Petrochemical Industries Company Limited

Environmental Management Program

Construction Management and Wastewater Treatment

Assessment by the
Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
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PETROCHEMICAL INDUSTRIES COMPANY LIMITED

ENVIRONMENTAL MANAGEMENT PROGRAMME

ASSESSMENT PROCESS ADOPTED BY THE
ENVIRONMENTAL PROTECTION AUTHORITY

VOLUME 1: CONSTRUCTION MANAGEMENT

VOLUME 2: (STAGE 1): WASTEWATER TREATMENT

ASSESSMENT BY THE ENVIRONMENTAL PROTECTION AUTHORITY

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PETROCHEMICAL INDUSTRIES COMPANY LIMITED

ENVIRONMENTAL MANAGEMENT PROGRAMME

ASSESSMENT PROCESS ADOPTED BY THE ENVIRONMENTAL PROTECTION AUTHORITY

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Assessment process adopted by the Environmental Protection Authority.

1. SUMMARY

Outlined below is the assessment process adopted by the Environmental Protection Authority for the Petrochemical Industries Company Limited proposed petrochemical plant. The process adopted by the Authority results from the "fast track" nature, and the complexity and the scale of the project. The Authority initially required an Environmental Review and Management Programme, which was assessed in 1988. As a result of that assessment, the company was required to develop an Environmental Management Programme, to outline further decision-making and developments in the project, and give sufficient details for environmental assessment.

This document outlines the current status of the assessment, and the anticipated timetable for assessment of the Environmental Management Programme.

2. BRIEF DESCRIPTION OF PROPOSAL

Petrochemical Industries Company Limited (PICL) proposes to establish an integrated petrochemical complex in the Kwinana industrial area. The facility will utilise natural gas and salt to produce a range of products. Associated with, but separate from, the PICL proposal, is a proposal by Wesfarmers LPG Pty Ltd, to modify the liquified petroleum gas extraction plant to extract ethane from natural gas. The ethane is to be supplied to PICL as feedstock and is to be stored on the PICL site.

The proposed PICL facility consists of three chemical plants:

- a chlor-alkali plant which will utilise salt and electricity to produce chlorine, caustic soda and hydrogen;
- an ethylene plant, which will use ethane feedstock;
- an ethylene dichloride/vinyl chloride monomer plant, which will react ethylene and chlorine to form ethylene dichloride (EDC). The EDC is then cracked to form vinyl chloride monomer (VCM).

There is also a potential for a polyvinyl chloride (PVC) facility to be established on site.

Virtually all chlorine will be used to make ethylene dichloride. Caustic soda will be sold locally for use in the bauxite refining process, and hydrogen will be used for fuel and further processing.

The final product mix of EDC, VCM and PVC has not yet been determined.

3. ASSESSMENT PROCESS FOR THE PROPOSAL

The proponent submitted a Notice of Intent to the Environmental Protection Authority in March 1987, indicating the nature and scope of the project. The Authority subsequently determined that an Environmental Review and Management Programme (ERMP),and a Preliminary Risk Analysis were required in order to adequately assess the proposal. The Authority also determined that a Notice of Intent (NOI) was required from Wesfarmers LPG Pty Ltd in respect of the expansion of the LPG facility to extract ethane. The ERMP and the NOI were published together in the same document.

The documentation (ERMP, NOI and Preliminary Risk Analysis) was released for a ten week public review period, commencing 2 December 1987 and ending 10 February 1988. The Authority received 23 submissions.

A set of questions seeking clarification and/or further information from the proponent was developed after considering the issues identified in the ERMP, the preliminary risk analysis and the public submissions, and forwarded to the proponent for response. The responses as well as other information provided by the proponent, the submissions and the EPA's own investigations enabled the Authority to assess the project. In carrying out its assessment, the Authority sought information from a variety of sources, including the United States Environmental Protection Agency, the Victorian Environment Protection Authority and the NSW State Pollution Control Commission. In addition, the Chairman of the Authority visited an EDC/VCM plant near Houston, Texas, and two officers of the Authority visited polyvinyl chloride manufacturing plants in Victoria and the ICI complex in Botany NSW.

4. NEED FOR PROGRESSIVE ENVIRONMENTAL ASSESSMENT

At the time the ERMP was prepared, the proponent had not made decisions on specific technologies for the ethylene plant, or the chlor-alkali plant. The proponent had made a tentative decision about the process for the EDC/VCM plant. Decisions about some other issues such as water sourcing, and waste disposal, also had not been made.

Decisions on some of the above aspects were incorporated in the responses given by the proponent. Some decisions, however,were still outstanding, resulting in the need for further assessment of specific aspects of the project. In the case of major developments, such as the PICL project, it is a common practice for the EPA to report on the overall environmental acceptability of such projects. This is then followed by a requirement for further assessment of outstanding components of the projects when more details become available. This information is submitted to the EPA in the form of an Environmental Management Programme.

In addition, the Pollution Control requirements of the Environmental Protection Act provide a further opportunity for detailed examination of plant safeguards and emission controls.

This sequential environmental assessment and approval process was adopted for this project and the Recommendations made in the Assessment Report (EPA Bulletin 331) were framed in this context.

The scope and quantity of information required from the proponent in order for EPA to carry out the assessment has been and is extensive. In early 1988, EPA suggested to the proponent that, in view of the complexity of the project, and the need for as high a degree of safety as possible, and the ongoing decision making that was occurring in respect of the scope of the project, a second opinion on the risks and hazards associated with the proposal was required. The company accordingly engaged another risk consultant, to give a second opinion on preliminary risks and hazards. The Authority based its assessment of the plant on the nominated plant capacities in the latter report, as these were in some cases larger than those in the ERMP, and took account of some on-going decision making by PICL in terms of plant capacity. In the past, the Authority has required verifications of preliminary risk analyses. The second study resulted in individual risk contours which were similar to those generated in the initial risk assessment.

The EPA's recommendations and subsequent conditions set by the Minister for Environment required the proponent to submit an Environmental Management Programme (EMP) to the Authority. The EMP was to outline in detail the following aspects:

. salt supply and storage;

. construction stage impacts;

. commissioning stage impacts;

. organochlorine waste treatment and disposal

. aqueous waste treatment and disposal

. disposal of polymeric and caustic materials;

. disposal of solid and tarry wastes;

. air quality;

. VCM emissions; and

. export operations.

After assessment of the EMP, further appropriate environmental requirements would be established, which would be in addition to the conditions already set by the Minister for Environment, following the initial assessment of the project.

The EPA stated in its Assessment Report that certain components of the EMP would be released for public comment prior to the completion of the Assessment of the EMP. In all cases, EMP components and the EPA's assessment of them were to be released for public information.

The EPA has since determined that all components of the EMP will be released publicly, although on different time scales and in different ways, depending on the EPA's view of public interest in the particular components.

The Authority has also requested PICL to provide details of design changes which have occurred since the proposal was assessed in 1988.

5. PROPONENT'S RESPONSE TO EPA'S REQUIREMENTS FOR EMP

The proponent has suggested that the EMP be developed in the following "volumes":

1. Construction management;
2. Wastewater treatment (two stages);
3. Organochlorine waste treatment;
4. Treatment of caustic, tar and cleaning wastes;
5. Air quality;
6. Salt supply;
7. Export operations;
8. Implications of design changes; and
9. Commissioning.

As these volumes include all of the requirements in the Minister's conditions, as well as a description of design changes to the proposed plant, the Authority found this suggestion to be acceptable.

6. ASSESSMENT OF THE EMP

As noted above, the Authority has determined that all volumes of the EMP will have some form of public distribution prior to assessment by the Authority.

Volume 1 (Construction Management) and Stage 1 of Volume 2 (Wastewater treatment) were released to relevant agencies and public interest groups for a period in excess of two weeks.

Volumes 3, 4, 5, 8 and possibly 6 and 7 will be produced by the company in June. The EPA requires that they be produced in a single document, which will be released for public review for an eight week period. The Authority will then assess the documents.

Stage 1 of Volume 2 outlines the broad principles of wastewater disposal (and water sourcing) which PICL intends to adopt. The details of wastewater disposal will be outlined in Stage 2 of Volume 2 in August. Commissioning impacts will be outlined in Volume 9, due much closer to commissioning of the plant.

The expected programme is detailed in the table below.

EMP Volume	(Expected) Receipt by EPA	Public Comment	EPA assessment finalisation
1. Construction Management	14 Feb	closed 3 March	9 March
2. Wastewater (Stage 1)	16 Feb	closed 3 March	9 March
3. OC waste treatment 4. Other wastes 5. Air quality 8. Design changes	June	8 Weeks (full public release)	September/ October
6. Salt supply	June		
7. Export operations	June		
2. Wastewater (Stage 2) 9. Commissioning	August 1990/1991		

Should the company propose a polyvinyl chloride plant, then this will be subject to separate assessment, possibly via a Public Environment Report.

7. OUTCOMES OF ASSESSMENT OF EMP

As a result of assessment of the EMP, the Authority will impose further requirements on the company. These requirements will be imposed through the works approval and licensing procedures under Part V of the Environmental Protection Act 1986.

The Authority will issue separate works approvals for the civil and mechanical construction phases of the project, and one licence for the whole facility.

PETROCHEMICAL INDUSTRIES COMPANY LIMITED

ENVIRONMENTAL MANAGEMENT PROGRAMME

VOLUME 1. CONSTRUCTION MANAGEMENT

ASSESSMENT BY THE ENVIRONMENTAL PROTECTION AUTHORITY

CONTENTS

APPENDICES

1. SUMMARY

Petrochemical Industries Company Limited have submitted Volume 1 of the Environmental Management Programme for assessment by the Environmental Protection Authority. Volume 1 deals with management of environmental issues resulting from construction activities.

The Authority considers that the proposals put forward by the company for management of vegetation, dust, noise, wastes, vehicle parking, equipment servicing, and workforce facilities to be acceptable.

Further information needs to be supplied on road access/egress requirements, and on-site and off-site emergency planning and response issues. The Authority considers that these issues are appropriately dealt with in a manner which reflects the increasing complexity of construction activities as construction proceeds.

2. INTRODUCTION

Volume 1 of the Environmental Management Programme deals with construction management. The particular issues dealt with include scheduling, workforce requirements, initial site preparation and construction activities.

3. ASSESSMENT PROCESS

Volume 1 of the Environmental Management Programme (EMP) was finalised by Petrochemical Industries Company Limited (PICL) and made available to the Environmental Protection Authority on 14 March. Copies were distributed by the Authority to relevant agencies and interest groups on that day. Copies were also distributed to several other groups subsequently. A full distribution list is at Appendix 1. The Authority required any comments, either written, or via the telephone, to be made by 3 March, so that it could finalise its report on 9 March 1989.

Written submissions were received from ten groups and agencies and telephone comments from three agencies. Those who made submissions and comments are listed in Appendix 2.

4. CONSTRUCTION PROPOSAL

Volume 1 of the EMP describes, in general terms, the constraints that PICL will observe during the construction period. The initial "civil" construction requirements (roads, concrete slabs, other infrastructure) can be put in place prior to completion of the design of the particular plants (ethylene, chlor-alkali, ethylene dichloride/vinyl chloride monomer, and perhaps polyvinyl chloride facilities). Volume 1 applies to all construction activities, but Volume 8, which outlines the implications of design changes since the original assessment of 1988, will go into more detail on specific mechanical site construction requirements. In assessing the latter, the Authority will be in a position to "fine tune" its construction stage requirements.

5. CONSTRUCTION SCHEDULE

The schedule for construction outlined by PICL is very "tight". Civil construction is planned to commence in April 1989 and be completed in May 1991, after which pre-commissioning activities will extend the commencement of operations to January 1992.

During this period, workforce levels are expected to build up progressively from April 1989 to a peak in May 1991 of 1000-2000, with a rapid decline upon completion of the principal construction activities in October 1991.

Volume 1 outlines the environmental impacts which will occur as a result of this construction activity.

In this assessment, the Authority has also taken cognisance of the effects of neighbouring activities, particularly the Cooljarloo Joint Venture pigment plant, which will be located immediately south of the PICL site. This is particularly so in relation to traffic and emergency procedures.

6. INITIAL SITE PREPARATION

Volume 1 of the EMP outlines PICL's proposals for initial site preparation in terms of:

- removal and protection of vegetation;
- earthworks and equipment;
- dust control;
- noise;
- traffic estimates;
- on site vehicle parking and servicing;
- workforce facilities;
- site drainage; and
- waste disposal.

Apart from vegetation and earthworks, all the above elements are also applicable to actual construction.

The Environmental Protection Authority regards initial site preparation activities as construction activities.

6.1 VEGETATION

PICL proposes that vegetation will not be removed unless necessary, as it will be effective in mitigating the effects of dust. In addition, the rows of trees already planted along the eastern and northern boundaries of the site are to be retained except where access roads are required.

Several references throughout the document are made to landscape planning. The EPA considers that landscape planning and management will enhance the appearance of the complex. Commitment 7.9 in the ERMP also refers to a landscape plan.

REQUIREMENT

The Environmental Protection Authority requires that PICL develop a landscape management plan for the construction phase, to be submitted within 2 months of commencement of construction, and to be to the satisfaction of the Environmental Protection Authority.

6.2 EARTHWORKS AND EQUIPMENT

PICL proposes that construction be on a 6 day per week basis. The Authority considers this to be acceptable, as long as dust and noise generation are within limits acceptable to the Authority and the local council.

6.3 DUST

PICL have made a commitment to comply with the requirements of the EPA Pollution Control Division on dust controls and ambient dust levels. The Authority finds this acceptable, and will ensure that the appropriate provisions are written into the works approval.

For dust control, PICL propose that (on-site) roads be sprayed with an appropriate agent. One section of Volume 1 indicates that oil will be used. The agent chosen must be such that no detrimental effects on the local environment will occur. The degraded environment of the site means that the use of oil emulsions would be acceptable. However should large quantities of oil result from servicing operations, off-site sale for recycling would be more appropriate.

6.4 NOISE

A noise study carried out for PICL concludes that construction noise is unlikely to cause annoyance in the Hope Valley residential area, which is most susceptible to noise pollution from the industrial area. The consultant suggests that equipment be tested prior to commencing work on site to ensure compliance with the levels used in the consultant's assessment. PICL have made a commitment to engage a noise consultant to assess general on-site noise levels, sound pressure levels of equipment and construction activities, and received noise levels at Hope Valley. These measurements will be made before and during construction.

The EPA finds the study and the commitment acceptable.

REQUIREMENT

The Environmental Protection Authority requires the proponent to provide details of its initial noise level assessment to the Authority prior to construction commencing.

The Authority also requires noise monitoring reports to be included in the regular 6 monthly reports which are to be provided to the Authority.

6.5 VEHICLE PARKING, EQUIPMENT SERVICING, WORKFORCE FACILITIES

The Authority considers that PICL's proposals for vehicle parking, equipment servicing and workforce facilities to be acceptable. The specific location of car parks, and therefore their access/egress points will impact on traffic flows in the different parts of Mason Road. This will have ramifications for the effectiveness of new roads into the area. PICL should take cognisance of this factor in planning their car parking requirements.

6.6 SITE DRAINAGE

PICL propose to construct V-drains, which will direct storm-water run-off from large compacted areas to soakage sumps which will later become part of the permanent drainage system. As there will be no requirements for hazardous chemicals on-site during construction, the Authority considers this proposal to be acceptable.

6.7 WASTE DISPOSAL

The proponent proposes to dispose of various waste steams:

Non-reusable vegetation is to be stockpiled and burnt on site. This should only occur if conditions are appropriate, and approval has been obtained from the local council.

It is proposed to remove "minor rubbish" to an approved landfill site. Health Department and local council advice should be sought by PICL on appropriate methods of disposal prior to disposal by such methods.

Waste oil is proposed to be used for dust control.

Dependent on quantities, off site sale of used oil for recycling could be more appropriate.

REQUIREMENT

The Environmental Protection Authority requires the proponent to liaise with the Health Department of Western Australia and the Town of Kwinana to ensure appropriate waste disposal procedures are utilised.

7. PLANT CONSTRUCTION

The issues discussed under "Initial Site Preparation" are also pertinent during the actual construction phase. For this reason, the following topics will not be discussed again:

- earthworks and equipment;
- dust control;
- vehicle parking and equipment;
- workforce facilities; and
- site drainage.

The aspects discussed below are noise, waste disposal, traffic issues and emergency planning requirements.

7.1 NOISE

Apart from the noise requirements outlined previously, hydraulic testing of pipes will be used, rather than pneumatic testing, which is extremely noisy. PICL have made a commitment in this regard, which the Authority considers acceptable.

7.2 WASTE DISPOSAL

Volume 1 of the EMP identifies a scrap metal waste stream additional to the general rubbish identified in the site preparation stage. PICL propose to dispose of this material to scrap metal merchants. Should any further waste streams be identified during construction, they are to be disposed of in a manner acceptable to the Health Department and the local council.

8. TRAFFIC

Road traffic will be an important factor in the construction phase, given the sustained high workforce levels, particularly in 1990 and 1991 (estimates range from 600 (minimum) to 2000 (maximum)). A build-up will occur during 1989. The PICL workforce will add to the traffic which already uses Mason Road, ie workforces for other industry located off Mason Road, as well as service vehicles and trucks carrying product (eg LPG).

These measures include ensuring that existing roads have sufficient capacity to meet expected demand, as well as examining possibilities for constructing new roads, in order to reduce demand on Mason Road. In the initial stages of construction, it is expected that existing capacity will be sufficient to meet requirements. However this will change as workforce levels increase markedly during 1990.

There is a need to manage traffic in the area for two reasons: road safety, and in case of an emergency. For road safety, the traffic can be managed by (for example) staggering shift times, upgrading existing roads and infrastructure, or modifying the road system.

The Main Roads Department in its submission indicated that it proposed to realign the intersections of Mason Road and Mandurah Road with Rockingham Road, such that one intersection with traffic lights would result. This would provide control of the traffic entering and leaving Rockingham Road. It is not likely to solve the issue of large traffic volumes (at particular times of the day) on Mason Road. Potential solutions for the latter problem include staggering shift times (on the PICL site, and in conjunction with other industries), and building extra access roads.

It is expected that site clearing activities for the proposed titanium dioxide pigment plant at Kwinana (immediately adjacent to the PICL site), will commence in August 1989, with mechanical construction commencing in November 1989.

It would appear that given the requirements of both the pigment plant and the PICL project, there will be large overlap of construction periods, and moreover, the scope for staggering shifts will be severely limited. This indicates that the principal emphasis will have to be on upgrading of roads, and an improvement in the road system. Practical considerations mean that this should happen in a staged manner.

The Authority is aware of the roads study coordinated by the Department of Resources Development to investigate this issue. In addition, the Kwinana Integrated Emergency Management System (KIEMS), coordinated by the State Emergency Service, has recently been established. The latter scheme will review emergency management requirements in the Kwinana industrial area, including access and egress. A number of submissions to the Authority have outlined the urgency of improving road access to facilities serviced by Mason Road. The Authority agrees with these comments, particularly given that it first highlighted these issues in its assessment of the ammonia/urea plant proposal in 1987.

Given that major physical improvements in the road system will not be feasible, nor necessary, until 1990, EPA considers that a staged approach is acceptable.

It would be appropriate for interim arrangements for road access and egress to PICL (and adjacent sites) to be developed as soon as possible. Such arrangements (in conjunction with off-site emergency planning and response requirements) can be developed readily in a "round table conference" format with relevant government agencies. Such a meeting should be convened by the Mines Department. The outcomes of the meeting would enable the company to develop an interim plan for road access and egress.

REQUIREMENT

The Environmental Protection Authority requires that PICL specify interim road access and egress arrangements for their site to the satisfaction of the Authority, prior to commencement of construction.

9. EMERGENCY PLANNING AND RESPONSE

The proponent put forward some ideas for emergency planning and response in Volume 1, and acknowledges the need for close cooperation with other industrial facilities in the area, and emergency response organisations.

The potential emergency situations that could arise during construction would be accidental releases of chlorine or ammonia from the CSBP facilities, chlorine from the pigment plant (should it be built and commissioned prior to completion of PICL construction activities) or flammable gas releases from CSBP or the BP refinery. Such releases, although of very small probability, must be allowed for in emergency planning for the industrial area. These incidents do not have any credible effects in areas beyond the industrial area.

The Mines Department considers that there is a need for provision of gas shelters, as has been arranged for the workforce on the silicon smelter construction, adjacent to a facility using chlorine gas at Kemerton. Gas shelters would allow workers to muster during the short duration of a toxic gas release. A site specific emergency management plan should be developed prior to commencement of construction. The plan should outline:

- the types of emergencies which could occur;
- alarm initiation;
- communications; and
- equipment requirements.

The communication systems should be tested prior to commencement of construction and at regular intervals thereafter.

The Authority agrees with this suggestion, and considers that the plan should also delineate roles and responsibilities of designated individuals. The plan should also integrate with site infrastructure, ensuring that sufficient points of egress from the site are in place, in case of emergencies which require evacuation. Provision for access by emergency services is also required. The plan may be developed in stages according to the extent and nature of the construction activities on site. Initially, the requirements of the plan will relate to the small workforce on site, but have the capacity to become more extensive as the site and complexity of activities increases. The plan should be developed to the standards required by the relevant government agencies.

REQUIREMENT

The Environmental Protection Authority requires the proponent to develop a site emergency plan for the construction phase. The plan should be submitted to the Environmental Protection Authority prior to commencement of construction, and be to the satisfaction of the Mines Department and DOSHWA. The plan is to be updated every six months to take account of the changing nature of the construction phase. The updates are to be to the satisfaction of the Mines Department and DOSHWA.

10. OFFSITE EMERGENCY PLANNING AND RESPONSE

Offsite emergency planning and response arrangements are to be developed by the Kwinana Integrated Emergency Management System (KIEMS). These arrangements will include the road system requirements already mentioned, as well as communications and equipment requirements. The KIEMS will interact with companies (who are responsible for the development of their own on-site plans) to ensure the optimum level of coordination for managing total area responses to emergencies. This regional planning and response system is to meet the standards required by the agencies represented on KIEMS.

REQUIREMENT

The Environmental Protection Authority requires that KIEMS specify, off-site emergency response requirements specific to the operations of PICL. The initial specifications should be prior to the commencement of construction. These requirements are to be commensurate with the nature and scale of activities on the PICL site, and are to be to the satisfaction of the agencies represented on the KIEMS Working Group.

11. APPLICATION OF EPA REQUIREMENTS ON PETROCHEMICAL INDUSTRIES COMPANY LIMITED AND THEIR CONSTRUCTION CONTRACTORS

The proponents for the project (PICL) are the party responsible for the project, and have been nominated under Section 38 (6) of the Environmental Protection Act 1986.

The construction will be carried out by JEA - Clough, who as principal contractors, will be responsible for site management during construction, and for implementation of environmental management requirements. PICL have stated in the EMP (p 7) that the contractors (JEA Clough) are responsible to PICL, who are in turn responsible to EPA for environmental management. PICL have also stated that they will ensure compliance with the EMP. The Authority will require compliance not only with the commitments in the EMP, but also with the requirements which EPA sets in this assessment report.

12. APPLICATION OF PART V OF THE ENVIRONMENTAL PROTECTION ACT 1986

Part V of the Environmental Protection Act 1986, deals with pollution control, and the issuance of works approvals and licences. Works approvals are issued in order to allow construction to proceed, and licences allow operation. Each usually has conditions attached. The conditions on each are compatible with the outcomes of environmental impact assessment (and any following assessments, such as that of an EMP). Other conditions may be imposed as a result of assessment of project details by the Pollution Control Division of the Authority.

For this project the Authority will issue separate works approvals for each major part of the construction phase, viz:

- civil construction
- construction of the plant facilities (mechanical construction)

Should a proposal for a polyvinyl chloride plant be put to the Authority, it will undergo separate environmental impact assessment by the EPA, setting of conditions by the Minister for Environment, and works approval and licensing by the EPA.

One licence will be issued for the plant.

DISTRIBUTION LIST FOR VOLUME 1 (CONSTRUCTION MANAGEMENT) OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

Health Department of WA
Main Roads Department
Department of Mines
Department of Occupational Health Safety and Welfare
Police Department
Department of Resources Development
State Emergency Service
State Energy Commission
Water Authority of WA

Australian Conservation Foundation
City of Cockburn
Conservation Council of WA
Environment and Community Task Force
Ms J Keily, Statewide Network of Action Groups
Kwinana Progress Association
Town of Kwinana
Mr P Llewellyn, WA Green Party
Petrochemical Project Team (Mayor of Kwinana, Chairman)
Pollution Action Network
Rockingham City Council
Wattleup Citizens' Association

APPENDIX 2

LIST OF SUBMISSIONS RECEIVED ON VOLUME 1 (CONSTRUCTION MANAGEMENT) OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

Written Submissions

Main Roads Department
Department of Mines
Police Department
Department of Resources Development
Water Authority of WA
City of Cockburn
Statewide Network of Action Groups
Town of Kwinana
Pollution Action Network
Wattleup Citizens' Association

Comments by Telephone

Health Department of WA
Department of Occupational Health Safety and Welfare
State Energy Commission

PETROCHEMICAL INDUSTRIES COMPANY LIMITED

ENVIRONMENTAL MANAGEMENT PROGRAM

VOLUME 2 (STAGE 1) WASTEWATER DISPOSAL

ASSESSMENT BY THE ENVIRONMENTAL PROTECTION AUTHORITY

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APPENDICES

1. SUMMARY

Volume 2 of the Environmental Management Programme outlines in broad terms the proposals by Petrochemical Industries Company Limited for water supply and disposal. it also includes a timetable for the further development of these proposals, which will culminate in a second stage of Volume 2, to be presented to the Environmental Protection Authority in August 1989.

The company have made a commitment to utilise treated sewage from the Woodman Point facility for cooling purposes, and to carry out further feasibility work to determine the suitability of such water for process requirements. The Authority considers this to be a major step towards water conservation in Western Australia and commends the company for its approach. This approach will mean that the impacts on future development of water sources will not be as great as they would otherwise be. In addition, the effective recycling of treated sewage water contributes to conservation of the scarce water resource.

A number of the submissions supported this initiative of PICL.

The Authority expects the proponent to include further details on waste water discharge streams in Stage 2 of Volume 2, to enable assessment of the actual proposals.

The company propose to dispose of their wastewater streams via pipeline to ocean, possibly making use of the Water Authority's Cape Peron outfall. In its initial assessment, the Authority considered that the beneficial uses of the ocean outfall area should not be affected by industrial effluent (PICL's effluent in this case). The Authority holds to this view, and it will be essential for the company to show that it will be able to meet discharge criteria from its site which will enable the Water Authority to meet the EPA's requirement in the ocean outfall area.

2. INTRODUCTION

Volume 2 of the Environmental Management Programme deals with wastewater disposal. Due to the interrelationships between water sourcing and water supply, both are referred to in the document. Given that important decisions by Government agencies regarding both sources and disposal of water are still under consideration, Volume 2 has been divided into two stages. Stage 1 deals with conceptual requirements, whereas Stage 2 (due in August 1989) will include details of operational proposals. In Stage 1, PICL discusses options for sourcing and disposal, makes commitments in relation thereto, and proposes a timetable for further developments. PICL seeks in principle approval for its plans.

3. ASSESSMENT PROCESS

Stage 1 of Volume 2 of the Environmental Management Program (EMP) was finalised by Petrochemical Industries Company Limited (PICL), and made available to the Environmental Protection Authority on 16 March. Copies were distributed by the Authority to relevant agencies and interest groups on that day. Copies were also subsequently distributed to several other groups. A complete distribution list is at Appendix 1. The Authority required that any comments, either written or via telephone, be made by 3 March, so that it could finalise its assessment on 9 March 1989.

Written submissions were received from six groups and agencies, and telephone comments from one agency. Those who made submissions and comments are listed at Appendix 2.

4. CONTENTS OF EMP VOLUME 2

Stage 1 of Volume 2 of the EMP not only outlines a programme for further submissions by PICL to the Authority on wastewater, but also describes the various wastewater streams which will emanate from the plant, and canvasses the various water supply options. Water supply options are described because of the major effects the choice of supply will have on treatment options prior to discharge as wastewater.

5. PLANNING AND DESIGN TIMETABLES FOR WATER SUPPLY AND DISPOSAL

PICL has proposed the following timetable for development of water supply planning and design in the form of a commitment:

"(1) Initial Planning Study

This study examines various options for water supply for cooling, process and potable requirements and has provided the basis for policy decision by PICL. It will be submitted to EPA/WAWA in February 1989.

(2) Process Air Cooling Reports

The various process designers associated with PICL have been asked to examine the potential for air cooling of process units in order to reduce the requirement for cooling water. This information will be incorporated in the Water Supply Design Concept Study.

(3) Water Supply Design Concept Study

Following analysis of the initial Planning Study by PICL, EPA and WAWA the design concept for water supply will be developed. This will include detailed planning for sewage water treatment. The Design Concept will be submitted to EPA/WAWA in July 1989.

(4) Environmental Management Plan

Information on water supply and Woodman Point sewage treatment will be incorporated in the wastewater treatment EMP to be submitted to EPA/WAWA for formal assessment in August 1989.

(5) Detailed design

Detailed design of water supply will occur after formal assessment of the EMP, and is scheduled for completion by February 1990.

(6) Government Sewage Water Treatment Study

This study is being coordinated by the Department of Resources Development and is due for completion by May 1989. This will enable relevant aspects to be included in the PICL Design Concept Study".

The Authority considers that this schedule is acceptable.

The initial planning study has been submitted to the Authority for consideration. The findings of this planning study have been incorporated into this stage of the EMP.

Stage 2 of the wastewater EMP volume (due in August 1989) must include sufficient technical detail for a technical feasibility evaluation by the Authority and the Water Authority of WA.

The Authority considers that the State Government study on sourcing (and potential recycling) of industrial water in the Kwinana area is of major importance in a regional sense. It is also directly pertinent to the water supply and disposal situation for PICL. The Authority concurs with PICL that pertinent aspects of the study should be incorporated into PICL's design concept study, and Stage 2 Volume 2 of the EMP.

PICL has proposed, in the form of a commitment, the following schedule for wastewater treatment planning and design:

"(1) Initial Planning Study

This study will review the various proposals for wastewater treatment the process designers and contractors associated with the chlor-alkali, ethylene and EDC/VCM plants with a view to integration and optimisation of those proposals. It will be presented to EPA/WAWA in March 1989.

(2) Design Concept

Following analysis of the Initial Planning Study by PICL, EPA and WAWA, the concept design of the actual treatment system will be developed as a basis for preparation of tenders. The design concept will include final choice of the means and site of disposal of treated wastes. The site will be at sea rather than into Cockburn Sound, with discharge via the existing Cape Peron pipeline or a new pipeline. The design concept will be submitted to EPA/WAWA in July 1989.

(3) Environmental Management Plan

Following general acceptance of the Design Concept the second stage of the EMP on wastewater treatment will be prepared for formal submission and review. The EMP will also include information on water supply which will also be at the design concept stage.

It is anticipated that the EMP will be submitted in August 1989.

(4) Detailed Design

Detailed design of the wastewater treatment system will proceed on the basis of the approved design concept with a target date for completion in February 1990."

There are obvious parallels between this schedule and that for water supply.

The Authority considers that this schedule is also appropriate.

REQUIREMENT

The Authority requires Stage 2 Volume 2 of the EMP to include technical details of waste streams, including their compositions, treatment processes, design specifications and expected water quality after treatment, flow rates and mass balances. In addition, the proponent should address the issues of odour control, chlorination, and potential public health issues arising from aerosol formation in cooling towers. This will ensure that a technical evaluation can be carried out by both the Authority and the Water Authority of WA. This requirement does not preclude further technical assessment at the detailed design stage.

6. WATER SUPPLY OPTIONS

The document canvasses the various water supply options, which are:

- mains water;
- bore water;
- Woodman Point effluent treated to either secondary or tertiary standard;
- Jandakot mound surface water (near Lake Thomson);
- seawater; and
- seawater desalination.

6.1 MAINS WATER

Mains water offers the most straightforward option, given reliability of supply and known price. PICL expresses concern at WAWA policy which requires review of the supply after 5 years. The Water Authority states that such a review is intended to keep other potential sources under review.

Other issues identified by PICL include potential political concerns should an extended number of dry years occur in the future. Furthermore, proposed industries in Kwinana (ie PICL and the Cooljarloo Joint Venture Pigment Plant), if supplied by mains, could take quantities of water equivalent to the capacity of the proposed North Dandalup dam.

Whilst it may not be feasible to directly attribute the water supply in any one particular catchment to the needs of particular companies, it is clear that mains supply will impact on the Water Authority's supply programme. Whilst the supply to PICL (and the pigment plant) may be only a small percentage of total water supply, it forms a much larger proportion of future supply options which could be developed in the short term. The Authority is particularly concerned to see that the environmental impacts of water supply engineering projects are minimised. Slowing down the supply requirements for the metropolitan area, and encouraging better use of the resources already in place, obviously have a major influence in reducing the impacts mentioned above.

Mains water quality will be required for process requirements.

6.2 BORE WATER

PICL has examined the use of bore water as a supplement to other sources. Its high salinity and temperature means that it cannot be used by itself, because of corrosion problems. These factors also mean that the economics are against its use for cooling. PICL is considering using this water as a source for dissolution of salt to make brine (for the chlor alkali process),

as the salinity and the temperature are conducive to this. This water supply would be subject to a licence issued under the Metropolitan Water Supply Sewerage and Drainage Act 1909. There are few existing users in the region. The allocation in the licence would be subject to on-going monitoring. Any unacceptable impacts (which are unlikely) would lead to review by WAWA of the allocation under the licence.

6.3 WOODMAN POINT EFFLUENT

Although there are cost and technical disincentives to using treated Woodman Point effluent, PICL has decided to use this source for cooling purposes. The negative aspect of utilising mains water for all purposes on the site (mentioned above under Mains Water) do not apply if this option is utilised.

Because of the highly positive aspects of this proposal for water supply and conservation, the Authority is highly supportive of this choice. Requirements such as odour control, chlorination and potential public health issues arising from aerosol formation in cooling towers, which will exist over and above the treatment requirements for other water sources, need to be addressed in detail in Stage 2 Volume 2 of the EMP.

6.4 JANDAKOT SURFACE WATER

It has been proposed by the State Planning Commission to intercept up to 4.4 Mm^3/a of nutrient enriched ground water from near Thomson Lake on the Jandakot Mound. The seasonality and low quality of this water, and the hypothetical nature of this proposal led PICL to reject it.

6.5 SEAWATER AND SEAWATER DESALINATION

Cost and ecosystem impacts have led to PICL rejecting these options.

7. PROPONENT'S POLICY ON WATER SUPPLY

The company states that their policy for water supply is:

"(1) restriction of mains water use to potable requirements for the workforce and possibly process requirements and steam generation, see (3) below;

(2) uses of bore water from the Yarragadee aquifer for salt dissolution for the chlor-alkali plant; and

(3) use of treated Woodman Point effluent for cooling purposes, and possibly process and steam generation requirements. The effluent will require tertiary treatment in order to be suitable for process and steam generation requirements and this involves significant costs. A cost-benefit analysis by PICL is still in progress and a final choice between effluent and mains water for these purposes is yet to be made".

The Environmental Protection Authority considers this policy to be acceptable, subject to:

- further details being provided in Stage 2 of Volume 2 of the EMP; and
- these details ensuring that the proposal is environmentally acceptable.

The state government study on sourcing and recycling of industrial water in the Kwinana area is expected to analyse the Woodman Point option in some depth.

8. WATER DISPOSAL OPTIONS

The document canvasses the aqueous waste streams which will be derived from the plant, viz:

- uncontaminated rainwater run-off;
- potentially contaminated rainwater;
- contaminated process wastes;
- cooling water blow down and demineraliser backwash; and
- sanitary sewage.

Treatment and disposal of each of the above waste streams is outlined. It is not feasible to give an assessment for each waste stream, as there is insufficient information in the document.

Such details are expected to be provided in Stage 2 of Volume 2.

The waste treatment system will result in liquid effluents and relatively stable solids. The proponent's concept is that the effluent from the wastewater treatment unit would be of a quality suitable for discharge to the ocean. Solids from the treatment unit would be disposed of off-site.
The concept for effluent disposal is acceptable, although there is an historical requirement for WAWA to submit any such firm proposal to EPA for assessment. There is inadequate detail at this stage to allow an informed choice between on-site or off-site disposal of organic sludges.

9. ISSUES RAISED IN SUBMISSIONS

Specific points which were raised in submissions include:

- handling of wastes which result from treatment of Woodman Point wastewater;
- ensuring that any mist from cooling towers does not harbour viruses etc;
- management of contaminated fire and deluge water (recycle for further use in an emergency); and
- plant operational areas should be sealed and non porous, to prevent contamination of groundwater.

These points need to be addressed in the proposal in Stage 2.

10. CONCLUSION

The Authority reiterates its position as stated in EPA Bulletin 331 (p 48).

> "The EPA requires that the beneficial uses of the ocean in the Cape Peron outfall area be not changed by PICL's activities. This means that the quality of the effluent from PICL must be at least as good as, if not better than, the quality of the input to the PICL plant from the Woodman Point Treatment Plant. In its assessment of the Cape Peron outfall in 1982 (DCE, 1982) it was noted by the Authority that further environmental assessment would be required if there were to be any substantial change in the characteristics of the outflow. The Authority considers that the impact of proposal on receiving water quality is manageable, and considers that the proponent should submit further information to cover the impacts of cooling water disposal".

The Authority's position has not changed, and it is incumbent on PICL to ensure that Stage 2, Volume 2 of the EMP can meet the above requirements. It is also incumbent on the relevant government agencies to ensure that appropriate decision making is in place for further development of the project.

In broad terms, the Authority concludes that the general thrust of the company's proposal for wastewater treatment and discharge is acceptable, subject to further detailed assessment.

APPENDIX 1

DISTRIBUTION LIST FOR STAGE 1 VOLUME 2 WASTEWATER TREATMENT OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

Health Department of WA
Main Roads Department
Department of Mines
Department of Occupational Health, Safety and Welfare
Police Department
Department of Resources Development
State Emergency Service
State Energy Commission
Water Authority of WA

Australian Conservation Foundation
Cockburn City Council
Conservation Council of WA
Environment and Community Task Force
Ms J Keily, Statewide Network of Action Groups
Kwinana Progress Association
Town of Kwinana
Mr P Llewellyn, WA Green Parks
Petrochemical Project Team (Mayor of Kwinana, Chairman)
Pollution Action Network
Rockingham City Council
Wattleup Citizens' Association

APPENDIX 2

LIST OF SUBMISSIONS RECEIVED ON STAGE 1 VOLUME 2 OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

Written Submissions

Department of Mines
Department of Resources Development
Water Authority of WA
City of Cockburn
Town of Kwinana
Pollution Action Network

Comments by Telephone

Health Department of WA