Fuel unloading, storage and dispatching facility, Kwinana

WA Refiners Pty Ltd

Report and recommendations
of the
Environmental Protection Authority

Environmental Protection Authority
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Summary and recommendations

WA Refiners Pty Ltd is proposing to develop a fuel unloading, storage and dispatching facility at Kwinana. The site of the proposal is at the corner of Barter and Leath roads, Kwinana. The elements of the proposal are:

- Install a 450mm (18 inch) fuel import line from the Bulk Cargo Jetty to the site
- Construct refined oil tanks (two of 11,000 cubic metres for ULP and two of 3000 cubic metres for diesel)
- Construct three small tanks for short term storage of each product
- Install road tanker loading unit
- Construct a small office and gatehouse

Following the proponent's referral of the project on 14 March 1990, and the setting of the level of assessment, the proponent prepared a Consultative Environmental Review (CER) in accordance with guidelines issued by the Authority. The CER was provided to the Authority on 10 April 1990, and distributed for public review to statutory authorities, the local authority, the Australian Conservation Foundation, the Conservation Council of Western Australia, and to local libraries. The Authority sought comments on the proposal and submissions received on environmental issues are discussed in this report. On 16 May 1990 the proponent submitted details of a number of changes to the original proposal. These details were circulated to the same groups as for the CER, and additional comments received have been considered in this assessment report.

In the CER for Phase 1, the proponent identified and discussed the following environmental issues:

- risks and hazards;
- waste water treatment;
- groundwater protection;
- air quality; and
- construction stage impacts.

The proponent engaged a risk consultant to advise on the safety of the proposal. The consultant found that the proposal would not generate unacceptable risk to the public from hazards emanating from the tank farm.

The only waste water from the operation will be approximately 70 cubic metres of fresh water used for clearing the import line at the end of each unloading. This will be treated in an oil separator then discharged to a lined pond for evaporation or use on landscaped areas.

Minimising the possibility of leaks from the tanks will be achieved by epoxy painting of the tank floor and regular (five yearly) examinations of the integrity of the floor. An overall check of the control system will be provided through regular groundwater monitoring at a bore downstream of the site.

Use of floating roofs in the ULP storage tanks will eliminate evaporative losses which could lead to odour problems off-site.

Minimal site preparation is required for Phase 1 of the proposal, so the potential for impact during construction is low.

In the Introduction of the CER the proponent made a number of commitments to manage the potential impacts of the project. The proponent's analysis of issues and environmental commitments have been assessed by the Environmental Protection Authority as adequate to control environmental effects to acceptable levels. Therefore the Authority makes the following recommendations.

Recommendation 1

The Environmental Protection Authority has concluded that the proposal to construct and operate a ship unloading facility, pipeline, petroleum products storage tanks, and a road tanker loading facility as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public and the government agencies that were consulted, is environmentally acceptable.

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

- **risks and hazards;**
- **wastewater treatment;**
- **groundwater protection;**
- **air quality; and**
- **construction stage impacts.**

The Environmental Protection Authority notes that these environmental factors have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed, subject to:

- **the proponent's commitments; and**
- **the Environmental Protection Authority's recommendations in this report.**

The Authority believes that non-substantial changes should be provided for in subsequent approvals.

Recommendation 2

The Environmental Protection Authority recommends that, subject to Recommendation 1, the manner of detailed implementation of the proposal should conform in substance with that set out in any designs, specification, plans or other technical material submitted with the proposal by the proponent to the Environmental Protection Authority. 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 Environmental Protection Authority, is not substantial, those changes may be effected.

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

The proponent plans subsequently to develop a small oil refinery, to be called the West Australian Refinery, at Kwinana. If approved, the plant would process 10,000 barrels per day (1.6 million litres per day) of gas condensate into three products, Premium Motor Spirit (PMS), Unleaded Petrol (ULP) and Automotive Diesel Oil (ADO).

This project would be integrated with the fuel importing facility considered in this assessment report into a complete unit and the fuel importing facility, while able to stand alone, is seen by the proponent as Phase 1 of the total development

For commercial reasons, and because of the time required to finalise the design and construction of the refinery proper, the proponent wishes to carry out the development in two phases. The Environmental Protection Authority accepts the proponent's desire for this approach, and has pointed out to the proponent that a decision on the first phase does not pre-empt any decisions on further phases. In particular, it does not imply that approval will be given to the second phase.

1 Introduction

1.1 The project

On behalf of WA Refiners Pty Ltd, Energy Process Systems Pty Ltd is proposing to develop a fuel unloading, storage and dispatching facility.

The proposed site is at the corner of Barter and Leath roads, Kwinana. The location of the site and the proposed pipeline route are shown in Figure 1. The proposed layout of the tanks, truck loading area and office block is shown in Figure 2.

The elements of the proposal are:

- Install a 450mm (18 inch) fuel import line from the Bulk Cargo Jetty to the site
- Construct refined oil tanks (two of 11,000 cubic metres for ULP and two of 3000 cubic metres for diesel)
- Construct three small tanks for short term storage of each product
- Install road tanker loading unit
- construct a small office and gatehouse

1.2 The process

During the feasibility assessment of the project, the proponent held discussions with the following groups:

- Department of Resources Development - to facilitate government and project approvals;
- Department of Mines - to identify codes and regulations for technical requirements;
- Industrial Lands Development Authority - to establish land availability;
- Fremantle Port Authority - to establish shipping and wharfage requirements;
- Australian Iron and Steel - to establish criteria for the use of their No. 1 Jetty and land availability;
- Kwinana Town Council - to advise council of the project details; and
- Environmental Protection Authority - to identify requirements for environmental assessment of the project.

Following the proponent's referral of the project on 14 March 1990, and the setting of the level of assessment, the proponent prepared a Consultative Environmental Review (CER) in accordance with guidelines issued by the Authority. The CER was provided to the Authority on 10 April 1990, and distributed for comment to government agencies, the local authority, to the Australian Conservation Foundation, the Conservation Council of Western Australia and to local libraries.

Submissions were received from Department of Resources Development, Department of Mines, Department of Occupational Health Safety and Welfare, the Town of Kwinana, Australian Conservation Foundation and Conservation Council of Western Australia. Comments received on environmental issues are incorporated in this report in Section 3.

On 16 May 1990 the proponent submitted details of a number of changes to the proposal described in the CER. The submission was in the form of a letter which is attached to this report as Appendix 2. The main alterations were: relocating the site to the north, from part of the AIS site to land owned by the Industrial Land Development Authority; installation of a pipeline from the Bulk Cargo Jetty rather than upgrading the AIS jetty: and reorganising the layout to suit the new site. These details were provided to the above groups for any further comments and the further comments were incorporated.

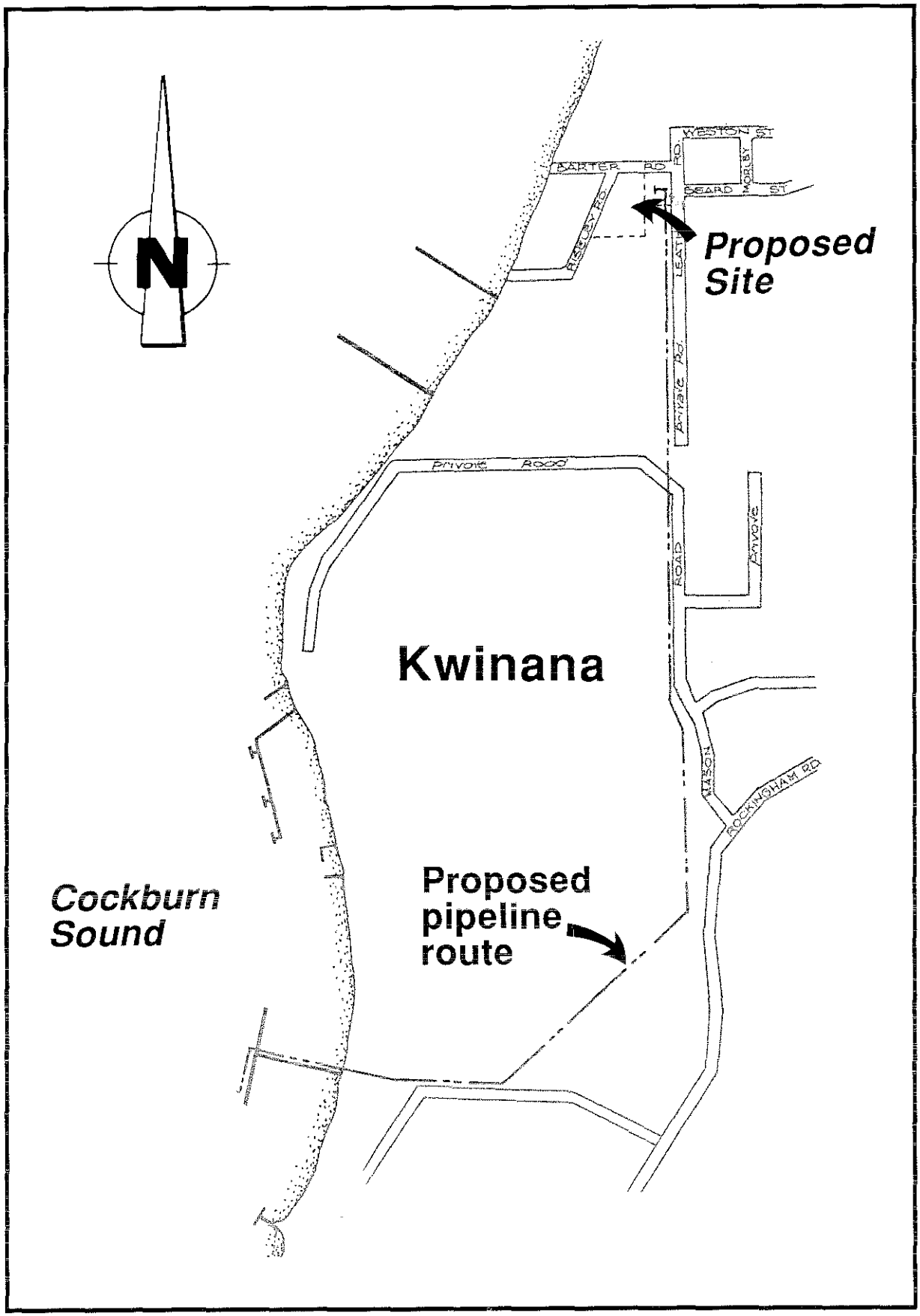


Figure 1: Locality plan and proposed pipeline route

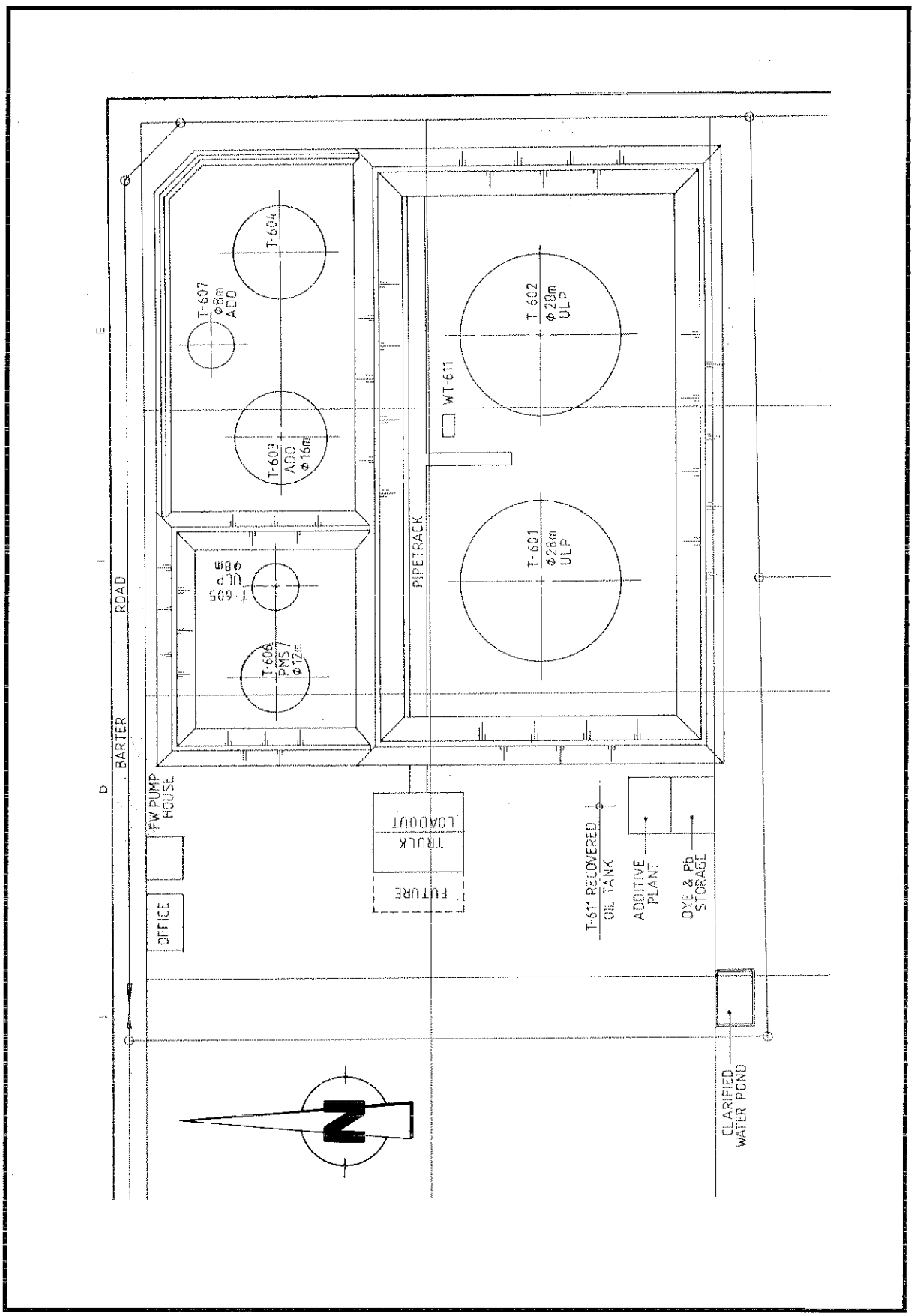


Figure 2: Site plan

2 Description of the proposal

2.1 Timing of the proposal

In order to meet contractual obligations to purchasers of its products, the proponent is keen to complete the project by the end of August 1990. This would ensure continuity of retail supplies to the public while the proponent seeks approval for the subsequent development of a refinery (See 2.6 below).

Meeting the timetable is being facilitated by the proponent's commitment to identifying and managing potential environmental impacts.

2.2 Jetty and pipeline

Refined fuels will be imported through the existing facility at the Kwinana Bulk Handling Jetty. Shipboard pumps would be used to provide the pressure necessary to unload fuel cargoes.

A 450mm (18 inch) fuel import line would be installed for delivering refined product to the storage tanks. On land the pipeline would be buried in a defined corridor and provided with adequate corrosion protection. The pipeline will generally follow the route of an existing pipeline from the jetty to the SECWA fuel storage, as shown in Figure 1.

Negotiations are being finalised with Fremantle Port Authority to determine their requirements, including any additional safety and fire-fighting facilities that would be needed. The proponent anticipates that some of the safety equipment and trained operating personnel would be provided by Fremantle Port Authority under contract for the time that the ship was being unloaded. This would be more efficient because an average of only one shipload of refined fuels per three months would be imported.

2.3 Product tanks

It is proposed to import unleaded petrol and diesel fuel. There are significant economic advantages in importing fuel in sufficient quantities to maintain supplies for about three months. To take advantage of this, the proponent proposes to construct two 11,000 cubic metre tanks for ULP and two 3,000 cubic metre tanks for diesel fuel. The proposed layout is shown in Figure 2.

The two petrol storage tanks would be floating roof tanks, to prevent the venting of fumes during tank filling. Because of the low rate of fume generation from diesel fuel, the proponent considers a floating roof to be unnecessary, and a cone roof would be installed on these tanks. All tanks, pipes, valves, etc. would be designed and constructed in accordance with Australian and international standards and codes, chosen as relevant in consultation with the Department of Mines. The Department of Mines regulates the handling of dangerous goods, in this case flammable liquids, under the Explosives and Dangerous Goods Act.

The tanks would be surrounded by earth bunds for the containment of any spillages. Each bunded area would be drained to a sump from which contaminated water or large spillages would be recovered.

To maintain continuity of fuel deliveries during ship unloading, customs and excise checking, and settling out of water impurities, the proponent intends to install three small tanks to hold about three days' supply each of ULP, "super" and diesel. Super petrol is required for high compression engines and must have a high "octane rating" to ensure that damage due to "knocking" does not occur. The octane rating is usually increased in petrol by adding lead alkyl compounds to standard petrol. The proponent proposes to make super petrol by mixing lead alkyl with ULP to raise the octane rating from 92 to 98. The Authority notes that this requires about one third of the normal lead addition required to raise the octane rating from "standard" to "super". This has the potential for significant environmental and public health advantages

2.4 Road tanker loading station

At this stage it is envisaged that all products would be distributed by road, and a truck loading station would be built with provision for top and bottom loading of refined fuels.

Dedicated product loading pumps located in the tank farm area would transfer the products through dedicated product loading lines to the loading station. A control panel would be located at the loading station for remote stop/start of product loading pumps and would incorporate conventional loading safety interlocks.

In hazardous areas, instrumentation and control systems would be intrinsically safe or explosion proof in accordance with the relevant codes.

The loading bay would have a reinforced concrete floor draining to a sump connected to the oily water drainage system.

2.5 Ancillary units

The fire water system would consist of foam systems for the storage tanks and a fixed deluge system for the tanker loading station. Water would be distributed by an underground ring main system kept at adequate pressure by fire water pumps.

Electrical power supply would be from the existing SECWA grid.

Oily water would collect in sumps located in the storage tank bunds and at the truck loading station. Contaminated water also would be produced during the clearing of the importing line at the completion of unloading. This water would be pumped to a corrugated plate interceptor (CPI) for the separation of oil and water. Details of the interceptor and proposals for discharge are discussed below.

Offices and a workshop would be built on the site. The proponent would establish a small laboratory in the office building.

Water supply to satisfy the small demands for service water, potable water and fire water would be drawn from existing Water Authority mains.

A gatehouse and fire pump room would be provided for security and to allow remote operation of fire fighting facilities.

Road access to the site would be along Beard Street, Leath Road and Barter Road. Anticipated tanker traffic is about 20 trucks per day.

2.6 Subsequent developments

The proponent has indicated that further development could be of a small oil refinery. If approved the plant would process up to 10,000 barrels per day (1.6 million litres per day) of gas condensate into petrol and diesel oil. The Environmental Protection Authority has pointed out to the proponent that a decision on the present proposal does not pre-empt any decisions on further developments.

3 Environmental assessment

3.1 Identification of issues

In the CER, the proponent identified and discussed the following environmental issues:

- risks and hazards;
- waste water treatment;
- groundwater protection;
- air quality; and
- construction stage impacts.

In the CER the proponent made a number of commitments to manage the potential impacts of the project. These have been consolidated by the proponent into a list which is included as Appendix 1 of this report. In the following sections, the proponent's analysis of issues and environmental commitments are assessed as adequate to control environmental effects to acceptable levels. Therefore the Authority makes the following recommendations for this proposal.

Recommendation 1

The Environmental Protection Authority has concluded that the proposal to construct and operate a ship unloading facility, pipeline, petroleum products storage tanks, and a road tanker loading facility as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public and the government agencies that were consulted, is environmentally acceptable.

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

- **risks and hazards;**
- **wastewater treatment;**
- **groundwater protection;**
- **air quality; and**
- **construction stage impacts.**

The Environmental Protection Authority notes that these environmental factors have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed, subject to:

- **the proponent's commitments; and**
- **the Environmental Protection Authority's recommendations in this report.**

The Authority's experience is that it is common for details of a proposal to alter through the detailed design and construction phase. In many cases alterations are not environmentally significant or have a positive effect on the environmental performance of the project. The Authority believes that such non-substantial changes, and especially those which improve environmental performance and protection, should be provided for. Accordingly, the Authority recommends as follows.

Recommendation 2

The Environmental Protection Authority recommends that, subject to Recommendation 1, the manner of detailed implementation of the proposal should conform in substance with that set out in any designs, specification, plans or other technical material submitted with the proposal by the proponent to the Environmental Protection Authority. 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 Environmental Protection Authority, is not substantial, those changes may be effected.

3.2 Risks and hazards

The Authority did not require a Preliminary Risk Assessment for this proposal because of the low levels of risk associated with this type of facility. Nevertheless, the proponent engaged a firm of specialist risk consultants to prepare a "Qualitative Risk Assessment". The consultant's report was included in the CER as Appendix 2. The assessment included review of the proposed facilities, safety systems and operations. The Authority believes that this level of analysis is adequate for the low risk normally associated with such installations.

In regard to shipping operations, the consultant indicated that "the requirements for tanker movements and cargo operations are laid down in various statutory regulations and guidelines. The statutory requirements of Fremantle Port Authority are generally acceptable to all other bodies with responsibility for the handling of petroleum products at marine terminals" and that "it is the intention of EPS to comply with all the guidelines and requirements of the FPA with respect to marine tanker operations". In the opinion of the consultant, "the proposed fire fighting facilities are considered to be acceptable and sufficient to ensure that a fire on the wharf could be readily contained and extinguished." Based on the advice of the Fremantle Port Authority and the Department of Mines, the Authority believes that the probability of a serious incident involving the shipping component of the proposal is sufficiently low, and the response system is sufficiently developed, as to be acceptable.

The consultant has indicated that "the pipeline will be designed in accordance with an appropriate internationally acceptable code and will be licensed by the (Department of Mines) Explosives and Dangerous Goods Division. All requirements of the licence approval will be complied with." Based on an assessment of the safeguards proposed, and the advice of the Department of Mines, the Authority considers that risk due to the proposed pipeline can be adequately controlled.

In assessing risks due to the product storage tanks, the consultant considered that the "worst case" fire scenario was radiated heat from a pool fire in the bund area. It was calculated that there would be severe effects from such a fire out to a radius of about 90 metres from the centre of the bunded area. It was conservatively estimated by the consultant that the frequency of such an event could be once in a million years. The consultant indicated that "the results of the analysis indicate that the potential for injury from fires to personnel is extremely low. (This 'worst case') analysis assumed that the fire fighting and safety systems to be installed at the site were not used to extinguish the fires" and is therefore very conservative.

In the conclusion to the report, the consultant has stated that "in the preliminary design of the facility, EPS have given consideration to the safety of the public and to the protection of the environment.

Recovered unleaded oil would be returned to the refined product, and leaded oil would be disposed of by means acceptable to the Authority.

Uncontaminated site runoff would be discharged to soak pits.

Sewage from the office and workshops areas would be handled through a septic tank system.

3.4 Groundwater protection

The greatest potential for groundwater contamination would be from an undetected leak from a tank floor. Minimising the possibility of such leaks would be achieved by epoxy painting of the tank floor and regular (five yearly) examinations of the integrity of the floor. An overall check of the control system would be provided through regular groundwater monitoring at a bore downstream of the site. Large losses would be detected by flow balances.

3.5 Air quality control

The potential for odours to occur due to venting of fumes during filling of the storage tanks would be controlled by installation of floating roofs in the two 11,000 cubic metre petrol tanks and cone roofs on all other tanks. The Authority believes that this will be adequate to control effects on air quality to acceptable levels.

3.6 Construction impacts

The proposed site is a partly developed industrial site with little vegetation cover. The potential for impact on the natural environment is minimal, and some improvements would occur with properly designed landscaping of the site.

In common with other construction projects, there is a potential for dust generation during earthworks. However the Authority believes that the small scale of the works, use of controls such as site watering, the location, and the time of year, minimise the potential for impact. No unacceptable impacts are anticipated.

3.7 Assessment of subsequent development

Should the proponent wish to proceed with the foreshadowed development of a small oil refinery, then a further environmental assessment will be required. The Authority believes that the key issues in such assessment will be the ability to comply with sulphur dioxide emission requirements, quantified risk analysis, and the implementation of the Kwinana Integrated Emergency Management System (KIEMS) by the State Government.

4 Conclusion

The Environmental Protection Authority has assessed the potential environmental effects of the proposal to construct and operate a fuel importing, storage and distribution facility at Kwinana.

The Environmental Protection Authority has found that the proponent has identified all potential environmental effects of the proposal, and that adequate commitments have been made to carry out environmental management. The Authority concludes that the proposal could be developed without unacceptable environmental impacts, and therefore recommends to the Minister for the Environment that the project could proceed.

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

Appendix 1

Consolidated list of commitments

Consolidated list of commitments

Risks and hazards

1 WA Refiners Pty Ltd will design, construct and operate the proposed facility in accordance with codes and standards to the satisfaction of the Department of Mines.

Wastewater treatment

2 WA Refiners Pty Ltd will collect all oily waste water from the facility, treat the water through corrugated plate interceptors, and discharge the treated water to a lined pond. Water in the pond will be analysed on a regular basis and, depending on quality, disposed of by evaporation or irrigation to the satisfaction of the Environmental Protection Authority and the local council.

Groundwater protection

3 To minimise the probability of a leak from any tank floor, WA Refiners Pty Ltd will paint the bottom of the tanks with a suitable epoxy resin. The tanks will be checked visually for corrosion every five years, and any necessary repairs carried out, to the satisfaction of the Department of Mines.

4 During the drilling phase for site investigation, one of the drill holes will be lined with PVC to enable monitoring of groundwater. During operation of the facility, WA Refiners Pty Ltd will monitor the groundwater for hydrocarbons at intervals of three to six months, to the satisfaction of the Environmental Protection Authority. Should significant levels of hydrocarbons be detected, WA Refiners Pty Ltd will identify and eliminate the source of the hydrocarbons, and rectify any groundwater contamination, to the satisfaction of the Environmental Protection Authority.

Air quality

5 The two 11,000 cubic metre capacity storage tanks will be fitted with floating roofs to minimise evaporative losses of product.

Lead alkyl handling

6 The procedures and equipment used for the handling of lead alkyl compounds on the site will be to the recommendations of the suppliers of the compounds and to the satisfaction of the Department of Mines.

Construction impacts

7 During construction of the facility, WA Refiners Pty Ltd will control dust emissions and noise levels to the satisfaction of the Environmental Protection Authority and the local council.

Appendix 2

Request to consider changes

TELEPHONE (61-9) 479 4757
FACSIMILE (61-9) 479 4756
PO BOX 257
BELMONT
WESTERN AUSTRALIA 6104

ENERGY PROCESS SYSTEMS PTY LTD

16 May 1990

Chairman
Environmental Protection Authority
1, Mount Street
PERTH WA 6000

SUBJECT: VARIATIONS TO:- PHASE I OF MINI OIL REFINERY DEVELOPMENT

Dear Sir

We seek your urgent attention on reviewing the variations that have occurred to the project in the past week. These variations have been made as a result of negotiations with, Department of Resources Development (D.R.D), Industrial Land Development Authority (I.L.D.A.) and Fremantle Port Authority (F.P.A). The variations are as follows:-

* Site Location:
  Changed from the Australian Iron and Steel Works (A.I.S.) parcel of land, zoned industrial and described as "part of location 506 and location 343" Leath Road Kwinana Beach to:-
  Lot 9 being portion of lot 31 Kwinana. (Copy of certificate attached)

* Tank Farm Layout:
  Configuration changed to suit new location. (Copy of Drawing Attached)

* Jetty Upgrade and New Pipe Line:
  The upgrade to the AIS No: 1 jetty will not eventuate as the Fremantle Port Authority (F.P.A.) in conjunction with ourselves will be installing an eighteen (18) inch line from the F.P.A. Bulk Cargo Jetty to our site. This pipe line where practical will follow the same line (known as the SECWA line) from the same jetty to SECWA's petroleum storage facilities just north of our new location.

  The pipe line will be buried and installed in accordance with the required statutory codes (AS-2885) and regulations (Pipelines Act). We will comply with all regulations and requirements.

* Hazardous Risk Analysis
Industrial Risk Management Pty Ltd (I.R.M.) were originally engaged by E.P.S. to complete the qualitative risk analysis report on blocks 1864, 7 & 9 which are owned by the Industrial Land Development Authority (I.L.D.A.) (The report is in the C.E.R. and refers to our new location.)

When it appeared that I.L.D.A. and ourselves could not achieve a commercial agreement we then changed to the A.I.S land and again engaged I.R.M to review the new site and to verify its suitability, the result of which is the additional comments attached as a letter to their report.

* Conclusion
We request your indulgence by seeking a most urgent resolution and approval of the changes as any delays further impact the approvals we need from the Kwinana Council. They have informed me that they cannot act until the Environmental Protection Authority has approved the project.

We would emphasise that the results of the changes are not of our accord but apparently due to problems with the State Agreement between B.H.P and the government.

Should you require any further information or documentation please do not hesitate in contacting the undersigned.

Yours faithfully

G H Hodgson
MANAGING DIRECTOR

ATTACHMENTS

1) Certificate of Title - Lot 9
2) Proposed pipe line route
3) Site Plot Plan (Phase I) Drg No: 89100-020-12003 Rev A.

Application E140235 WESTERN AUSTRALIA REGISTER BOOK VOL. 1844 FOL. 545
Volume 1795 Folio 105

CERTIFICATE OF TITLE

UNDER THE "TRANSFER OF LAND ACT, 1893" AS AMENDED

VOL. 1844 FOL. 545

Page 1 (of 2 pages)

I certify that the person described in the First Schedule hereto is the registered proprietor of the undermentioned estate in the undermentioned land subject to the easements and encumbrances shown in the Second Schedule hereto.

Dated 12th July, 1989

REGISTRAR OF TITLES

ESTATE AND LAND REFERRED TO

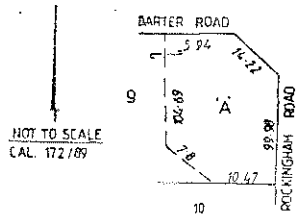
Estate in fee simple in portion of Kwinana Lot 31 and being Lot 9 on Diagram 76027, delineated on the map in the Third Schedule hereto, limited however to the natural surface and therefrom to a depth of 60.96 metres.

FIRST SCHEDULE (continued overleaf)

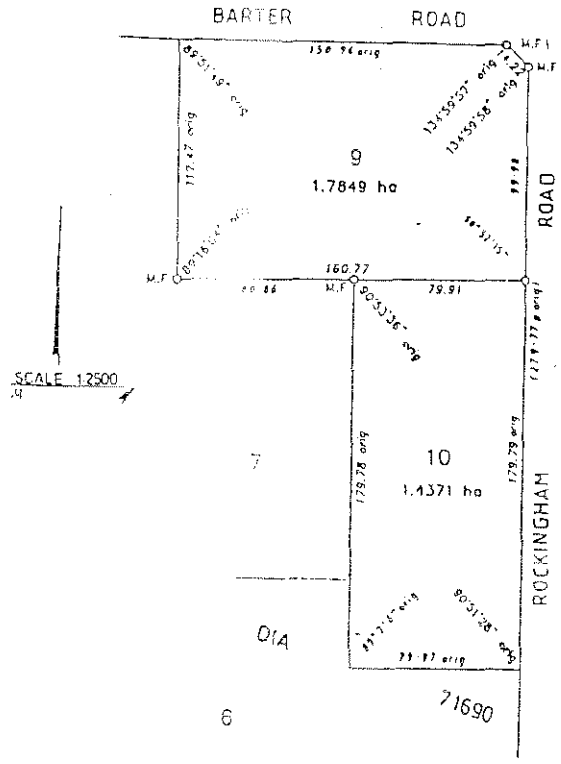
~~Tubemakers of Australia Ltd., of 41 Currie Street, Adelaide, South Australia.~~

SECOND SCHEDULE (continued overleaf)

1. TRANSFER D133510 The right to enter upon the portion of the within land marked 'A' on the map in the margin to construct use and maintain a pipeline for the carriage of natural or other gas as set out in the said Transfer is granted to The State Energy Commission of Western Australia. Registered 23.10.85 at 11.34 o'c.



THIRD SCHEDULE



NOTE: ENTRIES MAY BE AFFECTED BY SUBSEQUENT ENDORSEMENTS.

E67591/3/89-20M-L/4665

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON