found generally in the Montebello area, based on the WA Museum study and personal feelings it seems." The submitter argued that the CER should have made reference to a wider range of literature and, based on this, included more information on likely ecological impacts. Finally the submitter stated that "No meaningful concern for ecosystem impacts is embodied in the project commitments, either. Other than commitment 21 regarding helicopter overflight, species and area issues are not discussed at all."

Appendix 3

Proponent's responses to submissions

Ampolex addresses below common issues with a single explanation. This may require referral to another section for the complete response. Reference numbers relate to those against each public comment in Appendix 2.

1 CONSERVATION VALUES

Ampolex agrees with the Conservation Council on the "high conservation value" of the Montebello Islands. This is acknowledged in the CER. Furthermore, Ampolex's commitments are made in the light of this conservation value.

1.1 Opposition to Drilling

Ampolex cannot really comment on the Conservation Council's opposition to drilling in this area. The Joint Venture Partners have work commitments in TP/8. The Wonnich well forms part of these long term commitments to Government.

Any decision to ban drilling in this area because of its conservation value is for Government to make. In making such decisions however, it is essential that the Government have the best possible inventory of all the natural resources (biological and economic) for the area. The energy resources from hydrocarbons in this highly prospective area constitute an essential component of this required inventory before final decisions should be made to exclude any form of land/sea use.

The petroleum industry does not accept that petroleum and conservation interests are mutually exclusive. The recent Independent Scientific Review Committee's (ISRC) report on the marine effects of the offshore petroleum industry in Australia (Swan, *et al*, 1994) supports this claim. Ampolex's recent completion of the Cycad-1 well demonstrates the high level of environmental control and minimal impact of these types of drilling operations.

In its recent publication "New Horizons in Marine Management" the Government of Western Australia commits to "full and open consultation" before an area is dedicated as a marine conservation area. The Government's principles of carrying out "biological, mineral and petroleum resource assessment" for marine reserves before they are created, is consistent with the petroleum industry and Ampolex's policy on this issue.

1.2 Proposed Montebello Marine Reserve

In response to the criticism that "the proponent's response to this issue falls short of the expectation associated with such a public review exercise" we offer the following response:

> Ampolex's proposed exploration well is consistent with the economic resource evaluation endorsed by the above (1.1) Government statement prior to such reservation.
>
> Ampolex is aware of proposals for a marine reserve in the Montebello area. However, it is not as yet Government policy as outlined in the recent document "New Horizons for Marine Management".

What is being considered for the Montebellos region is a Marine Management Area (MMA). The petroleum industry, through the Australian Petroleum Exploration Association (APEA), is already contributing to the discussions and planning in Government for this MMA.

Ampolex is aware of the public interest and calls for some form of marine conservation area in the Montebello Islands area.

Finally, the Wonnich proposal needs to be put into a realistic perspective in both the size of environmental impacts and their duration when compared to the size of the area proposed as a MMA. The CER does exactly this within the framework of the established, legislative environmental impact assessment process for Western Australia. Its conclusion is that the effects are low risk, manageable, localised and short term.

2 OIL SPILL CONTINGENCY PLANNING

2.1 Oil spill contingency plan

Ampolex concurs with the Fisheries Department. The Company will have a fully operational, Government approved oil spill contingency plan before drilling. This is a requirement under the Petroleum (Submerged Lands) Act.

2.2 Oil Spill Trajectories

Ampolex acknowledges the need for detailed, site specific trajectories. This is stated in the CER.

Ampolex is having a 3-D model developed which will give site specific trajectories for the Wonnich location which will take bathymetric effects into account.

These trajectories will be included in the oil spill contingency plan to be submitted to the WADOME for approval.

Ampolex reiterates that its prime focus is not to spill oil in the first place. This will be done by the extensive management controls that will be put in place at all interfaces where spills could occur. These have been identified in the CER.

The recent completion of Cycad-1 without incident demonstrates the competency of Ampolex and the "Ron Tappmeyer" crew in effecting these controls.

2.3 WA Museum comments on use of booms to contain an oil spill

Ampolex heeds the WA Museum comments and acknowledges the local biological importance of the areas identified.

Detailed consideration to use booms to protect the areas mentioned will be taken into account in the contingency plan. Booms are available in the immediate area (Varanus, Barrow and Thevenard), but their deployment would need to be determined under the conditions prevailing at the time of an incident.

It is important to realise that the effectiveness of booms is limited by wave height and current strength. In the latter case, they have little value in currents greater than 0.8 knots. Current strengths past the areas identified by the WA Museum often exceed this critical limit.

The principal response for maximum protection of a spill from Wonnich moving towards the Montebellos, would be the immediate application of Government approved dispersants. The objective would be to disperse the oil into the water column to obtain maximum dilution to concentrations below any environmental effect.

These issues will be fully assessed in the final oil spill contingency plan for Government approval.

3 REPORTING OF OIL SPILLS

It is a requirement of both the Schedule to the PSLA and the Environmental Protection Act, 1986 to report all oil spills (viz all possible pollution events under the latter statute).

Ampolex will certainly abide by these reporting requirements.

Further public notification would be a matter for the relevant Government authorities.

4 REFUELLING PROCEDURES

In response to the recommendation that rig refuelling procedures should be specified in more detail and in accordance with those detailed in the EPA Bulletin 732, WAPET Roller Development; Ampolex advises the following:

> The "Ron Tappmeyer" already has an established, detailed and safe refuelling procedure (see Appendix 2). This procedure has already been demonstrated as safe during the recent fuel transfer on the Cycad-1 location.
>
> The fittings on the "Ron Tappmeyer" are Evertight, Camlock fittings which are not dry break. The inherent problem with dry break couplings is that it takes high pressure to

open them (100 psi) and the hose remains full of fuel with the connection at the supply vessel end. In the event of a hose rupture this increases the risk of a spill and the loss of the full contents of the transfer hose.

The "Ron Tappmeyer" currently has a "vacuum breaking system" which allows the hose contents to drain back to the supply vessel at the completion of refuelling.

In reality, drip trays on the rig are of limited value as diesel spillage would run along the hose and would miss the drip tray. Drip trays will however be available for use in an attempt to minimise spillage. At the vessel end, the hose fitting attachment is inboard and scupper drains catch any spillage.

Adequate absorbent material is onboard the rig and supply vessels. Furthermore, all decks are scuppered to the oily water deck drainage separator.

The wind and wave criteria for the deep water vessels (they are the only ones relevant in this drilling programme) are acceptable. However the final decision on safe conditions must remain with the Master of the vessel.

In conclusion, Ampolex believes the procedures for refuelling on the "Ron Tappmeyer" are more than adequate, and have already demonstrated a capability for safe fuel transfer.

5 PROCEDURES FOR SUSPENDING THE WELL

Ampolex will indeed notify mariners of the location of the Wonnich well should it be suspended in the event of a petroleum discovery as required under legislation. This would be done by appropriate advice to and through the Department of Transport.

In the event that oil is discovered, then the following details and Appendix 3 explain how the well would be suspended in a fail safe manner for future re-entry and tie-back.

Well suspension would be in accordance with the PSLA Schedule-1990, Sections 514 and 515. Any hydrocarbon bearing zones would be effectively isolated behind a 7 inch liner with a series of mechanical and cement suspension plugs set inside the casing.

In its suspended condition, approximately 1-1.5m of 30" conductor pipe would be left sticking up above the mudline. The 13-3/8" and 9-5/8" casing strings would be backed out at their respective mudline hangers and corrosion caps with back pressure valves installed to cap each string. Exposure to release of hydrocarbons resulting from damage to the well by anchors and/or fishing nets would not be possible due to the number and location of suspension plugs. and the fact that casing strings are capped inside the 30" conductor 1.5-2m below the mudline (see figure 2).

Well re-entry would be accomplished by successively retrieving each corrosion cap and running a tie-back string of casing. Suspension plugs would then be drilled out to expose the hydrocarbon-bearing zone for further evaluation or completion work.

6 MONITORING

In addressing both these comments, the drilling of this well needs to be put into a realistic environmental perspective. This is the function of the CER document and the environmental impact assessment process. Ampolex is of the opinion that the CER presents the following perspectives regarding the environmental risk and effects.

6.1 W.A. Museum comments

The well duration is 23 days in a water depth of 27m. The location is 3km from the nearest coral reef and 8 km from the nearest landfall (Hermite Island). The area is recognised for its high background levels of turbidity due to high semi-diurnal tides, consistent wave activity and strong along-shore currents (WAM, 1993).

Against this background, the proposal is to discharge 283m^3 of drill cuttings (naturally occuring rock with a minor coating of water-based clay), and 273m^3 of specially selected, low toxicity drilling fluids over the 23 day drilling period.

In this context, there is neither the degree of environmental risk, nor the likelihood of any measurable effects that warrant the establishment of a meaningful scientific baseline.

In response to this comment, Ampolex held discussions with Dr Berry of the W.A. Museum on 13 March 1995. Dr Berry agreed that some pre and post drill aerial photography would provide an adequate record of any effects.

Ampolex will carry out aerial photography of the adjacent reef areas before and after drilling Wonnich.

6.2 Possible effects on the ecology of the Leeuwin Current

Extending the rationale and perspective above (3.6.1), we supply the following comments:

> no, the substances in suspension will not have a significant impact on the ecology of the Leeuwin Current.
>
> no, such impacts can not be effectively monitored.

The most comprehensive reference on the Leeuwin Current is Vol. 74, 1991 of the Journal of the Royal Society of Western Australia (Pearce and Walker, 1991).

The Leeuwin Current runs from at least the outer North West Shelf area of the Indian Ocean in a south westerly direction to Cape Leeuwin and hence across to Tasmania. Off North West Cape, it is broad and shallow (400km wide by 50m deep) and flows at speeds from 0.1 to 0.5m/sec. At Cape Leeuwin, the current narrows and deepens (100 km wide and more than 100 m deep) with current speeds in excess of 1.5 m/sec.

Given the range from tropical to temperate cold waters and the concomitant changes in salinity, flora, fauna and consequently ecology; it would be hard to even determine what is meant by the ecology of the current.

Clearly the 23 day discharge of approximately $0.5m^3$ per hour of inert limestone and clay, and $0.5m^3$ per hour of especially selected low toxicity water based drilling fluids, will have no measurable effect on the Leeuwin current.

6.3 AIMS SUBMISSION

6.3.1 General

In the following response to the AIMS submission, we reiterate the perspective in which this exploration well must be viewed (see Section 3.6).

This is a single short term (23 days) exploration well located in a water depth of 27m some 3km from the nearest coral reef and some 8km from the nearest land fall (Hermite Island).

The predicted impact of this well, properly managed through the nominated environmental management controls, is very small and limited to disturbance to the sea floor at the Wonnich-1 location. This disturbance will be short term with benthic re-colonisation of the area occurring in a relatively short time after removal of the rig.

This finding of the CER assessment report is supported by the exhaustive findings of the recently completed Independent Scientific Review Committee's (ISRC) report (Swan, J.M. *et al*, 1994).

In short, the predicted impact of this project in a benthic environment of unconsolidated sand/mud (extensively represented in this area), does not warrant, nor justifies the level of baseline studies and monitoring required to produce meaningful and scientifically valid results of the kind suggested by AIMS.

AIMS comments that the EMP's assessment of "marine ecosystems impacts could be more rigorous and comprehensive". In response, Ampolex advises that the CER was prepared in accordance with Guidelines prepared by and discussed with the WA DEP. These guidelines are included as Appendix 1 to the CER. They do not include a requirement to address marine ecosystems impacts, the integrated assessment of which Ampolex believes is not warranted for the short term of this project.

6.3.2 Specific Comments

AIMS raised five specific comments to the CER. Ampolex's responses to each follow:

(a) Benthic Monitoring

If this were a production well with a long term presence, then Ampolex would agree with the AIMS comment. However, such is not the case.

Our terminology in the CER in this section was not clear. Our intention of doing drop core sampling before drilling is not to provide a baseline for benthos sampling. Rather it is to confirm the substrate type.

This objective was achieved at the recent Cycad-1 well and the process will be repeated at the Wonnich-1 well location. All results yielded sand/mud substrate commonly throughout the area.

The objective of the ROV post drilling survey is to assess the seafloor impact of the rig and to ensure that no rubbish is left on the seafloor.

If there is an unexpected visual impact, then Ampolex will revert with further monitoring proposals. The results of the ISRC (Swan, J.M. *et al*, 1994) would indicate this is extremely unlikely.

(b) ROV Surveys

Ampolex agrees with this comment by AIMS and undertakes to carry out pre-and post drilling ROV surveys.

(c) Benthic Sampling

Ampolex's response to this comment is fully addressed in 3.11.2.1 above. We reiterate that our use of the words "benthic condition survey" was incorrect. Our intention was to assess substrate conditions not the associated benthos and in-fauna.

(d) Impacts on Coral Reefs

Ampolex concurs with the validity of AIM's statement. Again we respond with the perspective of this project in time and impact.

The CER (and therefore the environmental impact assessment process) assesses the risks as low and the impacts on the corals as insignificant (unless there is the unlikely event of a major oil spill).

Ampolex believes its environmental management commitments are fit for the purpose and the level of risk involved.

In the event that ongoing exploration required a significantly longer term presence at this location, then Ampolex would review the need for marine monitoring. This would be done in consultation with the appropriate Government and scientific organisations.

(e) Important Biological Attributes

Ampolex accepts and agrees with these two statements by AIMS.

Ampolex's biological assessment is largely based on the most recent and comprehensive survey and published report on the Montebellos. This is the W.A. Museum report of 1993 (WAM, 1993).

Ampolex however maintains that the CER and its environmental assessment of risk is relevant to the duration and scale of operation proposed.

7 INSURANCE

Ampolex Limited confirms that it has comprehensive covers in Third Party Liability, Corporate Insurance and a special Oil Spill Insurance Policy.

8 PUBLIC DISCLOSURE

The Ampolex environmental policy is a statement by Ampolex's Board of Directors, to its employees, to the Government regulators and to the public in general. It states generally how the Company will manage all environmental aspects of its business activities. It is a statement of principals that Ampolex will apply in planning, managing and ameliorating the environmental effects of its operations.

In this context, the policy commits Ampolex to:

> ".... meet the environmental standards imposed by all regulatory authorities..."
>
> ".... consult with government and industry bodies shaping laws and regulations on environmental matters for the petroleum industry"

In this context, Ampolex's environmental performance is already monitored by Government regulators (and therefore the "wider community") through the variety of statutes and regulations, and their associated reporting requirements.

9 WASTES

9.1 Dilution

Ampolex believes that this question is fully addressed in the CER which provides:

> the water depth
>
> the volumes of mud and drilling fluid to be discharged
>
> the duration of the well
>
> the chemical composition of the materials used (and therefore wastes produced)

A simple mathematical calculation of total drill cuttings ($267m^3$) or drilling fluids ($275m^3$) to be discharged in a water column of 27m over a duration of 23 days would yield an average hourly release of approximately 0.5m3 per hour.

Considering the benign quality of the materials, the water depth and strong local currents for mixing, and the location of the nearest coral reef (+ 3km); any further detailed analysis would be superfluous.

All drill fluid additives have been especially selected for their low ecotoxicity.

9.2 Independent Monitoring And Public Disclosure

This is a matter which Ampolex believes has been answered in 3.8 above.

9.3 Drill Waste Chute

Ampolex does not propose to use a chute (conduction pipe) to convey drilling waste to the sea floor and so reduce turbidity. This option is rejected on the following grounds:

> The amount of wastes to be discharged, the duration of discharge and the water depth into which they will be discharged, indicate that the dispersion will be quick with little turbidity effect far enough from the rig to impact on any shallow water biota. (see section 9.1 above).
>
> As documented by the West Australian Museum (Berry 1993) and reported in the CER (page 12), the waters of the Montebello Islands have high natural levels of turbidity. Consequently the fauna are adapted to these "typical, mid continental shelf" conditions and are unlikely to be affected from the small, short term input from the drilling rig.
>
> The special construction and then operation of the proposed chute from the drilling floor would add a further cost, and operation to be performed, to the drilling process. For the above reasons, Ampolex does not believe these additional costs are justified.

10 ENVIRONMENTAL IMPACT AND MANAGEMENT SECTIONS OF THE CER

Ampolex rejects the claim that "... the environmental impact and management section is treated rather casually".

Ampolex has made detailed commitments in managing all aspects of its proposed operations in such a way that there will be minimal if any impacts. Commitments regarding preventing oil/fuel spills, the proper disposal of wastes and the education and induction of workers have been considered and documented so that potential for accidents is minimised.

On this basis we reject the comment that "no meaningful concern for ecological impacts is embodied in the project commitments". On the contrary, we suggest that this comment stems from a lack of understanding of how the petroleum industry manages its environmental effects in a responsible manner.

Ampolex has addressed the environmental impact assessment by identifying all possible waste streams and all possible activities by which there could be an adverse impact on the environment. In identifying possible risks, the Company has then put the appropriate controls in place.

In this manner, the CER assesses that the impacts on the drilling location will be small and short-term. In the same context, the CER assesses that there will be no significant environmental (and ecological) effects on the Montebello Islands, 8 km away.

We note that the item relating to helicopters is Item 20 in the CER, not Item 21 as identified by the DEP.

Appendix 4

List of submitters

Government agencies

Australian Institute of Marine Science

Department of Conservation and Land Management (CALM)

Fisheries Department of Western Australian

Pilbara Development Commission

Department of Minerals and Energy

Western Australian Museum

Non-government organisations

Coastal Heritage Association of Western Australia Inc.

Conservation Council of Western Australia Inc.

Members of the public

Evans, N

Appendix 5

Proponent environmental management commitments

The following is a consolidated list of all environmental management commitments which will be audited by the Department of Environmental Protection.

1. In the event that the operations give rise to an oil spill or discharge, Ampolex will be responsible for the costs of operations conducted for the purpose of containing or treating spilt oil or cleaning up areas contaminated by such oil. It will also promptly compensate any party for damages associated with an oil spill to the extent to which they are legally entitled.

2. All personnel involved at the location will be given an induction course which will include an outline of the material in the Consultative Environmental Review Report and these Commitments.

3. Transfers of fuel from work boats to the rig at the location will only be undertaken:
   - under the direct supervision of the support vessel Master and the Reading & Bates Barge Captain;
   - in the daylight hours;
   - in suitable sea conditions, and
   - with crew of the work boat and the drilling rig constantly monitoring the operation.

4. The testing of any hydrocarbons discovered by the well will be undertaken with the initiation of first hydrocarbons to surface during daylight hours. This will be carried out using the specialist contractor's (Schlumberger) latest technology, including "Green Burners."

5. Satellite tracker buoys will be kept on the drilling rig so that in the event of a spill they can be deployed into the spill to provide 24-hour location information.

6. The well will be drilled using water-based drilling fluids with additives selected so as to minimise the toxicity of the fluids.

7. Releases of drilling fluids will only be permitted by the Ampolex representative when currents will move the resulting plume away from reefs and islands. A log of all drilling fluids and cuttings discharged to the environment will be kept .

8. Waste oil and grease from machinery will be returned to shore for recycling or disposal. A log of these wastes will be kept.

9. Solid wastes will be returned to shore for disposal in approved landfill dumps. A log of these wastes (type, amount and disposal location) will be kept.

10. Prior to drilling, and at the completion of the programme before the rig moves off location, remotely operated vehicle surveys of the ocean floor will be conducted. This will confirm that no rubbish has been left behind and will provide useful information on the seafloor area disturbed by drilling activities.

11. Helicopter pilots will fly at least one kilometre offshore from any islands in the Montebello or Lowendal groups to avoid alarming birds.

12. Work boats will stand off from islands and reefs and not permit crew access to these areas. Captains will be advised of the presence of known historical wrecks and will avoid them. Captains will avoid anchoring in areas where coral reef occurs.

13. Immediately prior to the mobilising of equipment to the location, discussions will again be held with both the Western Australian Fishing Industry Council and Morgan & Co Pty Ltd, as agreed in initial consultations.

14. Ampolex will undertake, before and after drilling, aerial photography of those coral reef areas of the Montebellos which are the closest to the Wonnich-1 well location.

15. An environmental audit of these management commitments will be undertaken by Ampolex during the drilling of the Wonnich-1 well.

16. In the event of an oil spill during the drilling of Wonnich-1 exploration well, Ampolex will take every action possible to protect the marine environmental resources of the Montebello Islands. This commitment includes the deployment of appropriate oil booms, already available in the immediate area, to protect those areas identified by the WA Museum, and other areas of high environmental priority as determined by the environmental resource maps of the area. In this commitment, it must be acknowledged that boom efficiency may have limitations by the current, wind and sea state conditions prevailing at the time.