SENATE STANDING COMMITTEE ON NATIONAL RESOURCES

- ENQUIRY INTO THE ALUMINIUM INDUSTRY

This paper describes Alcoa of Australia Limited's operations in Western Australia. It supplements a formal submission to be presented to the Committee in the near future.

This paper outlines the environmental considerations which impact on the Company, particularly with regard to the legislative requirements of the Western Australian and Australian Governments. It also gives background information on three of the areas covered by the terms of reference of the Committee's Enquiry - on labour, infrastructure and energy,

27 January, 1981

1. BACKGROUND

Alcoa of Australia has operated bauxite mining and alumina refining facilities in Western Australia since 1963. There are currently three operating mines and two alumina refineries, with a fourth mine and a third alumina refinery under construction.

The Company activities are governed by three agreements which relate to the three refineries:

1.1 Alumina Refinery (Alcoa Bauxite) Agreement Act of 1961

This Act facilitated the establishment of the Kwinana Refinery which produces approximately 1.4 million tonnes of alumina per year from 5.3 million tonnes of bauxite mined at Jarrahdale and railed to Kwinana.

1.2 Alumina Refinery (Pinjarra) Agreement Act No. 75 of 1969

This Act facilitated the establishment of the Pinjarra Refinery currently producing approximately 2.4 million tonnes of alumina per year from 9 million tonnes of bauxite, delivered by overland conveyor from Huntly and Del Park mines.

1.3 Alumina Refinery (Wagerup) Agreement and Acts Amendment No. 15 of 1978

This Act facilitated the establishment of the Wagerup Alumina Refinery and its expansion to an approved capacity of 2 million tonnes of alumina production per year using approximately 7.5 million tonnes of bauxite, which will be delivered by overland conveyor from the mine at Willowdale.

2. ENVIRONMENTAL CONSIDERATIONS

2.1 Scale of Mining Operations

The development of Alcoa's W.A. Operations over the past two decades has been accompanied by considerable environmental debate, and the introduction by Government authorities of close controls and monitoring programmes associated with mining operations.

While Alcoa's mineral lease (1.S.A.) stretches from Bindoon in the north to Greenbushes in the south and covers approximately 1.2 million hectares, the area

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of high interest for bauxite exploration extends from Byford in the north to Harvey in the south over an area of approximately 400,000 hectares.

Mining is carried out in areas of State Forest dominated by jarrah type vegetation. There is approximately 1.9 million hectares of State forest of which approximately 1.4 million hectares is occupied by jarrah forest.

Since bauxite mining operations began in 1961, approximately 2,600 hectares have been cleared to cover the requirements of all of Alcoa's mining operations. Of this area about two thirds has been cleared, mined and progressively rehabilitated, and the other third is made up of permanent fixtures such as workshops, amenities buildings, administration offices, or is in various stages of clearing, mining and rehabilitation.

Current mining and refining capacities require the progressive clearing, mining and rehabilitation of approximately 300 hectares per year of State forest for supply of bauxite requirements. It is expected that this will reach 420 hectares annually by 1990 to cater for Wagerup Alumina Refinery at its full approved capacity of 2 million tonnes of alumina production per year.

2.2 Land Use Interactions

The environmental questions concerning bauxite mining relate to the demands for land in the Darling Range for various uses, including forestry production, water catchments and storage, recreation, communications - power lines and roads, flora and fauna conservation, agriculture and horticulture, mining and quarrying.

Bauxite mining is a transient land use and there has been a need to develop rehabilitation practices such that, after mining, land can be restored to a state where it is compatible with the desired alternative uses. Since mining operations were initiated in the early sixties there has been a progressive programme of research and development - particularly by the W.A. Forests Department and Alcoa, but with assistance from other Government departments, to develop land management and rehabilitation techniques appropriate to bauxite mining and other activities involving disturbance in the forest. Techniques of tree and understorey establishment now make it possible to provide a good vegetative cover for mined areas within

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three years of the completion of mining, and commercial tree species are used in many areas to provide potential for timber production in the future. With the exception of some commercial timber species plants native to the Darling Range environment are used in the revegetation, and recent monitoring studies indicate that most of the native fauna species are returning to mine and rehabilitated areas.

There are stringent controls on the flow of water from mine pits during the mining operations and after rehabilitation to ensure that surface water does not carry silt into streams and water catchments.

2.3 State and Federal Environmental Controls

While the Company and the State have co-operated closely over the last two decades to minimise environmental effects of mining operations, and to develop mining plans consistent with other land uses, the last expansion of mining operations proposed for the Wagerup Refinery involved a new Agreement with the State which required the Company to produce an Environmental Review and Management Programme and have this approved by the State before operations could proceed. A study and report was undertaken by the Company to comply with this State requirement, as well as the Federal Government requirement for an Environmental Impact Statement. There was a public review of the study in 1978, which resulted in a final Environmental Impact Statement (EIS) (in the form of a supplement to the draft) and a final Environmental Review and Management Programme (ERMP) being published by the Company to satisfy Commonwealth and State requirements respectively. This document addresses the public's comments as well as a detailed report and recommendations on the project issued by the State Environmental Protection Authority (EPA)* after their review of the draft ERMP.

During the public review period concern was expressed on the need to protect water resources from the risk of salinity associated with the clearing for mining, on the need for adequate conservation reserves to preserve representative examples of native vegetation systems, and on the need for accelerated research and better controls on the spread of jarrah dieback disease.

* Wagerup Alumina Refinery Proposal by Alcoa of Australia. Report and recommendations by the Environmental Protection Authority 1978 (Bulletin No. 50), Department of Conservation and Environment, Western Australia.

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Environmental Protection Authority recommendations based on their review of the draft ERMP were:

1. *that, subject to the conditions contained in our further recommendations below, the construction of the alumina refinery should be allowed to proceed.*

2. *that the State should not approve the ERMP as submitted by the Company.*

3. *that the State should require:*

   a) *that all mining plans of the Company should be as agreed from time to time between the Company and the State, giving recognition both to the Company's need for a commercially viable mining operation and the State's need to manage and conserve the forest, to maintain water quality in the catchments, to cater for the proper needs of the community for recreation and to protect the flora and fauna of the forest. In the event of the Company and the State at any time failing to agree on the mining plans the matter should be decided by arbitration.*

   b) *that without the approval of the State there should be no further expansion of the Kwinana and Pinjarra refineries beyond 1.5 and 2.5 million tonnes per year respectively, nor expansion of the Wagerup refinery beyond 2 million tonnes per year.*

4. *that the State establish a means of developing land use policies and options for the Darling Range, and for co-ordinating land use planning by the several government agencies concerned.*

5. a) *that a single research co-ordinating committee be established; it should include adequate representation of the industries contributing funds, together with an equal number of representatives from the State; its function will be to draw up a budget and negotiate contributions from industry and from the State; it will also be responsible for assessing research priorities.*

5. b) *that in addition, there should be a specialist committee of scientists responsible for directing and co-ordinating research in particular areas of concern, and for publishing results.*

Following these recommendations the Company incorporated in its revised ERMP and final EIS a number of commitments, which under the Wagerup Alumina Refinery Act are now legally binding, relating to joint planning and approval of mining plans with the State, research into the effects of mining and other land uses, and that establishment of approved upper limits for refinery size at all three refinery locations (Kwinana 6 digester units, Pinjarra 5 digester units and Wagerup 2 million tonnes) be exceeded only after further detailed environmental assessment and approvals. Specific management commitments by the Company were as follows:

1. IN ADDITION TO THE TEN YEAR MINING PLANS TO BE SUBMITTED TO THE STATE UNDER CLAUSE 5 OF THE WAGERUP AGREEMENT, ALCOA WILL ALSO PREPARE AND SUBMIT TO THE STATE MINING AND MANAGEMENT PROGRAMMES WHICH WILL SPECIFY SUCH MATTERS AS THE AREAS WHICH IT IS PROPOSED TO MINE, THE METHOD OF MINING, AND THE PROPOSED METHODS OF REHABILITATION IN ACCORDANCE WITH PROCEDURES TO BE AGREED BETWEEN ALCOA AND THE STATE. ALCOA UNDERTAKES TO CONSULT CLOSELY WITH THE STATE ON THE PREPARATION OF THESE PROGRAMMES UNTIL AGREEMENT TO THEM HAS BEEN REACHED WITH THE STATE OR THEY HAVE BEEN DETERMINED BY ARBITRATION AS SET OUT BELOW. In endeavouring to reach agreement recognition shall be given to the Company's need for a commercially viable mining operation (taking into account the Company's investment in the State, its expectation of a long term mining and refining operation, and its obligation under long term contracts for the sale of alumina) and the State's need to manage and conserve the forests to maintain water quality in the catchments, to cater for the proper needs of the community for recreation and to protect the flora and fauna of the forest.

   If the Company and the State at any time fail to agree on a mining and management programme within four months of submission of that programme, the matter is to be decided by arbitration under the Wagerup Agreement.

2. MINING WILL NOT TAKE PLACE IN THE EASTERN, LOWER RAINFALL PORTION OF ALCOA'S LEASE, UNTIL RESEARCH SHOWS THAT MINING OPERATIONS CAN BE CONDUCTED

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WITHOUT SIGNIFICANTLY INCREASING THE SALINITY OF WATER RESOURCES. This commitment excludes any trial mining and rehabilitation which the State and Alcoa may agree is desirable for the purposes of gathering long term data on the effects of mining and rehabilitation in the eastern lower rainfall zone. Alcoa supports the concept of such a trial programme and will fully co-operate with the State in its implementation and monitoring.

3. ALCOA UNDERTAKES TO FORMULATE ITS DETAILED REHABILITATION PROPOSALS TO BEST SUIT THE LAND USE PRIORITIES ESTABLISHED BY THE STATE FOR THE PARTICULAR MINING AREA CONCERNED. Alcoa will also co-operate with the State in any programme to determine land use priorities for areas in which Alcoa's mining operations are likely to occur.

4. ALCOA IS COMMITTED TO AN ONGOING RESEARCH PROGRAMME INTO ALL ASPECTS OF ITS OPERATIONS THAT HAVE THE POTENTIAL TO ADVERSELY AFFECT THE ENVIRONMENT AND INTO THOSE ENVIRONMENTAL CHARACTERISTICS THAT COULD BE AFFECTED BY ITS OPERATIONS. Should a single co-ordinating committee be established to co-ordinate research on the Darling Range environment, Alcoa would agree to participate and assist in its funding.

5. ALCOA AGREES THAT A DIEBACK RESEARCH FOUNDATION WOULD BE AN APPROPRIATE VEHICLE TO CO-ORDINATE RESEARCH INTO THE DISEASE. Alcoa is prepared to be a major contributor to this foundation in terms of both money and practical co-operation. Alcoa has allocated more than $500,000 for use in dieback research over the next three years. Alcoa would wish to be represented on the committee administering this research programme and setting research priorities. In order to avoid a proliferation of committees with overlapping responsibilities, Alcoa suggests that the dieback research foundation's activities could be incorporated into the general responsibilities of the State's research co-ordinating committee.

6. ALCOA IS PREPARED AT ITS EXPENSE TO REHABILITATE DIEBACK-INFECTED AREAS ADJACENT TO ITS MINE OPERATING AREAS, IN ACCORDANCE WITH PROCEDURES TO BE AGREED TO WITH STATE AUTHORITIES, IRRESPECTIVE OF THE CAUSE OF THE INTRODUCTION OF THE DISEASE.

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In the medium term mining area, the effects of the disease are already widespread and this undertaking will lead to a clear improvement of a substantial area of degraded forest.

7. ALCOA WILL MONITOR THE SUCCESS OF ALL ITS REHABILITATED MINED AREAS IN CO-OPERATION WITH THE FORESTS DEPARTMENT AND, IF NECESSARY, IS PREPARED TO CARRY OUT FURTHER TREATMENTS.

8. ALCOA WILL RECOVER AND TREAT CAUSTIC SODA SOLUTIONS IN THE RESIDUE DISPOSAL AREAS UNTIL SUCH TIME AS IT IS DEMONSTRATED THAT SUCH SOLUTIONS DO NOT POSE AN ENVIRONMENTAL HAZARD.

9. ALCOA WILL DISMANTLE ITS FACILITIES AT THE TERMINATION OF MINING AND REFINING OPERATIONS AND CARRY OUT REASONABLE RESTORATION MEASURES AT THE SITES OF THOSE OPERATIONS PROVIDING SUCH FACILITIES ARE NOT REQUIRED FOR OTHER PURPOSES. In the event of Alcoa and the State not being able to reach agreement on the reasonable restoration measures necessary, the matter is to be decided by arbitration under the Wagerup Agreement.

10. ALCOA WILL CO-OPERATE IN A JOINT COMMUNITY SERVICES MONITORING PROGRAMME IN CONJUNCTION WITH THE STATE AND EACH OF THE SHIRES INVOLVED, TO MONITOR SOCIO-ECONOMIC EFFECTS OF THE PROJECT INPUT FOR COMMUNITY SERVICES PLANNING.

The objectives of the State in requiring an ERMP incorporating the provision for ongoing environmental assessment and revision of the Management programme, and under the requirements of the Alumina Refinery (Wagerup) Agreement and Acts Amendment, the Company is required to submit at yearly intervals an interim report to the State concerning investigations and research carried out in the implementation of the Environmental Management Programme, and at three yearly intervals submit a detailed report to the State on the result of the investigations and research during the previous three years.

2.4 Corporate Commitment to Environmental Control

Alcoa of Australia has strong corporate commitment in the environmental area to minimise the environmental impacts of its operations consistent with the legislative

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requirements and community expectations on pollution control, and the wise management of the nation's resources.

Its major thrusts in environmental control for bauxite mining operations in Western Australia involve expenditure of $3 million per year ($10,000 per hectare) on mine rehabilitation, and over $3 million per year on research into environmental questions associated with mining operations. A significant amount of research is funded externally in W.A. Universities, C.S.I.R.O., and State Government Departments. Currently the amount of $500,000 over a three year period has been allocated to dieback research.

The research being undertaken in the Darling Range with respect to bauxite activities has valuable application to other land uses and the control of their effects.

3. LABOUR

Alcoa presently employs 3,400 people directly in the operating mines and refineries and support areas. In addition, there are about 500 contractors permanently employed on site. Total employment on site is thus about 3,900 people.

Construction employment at Wagerup is about 950 people and will peak at about 1,200 in 1981.

Employment at Wagerup at the commencement of mining and refining operations will be about 550 and will grow to about 1,000 people at full refinery capacity of 2 million tonnes p.a.

Total employment by Alcoa and on-site contractors (excluding construction employees) will then be about 5,100.

Alcoa is presently the fourth largest private employer in Western Australia and expects to be possibly the largest employer in the State by 1982.

Approximately 65% of the workforce is employed in production and maintenance activities at the mines and refineries. Production operators and semi-skilled maintenance workers are recruited locally and trained on the job. Prior to the start-up of Wagerup suitable people will be recruited from the surrounding areas and trained for both refining and mining operations.

Alcoa also has major training programmes for skilled tradesmen. In 1977, the Company anticipated its future requirements for skilled tradesmen by doubling its annual intake of apprentices.

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There are now 160 apprentices at all W.A. locations. To meet the future needs of the Wagerup Refinery and to provide early job opportunities for local youth, apprentices were specially recruited in 1980 and 1981 from the townships surrounding the Wagerup Refinery. These apprentices are being trained at the Pinjarra refinery, in addition to the normal intake at Pinjarra, and will be transferred to Wagerup at the commencement of operations in 1982.

On commencement, all apprentices receive intensive six months instruction under the supervision of Apprentice Training staff at our Apprentice Training Centres at Kwinana or Pinjarra. A similar Apprentice Training Centre is planned for Wagerup.

Alcoa is also participating in the Commonwealth/Union supported Special Trade training scheme and has 15 trainees at all locations. This scheme enables Australian unskilled and semiskilled workers to qualify as tradesmen, and so is assisting to overcome existing and expected shortfalls in qualified tradesmen.

Moreover, Alcoa of Australia has assisted in the training of these trainees by releasing tradesmen to act as instructors in some trade areas, e.g. Instrument Fitting.

From 1979 the Company also substantially increased its employment of tertiary qualified graduates, with 35 recruited at the end of 1979 and a further 40 at the end of 1980. This recruitment has taken in graduates in all areas relevant to Alcoa's operations - including engineering, personnel, computing, accounting and the environmental sciences.

Indeed, Alcoa Management believe strongly that the training and development of young graduates is the key to future development and success of the Company.

Where appropriate, training continues after recruitment. Special emphasis was given to safety in 1980 with the commencement of an intensive two year training programme on safe working practices and procedures. A variety of external training and development courses are provided for employees through training and development staff at each location and considerable use is made of external training courses offered by Government Agencies and Consultants.

The Company actively encourages further individual employee skill and qualification attainment through its Education Tuition Aid programme which provides financial assistance to those employees who wish to undertake further studies. Some 90 employees are currently taking advantage of this Scheme.

As indicated above, Alcoa has been recruiting and developing skilled and professional manpower in anticipation of its expanding requirements at Wagerup. As a result no critical problems are

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foreseen in staffing its existing and new facilities - however, there are strong indications that shortages will occur in some skilled and professional categories. For the medium to longer term the Company shares the widely expressed concern at the shortages which will develop in W.A. as a result of the major developments occurring in this State. In response to this concern, Alcoa has participated in a considerable number of Manpower Planning Meetings and discussions with the Chamber of Mines, Confederation of W.A. Industry, and various Government Departments. Alcoa has also recruited professionals in a limited way from the U.K., South Africa and New Zealand to assess the suitability of these countries for longer term extensive recruitment if the need arises. Overseas recruiting is dependent on Government approval which is only granted after it has been demonstrated that suitable candidates are not available within Australia.

4. INFRASTRUCTURE

Infrastructure to support Alcoa's mining and refining operations has been developed by both the Company and the State Government. In some instances development was undertaken by the State with Alcoa reimbursing either by direct capital payment or through payment for service.

4.1 Land

All of the land at the three refinery sites is owned by Alcoa. The refinery sites at Pinjarra and Wagerup are each about 5,000 hectares in area to provide a buffer zone for the neighbouring communities to ensure minimum perceived impact in the rural environment. The refinery site at Wagerup was purchased mainly over the period 1977, 1978 and 1979 at a cost of $14 million.

4.2 Transportation Systems

Under State legislation Alcoa is required to use the State Government Railways for rail transportation. These railways are used to transport bauxite from Jarrahdale to Kwinana, alumina from Pinjarra to Kwinana and Bunbury (and from Wagerup from 1982), and caustic soda and oil from Kwinana to Pinjarra (and Wagerup).

Alcoa paid for the construction and maintenance of sidings and loading facilities at Kwinana, Jarrahdale, Pinjarra, Wagerup and Bunbury and for some other items of railway infrastructure.

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Railway freight rates are determined by a formula provided by State legislation and are set to recover operating and maintenance costs, to contribute towards the capital costs and to provide a profit margin to the rail system. In 1980 payments to the State Railways totalled $16 million and it is understood that Alcoa's traffic is the largest revenue earner for the State system.

Bauxite for the Pinjarra and Wagerup refineries is transported by Company constructed and operated conveyor facilities. Mine haul roads are constructed by the Company.

4.3 Ports

Alcoa paid all costs for the construction of its alumina loading facilities at Kwinana and Bunbury and for the caustic unloading facility at Kwinana. These loading and unloading facilities cost more than $25 million in historical dollars (1961 to 1976). Oil is unloaded at the BP terminal at Kwinana on normal commercial terms.

In addition, both ports required dredging. The State undertook and paid for this dredging but Alcoa made a capital contribution, for its share, of $1.6 million at Kwinana (in 1963) and $8.5 million at Bunbury (in 1973-75).

4.4 Housing and Social Infrastructure

Alcoa spent $3.3 million in constructing 352 houses and flats for the Pinjarra refinery and spent an additional $3.2 million on social infrastructure, such as sewerage, water, schools, recreation facilities and the upgrading of hospital facilities.

Another 150 houses are being constructed at a cost of over $6.0 million at Waroona and Harvey for the first phase of the Wagerup project. There is also a provision in the Wagerup legislation for Alcoa to contribute towards the costs of establishing and extending social infrastructure requirements for water, sewerage, schools, hospital and police services - having regard to the benefits flowing to the State, the community, the Company and others therefrom.

4.5 Water

The Pinjarra refinery is, and the Wagerup refinery will be, independent of the State Water Supply System. At these

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plants, process and potable water supplies are gathered from dams on the plant sites, from bores and from recycled process flows. Until 1979 the Pinjarra refinery drew surplus run off water, during the winter months, from a pipehead dam. The costs of installing and maintaining the pipes to the Plant site were paid by Alcoa.

Approximately 10% of Kwinana's water supply comes from the State system - for use as drinking and eye wash water. This water is supplied under normal industrial tariffs.

4.6 Power

Alcoa production facilities in W.A. are substantially independent of State electrical system.

Each of the three refineries will have its own power station which produces steam for the Bayer refining process. Electrica energy is generated as a by-product of this steam production at very high thermal efficiency. Total electrical generating capacity at a production of 6,000,000 tpa of alumina will be approximately 230 MW.

Each of the three refineries will eventually be tied to the State electrical grid. Power from the State grid will be used in an emergency if a powerhouse is totally shutdown and also to balance steam/power needs. All capital costs of the inter-connection to the State grid will be borne by Alcoa. Power will be purchased at published industrial tariffs.

5. ENERGY

Energy is consumed in the alumina refining process in the powerhouse for the production of process steam and electricity and in calcination, in the final stages of production, to drive water off the finished product.

Energy is primarily supplied from imported fuel oil and from natural gas from the Dongara field. Imported fuel oil provides about 60% of the energy requirements and gas about 40%. Total energy is equivalent to about 1.0 million tonnes of oil p.a. From 1985 energy requirements will be supplied from the North West Shelf project.

Energy is the highest single cost element in Alcoa's refining process. As energy costs in recent years have risen faster than inflation, considerable emphasis has been placed on energy management - to conserve energy resources and to reduce costs of production. Energy

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used by the refinery process has been reduced by more than 25% in the past eight years. Further reductions are projected.

The refining process, by its nature, is a highly efficient user of energy. About 70% of the energy consumed in refining is used in the powerhouse where steam is initially produced and passed through turbines for the generation of electricity and then the waste steam is used to heat the process liquor. Thus the thermal efficiency of the process is about 85%, which compares to a thermal efficiency of about 30-35% in conventional powerhouses dedicated to electricity generation alone.

Energy conservation is a management priority in the design of new facilities, especially with the relatively fast increase in energy costs. Success in this area is indicated by a comparison of energy usage at Alcoa's facilities in Western Australia. For instance, energy consumption at Pinjarra is only 85% of equivalent consumption per tonne of alumina at Kwinana. The Wagerup refinery will be even more efficient with consumption about 75% of the energy per tonne of alumina, of the Kwinana refinery, and the Kwinana refinery itself is significantly more energy efficient today than it was when production first commenced in 1963.

Energy conservation has been achieved in many areas - by improved insulation, and by capturing heat given off in the production process to heat the incoming liquor streams. A signficant advance was made in calcination, which consumes about 30% of total plant energy, through the introduction of the Aluminum Company of America designed fluid bed calciner which uses one third less heat energy than the most efficient calciners previously employed in the alumina industry.

Energy conservation is a continuing priority. Each year the refineries prepare a cost improvement programme, and energy savings are a major component of this programme. For 1981, energy savings will be 75% of the total projected cost savings and Alcoa expects to reduce energy consumption per tonne of alumina by 6% compared against 1980.

The impact of these savings in energy consumption at the existing refineries is shown in the chart below. It shows that with the start up of the Pinjarra refinery in May, 1972, average energy consumption per tonne of alumina, has declined by 25%:

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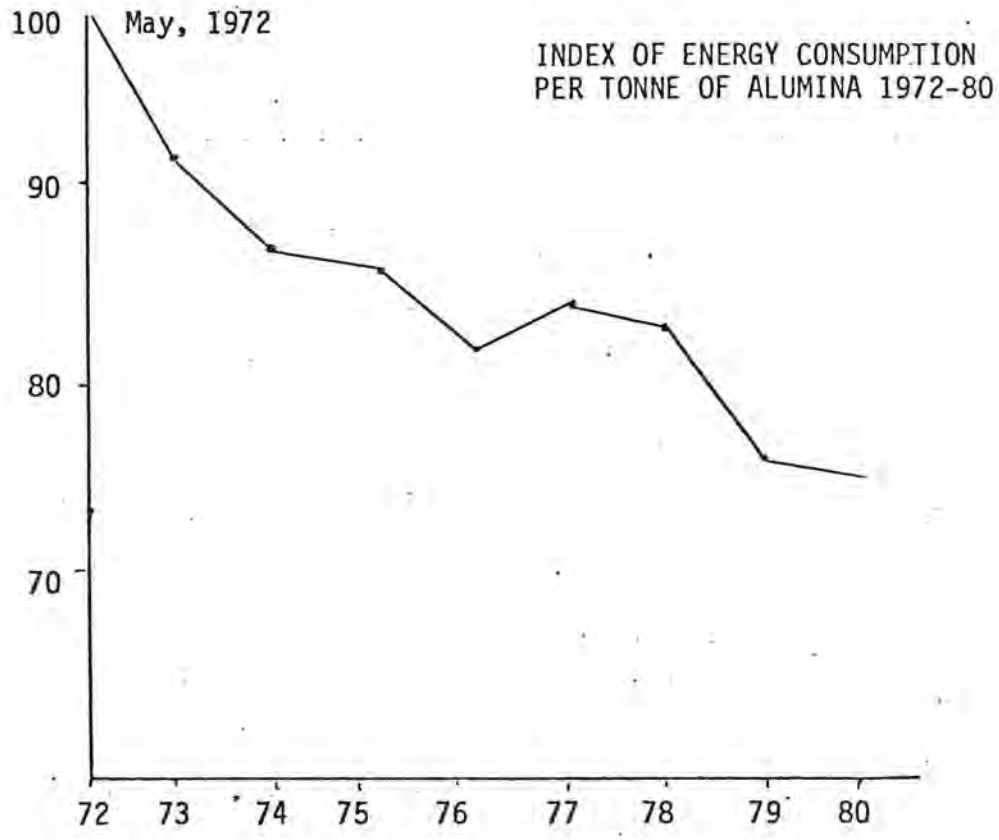

Alcoa accounts for about 15% of total energy consumption in W.A. At present, 60% of Alcoa's energy is imported, but Alcoa's consumption of domestic sourced energy has been of great significance to the State in the past and will be even more important in the future.

Alcoa has provided the secure, high volume, base load consumption necessary for the economic development of the Dongara gas project in the early 1970's and of the North West Shelf - Perth gas project in the mid 1980's.

Alcoa committed to take 50% of the available domestic gas from the North West project in 1977 and was vital to the project at that time. The domestic, commercial and industrial market in the South-West was relatively small and could not, of itself, have justified the $500 million plus pipeline investment. The SEC of WA is the contracting party with the North West Shelf Joint Venturers, and, in 1977 its gas market was only 16 million cubic feet (MMCF)

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per day, compared to its North West commitments of 300 MMCF. Alcoa committed to take 150 MMCF, on a take or pay basis, and effectively underwrote the project. Without Alcoa's commitment it is possible that the pipeline project would not have proceeded and that the south west would have been denied access to an efficient, clean source of energy. Looked at alternatively, Alcoa provided the base load and enabled the achievement of reasonable economies of scale which should result in a lower cost gas supply to the south west.

SUPPLEMENTARY SUBMISSION TO THE SENATE STANDING COMMITTEE ON NATIONAL RESOURCES - ENQUIRY INTO THE ALUMINIUM INDUSTRY

This paper reviews the submission presented by the Conservation Council of Western Australia.

We believe that the submission does not truly represent the industry in the State and we reject the substance of the Council's argument.

Alcoa of Australia's operations in the State are not subsidised. Rather, the Company has made a substantial economic contribution sinces its establishment in 1963, as indicated by the following:

- Energy : Alcoa has been one of the major factors in allowing the development of gas projects within Western Australia. Its commitment to the SECWA in 1977 ensured that gas from the North West would be available in the Perth region and its contract on a take or pay basis effectively underwrote the loan funds required by the SEC to finance the project.

- Labour : Alcoa is the largest employer in the South West of the State. The Council in its argument, ignored the multiplier impacts of Alcoa's employment, and after this is considered it is estimated that about 18,800 jobs are dependent on Alcoa.

- Taxes : Alcoa is one of the largest tax payers in Australia and has paid $325 million over the last five years.

- Royalties: Alcoa's royalty rates are the highest in Australia for domestically processed bauxite, and excluding extreme production levies such as Jamaica, are commensurate with royalty rates of other countries.

- Railways : Alcoa is the largest single customer of Westrail and in 1980 contributed about $16 million in revenue. It is understood that this revenue returns a profit to Westrail.

This contribution can be seen in overall perspective when it is considered that in 1980 Alcoa injected $350 million into Western Australia in terms of wages and salary payments, royalties, and payments for goods and services and capital expenditures.

WESTERN AUSTRALIAN ENERGY SUPPLY:

Western Australia's energy resources although small in relation to Australia's reserves are still large in the world context.

Published economic recoverable reserves of coal and natural gas in W.A. are only a small proportion of the resources expected to be proven in the next decade. The Collie coal fields have a stated reserve of 400 million tonnes of extractable coal but this reserve is based on exploration drilling complete many years ago. This proven reserve was then considered sufficient for the then expected long term demand. There was no reason for mining companies to expend their money on proving more reserves that may not be required for more than 100 years.

However, because of the greater demand for Collie coal expected because of the "World oil crisis", resulting in the expected development in W.A. the mining companies have recently undertaken extensive drilling programmes to extend proven reserves.

As drilling has progressed the mining companies have been publishing increased proven reserves. Expected economically recoverable reserves from Collie have been stated as at least 1,000 million tonnes and possibly 2,000 million tonnes. Similarly the recoverable reserves of the NW Shelf are expected to increase after further drilling to well in excess of the stated reserves.

For these reasons the planned growth of industry in W.A. in the future and specifically the alumina industry will not over-stretch the State's fuel resources as stated by the W.A. Conservation Council.

ENERGY REQUIRED FOR THE ALUMINA INDUSTRY

Alcoa uses energy to process its bauxite to alumina prior to export and further processing at its Point Henry smelter. This further processing increases direct and indirect employment, and significantly increases the "value added" of the bauxite prior to shipment.

It is misleading to compare the alumina industry energy use with that of the W.A. iron ore industry which only does a minor amount of secondary processing of iron ore.

Energy is the highest single cost element in Alcoa's refinery process, therefore, a major, continuing programme of energy conservation is followed throughout the Company as detailed in Alcoa's Paper to the Senate Standing Committee Enquiry into the Aluminium Industry dated 27 January.

Also Alcoa's use of energy is highly efficient (85% thermal efficiency) due to co-generation of steam and electricity as explained in the same submission.

DONGARA GAS

Alcoa obtains gas from Dongara under a long term contract negotiated directly with the Dongara Gas field developer.

The price paid for this gas does not reflect the price paid for gas purchased by the SEC from the same supplier and Alcoa believes that the SEC has a more favourable purchasing arrangement with the supplier than Alcoa The gas price to SEC customers reflects the considerable costs to the SEC of constructing and operating the gas distribution system and the costs of managing and marketing the gas.

NORTH WEST SHELF GAS

In 1977 Alcoa signed a letter of intent to purchase half of the 8.5 million cubic metres per day that was planned to be purchased by the SEC from the Joint Venture Partners and transport to Perth in a new gas pipeline.

Alcoa undertook a long term risk with the proposed gas prices being close to the oil import prices of the day.

However, the SEC required a long term take or pay contract of this magnitude to underwrite the loans that they required to finance the $500 million plus cost of the 1,500 km long Dampier to Perth pipeline.

The price Alcoa will pay for the gas has not been finally negotiated with the SEC. However, it is expected to be the SEC purchase price from the NW Shelf Venturers plus pipeline transportation charges plus a profit to the Commission.

In no way will the State be subsidising Alcoa's gas purchase.

The quantity of gas for which Alcoa have contracted will approximately balance the energy demand of Alcoa's alumina industry when it reaches the government approved maximum capacity of 6 million tonnes per year of alumina.

LABOUR

As outlined in Alcoa's submission, a total of approximately 4,850 people are employed currently on Alcoa sites in Western Australia. In June, 1980 the Department of Resources Development in Western Australia conducted a study which indicated that for every person directly employed, a multiplier effect results in a total of 5.53 people being directly and indirectly employed. If this multiplier is applied to the 3,400 people directly employed on Alcoa sites in Western Australia, it indicates that approximately 18,800 people are employed as a direct result of Alcoa's presence in Western Australia or about 5% of the total Western Australian workforce.

The employment of these 18,800 people is a direct result of Alcoa's establishing its alumina refining operations in Western Australia using bauxite from its leases in the Darling Ranges which would otherwise not be available for use. The grade of bauxite contained in the Darling Ranges is very low by world standards and would not be economic to export as happens in other parts of Australia.

The establishment of Alcoa's refineries in Western Australia resulted in a direct impact of approximately $350 million to the economy of Western Australia in 1980. The continuing support by Alcoa of Western Australia's industries ensures ongoing and increasing employment for the Western Australian workforce.

VALUE OF ALUMINA

Approximately 80% of alumina produced by Alcoa is sold to companies unrelated in any way to Alcoa of Australia Limited. This alumina is sold under long term contracts which reflect market prices and contain escalation provisions which ensure that prices reflect changing circumstances. Since 1974 the Department of Mineral Resources has continually reviewed the contract prices to ensure that the prices of alumina are reasonable and reflect market prices. All new contracts written are subject to the approval of the Australian Government.

A portion of the refineries' output is sold to a subsidiary of the Aluminum Company of America in Australia. The price of this alumina is also subject to export approval by the Australian Government.

The suggestion that the Australian Government should accord with the minimum prices set by the International Bauxite Association implies that prices being established do not reflect the market place. All of the expansion of Alcoa's operations since 1976 (including Wagerup) has taken place as a result of new contracts with customers which are unrelated to Alcoa of Australia. These contracts were established in the World market where our competitors are new and existing alumina refineries.

TAXATION :

Over the 19 years of operation Alcoa's accumulated net profit after tax is $475 million, $366 million being generated over the last five years (1976-1980)

Tax paid or payable for the same period is $349 million, $325 million relating to to the years 1976-1980.

The effective tax rate on profits generated over the last five years is 47% (compared to current Company tax rate of 46%).

The zero or low tax payments in the early years to 1975, resulted from:

- Alcoa did not earn profits in its first six years of operation. Accumulated losses 1961-1966 being $13 million.
- Only low profit levels were achieved from 1967 to 1975 of $2 million in 1967 to $17 million in 1975.
- A large capital investment programme. Total assets in 1975 were $576 million, giving a return on assets of 3%.
- High capital expenditure gave investment allowances which reduced effective tax rate over the period.
- Recent effective tax rates have been

1980	-	46.5%
1979	-	49.7%
1978	-	48.1%

Alcoa complies with the requirements of the Australian Tax Act. The advantages of investment allowances and high depreciation rates are available to all industries.

Further, they were designed to encourage investment and the creation of jobs.

ROYALTIES

Royalty payments by Alcoa to the W.A. Mines Department totalled $15.4 million to December, 1980. It is anticipated that these will be more than $6.0 million in future years (the royalty is at present $1.50/tonne and is escalated according to movements in world aluminium prices).

The Alcoa royalty rate was renegotiated in July 1979, and is now 300% of the royalty applying in June 1979. The renegotiated price reflects what is believed to be a realistic royalty rate considering:

- the low grade of bauxite of 30% alumina.
- the additional costs of a substantial nature and recurring order which relate to mining that other companies or countries do not face, e.g. rehabilitation, environmental research.
- the impact the value added from processing bauxite to alumina on the W.A. economy. In 1980 $350 million was spent on labour, material and services in W.A.

Comparison of Alcoa's royalty rate with:

1. other bauxite/alumina industry countries fails to consider the low alumina content of the Darling Range bauxite mined by Alcoa. In general the content of the grades being mined in other countries is 50% aluminium oxide.

2. Iron Ore industry comparison of royalties with Alcoa's is somewhat misleading as it compares unprocessed iron ore with secondary processed alumina. Based on the imputed value of unprocessed bauxite, the royalties payable would be comparable with those of the iron ore industry at 5% of FOB revenue value.

The countries with growing market shares of the world bauxite/alumina requirements are - Australia, Brazil and Venezuela. The latter two countries are not members of the IBA and have no royalties on bauxite.

The impact on Alcoa of the proposed $148.5 million royalty payment suggested by the Conservationists for 1978 production, would have resulted in Alcoa's profit before tax of $117.5 million being converted into a loss of $29.3 million. This means Alcoa would, after 19 years of operation, be in a loss situation.

The comparison with Jamaican bauxite royalties has simple appeal - but is misleading. It ignores the underlying pressures on Jamaica to introduce such high taxes and the consequent impact on the industry and the economic well being of Jamaica.

ROYALTIES (contd)

Until the early 1970's Jamaica was the world's largest bauxite and alumina producer and had been experiencing rapid growth. It has ample bauxite reserves and is well positioned to the major alumina markets of the USA, Canada and Europe, and thus should have grown in the 1970's and 1980's. The industry was also of major economic significance - contributing about 16% of GDP and about 66% of foreign exchange earnings. Unfortunately, it was the only industry to which Jamaica could turn to overcome the problems introduced by rapid world inflation from 1972 and the "oil crisis" of 1973. It needed higher State revenues to finance the oil imports on which Jamaica is almost totally dependent for its energy.

Rather than solving its problems it is evident that the production levies were uneconomically high and have forced the industry to partially withdraw from Jamaica. Since 1974 the industry has shrunk by some 25% and the overall contribution to the Jamaican economy has declined - more significantly, Jamaica lost its investment expenditure which would have stimulated its declining economy. As a result Jamaica had chronic balance of payments problems, high levels of unemployment and inflation, negative economic growth and political unrest throughout the 1970's.

In comparison, the industry in Australia over the same period has prospered and has made a significant contribution to our economic development. In Western Australia alone production has trebled since 1971 and it will probably more than double again within this decade.

RAILWAYS AND ALCOA RAIL FREIGHT

The Council has accused the State Government of subsidising Alcoa's rail freight costs by Westrail under-charging for their rail services. Alcoa's freight requirements are for large tonnage bulk material movement between fixed locations on a regular repetitive basis. This contrasts with many of Westrail's freight customers who ship small tonnages between many different locations on an intermittent basis.

Alcoa's freight requirements must be put in perspective with total Westrail operations to appreciate the economies of scale that can be obtained from Alcoa's business.

The following data has been obtained or deduced from Westrail public documents:

Commodity	1980 Tonnage		% of Locomotive Fleet	% of Track Used
	Million Tonnes	% of Total		
Bauxite	5.58	27	3	Less than 1%
Alumina	2.45	12	1.5	2
Alcoa Total	8.78	42	6	3
Coal	1.77	8	7	6
Grain	3.53	17	Plus 50	Plus 70

Westrail in 1980 shipped a total of 21 million tonnes of freight on open railway track network of 5,773 km using an estimated 120 locomotives.

The Council compared Alcoa Bauxite and Alumina freight with coal freight and implied that Alcoa's operations were subsidised.

The above data shows that coal tonnage was 20% of Alcoa freight but required more rolling stock operating on double the amount of rail track.

In addition, the Council implied that Alcoa is not contributing sufficiently to Westrail's infrastructure costs.

In fact Alcoa has paid for all rail sidings, spurs and all unloading and loading facilities required to haul its freight. Westrail has paid for main lines, rolling stock and support facilities. However, under-utilisation premium charges are paid to Westrail by Alcoa if rolling stock assigned to Alcoa is not fully utilised.

For all of the above reasons Alcoa considers that its rail freight rates and charges cover all related Westrail costs and also return them a profit on Alcoa's business.

ECONOMIC IMPACT

During 1980 Alcoa's operations in Western Australia resulted in a direct induction of approximately $390 million into the Australian economy. This figure includes company taxation. Company taxation actually paid in 1980 added a further $51 million. Of this impact approximately $350 million has been injected into the economy of Western Australia by way of:

- payments for wages and salaries
- payments to Local and State Government for rail freight, royalties, payroll tax, port authority, etc.
- payments to local industry for materials and services and capital goods.

This injection of funds is as a direct result of Alcoa's operations in Western Australia and contributes significantly to the establishment and on-going viability of industry in Western Australia.

The $350 million added to the State economy reflects a contribution of over $100,000 for the year for each person directly employed by the Company.

BAUXITE MINING, JARRAH FORESTS, STREAM SALINITY AND JARRAH DIEBACK IN THE DARLING RANGE, WESTERN AUSTRALIA.

Additional information requested from Alcoa of Australia by the Australian Senate Committee enquiring into the aluminium industry in Australia.

THE WESTERN PART

i) Rich deposits of bauxite are found on the western part of the Darling Range. These deposits are thought to have enough ore to satisfy mining requirements for at least 25, and possibly 50 years.

ii) The western part is classified as a "high" rainfall zone. It has very little salt stored in the soil, and streams yield fresh water regardless of land management or vegetation cover. Bauxite mining, cannot and will not cause stream salinity in this region.

iii) Jarrah forest covers most of the western part of the range. The forest is a most important resource, with value for timber production, watershed protection, recreation, and flora and fauna protection, and has a strong intrinsic value for Western Australians. The function and value of the forest should be protected.

iv) The incurable plant disease, jarrah dieback, has been present in the jarrah forest for about 60 years. Large areas of the forest are now degraded by the disease, and many understorey species, as well as jarrah, are susceptible. The disease, caused by a root fungus, mainly spreads when soils are warm and wet as in Spring. The rate of spread has previously been accelerated through use of infected gravels in road building and other forest activities, which now include bauxite mining.

v) The jarrah trees are slow growing, with a life cycle of 100-200 years. Jarrah dieback infects more than 10% of all the Jarrah forest, and about 30% of the western part of the Darling Range, where Alcoa's mining interests are concentrated for 25-50 years. In the absence of bauxite

mining, at the present rate of spread of disease, nearly all of the forest on the western Range will be infected by dieback in about 50 to 100 years. Only jarrah in pockets of "resistant" soil will be spared. Bauxite mining will contribute to the demise of jarrah forest in this region, as about 25% of the land will be cleared and mined.

vi) In the dieback infected areas, the disease can be seen to spread as a result of bauxite mining activities. The accelerating effect of bauxite mining in infected areas has been too small to measure on a whole catchment basis. Studies in the intensively-mined Seldom Seen area of the Wungong Brook catchment showed similar rates of spread of disease to areas without bauxite mining. Mining has not been shown to have a significant multiplier effect on the rate of spread of dieback in presently infected areas. It is, however, a catalyst to a disease which is already spreading quickly. So far only 0.3% of the Northern Jarrah forest has been mined.

THE EASTERN PART

vii) Bauxite quality within Alcoa's lease declines with easterly position, and present forecasts do not see the need to mine here for up to 25 to 50 years.

viii) This zone has lower rainfall, large quantities of salt stored deep in the soil, and shows increases in stream salinity when forests are cleared and not replaced by other forests.

ix) The jarrah forest on the eastern part is relatively free from dieback. Most of it has been "quarantined", and access is restricted. This process will allow measurement of the amount of dieback present, through observation of "indicator" species. It will also give time to develop management plans for control of the spread of the disease.

x) Alcoa has given a binding commitment not to mine in the eastern part until research, perhaps including "trial mining" has shown that salinity can be controlled. As forest "clearing"

through dieback also causes stream salinity, there is an inferred commitment to prevent, control, or ameliorate the effects of dieback.

THE FUTURE

xi) *Research will find a cure to dieback and save the jarrah forest.*

This is unlikely. The disease is prevalent and devastating throughout the world. No cure has yet been found and no cure for any similar disease has ever been found. The effects of the Dutch Elm Disease in the U.K. give a well known example. Nonetheless, the stakes are so high that research should be given high priority Alcoa is providing $0.2 million per year to independent researchers, as well as doing its own research.

xii) *Protectable areas of good forest should be reserved from interference, including from bauxite mining.*

Alcoa accepts the sound logic in the concept of "conservation through reserves". The selection and delineation of reserves within the mining lease should be negotiable, and decided after detailed input from many interested parties, including Alcoa.

xiii) *A dieback resistant forest should be established on the Western Part of the Range.*

This alternative is desirable as all responsible forecasts suggest that the Western forest will soon be lost, irrespective of the presence of bauxite mining. Bauxite mining and rehabilitation, and the Alcoa sponsored F.I.R.S. (forest improvement and rehabilitation scheme) project on land which is low in bauxite, and will not be mined, are at least a promising start to developing this forest. At most the combined impact of mining rehabilitation and F.I.R.S. will be one-third of the total jarrah forest. There is no other obvious source of funds for such a large scale, long-term project.

xiv) *Bauxite mining should not enter the dieback-free eastern part of the lease until trials have shown that it is safe to do so.*

Alcoa has already given this commitment. We would prefer to undertake such trial or trials only when

we are more certain of the criteria which will be used to judge success. Furthermore we want to be satisfied that we have the appropriate technology for both successful rehabilitation in Eastern areas, and for the successful prevention, containment or amelioration of salinity and dieback.

SENATE STANDING COMMITTEE ON NATIONAL RESOURCES

ENQUIRY INTO THE ALUMINIUM INDUSTRY - 29 JANUARY 1981

Additional information relating to the effects of mining on water salinity:

Alcoa wishes to draw the attention of the Senate Committee to the "Report and recommendations by the Environmental Protection Authority on the Wagerup Alumina Refinery Proposal" dated September, 1978. (Department of Conservation and Environment - W.A. Bulletin No. 50).

On page 6 in the Summary and Recommendations, the Environmental Protection Authority indicated that ... *The Wagerup Alumina Refinery should be allowed to expand to a maximum capacity of 2 million tonnes of alumina production per annum and that with proper planning by the Company and the State acting together there are adequate bauxite reserves available to allow the refinery to operate economically for a minimum of 30 years without risk to forestry, water resources or conservation and recreation. In reaching this conclusion our objective is to minimise any long term deletirious effects on the environment.*

Additional recommendations by the EPA are included on page 4 of Alcoa's submission to the Committee and Alcoa's response to those recommendations in its final Environmental Review and Management Programme dated September, 1978 are incorporated on pages 5, 6 and 7 of Alcoa's submission. Alcoa wishes to draw the Committee's attention in particular to commitment number 2 on page 5 - *Mining will not take place in the eastern lower rainfall portion of Alcoa's lease until research shows that mining operations can be conducted without significantly increasing the salinity of water resources.*

In association with the above commitment the Company is currently involved in joint planning and research with State Government departments to investigate the effects of mining in areas where salinity is a potential problem and would not be of significance for mining for some 30/40 years hence.

CHAIRMAN - I invite you to speak briefly to the submission.

Mr Reid - We would like to summarise the original submission briefly. If time permits, we would like to give supplementary comments on the submission presented by the Conservation Council of Western Australia because we believe some points to be made about it are relevant; they are contained in one of the additional documents just incorporated in the evidence. We also have other submissions which Mr Carbon would like to give to you on environmental matters. Mr White also has material. In view of the limited time available if you prefer we can go directly to questions or we can summarise this main submission now.

CHAIRMAN - If you prefer to summarise the submission, I invite you to proceed.

Mr Reid - As you are aware Alcoa of Australia will shortly be making to this inquiry a detailed submission relating to the terms of reference. This submission deals primarily with issues pertinent to Western Australian operations. In Western Australia we operate under three Acts of Parliament which cover agreements between the State and the Company to mine bauxite in the Darling Range and to build and operate three alumina refineries at Kwinana, Pinjarra and Wagerup. The planning, construction and operation of Alcoa's facilities take into account objectives of the States and the Commonwealth and their requirements in the areas of energy, capital, infrastructure, labour and environmental control.

In terms of environmental management there is a strong environmental commitment in the management of Western Australian operations. Approximately 50 staff members are involved in research, monitoring and operational activities. The major emphasis is in the Darling Range where joint activities have been undertaken by the State, Alcoa and CSIRO over the past decades to examine environmental questions associated with forest disturbance due to mining and other activities. Major environmental issues result from multiple and often competing demands on forest land. These have necessitated research into long term effects of mining and methods of rehabilitating disturbed areas. Although there has

long been a strong corporate commitment to joint planning and research, the Wagerup agreement between the State and Alcoa formally committed the company to joint planning with the State taking into account other land uses and to undertaking or financing research into a range of long term environmental questions relating to a number of land use practices in the forest. Major areas of activity are in salinity research, dieback research, flora, fauna and water quality monitoring and mine rehabilitation with annual summary and triennial detailed reporting to the State. Current expenditure on mine rehabilitation work is $3m per annum with a further $2m per annum in mining related environmental research and monitoring. In terms of the economic impacts, we estimate that in 1980 Alcoa contributed $350m to the State through payments for wages and salaries, purchases of goods and services, capital construction payments and payments of royalties, railway freights et cetera to the State Government.

In terms of labour, we have 3,400 people directly employed in mining and refining operations and a further 500 are permanently employed by contractors on Alcoa sites.

In addition, construction employment is currently about 1,100 people. This makes Alcoa one of the largest employers in the State and certainly the largest in the south-west of the State. Permanent employment will grow with the Wagerup refinery by an additional 1,000 people. By the mid-1980s, we estimate that total permanent employment by Alcoa will be 5,100 people. Given the impact of this, estimated by the Department of Resources Development, we can extrapolate this 5,100 to approximately 25,000 jobs which will be dependent on Alcoa's operations in this State by the mid-1980s.

The submission also details infrastructure commitments. In terms of power and water supply, we are basically independent of the State. We have made substantial commitments in housing and social infrastructure with the construction of over 500 houses. We have constructed our own loading and unloading wharves at Kwinana and contributed towards dredging of channels at both ports. The State Government has provided rail facilities and Alcoa has paid for the construction and maintenance of sidings and rail loading facilities and for some other items of railway infrastructure.

Alcoa is admittedly a relatively large user of energy, but we achieve high thermal efficiencies in our operations. For instance, the powerhouses operated by Alcoa achieve a thermal efficiency of 85 per cent, compared with a thermal efficiency of 30 to 35 per cent in conventional powerhouse generation. Moreover, as indicated in the submission, our energy consumption has declined by approximately 25 per cent in the last eight years: We practise energy management. We draw approximately 60 per cent of our energy from imported oil and 40 per cent from the Dongara gas field. From 1985 we expect to draw gas from the North West Shelf. Furthermore, as outlined in our submission, we believe that Alcoa has played a key role in the development of the gas pipeline project to bring gas to the Perth and south-west market. Alcoa's contract underwrote the loans required by the SEC to fund the pipeline and Alcoa will contribute towards the interests,

costs and amortisation of these loans through its take-pay contract. Alcoa was thus instrumental in ensuring that part of this gas was secured for the domestic market.

That briefly summarises our submission. If you wish we can make supplementary comments on the Conservation Council of Western Australia. We have made this submission in evidence so that we can either take questions on it, or summarise other relevant points if required.

Senator ROBERTSON - What is your reaction to the suggestion put by some of the witnesses this afternoon that the revegetation program is without any clear purpose? Do you understand what I mean by that?

Mr White - Perhaps I can answer that. The objectives of rehabilitation as defined by the Forests Department relate to the long-term land-use of the area being mined. A lot of the mining is in water catchments, where the objective is to stabilise the area by introducing vegetation as rapidly as possible to avoid erosion and consequent movement of silt into streams. The secondary objective is to establish trees with commercial potential.

In the assessment of Alcoa's environmental review and management program for Wagerup, a supplement which I will table for the use of the Committee, a lot of the questions relating to the effects of mining were answered. Specifically in response to that environmental review, the Environmental Protection Authority produced this document listing their recommendations to the State. Among their recommendations they included one that the project should proceed but they also included a recommendation that the States should require that all mining plans of a company should, as agreed from time to time between the company and the State, give recognition both to the company's need for a commercially viable mining operation and the State's need to manage and conserve the forest, to maintain water quality in catchments and to cater for the proper needs of the community. It goes on as outlined in our submission. In addition, the EPA recognised that there was a need for the State to establish a means of developing land use policies and options for the Darling

Ranges, presumably with a view to setting better objectives for rehabilitation among other things. Since that time the State has established a Darling Ranges study group under the leadership of a senior public servant. This has several professional staff and they are addressing the question of land use in the Darling Ranges.

Senator ROBERTSON - So is it fair to say that you have met the requirements of the agreement and that from year to year the Government, through the Conservator of Forests, has been happy with what you are doing?

Mr White - We have a committee which reviews and makes recommendations to the State on our mine plans. We are members of that committee and so are all the relevant government departments. Our mine plans have to include proposals for rehabilitation. Our 5-year plans last year were approved.

Senator ROBERTSON - I assume that any company such as your own would pay as little in royalties as possible. That would be part of your commercial operation. How would you react to the proposition that has been put forward that the royalty paid on bauxite ought to be the same as that paid on iron ore?

Mr Reid - Perhaps I can answer that. Some comment on that is contained in the supplementary document. We believe that the comparisons made are somewhat erroneous. That is primarily because the comparison is based on the difference between a processed product such as alumina and an unprocessed product such as iron ore. If you simply took the royalties on an imputed value of bauxite you would most probably conclude that the rate of royalty in bauxite and iron ore is about the same.

Senator ROBERTSON - How would you react to the comment made by some of our politicians that the royalty paid by Alcoa is among the lowest in the world?

Mr Reid - We have answered that in the supplementary submission. Firstly, the royalty paid on bauxite processed by Alcoa of Australia is higher than any other royalty imposed on domestically processed bauxites within Australia. It is higher than the royalty at Gove and at Gladstone. It is especially relevant to take into account the low grade of the bauxite mined

by Alcoa of Australia. It is approximately 30 per cent aluminium oxide compared with about 50 per cent or so at Weipa and in the ore which is refined at Gladstone. We should also take into account the additional costs that we bear in the Darling Ranges compared with other locations because of our additional environmental and research commitments. We should also look a bit further afield and compare the royalty with those in other countries around the world. Our royalty levels are higher than those in Brazil and Venuzeula for a start. They are two of the developing countries in the bauxite mining industry. They are lower than those in the Jamaican industry but it can be demonstrated that the royalty levels in Jamaica were uneconomically high. In fact they resulted in a decline in the industry.

Senator WATSON - Are you speaking of the secondary levels there and not the initial one?

Mr Reid - Yes. Since 1974 the Jamaican bauxite and alumina industry has declined by about 25 per cent whereas in that time the alumina industry in Western Australia has more than doubled. With that doubling there has been a significant increase in the economic contribution of the industry to Western Australia. So in general terms we would say that in assessing royalties we have to assess the overall economic impact of the industry. We cannot isolate royalty payments. We have to look at the impact in terms of employment, in terms of the value added to the product and in terms of the flow on effects from the investment which has occurred since 1974.

Senator ROBERTSON - I would not enter that debate. It is quite clear that anyone who would be paying royalties in any other country of the world would have the same problems. I was only trying to relate the circumstances of Mr Mensaros' comment. So what he said was in effect not true. It is not among the lowest in the world.

Mr Reid - We pay approximately $1.50 per tonne of alumina. That is not the lowest rate but it is certainly not anywhere near as high as the rate in Jamaica. We could certainly say that if our royalty levels were the same as those in Jamaica we would not be here today.

Senator ROBERTSON - You made a comment about the railway built by Westrail to service your industry. Is this particular section of rail used by anyone else? You made a contribution by building sidings and so on. Is this stretch of rail used by anyone else?

Mr Reid - I am not entirely familiar with it.

Mr White - Part of it is used by someone else but the part between the coastal plain and the bauxite mine at Jarrahdale is not used by anyone else.

Senator ROBERTSON - So basically it was built by Westrail for you?

Mr White - Part of the line existed already and part had to be built.

Senator ROBERTSON - So your contribution to the railway, an extension of which was built for you, was to build the sidings that you mentioned?

Senator TATE - The real question there is whether the rates charged are realistic.

Senator ROBERTSON - No, I would rather get this clarified first. You can go on with the rates later if you want to.

Mr Reid - I would like to comment on the rates if I may.

Senator ROBERTSON - Could you answer my question first? Is that a fact? Did Westrail build that for you?

Mr White - Westrail built all the rail facilities but Alcoa paid for the sidings and the loading facilities.

Senator ROBERTSON - Which they alone use?

Mr White - Yes.

Senator TATE - You heard evidence earlier in the day that you were receiving a $7.89m subsidy per year, according to the Conservation Council of Western Australia. Could you respond to that allegation?

Mr Reid - We are not privy to Westrail information which would tell us whether or not it definitely makes a profit on our freight carriage but certainly public statements have been made by the Minister for Transport in which he has said that Westrail does recover full costs and makes a profit on Alcoa's freight business. This can be deduced from some information which is publicly available and which we have in our supplementary submission. That evidence indicates that Alcoa in 1980 was responsible for 42 per cent of total Westrail freight traffic but that it accounted for only 6 per cent of Westrail's locomotive fleet. So it is about seven to one. It used only 3 per cent of the open Westrail track. So we used a very small portion of the facilities of Westrail relative to the total freight carried. A comparison was made with coal and the information in the Westrail report indicates that coal constituted approximately 8 per cent of total Westrail traffic yet accounted for 7 per cent of the locomotive fleet. That compares with 6 per cent for Alcoa. Coal accounted for 6 per cent of the track used compared with 3 per cent for Alcoa. The figures for grain are even more compelling. Grain accounts for 17 per cent of the freight, more than 50 per cent of the locomotive fleet and more than 70 per cent of the track used.

There is reasonable evidence to suggest that a comparison between bauxite and coal, or bauxite, alumina and other commodities is somewhat erroneous because Westrail clearly gets a much higher level of utilisation of the facilities dedicated to Alcoa than it does for other commodities. This is simply a reflection of the particular and unique characteristics of our trade. These enable Westrail to achieve very high levels of efficiency. It is a constant almost repetitive business. Trains are scheduled almost 24 hours a day for six and sometimes seven days a week throughout the year. We provide highly efficient loading and unloading facilities. These enable a fast turnround. We do have commitments to Westrail to ensure minimum turnround and we do have a charge for any unutilised rail facility. So in

effect it has a guarantee from Alcoa that those facilities will be highly utilised. That inevitably is reflected in the freight rates we pay.

Senator WATSON - One of the earlier witnesses stated that your regeneration process represented a patchwork development, or words to that effect. Would you like to respond to that?

Mr White - Yes, you would probably be familiar from our submission with the fact that mining does not involve clearing the whole of the forest area. It involves clearing about 300 hectares a year in the State forests which are about 1.4 million hectares. These areas of bauxite are in pods of up to 50 hectares and down to as low as 2 hectares or 3 hectares. They are rehabilitated as discrete pods. The choice of species varies according to site, aspect and soil quality. For that reason they vary from site to site. Jarrah trees are not extensively planted in rehabilitated areas although some jarrah trees are. So the dominant species which have timber potential are different from those in the surrounding jarrah forest. To that extent there is discontinuity in the vegetation. Recent innovations in the rehabilitation work involve adding a lot of native understorey seed and fresh topsoil to the regeneration areas on mined areas. These are tending to even out the disparity between the rehabilitated areas and the surrounding forest. In addition where dieback is prevalent around rehabilitated areas, the company has an undertaking with the State forest to finance forest improvement in those areas. That involves removal of dead jarrah trees, heaping and burning, and replanting with resistant species. So, to an extent, the rehabilitation creates a patchiness in the forest; it certainly creates a diversity beyond that which existed before.

Senator WATSON - To the commercial manager. Your company operates under a different financial structure from that of Worsley, which is essentially a joint venture. Do you believe that your structure provides you with certain taxation penalties that would not apply to a joint venture arrangement? Had you the

opportunity of starting again would you recommend a different type of corporate structure from the one under which you are now operating?

Mr Reid - I am a commercial manager but not a taxation expert, so I do not really feel qualified to answer that.

CHAIRMAN - Perhaps we could put that question when we hear the full submission later on.

Mr Reid - We will take notice of your question and respond accordingly.

Senator TATE - On page 12 of your original submission you say:

> Power from the State grid will be used in an emergency if a powerhouse is totally shutdown and also to balance steam/power needs.

In speaking of the three refineries you say:

> All capital costs of the inter-connection to the State grid will be borne by Alcoa. Power will be purchased at published industrial tariffs.

Will that also be the case when you come to negotiating and finalising your smelter contracts with the SEC? Will those tariffs be published in that instance?

Mr Reid - I cannot answer that because we have not gone into that level of negotiation with the State Energy Commission. The Commission would decide how the rate would be structured. It would propose a rate to Alcoa which we would discuss with it. It would take the iniative in determining how the rate would be structured and whether or not it would be published.

Senator TATE - I agree that the actual structure of the rate would be a matter of negotiation. Whether it would be published would depend on whether either or both regarded it as a matter of such deep confidentiality that the public need not be informed. From Alcoa's point of view would there be any inhibitory factor which would require you to say to the Government that you do not want this published.

Mr Reid - We have demonstrated in Victoria that we are prepared to accept the published tariff. That is the only consideration we have ever given it. We have a precedent already within the organisation.

Senator TATE - That is very pleasing to hear. I ask a brief question concerning your labour requirements. Could you outline precisely how it is that you hope, as an organisation, to avoid the situation which we seem to be seeing weekly, that as the resources boom gets under way, employers are asking the Government to import skilled tradesmen, rather than to provide a framework of training and recruitment within which in particular young Australians, but it could be any Australian who was unemployed, might receive a job within this industry?

Mr Reid - From 1977 onwards we have recognised the impending resources boom and the so-called resources boom and the impact that would have on the demand for skilled labour. In that time we doubled our apprenticeship intake. At the moment we have 160 apprentices training within Alcoa's refining and mining facilities in Western Australia. We also have 15 adults on the joint Commonwealth-Trade Union Adult Training Scheme. That is a total of 175 people who have been trained towards skilled labour status now and that is sufficient to meet Alcoa's requirements. In fact the experience has normally been that we have had a surplus of apprentices qualifying as tradesmen and normally we have released tradesmen to industry. So I think you could say that Alcoa has done more than train its own requirements. Also in the area of graduates for professional and technical positions we have been recruiting quite extensively over the last two or three years. In 1980 we recruited 40 graduates from all sorts of disciplines, accounting, engineering and computing sciences, and environmental sciences. We most probably have a reasonable stock of professional people in training as well.

Senator McLAREN - What sort of trades are the apprentices engaged in?

Mr White - Metal work, electricians, instrument fitters, welders, boilermakers are some of the trades.

Senator McLAREN - These are all skilled trades. So they are learning trades which could be utilised in the other aspects of the mining industry?

Mr White - Yes. They include heavy equipment fitters and light vehicle fitters.

Senator WATSON - Could you give us some idea of the impact your operations have on a balance of payments situation? Would it be spilling confidence to give us the net effect of payments overseas for dividends, royalties and all of those sorts of things? This would give us some idea of the impact your company has on the overall balance of payments. If you regard this in confidence I will recognise that it is an inappropriate question.

Mr Reid - The only way we can assess that really is by looking at the total Alcoa for Australia operations, not just Western Australia. It is true, I think, that all of the metal operations are also dependent on the bauxite alumina industry and unfortunately, having said that, I cannot give you the figures. But we can supply this information. It is a matter of public record. We do in fact calculate this each year in terms of the net contribution to the balance of payments. So I think we can supply both that and the net or the total export earnings to you. Perhaps we can forward that to you at some later time.

Senator TATE - In this submission of the yearly mining plan that I understand is undertaken, you said five years but I thought we had evidence that it was yearly.

Mr White - It is a five-year plan that is updated annually.

Senator TATE - I see. Have there been any instances where this committee, which I think Senator Thomas said was headed or at least chaired by the Conservator of Forests, has knocked back proposals by the company to mine a particular bauxite deposit? And if so, what were the grounds and how often might this occur?

Mr White - Just one point, it is not chaired by the Conservator of Forests; the Conservator of Forests has a representative on it. The research co-ordinating committee is chaired by the Conservator of Forests.

CHAIRMAN - I am sorry, I misunderstood.

Mr White - An instance occurred this year at one of our mine sites where we proposed to mine bauxite fairly close to a metropolitan storage reservoir. We produced evidence from previous trials to indicate that this could be done quite safely without discharging silt into the reservoir but the State committee was not satisfied that a long enough period of time had elapsed for it to be convinced that it was 100 per cent safe. It has asked us to defer or delete from our mining operations that area which totals approximately 2m tonnes of bauxite which represents about six months production for the particular mining system which is the Huntly mine system at Pinjarra.

Senator McLAREN - You have provided us with tonnage and spoken about grain being 17 per cent. You have not made any allowance for the other utilisation of the railways by the farming communities - such as the cartage of superphosphate which would amount to a very great tonnage. Would I be incorrect in my assessment that the table could be somewhat misleading as to the tonnage carted by Westrail?

Mr Reid - It is taken from the published statistics. We will have to go back and check that for you.

Mr Carbon - I propose to run through the supplementary submission on the Darling Range. I have divided the Darling Range, or that part of the Darling Range covered by Alcoa's bauxite lease, into two parts - a western part and an eastern part. The reason will become obvious. The western part has the richest deposits of bauxite and it is the part which Alcoa has at present been given permission to mine. Likely predictions are that Alcoa's activities will be restricted to this area for 25 years to 50 years. That is the term we are considering for the western part, which is classified as high rainfall area. The streams have little salt and with a very few exceptions very little salt is stored deep in the soil. Even if you had bauxite mining, farming or other activities which reduced the vegetation, it cannot be predicted that the activities will cause increase salination. In the 25 year to 50 year time span, there is no

point in talking about salinity increasing as a function of bauxite mining. It can be demonstrated fairly clearly that an increase in run off in these areas leads to a decrease in the overall salinity of streams because the water from that area is fresher than water from further inland.

The jarrah forest on the western part of the range is a very valuable and important resource to Western Australians. It is important from a watershed point of view and its importance to recreation activities, flora and fauna has been stressed several times to date. It has very strong intrinsic value to Western Australians. I strongly believe that the function and the value of this forest should be protected. However, jarrah dieback which as we have heard today is a widespread disease is at present an incurable disease and nowhere in the world has a cure for this type of disease ever been produced. It has spread rapidly through this area and some 30 per cent of the western part is now infected. At the present rate of spread, the forest on the western half of the lease has a life span of between 50 years and 100 years. That point must be clearly accepted before you make decisions about the appropriate management for that land. The jarrah trees growing throughout the area are slow growing with an 100 year to 200 year life cycle. With this likely spread of dieback, in the absence of bauxite mining, the State will lose most of the forest in the western part. There are exceptions in some preferred soils. Where the dieback does not spread the area can be preserved, provided there is no radical change to present management.

We have heard today about multiplier effects of bauxite mining on jarrah dieback. The figure quoted shows up to three times as much jarrah dieback spread as area of land bauxite-mined. If you assume that a quarter of the land is mined for bauxite, the remaining three quarters can be affected by dieback. That is the upper limit. In the western part of the forest, by some weird logic, this may be correct: Over the next 50 to 100 years, the other three quarters will be affected by dieback. The best predictions of the Forests Department, of Alcoa and of independent researchers say that it will be affected by dieback. But it would also be affected by dieback in the absence of bauxite mining. Let us not get away from the fact that bauxite mining does have an effect on jarrah dieback. It can be seen on the roads associated with mining and around the mining areas that there is a spread of dieback associated with bauxite mining. So the mining has a catalytic effect on the spread of dieback. The only measurements that I know of were done in a large catchment area. Comparisons made between the rate of spread of dieback with and without bauxite mining showed no measurable difference in an area that was already infected. Those results have been published by the Forests Department.

Senator ROBERTSON - Are you talking about the intensity of infection?

Mr Carbon - No, the area that is infected. The Forests Department classifies areas as being infected or not infected; in fact there is a further classification, that of 'graveyard' which means totally obliterated.

Senator TATE - Are you mining only in infected areas?

Mr Carbon - Alcoa's mining activities are totally restricted to the infected areas as defined by the Forests Department. Our 25 year plan restricts mining to a zone where 30 per cent of the forest is presently infected.

Mr White - I should like to make a point in case there is misunderstanding. Alcoa does mine bauxite in areas that are

not infected with jarrah dieback. But on a regional basis, we are mining in regions where there is 30 per cent infection.

Senator ROBERTSON - Is it a matter of definition?

Mr Carbon - Yes. Some parts may not have jarrah dieback but the region does. The eastern part is quite different. The bauxite quality is lower. At present, we do not foresee the need to mine here for 25 to 50 years. The zone is lower in rainfall, which means that it would be more difficult. Nor do we yet have the technology to reforest that area. Increases in stream salinity in this region have resulted from other changes in land use, such as agricultural changes. The jarrah forest in this region is relatively free of dieback; most of it has been quarantined and access is restricted. This quarantine will allow State authorities to identify whether there is dieback in a particular area and develop what they think are the appropriate management plans. Alcoa has given a binding commitment not to mine in the eastern part until research, perhaps including trial mining, has shown that salinity can be controlled. As forest clearing, through dieback, also causes stream salinity, there is an inferred commitment by Alcoa to either prevent, control or ameliorate the effects of dieback. There are four possibilities for the future which concern points raised today. The first is that research will find a cure for dieback and save the jarrah forests. This is unlikely. The disease is prevalent and devastating throughout the world. No cure for it or any similar disease has been found. Dutch elm disease, which affects mainly urban trees, is a well-known example from the United Kingdom. Nonetheless research should be done because the stakes are extremely high. Alcoa is spending $0.2m per year on independent research as well as doing their own. The second point is that protectable areas of good forests should be preserved from interference, including bauxite mining. Alcoa accepts the logic in the concept of conservation through reserves and we heard a little about reserves today. The selection and delineation of reserves within the mining lease, however,

should be negotiable and done after detailed input from many interested parties including Alcoa. So Alcoa is not opposed to the idea of reserves. It would like to play a significant part in providing information in the selection of those reserves.

Senator TATE - Who is the arbitrator in that case?

Mr Carbon - The arbitrator in all these things is the Western Australian State Government.

Senator TATE - I thought you might go to arbitration.

Mr White - It is the Minister.

Senator WATSON - Do you take special precautions to select a fire resistant or fire retardant species of trees?

Mr Carbon - I believe - and I can put on the hat I was wearing three weeks ago when I could look outside the system - that one of the problems in selecting what is planted has been a lack of clarity as to what was required from the forest in the long term. In the early stages people were concerned about protecting initially water supplies and it took a long time to accept that the water supplies in the western region could not be damaged by salinity if trees were not planted. So the idea was to plant some trees which grew quickly and rapidly used up the extra water. We are now going through a phase of considering those trees which are dieback resistant and further researching now, as we heard earlier, about the resinifera trees which can give us a good forest yield - usable timber. I believe that the matter of fire resistance has probably been given a lower priority than it should have been but it is now considered. It has been a game which we are still learning.

Senator WATSON - You mentioned earlier that your company was reluctant to move into the eastern area. Do you think, as a forester, the State was wise in granting leases to another company further inland in view of salinity and other problems which have been raised today?

Mr Carbon - I will half dodge the question by saying that problems of reafforesting increase radically as you go eastwards.

The problems are that, firstly, it is drier and, secondly, the soils are much more hostile in that they have much more salt and are very acid. It is beyond me to say whether present technology can revegetate those areas.

Senator TATE - You said earlier we do not have the technology.

Mr Carbon - We do not have the technology now.

Senator WATSON - Is there the same need to regenerate in those areas?

Mr Carbon - It depends on the end use required of the specific soil in that area and the specific streams. It is my belief that some of the streams have been considered as being saline and therefore not protectable and so therefore the State may be prepared to accept a specific stream or streams becoming more saline. It is, however, the protectable streams which are of most concern.

Senator WATSON - Are they significant in total?

CHAIRMAN - As time is running out, are you prepared to answer questions put to you in writing? Are there any final comments you wish to make briefly?

Mr White - I have just one comment in respect of some of the evidence which has been given this afternoon. There was an exhaustive examination of our operations a couple of years ago and a technical advisory group was set up by the State led by a senior research scientist consisting of members who had experience in forestry and groundwater hydrology. They produced recommendations for the environmental protection authority to develop. As part of the summary of the report it was stated that the Wagerup refinery should be allowed to expand to a maximum capacity of two million tonnes of alumina production per annum and that with proper planning by the company and the State acting together adequate bauxite reserves were available to allow the refinery to operate economically for a minimum of 30 years without risk to forestry, water resources or conservation