Proposed wet-blue hide tannery at Darkan

Deras (Australia) Pty Ltd

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
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Summary and recommendations

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The proposal was referred to the Environmental Protection Authority (EPA) in 1990, and the Authority set the level of assessment at Consultative Environmental Review (CER). The CER was released for a four week public review period from 20 March to 15 April 1991, during which a public meeting was held at Darkan.

The Authority has assessed the potential environmental impacts of the proposal as described in the CER, and utilized additional information supplied by other Government agencies, the public and the proponent .

In consultation with the Authority's officers the proponent has developed a comprehensive list of commitments covering the environmental issues raised during the assessment (Appendix 1).

Environmental issues such as irrigation of wastewater, solid waste disposal including chrome sludge, wastewater treatment pond leakage and odour, and sustained water supply have been considered in this assessment. The proponent has addressed these issues by making a commitment to monitor the environment to the satisfaction of the EPA (Appendix 1). Specific details of works to be carried out will be discussed with the EPA prior to works approval being granted.

Recommendation 1

The Environmental Protection Authority has concluded that the proposal to build a 'wet-blue' tannery to process up to 220,000 hides per annum, is environmentally acceptable.

In reaching this conclusion, Environmental Protection Authority identified the main environmental factors requiring detailed consideration as irrigation of wastewater, solid waste disposal, wastewater treatment, pond leakage and odour, and sustained water supply.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's commitments given in the Consultative Environmental Review (CER), as modified in response to the environmental issues raised during the public review period and the Environmental Protection Authority's recommendations.

Recommendation 2

The Environmental Protection Authority recommends that during the first year of operation, the proponent be required to investigate, to the satisfaction of the EPA, the recycling of chrome so as to minimise the amount of chrome sludge requiring disposal. Additionally, the proponent should report the results to the EPA within one year of the commissioning of the plant. The Minister for the Environment may place a Ministerial Condition on the proponent to ensure that chrome recycling is incorporated into the proponent's tanning process.

The proponent undertook an effective consultation programme where issues of concern and interest to the local community were raised, discussed and documented in the CER. The proponent's commitment to ongoing consultation is important and the Authority wishes to acknowledge the work of the proponent and the local community in identifying relevant issues and responding in a constructive manner.

Recommendation 3

The Environmental Protection Authority recommends that Deras (Australia) Pty Ltd establish formal liaison and social monitoring processes with the Shire of West Arthur.

1. Introduction

The proponent Deras (Australia) Pty Ltd (Deras), a wholly owned subsidiary of Deraswiss Ltd, proposes to establish and operate a 'wet-blue' hide tannery within the Shire of West Arthur approximately 14 km north-east of Darkan (Figures 1a and 1b). The proponent presently operates tanneries in Kenya, Nigeria and Zimbabwe with another under construction in the Sudan.

The proposal was referred to the Environmental Protection Authority (EPA) in 1990, and the Authority set the level of assessment at Consultative Environmental Review (CER). The CER was released for a four week public review period from 20 March to 15 April 1991, during which a public meeting was held at Darkan.

The Authority has assessed the potential environmental impacts of the proposal as described in the CER, and utilized additional information supplied by other Government agencies, the public and the proponent .

In consultation with the Authority's officers the proponent has developed a comprehensive list of commitments covering the environmental issues raised during the assessment (Appendix 1).

Environmental issues such as irrigation of wastewater, solid waste disposal including chrome sludge, wastewater treatment pond leakage and odour, and sustained water supply have been considered in this assessment. The proponent has addressed these issues by making a commitment to monitor the environment to the satisfaction of the EPA (Appendix 1). Specific details of works to be carried out will be discussed with the EPA prior to works approval being granted.

2. Description of proposal

2.1 Outline of the operation

The proponent intends to tan up to 220,000 cattle hides per annum using conventional tanning procedures. Hides would be mainly purchased from abattoirs in the South-West. The site (65 ha) (Figure 1b) would include a receival yard; a parking area; a process building (including storage areas and offices); a water reservoir; and wastewater treatment and evaporation lagoons. Solid waste disposal facilities will be on-site. Subsequent to the release of the CER, the Shire of West Arthur has agreed to take on the responsibility for the management and monitoring of any solid waste disposal on-site and proposes to gazette part of the site for that purpose. Additionally, the proponent has received permission from surrounding landowners to use over 1000ha of surrounding farm land to dispose of wastewater during winter and organic-rich solid waste throughout the year.

2.2 Site description

The site is typical cleared farmland found east of the Darling Scarp with soil comprising kaolinite-lateritic clay and some sand. The majority of the site is covered with a layer of gravelly, sandy or silty topsoil, which varies in depth between 1 m and more than 8 m. The depth of clay varies from zero (granite outcrops) to approximately 20m. The site is gently sloping with a drop of approximately 20m (Figure 1b). It is 3km distant from the nearest resident and offers a natural buffer from potential noise, odour and general aesthetics. The site drains towards the Dardanine Brook which is moderately saline as is the groundwater. Large quantities of salt are stored in the deep clay profile beneath.

Freshwater occurs in a regional palaeochannel aquifer from which the tannery would obtain water for production purposes.

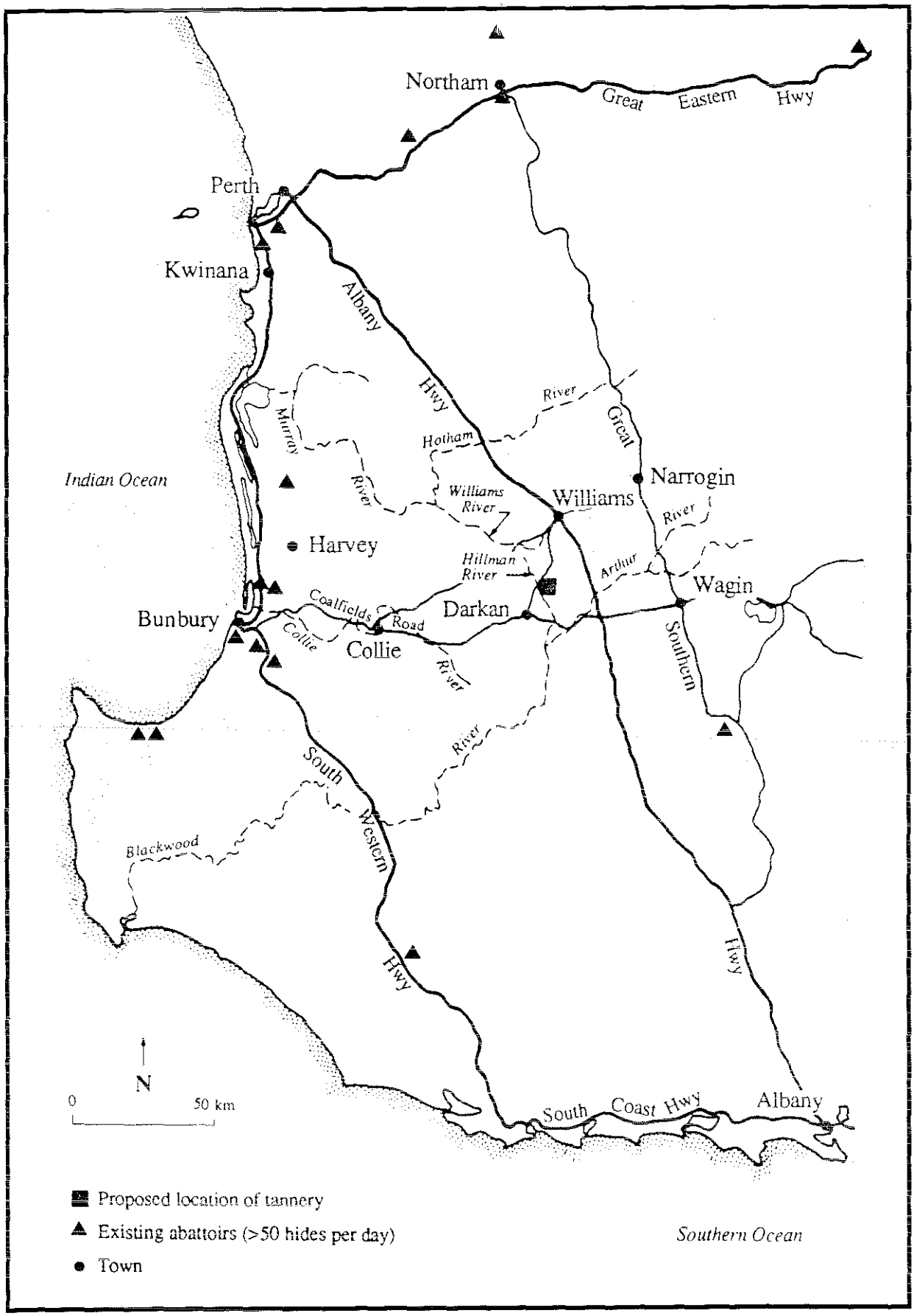

Figure 1a. Regional map

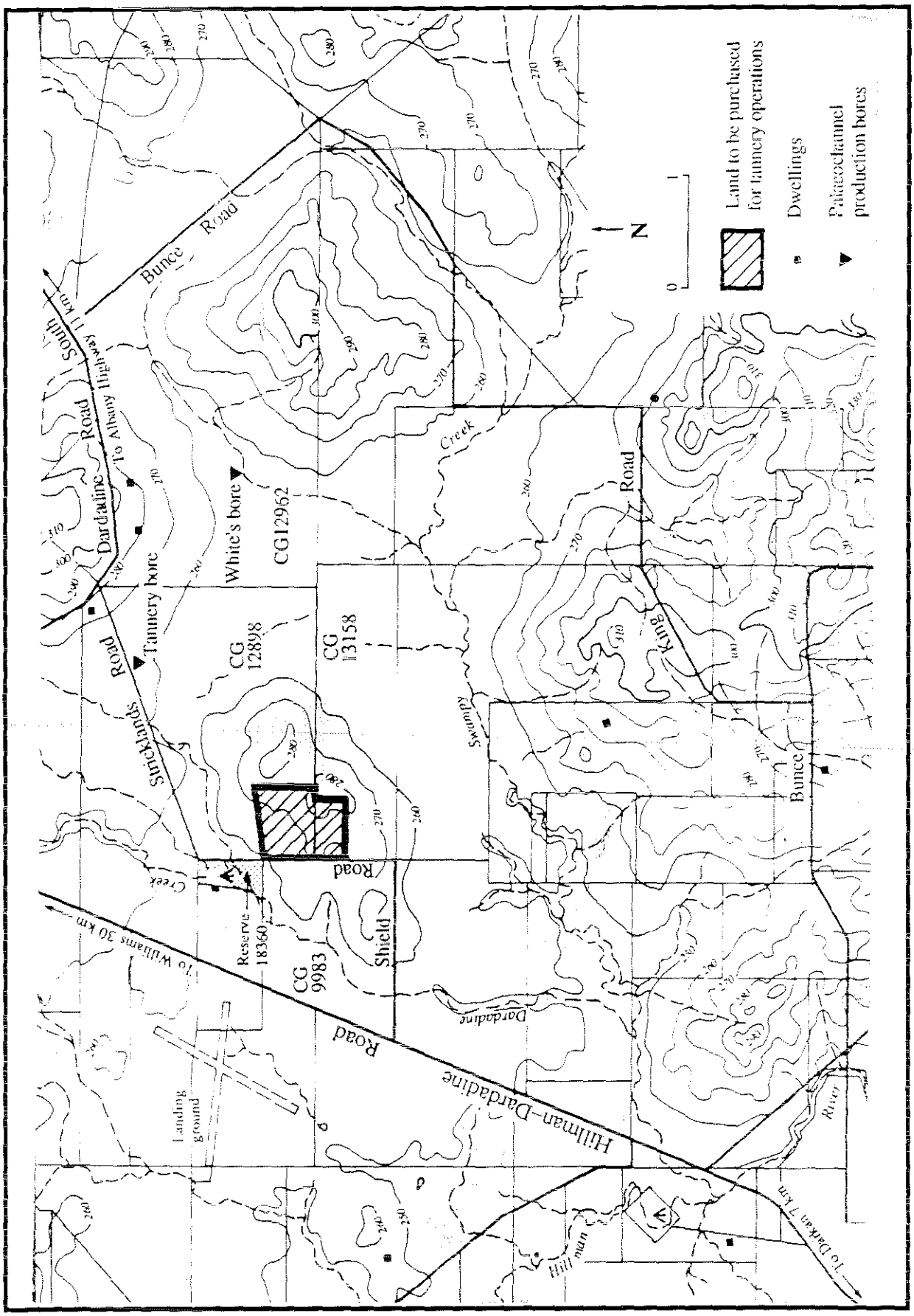

Figure 1b. Environs of tannery site

The climate is Mediterranean with high evaporation in summer and wet winters, offering the potential for wastewater disposal via a combination of evaporation and irrigation.

The site has no particular conservation value although a degraded reserve vested in the Department of Conservation and Land Management is close to the boundary of the site.

3. Potential environmental impacts and management as given in the Consultative Environmental Review

The proponent believes that, with the exception of the recycling of chrome, all potential environmental impacts are covered by suitable commitments (Appendix 1).

The CER identified the following potential environmental impacts for the project.

3.1 Soils, surface water and groundwater salinity

3.1.1 Irrigation

Salinity is moderately high in the area. Irrigation of saline-rich wastewater has the potential to increase the salinity of the environment in proximity to the irrigated area. To avoid this the proponent has resubmitted a management proposal to spray irrigate its wastewater during winter over more than 1000ha of land thus eliminating the potential for a significant environmental impact on land immediately downstream of the site. This translates into an application rate of less than 0.15mm of effluent per annum, which is minimal.

3.1.2 Leakage from the lagoons

Some leakage will occur from the wastewater treatment system. However, the ponds will be constructed to sound engineering principles with monitoring and recovery bores to eliminate any potential impact on the surrounding landowners. Should a failure in the wastewater system occur, Deras will take immediate remedial action to ensure contaminated water did not reach the Dardanine Brook.

3.2 Nutrients and chromium in spray irrigated water

As the proponent has modified its proposal so as to use over 1000ha of land for irrigation, it is unlikely that at the above application rate a problem from nutrients or chromium would arise from spray irrigation in this type of lateritic-kaolinite type soil.

3.3 Solid waste

There are four types of solid waste which have the potential to cause an environmental impact: organic-rich waste and chromium sludge produced on a daily basis, and organic-rich sludge and salt slurry from the wastewater treatment pond system produced every 5 to 10 years.

In the modification of the proposal the Shire of West Arthur has accepted the responsibility to manage and monitor all solid waste disposal on site. Additionally, the proponent intends to dispose of organic-rich waste as a soil conditioner on land owned by local farmers. A sufficient number of farmers, owning over 1000ha of land, have already agreed to take the treated wastewater as a fertilizer. Disposal of solid waste off-site would be carried out in a manner satisfactory to the Department of Health. It will be the responsibility of the Shire of West Arthur

to manage the disposal of chromium-lime slurry on-site. At this stage a firm proposal has not been reached as to where the salt slurry will be disposed of. However, it may be up to 10 years before disposal is necessary and the issue will be resolved to EPA's satisfaction before the commissioning of the plant.

3.4 Odour, noise and dust

While the wastewater treatment ponds have the potential to create odour if not managed properly, this should not be an issue given the proponent's commitment to operate the system to the satisfaction of the EPA. Additionally, the nearest resident is 3km away from the site.

The Shire of West Arthur will ensure that solid waste would be buried on site on a daily basis to prevent odour generation. Odours may be generated during desludging of the anaerobic lagoons. However, it is likely that desludging would need to be carried out only once every 5 or more years. Deras would consult residents before desludging, and attempt to select an occasion when the strength and direction of the winds were favourable for minimizing odour nuisance.

Tanneries do not generate much noise. For reasons of distance to residences, noise is not likely to be a problem. The proponent would operate the tannery within the noise levels prescribed by the EPA.

The risk of dust generation would be greatest during the construction period. All construction work would be performed in accordance with the Dust Control Guidelines (EPA 1990) as measured at the site boundary.

Appropriate measures would be taken to prevent dust from being generated by vehicles at the site: roadways and parking lots would be sealed or otherwise maintained. Clearing would be limited to the minimum necessary for construction and efficient operation of the tannery and waste treatment and disposal facilities.

3.5 Stormwater and flooding

Stormwater runoff from roof and site drainage would be disposed of separately from the wastewater treatment system. Runoff would be collected in open gully drains and directed to sumps for disposal by evaporation and/or infiltration through the ground.

Interceptor drains and bunds would be constructed around the solid waste disposal areas where required, to prevent erosion and possible contamination of the runoff waters. These drains would be designed to return stormwater to the natural drainage system during a one in thirty year flood.

3.6 Weed and pest control

The proponent considers that as the majority of hides are expected to come from animals raised and slaughtered within 250 km of the site, most of the associated weeds, pests or diseases are likely to be indigenous to the area. There is the potential for diseases and weed seeds to be introduced into the area via unprocessed hides or vehicles: this risk is considered small. All hides would be purchased from accredited abattoirs as required by the Agriculture and Related Resources Protection Act, 1976. All hides imported from interstate would be inspected by the Agriculture Protection Board to ensure declared noxious species were not introduced via the hides or the vehicles.

Weed seeds and disease organisms would be removed from the hides during the first two steps of processing (washing and dehairing). Washing water would be treated and evaporated rather than being used as fertilizer.

Deras would regularly inspect its land for weed growth, and promptly remove any weeds that were found. All waste disposal areas would be maintained to the satisfaction of the Health Department of Western Australia and the Shire of West Arthur.

Deras would control insects and weeds around the wastewater treatment system (including the lagoons and any sludge drying facilities or temporary stock holding areas) to the satisfaction of the EPA.

3.7 Chemicals: chromium, manganese and aluminium

Traces of the chemicals in the wastewater should not present any environmental problem as they are in non-toxic forms and in low concentrations when disposed of to the surrounding land by spray irrigation.

To prevent any possibility of any toxic effects of organic-rich waste disposal to pasture, Deras would undertake to dispose of such waste in accordance with guidelines from the New South Wales Department of Agriculture and Fisheries, which give loadings and rates for metals (in sewage sludge) applied to soils.

The Shire of West Arthur will manage all solid waste disposal on site.

3.8 Fungicides

Residual fungicides that are not absorbed by the hides or degraded during pre-treatment would pass (with the pickling and tanning wastewaters and samming wastewater) to the facultative lagoon.

The active ingredients in the fungicide formulations are likely to be either a mixture of phenols or an organic sulphur-nitrogen compound. Both are degradable by biological treatment. Consequently, fungicides would pose no threat the environment.

3.9 Visibility and appearance

The tannery buildings and waste treatment and disposal facilities would not be clearly visible from main road or dwellings. Three months before commissioning the plant, Deras would submit a landscaping plan (for tree planting) to the EPA for approval, to ensure the amenity of the area was retained.

3.10 Traffic

Apart from the construction period, there would be approximately 34 truck movements per week. Workers and visitors to the tannery could make up to 60 vehicle journeys per day. There are currently 38-40 traffic movements per day along the Hillman-Dardadine road.

No unique transport problems are expected to be generated by the tannery project. A likely benefit is that the increase in traffic movements along the Hillman-Dardadine Road could justify an application to the Main Roads Department for funding to assist with sealing. Deras would endeavour to assist the Shire of West Arthur with an application for such funding.

3.11 Fire

Tanneries are not usually a fire risk. If propane gas were to be used for water heating, it would be handled, stored and used in an approved manner. Flammable solvents are not required in the tannery processes, so only minimal quantities are likely to be used. The proponent would comply with the requirements of relevant fire prevention agencies before commissioning.

4. Summary of public and government agencies' submissions

4.1 Introduction

A total of 23 public and Government submissions on this proposal were received by the Environmental Protection Authority. Names of contributors are given in Appendix 2. Several issues raised were not of an environmental nature. The Authority specifically notes the high quality of the public submissions.

Submissions indicated that the potential environmental problems of greatest concern were: waste management including wastewater irrigation, solid waste disposal on-site, leakage of the wastewater treatment ponding system, odour, procedures to ensure against contamination of surrounding land, and the water supply.

4.2 Specific issues raised in submissions by the public and government agencies and the proponent's responses.

Comments from submissions can be broadly classified as follows:

- very strong community and Shire support for the proposal;
- adequacy and management of method of wastewater treatment and disposal;
- contamination of adjacent land by runoff and groundwater;
- leakage of the wastewater treatment ponding system;
- solid waste disposal;
- chrome recycling in bovine tanneries in the eastern states;
- lack of definitive proposals for environmental management;
- groundwater extraction;
- odour, dust and noise; and
- fire

There is a very strong community and Shire support for the project.The Shire has indicated a high degree of commitment to ensuring that the proposal would be managed properly The proponent has addressed the issues relating to the potential impacts with commitments, which are listed in Appendix 1, and in the answers to questions raised in submissions (Appendix 3). The key element of the proponent's response has been to allow the Shire to take responsibility for the management and monitoring of the disposal of solid waste on-site, and the use of over 1000ha of neighbouring farmland for wastewater irrigation and disposal of organic-rich waste.

5. Environmental impacts and management identified by EPA

5.1 General introduction

In the Consultative Environmental Review, EPA gave particular consideration to the issues of spray irrigation of wastewater and solid waste disposal (including chrome) on the proponent's property, salt disposal, pond leakage, sustained water supply and long term responsibility for any environmental impact that might occur. Specific emphasis was placed on the proponent's commitment to carry out and monitor the proposal to the satisfaction of the EPA, and to redress any detected environmental impacts.

Since the release of the CER the proponent has modified its proposal by proposing to dispose of its wastewater by irrigation of over at least 1000ha of surrounding land and allowing the Shire to take responsibility for on-site solid waste disposal. Additionally, the proponent will dispose of much of its organic-rich solid waste over a similar area, to local farmers, as a soil conditioner, Consequently, the proponent has, with the exception of chrome recycling, addressed all issues by explanation and/or commitments (Appendix 1) to the satisfaction of EPA. Details of some issues raised during the public review period can be addressed at the works approval and licensing stage.

Recommendation 1

The Environmental Protection Authority has concluded that the proposal to build a 'wet-blue' tannery to process up to 220,000 hides per annum, is environmentally acceptable.

In reaching this conclusion, Environmental Protection Authority identified the main environmental factors requiring detailed consideration as irrigation of wastewater, solid waste disposal, wastewater treatment, pond leakage and odour, and sustained water supply.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's commitments given in the Consultative Environmental Review (CER), as modified in response to the environmental issues raised during the public review period and the Environmental Protection Authority's recommendations.

5.2 Chrome effluent recycling

During its assessment the Authority sought comment from several Government agencies. The Authority has been informed that it is common practice in tanneries in the eastern states, which process bovine hides, to recycle chromium. The Authority is further informed that recycling of chrome does not interfere with the quality of the final product.

The Authority believes that in the interests of the long term management of the proposal that waste recycling should be employed where possible. Recycling of chrome would be a major step in reducing the quantity of chrome contaminated sludge needing disposal on-site. The proponent has requested that it be allowed to trial recycling initially (commitment 19).

Recommendation 2

The Environmental Protection Authority recommends that during the first year of operation, the proponent be required to investigate, to the satisfaction of the EPA, the recycling of chrome so as to minimise the amount of chrome sludge requiring disposal. Additionally, the proponent should report the results to the EPA within one year of the commissioning of the plant. The Minister for Environment may place a Ministerial Condition on the proponent to ensure that chrome recycling is incorporated into the proponent's tanning process.

5.3 Monitoring

One very important aspect of the proposal is monitoring. The Authority notes that monitoring is a critical factor in ensuring that the disposal of both liquid and solid waste is managed properly. The Authority recognises the proponent's commitment to monitor all aspects of the proposal to the satisfaction of the EPA and the Shire of West Arthur's willingness to take responsibility for

the long term management of both the on-site area for solid waste disposal and the whole site upon decommissioning.

5.4 Water supply

There is an adequate water resource in the palaeoaquifer to supply the needs of the tannery, However, the Authority notes that this water resource is public and may be proclaimed by the Water Authority in the future. During discussions with the EPA concerning works approval and licensing, the proponent will be required to show that the water resource within that part of the palaeoaquifer 2km upstream of the tannery is sufficient for the needs of the tannery.

5.5 Social

The benefits of the project to the community were documented in the CER and were raised in a number of the public submissions. The Shire of West Arthur highlighted benefits which would flow to the local community should the project proceed.

The Social Impacts Unit has advised the Environmental Protection Authority that the social factors and context of the proposal and its site were adequately covered in the CER. Social infrastructure was considered adequate, with the main emphasis placed on the importance of the extra employment generated to ensure viability and maintenance of existing services

Issues raised in the public submissions generally related to employment, monitoring, transport, effects on neighbouring properties, odour and fire.

The responses and extra commitment given by the proponent should ensure that negative impacts are minimised or eliminated, and positive impacts (employment, maintenance of services) enhanced.

5.6 Consultation

The proponent undertook an effective consultation programme where issues of concern and interest to the local community were raised, discussed and documented in the CER. The proponent's commitment to ongoing consultation is important and the Authority wishes to acknowledge the work of the proponent and the local community in identifying relevant issues and responding in a constructive manner.

Recommendation 3

The Environmental Protection Authority recommends that Deras (Australia) Pty Ltd establish formal liaison and social monitoring processes with the Shire of West Arthur.

Further, the Authority considers that any approval for this proposal based on this assessment should be limited to 5 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 Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the design and specification which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal should make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

6 Conclusion

Based on the information supplied in the CER and additional information supplied by the proponent during the assessment, the Environmental Protection Authority has concluded that the proposal could proceed subject to the commitments given by the proponent (Appendix 1) and to the Authority's recommendation in this report.

Appendix 1

Deras (Australia) Pty Ltd
Consolidated list of environmental management commitments

GENERAL COMMITMENTS

1 Deras would adhere to the proposal as assessed by the EPA and would fulfil the commitments made below.

2 The tannery would be constructed and operated according to the requirements of all relevant Government statutes and agencies, and to the satisfaction of the EPA.

WASTEWATER MANAGEMENT COMMITMENTS

3* Deras would build a fully integrated wastewater treatment and disposal system, which would be designed and installed by a recognised water/wastewater treatment contractor to the satisfaction of the EPA. The system would be operated and monitored by Deras to the satisfaction of the EPA.

4 Prior to construction of the wastewater treatment lagoons, Deras would supply details of their exact location and design to the EPA for approval.

5* Prior to commissioning the plant, evaporative lagoons would be constructed to dispose of treated wastewater and would be operated subsequently to the satisfaction of the EPA.

6* In the event of treatment or holding lagoon leakage causing an environmental impact, as defined by the EPA, Deras would take immediate action to stop the leakage so that the environmental impact was rectified to the satisfaction of the EPA.

7 All wastewater treatment lagoons would be constructed to have at least 0.6 m freeboard so as to be able to cope with a 'once in thirty year storm event'.

8* Deras would ensure that the water level in the wastewater treatment lagoons was maintained to the satisfaction of the EPA.

9* Deras would take immediate remedial action should failure of the wastewater treatment system occur and would carry out such action to the satisfaction of the EPA

10* In order to cope with equipment failure, Deras would keep sufficient spares for immediate repair of the aerators, the electrical system and other key elements of the failure Deras would take steps to construct holding lagoons, to the satisfaction of the EPA and relevant authorities, as quickly as possible.

11 Deras would ensure that stormwater runoff from areas adjacent to the lagoons did not, at any time, enter the wastewater treatment lagoon system

12* If, due to some unforeseen circumstances, the disposal of treated wastewater by irrigation did not meet the EPA's requirements, Deras would take action to hold that wastewater until it met EPA's standards for irrigation, and this action would be carried out to the satisfaction of the EPA

13* Deras would ensure that any treated wastewater would only be irrigated on to the site if it complied with EPA requirements

14 Deras would rectify immediately any unforeseen problems resulting from disposal of wastewater.

15* Before Deras irrigated wastewater on to its property, or any other property, it would provide the EPA with a chemical analysis of the treated water and have it approved for

irrigation by the EPA. Additionally, Deras would have the area of land to be irrigated approved by the EPA prior to commissioning the plant.

MONITORING

16* Prior to construction, Deras would submit and subsequently implement a monitoring programme to the satisfaction of the EPA.

The monitoring programme would include:

initial baseline sampling period to determine the status quo;
parameters to be measured;
sampling sites and times;
reporting times to the EPA;
a commitment to modify the environmental management programme, if necessary, to reduce the impact of pollution to the satisfaction of the EPA

17 Deras agrees to establish monitoring and recovery bores at locations satisfactory to the EPA.

18* All samples taken in the monitoring programme would be analysed in a laboratory acceptable to the EPA. In the event that the monitoring programme indicated an adverse introduce additional environmental management controls as necessary, to reduce the impact to a level acceptable by the EPA.

CHROME RECYCLING

19 Deras would perform ongoing tests and trials for the suitability and performance of chrome recycling and the use of high absorption chrome compounds during the first 30 months from commissioning. Deras would adopt such technology and include it in its process once it was satisfied the the result showed negligible decrease in finished product quality before this period was up. Deras would submit reports of the results of these investigations every 6 months to inform the EPA of when it will utilise the recycling of chrome in its process.

SOLID WASTE

20 Deras would dispose of solid wastes only in a manner satisfactory to the EPA, and would obtain the approval of the EPA for the method of and location for solid waste disposal prior to commissioning the plant.

21 Deras agrees to allow the Shire of West Arthur to take responsibility for managing and monitoring a solid waste disposal site on Deras's property for as long as the EPA requires that waste disposal area to be managed and monitored.

22* Deras will supply the EPA with a waste disposal method and site for the disposal of evaporated salt and have them approved by the EPA prior to commissioning the plant.

DUST, ODOUR AND NOISE

23* Deras would ensure that dust, odour and noise would be controlled at all times to the satisfaction of the EPA

24 All machinery with a potential to cause nuisance noise levels would be enclosed to ensure that noise levels were satisfactory to the EPA.

OTHER COMMITMENTS

25 Deras would control insects and weeds around the wastewater treatment system (including the lagoons and any sludge drying facilities or temporary stock holding areas) to the satisfaction of the EPA

26 Three months before commissioning the plant, Deras would submit a landscaping plan (tree planting) to the EPA for approval, to ensure the amenity of the area was retained

27* Deras would modify its pollution control operations, if it could not meet its licence conditions, so that environmental impacts were reduced to a level acceptable to the EPA.

28 Deras would be responsible for decommissioning the plant and rehabilitating the site and environs to the satisfaction of the EPA.

29 Deras would, at least six months prior to decommissioning, prepare a decommissioning and rehabilitation plan to the satisfaction of the EPA.

30 Deras would not transfer ownership, control or management of the project, without consulting the EPA and the Minister for the Environment.

Note: * denotes those commitments that can be administered under Part V of the Environmental Protection Act, 1986. The remainder may be implemented via Ministerial Conditions.

Appendix 2

List of Government agencies and members of the public who made a submission

Commonwealth Scientific and Industrial Research Organisation
Department of Agriculture
Department of Conservation and Land Management
Department of Health
Department of Mines
Department of Planning and Urban Development
Department of State Development
Water Authority of Western Australia
Social Impacts Unit
Shire of West Arthur
Mr B McCann, Hon. Sec. Darkan Golf Club
Ms G M Johnston, Darkan Community Swimming Pool Committee
Mr T Lloyd, Darkan and Districts Apex Club
Mr C M Buller
Mr and Mrs N Cockcroft
Mrs S Curnow
Mr and Mrs Paul Double
Mr and Mrs Peter Double
Mr K King
Mr G King
Mr and Mrs P Plank
Mr D South
Mr M J Tichbon
Mr I Woodruff

Appendix 3

Responses to public submissions

DARKAN TANNERY—
RESPONSES TO PUBLIC SUBMISSIONS

WATER SUPPLY

1 ***In its calculations, the proponent should only use 2 km of the palaeochannel upgradient of the site for storage and recharge. Consequently insufficient data have been provided to ensure that the long-term water supply can be guaranteed. Data should include defining the position, width and depth of the channel as well as the long-term groundwater quality.***

The proponent is confident that the palaeochannel aquifer is capable of supplying considerably more water than the tannery would require. The bore on Mr G. White's land was installed in an attempt to dewater a permanently wet low-lying part of his property. The palaeochannel water was removed at a rate of 350 m^3/day for a year. This action resulted in negligible draw-down of the aquifer during pumping and rapid recovery to artesian levels after pumping ceased. In contrast to the area around DT2P (where surface soils over the palaeochannel are sand), White's bore has about 5 m of clay overlying the aquifer throughout most of the valley. This presumably hinders recharge in this area, yet high production levels are possible. This production rate was 2.4 times that required by the tannery at full production and five times greater than that required at start-up. The proponent will conduct a longer term pump test to support an application for a license for bore DT2P if required by the Water Authority of Western Australia (Water Authority).

The proponent owns bore DT2P and is in the process of obtaining an option over Whites bore (situated 2 km upstream on the paleochannel).

Recharge to the paleochannel would be both by direct infiltration of rainfall on the area of the paleochannel and run-off from the surrounding hills. As the valley soils are sandy a conservative estimate is 10% of rainfall on the area of the channel which has an estimated width of 500 m. Based on the average rainfall of 564 mm a 2 km length of paleochannel is required to provide recharge equal to the 45,000-55,000 m^3 required annually by the tannery at full production. The results from the short-term pump test already conducted show that a single bore can harness the recharge over a 2 km length of channel.

The exact dimensions of the palaeochannel are not known - no doubt they vary from place to place. At White's bore the sand is at least 30 m deep; at DT2P, at least 45 m deep.

The width of the palaeochannel is not known with certainty, an estimate from the area geomorphology suggests it is 500 m wide.

In discussions with staff of the Water Authority it was agreed that the proponent would carry out some further proving up of the resource, probably by geophysical methods, prior to commencing construction.

2 ***Will the proponent make a commitment to provide an alternative water supply of stock or domestic water supply is shown to be adversely affected as a result of the tannery groundwater extraction?***

Yes the proponent makes a commitment to provide an alternative water supply for stock or domestic water supply if existing supplies are shown to be adversely affected as a result of the tannery groundwater extraction.

In March 1991, there was only one known bore or well that could possibly have been affected by extraction from DT2P: namely, Bunce's well, situated 250 m north of DT2P. This well is used for watering stock (sheep), and the quantity of water required for this purpose is very small in comparison to the tannery requirements. The high-rate pump test had no effect on the water level in this well.

There is adequate surplus capacity at DT2P to provide good quality water for the stock.

3 ***Will an impact occur on the marshland/Reserve No. 18360 from drawing water from bore DT2P?***

Reserve No. 18360 supporting an open casuarina woodland heavily used by local farmers is located 2 km west-south-west of DT2P, and is believed to be south of the western extension of the palaeochannel: a bore on Strickland's former property (west of the reserve) intersected brackish/saline groundwater.

Even if the reserve overlies the palaeochannel, the results of numerical modelling (CER:Appendix G3) indicate there would be negligible water level drawdowns (less than 0.1 m) at distances of more than 700 m along-channel from DT2P. Therefore, it is considered that there is no possibility that pumping from DT2P will affect the Reserve No. 18360 (no marsh is present) which is 2 km from DT2P. Deris has commited itself to monitoring groundwater levels in the palaeochannel.

4 ***Rockwater infers that a long-term supply of water may require more bores to be established at a considerable distance from the tannery? How would this impact on other users?***

As discussed in the answer to Question 1 above, DT2P is more than capable of yielding the required supply of 62,500 m³/year, and G. White's bore is available as a reserve supply, therefore no additional bores will be needed. The work by

Rockwater Pty Ltd referred to in this question was commissioned at a time when the water requirement for the tannery was thought to be up to 750 m^3/day to permit year round irrigation (CER:Appendix G1). There are now known users, except as described in response to question 2 above, who would be affected.

PROCESS – HIDE SUPPLY

5 ***The Boyanup proposal was to use 90% chilled hides. Why is this not the case for Darkan?***

6 ***Is the proponent committed to using 50% brine cured hides and 50% chilled hides to reduce the potential for a salt problem? If the number of chilled hides increase to greater than 50%, will the proponent irrigate more water?***

7 ***The option of using chilled and green hides may be environmentally preferable as the solid waste is more easily manageable. Could the proponent explain what the limitations are on using green or chilled hides?***

8 ***Has the proponent considered obtaining fresh or chilled hides from regional abattoirs instead of the abattoirs sending hides to Perth for salting and then back to the Darkan tannery? If the proponent co-ordinates the killing, delivery and receival times, then the hides may not require refrigerated transport. Will the proponent install on-site chilling facilities to temporarily store fresh hides received at times which are not co-ordinated with immediate processing requirements?***

9 ***What chilling facilities will exist at abattoirs or at the proposed tannery?***

The proponent is not committed to using any proportion of brine cured or other types of hides. The intention is to obtain and process as many green or chilled hides as possible. If the requirements for hides can be met by these supplies, which requires only a consistant supply from the abattoirs, then only these would be used. However, the uneven demand for the supply of beef, both throughout the year and from year to year, may make this difficult. The proposed tannery at Boyanup had a ????? production of 100,000 hides and it would have been possible to guarantee obtaining other fresh hides.

A stock of brine cured hides would be kept in store at the tannery. If on any particular day there was to be a shortage of green or chilled hides, sufficient brine cured hides would be used to enable a full days production to be achieved. However, brine curing and storage adds to the cost of purchase of a hide. The proponent realises clearly that salt imported to the tannery must also be removed, in both cases at the proponent's expense.

In the CER (Section 5.2.1) it was stated that 'To allow calculation of wastewater composition ..... it has been assumed that 50% of the hides processed would be brine cured. This assumption affects the quality of the washing water only.' It was also clearly stated in the CER (Section 6.2.1, Section 6.4.3, Figure 6.3) that washing water would not be used as fertilizer; this means that any salt used to preserve hides would be contained within the treatment and evaporation lagoons. If no brine-cured hides were included in a particular batch of hides, it might indeed be possible to use the washwater as fertilizer, though this was not proposed (see Question 45)

The proponent has no power to dictate killing schedules at abattoirs. These are determined by the demand for meat and the availability of cattle. Most abattoirs cure their own hides, and have refrigerated areas.

Initially, the proponent intends to use refrigerated containers to transport and to store hides. A scheme under consideration, that would allow use of green hides from the many smaller local and regional abattoirs, is to use a refrigerated container rig to travel in a circuit around the south-west region. This appears to be a satisfactory method to collect and preserve hides from small abattoirs. Short-falls in requirements could be made up from the larger or municipal abattoirs. As described in the CER (Section 5.2.1) these could be green, chilled or brine-cured. In time, a chiller room could be added to the tannery building.

10 Is the proposed site the nearest site the proponent can find to the supply of hides?

Even though the proposed site near Darkan is not adjacent to the largest abattoirs, it had many other advantages which Deras considered outweighed this disadvantage when the site was considered. Such advantages are listed in the CER (Chapter 3). Collection of hides from smaller regional abattoirs would always involve considerable travelling, no matter where the tannery were located.

11 Is there a sufficient number of hides in the State to meet with the demand at maximum production?

The annual cattle kill (in abattoirs) in the south-west of Western Australia is approximately 500,000. This is more than twice the quantity required by the proposed tannery at its full rate of production (CER Section 2). Currently these hides are used by Gosh Leather or preserved and exported. Gosh Leather is intending to close its beamhouse operations and obtain its supplies from Deras. Deras would bid for its supplies at the abattoirs in the normal manner.

12 How will the proponent ensure that hides from other areas will not import weeds?

The Agriculture Protection Board under the *Agriculture and Related Resources Protection Act 1976* (AP, Act 1976) controls the movement of hides to prevent the introduction and spread of declared plants. Deras would be subject to same

conditions as all other traders in 'restructured animals and/or their coats' (clause 71-AP Act 1976).

Deras's aim is to produce a high quality product. Hides with blemishes, such as might be caused by the 'Nangura burr', would not be in accordance with such an objective and hence would not be purchased. In any case, properties affected by this weed are placed under quarantine so that affected hides would not be available.

Methods of controlling the import and establishment of weeds and other pests are outlined in the CER (Section 7.2.2).

PROCESS - TECHNOLOGY

13 Is the level of technology proposed for this tannery lower than that for Boyanup and has the proponent incorporated CSIRO technology?

The beamhouse processes are essentially identical with those proposed at Boyanup. The tanning process is slightly different in that a mixed metal tannery is proposed. This is neither higher nor lower technology, just different.

As stated in the CER (Section 5.1.2) 'The tanning process ..... has been adopted without alteration from the process sheets of Gosh Leather'. Similar levels of technology (tannery drums and ancillary equipment), would be used as in this existing Western Australian tannery. Most of the equipment would be imported from Italy, a country famous for its advnced tanning technolgy and the high quality of its leather goods.

Some modern European tanneries have installed equipment which has allowed virtually complete automation of operations. A high throughput, exceeding the entire Western Australian hide production, is required to support the huge capital investment needed for such a design.

The proponent has not sought to incorporate CSIRO developments. The SIROLIME process (CER; Section 5.8), an adaption of the processes used for many decades to recover wool from sheepskins prior to tanning, has little value for this tannery. In addition, this process is still under development. A CSIRO scientist, asked to assist the former Boyanup tannery task force stated that the Sirolime process was (variously) 'still being tested', 'a bit of a gamble', and that it has had 'some problems in implementation'. The proponent has no wish to take unnecessary risks.

The other form of technology which CSIRO has played a part in developing is the recycling of tanning liquors (CER; Section 5.8). The proponent's attitude to this is discussed in answer to Questions 19–21.

CSIRO are advocates of land application of tannery wastewaters throughout the entire year. This practice works well in the south-easterly states, but is difficult to manage in the very dry summers of the south-west of Western Australia. Land application has been proposed in the winter at Darkan (as it was at Boyanup).

14 Why has the proponent not given an independent report, nor any Australian authority comment, on BUSAN 30WB and TCMTB? What are the names of these chemicals?

TCMTB is an abbreviation of the name of the fungicide 2-(thiocyanomethylthio) benzothiazole. This name and abbreviation was shown in the CER; Appendix I. Busan 30WB is a trade name of Buckman Laboratories Inc, of the United States, and this particular product contains a 30% formulation of TCMTB. Busan 30WB is formulated for use in the timber industry (to prevent fungal growth on newly sawn timber) as well as the leather industry. Other formulations from this or other manufacturers are used in many other industries to prevent degradation of materials.

It would be unusual for Australian authorities to carry out actual testing of such substances; normally, advice and testing results from Northern Hemisphere authorities are considered before any chemical is registered for use in Australian States. The information shown in Appendix I was the best available from the Australian agents for the various manufacturers.

15 The proponent proposes to use Bayer Baychrom F and Kromex. Is the proponent aware that the German Government Resources Act *says that these chemicals should not escape into waters, wastewaters, or soil because of their toxicity?*

Yes, the proponent is aware that these formulations (as opposed to diluted, neutralized residues) should not escape into natural waters, wastewaters (or sewers), or onto soil. This is because of the very high acidity of the formulations (CER: Appendix I), not because of unusual toxicity (the chromium and sulphate contents are also significant). The only way in which these or equivalent products would escape is by accidents during transport of chemicals to the tannery. The safety of such transport is regulated by the Department of Mines (Explosive and Dangerous Goods Division) and the proponent has committed (Commitment 2) to abide by the requirements of all relevant Government Statutes and agencies. The primary responsibility for safe transport would, however, lie with the cartage contractor.

The proponent is not proposing exclusively to use products from the Bayer company. Other manufacturers produce quality tanning agents, equivalent in composition, which might be preferred for commercial or other reasons.

16 Is the proponent prepared to use ammonium sulphate for deliming rather than ammonium chloride as mentioned in Section 5.8 so to reduce the potential impact of salt?

17 To what extent will the proponent substitute $(NH_4)_2SO_4$ for NH_4Cl in deliming liquor? How will this change the concentrations of SO_4 and Cl in irrigated wastewaters?

The ammonium sulphate (a by-product of mineral processing) which is produced in Western Australia at present is not suitable for use in tanning processes. Imported ammonium sulphate is substantially more expensive than ammonium chloride. If this situation changes in the future, the proponent would seek to use ammonium sulphate exclusively. The concentration of chloride in the fertilizer water would then be approximately that in the water supply–215 g/m^3 (CER: Table 4.6). Sulphate concentrations would increase correspondingly.

18 ***Will the proponent partly or fully substitute NaHS for Na_2S in the dehairing process waters? How will this affect the concentrations of sodium and sulphate in irrigated wastewaters?***

No. as stated in the CER, the proponent plans to use the Gosh Leather procedures exactly. The proponent realises that all sulphide species in dehairing liquor are completely and instantly converted to bisulphide ion . This results in formation of sodium hydroxide from Na_2S. If NaHS were used alone, the concentration of sulphur in fertilizer water would be unchanged. The concentration of sodium might be reduced (but only if additional lime were used instead of sodium hydroxide to replace the lost alkali).

19 ***Is the proponent aware that instead of using a 6% salt on hide weight for each pickle, 1% salt could be added in efficient chrome recycling. To achieve good results, it is not necessary to have recycling drums provided the liquors can be collected efficiently. Could the proponent comment?***

20 ***The description of the proposed tanning method indicates that chrome salts will only be used once and not recycled. This is extremely wasteful and vastly increases the amount of chrome to be disposed. It is recognized that the proponent is aiming to produce well tanned hides, but it should be noted that the tannery in Casino, New South Wales directly recycles chrome tanning waters and good quality tanning is achieved. It is understood that the CSIRO will assist the proponent in applying the chrome recycling method.***

It is estimated that the proposed tanning method will cause a 6% increase in the salinity of tanning wastewaters, whereas only a 1% increase in tanning wastewater salinity may be achieved through chrome recycling. Will the proponent adopt the chrome recycling method and if so what effect will this have on the salinity of wastewater to be irrigated.

21 ***The precipitation of chrome from tanning liquors as proposed is not recommended. Efficient direct recycling of chrome liquors will reduce the salt usage, and consequently the salinity of the effluent, in addition to reducing the usage of chromium sulphate. Chrome can be precipitated from excess liquors and can be reused. Why has this not proposed for this project? Was it proposed for the Boyanup Tannery?***

The proponent is aware of the possibility of recycling pickling and tanning liquors, and of the role played by CSIRO in developing the process in Australia. Nevertheless, a survey of the literature, some published by CSIRO scientists and some by overseas workers, has not convinced the proponent that the recycling process can be guaranteed to produce such high quality leather as the conventional processes.

This is particularly the case with the present proposal where a mixed chromium-aluminium tanning agent is to be used. As far as is known, no bovine hide tanneries are recycling such a liquor (although CSIRO advises that a sheepskin tannery has been doing so).

The proponent is aware that substantial savings in chemicals and evaporated salt disposal costs are potentially available. The proponent would commit itself to undertake trials of the recycling process and alternative use of high uptake chrome systems once the tannery is operating successfully (and so producing sufficient cash flow to support such research). It would report progress to the EPA. It is intended that this program would occupy eighteen months and would be instituted after the first full year of operation.

As can be deduced from consideration of Figure 6.1 and Table 6.1 in the CER, the dissolved salts content of the wastewater would be reduced by 81% of 30%, or approximately one-quarter. The salt ultimately to be disposed off-site would be reduced by a larger proportion, close to one-half (because calcium salts are expected precipitate in the first lagoons (anaerobic, facultative) and so contribute to lagoon sludge tallies; or to be used in fertilizer water).

No tanning wastewater would be used as fertilizer. It has no nutrient content and is too saline. All tanning wastewaters would be neutralized, settled and treated in the facultative and evaporation lagoons at all times (CER: Section 6.3.2 and 6.4.3 and Figures 6.2 and 6.3).

The proponent recognizes that it is possible to reuse chrome which has been precipitated from the pickling and tanning wastewaters. This was proposed for the Boyanup site. It is not known, but it may be possible to reuse mixed chromium-aluminium precipitates such as would be produced at Darkan. It is now proposed that these be stored on-site rather than taken to the Perth area for disposal (Question 63) and so they could easily be recovered for reuse at any future time.

PRE-TREATMENT OF WASTEWATERS

22 There appears to be considerable potential for odour problems occurring in wastewater pre-treatment facilities and in the lagoons, principally through the emission of hydrogen sulphide gas. Section 6.3.1 of the CER refers to use of manganous sulphate to oxidize bisulphide and thiosulphate to sulphate in dehairing

wastewaters. The oxidation of these reduced sulphur compounds to sulphate may not be complete using this oxidant thus odours may continue to be a problem. In addition the manganous sulphate will increase the pool of sulphate available for reduction to sulphide in the lagoons.

Martin and Rubin (1987) are cited in Section 6.3.1 for the use of manganous sulphate in the treatment of wastewater – how applicable are their findings to the treatment of tannery wastewaters? *Section 6.3.1 also refers to more conventional methods of bisulphide and thiosulphate oxidation by aeration as used at other tanneries.* **Will Deras adopt these methods instead of using manganous sulphate as an oxidant?** *This would alleviate the need for costly chemical additions and need to dispose of contaminant (Mn) sludges.*

23 The proposed pre-treatment of dehairing waste (Section 6.3.1) is unlikely to achieve the levels of pH, suspended matter and sulphur listed in Table 6.2 and will not significantly reduce dissolved slats. During dehairing and manganese catalysed oxidation of sulphide, high levels of thiosulphate will be produced. The thiosulphate will not be precipitated in the pre-treatment. Even is sulphur were present as sulphate, it is difficult for tanneries to achieve 1,500 mg/L sulphate in practice. Could the proponent comment?

As stated in the CER (Section 6.2.1, Section 6.3.1, Figure 6.2, Figure 6.3) the dehairing wastewater would be aerated, probably with a mechanical floating aerator. The reaction between oxygen (molecular) and bisulphide ion is rather slow, even at very high pH. Therefore, manganese ion would be used *to increase the rate of reaction* (it is not an oxidizing agent under these conditions).

Such a mode of participation is called catalysis. This method of catalysed aeration, has been used at tanneries, pulp mills, refineries, and a variety of other industries to reduce the total sulphide content of wastewaters. Only relatively small quantities of the catalysing substance are required. It would be possible to use another manganese compound instead of the sulphate salt; however, the amount of additional sulphate added to the total sulphate pool is very small (less than one per cent).

The proponent considers that it is an open question whether aeration will produce thiosulphate or sulphate as the major sulphur species. As described in the reference quoted in the CER and Question 22, thiosulphate is the major product of aeration at moderately high pH (8-11). At very high pH, sulphate is the major product. The pH is reduced only in proportion to the sulphate produced. The situation is complex and dynamic and impossible to predict. If it were essential to oxidise all reduced sulphur to sulphate, (it is not) this could easily be accomplished with addition of another catalyst after a few hours operation. However, as stated in the CER (Section 6.3.1) catalysed aeration would be carried out to destroy sulphide, specifically. This would be done to prevent the conversion of significant proportions of bisulphide ion to hydrogen sulphide when dehairing water is mixed with other wastewaters (in a

balancing tank, as described in the CER, Section 6.4.1 or with anaerobic lagoon water). Such a conversion might create an odour problem. In addition, destruction of the high sulphide content has the advantage that the dehairing wastewater is rendered much less toxic to bacteria of the type which would inhabit the anaerobic lagoon. Refer also to the response to Question 28.

Published literature on settling characteristics of dehairing and similar wastewater shows that relatively brief retention times (two hours) are sufficient to remove up to 90% of the suspended solids. These solids are predominantly inorganic in nature, so possess high densities and settling rates. It was assumed (CER; Section 6.3.1) that little change in the oxygen demand of the wastewater would result.

The quoted estimate of inorganic sulphur in pre-treated dehairing wastewater (CER; Table 6.2) corresponds approximately to the solubility of gypsum in water.

24 With the chrome precipitation method proposed, it is very difficult to achieve chrome levels of less than 2 mg/L in tanning liquors. Salts are added to achieve chrome precipitation. Direct chrome liquors recycling gives considerable cost savings and reductions in effluent chromium and salinity. Could the proponent explain why it has chosen the method proposed in terms of its impact on chromium levels/build-up in irrigation water or pond sludge.

The proponent believes it would be possible to achieve lower concentrations, although the benefits of doing so are minimal.

A wide variety of chromium-using industries, including tanneries, routinely achieve final chromium concentrations up to two orders of magnitude less than the quoted figure of 2 mg/L. Poor results are a consequence of producing a poorly settling (i.e. finely divided) floc in the neutralization tank. The neutralization tank would be designed and operated so that finely divided flocs were not favoured. The presence of aluminium in the tanning liquors is expected to assist in capturing and settling of any remaining fine particles.

Chrome liquor recycling is discussed in answer to Questions 19–21. It is recognized that cost savings are possible. Product value is considered more important, however, and it would not be introduced without very careful trials.

As stated in the CER (Section 6.2.1, Section 6.3.2, Figure 6.2. Figure 6.3) and in the response to Questions 19–21 treated pickling and tanning wastewaters would not be used as fertilizer, but instead would pass directly to the facultative lagoon.

Chromium has no effect on lagoon performance. The total quantity of chromium which would accumulate in the lagoon is very small. To illustrate, even at a discharge concentration of 2 mg/L (as quoted in the question) only 335 kg would accumulate over the 1.3 ha of facultative pond bottom over a thirty year period. On decommissioning of the facility, it is probable the 30 cm thick lagoon liner would be ripped and ploughed to restore the natural hydraulic conductivity of the soil. The

average resulting concentration increase of chromium in the clay in this layer (bulk density ~ 1.6) would then be 54 mg/kg. For comparison, the average world soil concentration (excluding those derived from ultrabasic rocks) is 84 mg/kg, with a range of 0.9–1,500 mg/kg. Soils are not considered contaminated with chromium unless the concentration exceeds 600 mg/kg. Therefore, even if the chrome precipitation method gave results as stated the effect on the soil at the lagoon bottom resulting from this would be inconsequential. The actual effect is expected to be barely detectable.

WASTEWATER TREATMENT - LAGOON MANAGEMENT

25 Will the proponent make a commitment to remove sludge from its ponds every few years as stated in the CER?

The proponent has commited to carry out this work when (and if) it is necessary (to prevent odours). Because of the very low loading rates on all lagoons, it is possible that desludging would not be necessary during the life of the tannery. The proponent believes that commitment 19 in the CER is sufficient to allow control of this aspect of management.

26 It is difficult to remove suspended solids from lime liquors by settling or by dissolved air flotation although both systems will bring about some reduction. It is questionable as to whether the oxidation of sulphide will be effective in preventing odours because under anaerobic conditions, sulphate and thiosulphate will be reduced to hydrogen sulphide. Would the proponent comment on the possibility of providing aeration in the anaerobic pond rather than oxidizing the dehairing liquors?

As described in the response to submission 23, inorganic solids are removed readily from lime liquors by settling. It was assumed that little reduction in organic strength resulted from this.

Also described in the response to Questions 22 and 23 the objective of out-of-lagoon, pre-treatment aeration is to reduce or prevent odour generation during balancing (which is essential if water is to be used as fertilizer), during fertilization operations, and during admission to the anaerobic lagoon. This is necessary because otherwise the neutralization of the dehairing wastewater which would occur during these operations would create an appreciable quantity of hydrogen sulphide and possible odour impact. It is not supposed that this aeration would prevent formation of sulphide in the lagoon–in fact, continual formation, oxidation and reformation of sulphide in the lagoon is an essential part of the process. Further details are presented in the response to Questions 27 and 28, and in the CER (Section 6.4.1).

Anaerobic lagoons are, by their nature, devoid of dissolved oxygen (or nitrate). To aerate an erstwhile anaerobic lagoon is to attempt to change it to an aerobic (or aerated) lagoon. It would be impossible to provide sufficient oxygen to the 'anaerobic' lagoon described in the CER to treat all the BOD in the wastewater: instead, it would be necessary to provide a very large shallow lagoon similar in design to the facultative lagoon. This would need to be approximately 1 ha in extent and containing 5–10 large floating aerators. Operating problems (odour from 'dead' spots, foaming, sludge management, contingency for power failures) would be very great as would be the capital and operating costs.

2 7 It is probable that the malodor will occur from the anaerobic pond. The ponds will need to be well managed for the sulphur bacteria to control odour. Can the proponent clarify its management intentions in the case of malodor occurring?

2 8 The effluent treatment system will require very good management at each stage. During the detailed design of the effluent treatment system, more information should be collected on the concentrations and loads of the wastewater constituents. it is probable that the washwater will have a higher BOD value than anticipated and what the tannery effluent characteristics will differ from the synthetic fellmongery effluent used for the preliminary design calculation for the anaerobic lagoon. Would the proponent comment?

The pre-treatment system would require careful day-to-day operation. However, the lagoon system has been designed to require minimal management (other than control of water levels).

Management is not the feature which would prevent odours occurring from the anaerobic lagoon: rather, design is. It is recognized that the design of the size of the anaerobic lagoon is based not on firm precedent but on laboratory trials. It is correct that the synthetic effluent used for laboratory trials of growth and inhibition of *Thiocapsa roseopersicina* is likely to have different strength from that effluent admitted to the anaerobic lagoon. This is irrelevant. Laboratory trials are carried out to derive bacterial growth constants, and these are independent of feed strength. The *rate constant* is a quite different quantity from the *rate of reaction* (which *may be* concentration dependent). However, the precision of those measurements is always 100 (even with use of a synthetic effluent of reproducible quality) which is why monitoring and possible consequent expansion of the lagoon are proposed.

The important feature, to prevent odours, is to maintain a high concentration of sulphur bacteria. While these are present, odours do not occur because sulphide steady-stock concentrations are low. Growth rates are high during summer (warmer temperatures, longer photoperiod) so no difficulty in establishing and maintaining a flora is expected at this time. The very great reduction in hydraulic load (from 184 to 30 m^3 per day) results in a long 'winter' retention time (ca 40 weeks) so that the flora would not be diluted out—as normally occurs with overloaded lagoons during winter.

The washwater quality quoted in the CER was the result of analysis of successive batches from Gosh Leather's operations. Obviously, when the wastewater quality depends on chance factors (blood or dung contamination of the hide) the quality would be variable, although the quoted values accord reasonably well with literature values (washwater from sheepskin tanneries has higher strength–due to lanolin on the skin). As can be appreciated by examination of Figure 6.1 in the CER, even if the washwater were several fold more concentrated there would be little effect on the total quality of the combined wastewaters, which are dominated by the dehairing and bating wastewater streams. In fact, during winter it would be advantageous if the

washwater were stronger than stated, so that continued microbial activity in the anaerobic lagoon would be promoted.

The tannery would commence production at 45% of this final planned production rate and would increase to full production during the following four years. As stated (CER: Section 6.4.1) the anaerobic lagoon 'performance would be monitored carefully over the first years of operation to evaluate the need to expand or duplicate the lagoon'. At start-up, the lagoon would provide a detention time of ninety-six days—probably enough to allow year-round operation, and much greater than required for the proposed cycle of loading. At full load and even during these early years, it may be advantageous to introduce some recycle of effluent back to the start of the lagoon. This would involve diluting influent wastewater with treated water (of roughly neutral pH), the ratio being varied as appropriate to avoid local concentration effects. Allowing this possibility is a further advantage of preliminary destruction of sulphide by aeration (refer Questions 22 and 23).

29 Projected stabilization pond leakage of about 4,000 m^3/a is excessive (11% of input) and will lead to a loss of 418 tonnes of salt/annum (71% of total). Is the proponent prepared to provide an impervious lining with another order-of-magnitude impermeability (not achievable), or use a clay liner of 500 mm thickness, or a plastic liner?

The clays available for the lagoon liners exceed EPA criteria for this purpose. These are that the hydraulic conductivity should be less than 10^{-9} m/s.

Actual leakage is likely to be considerably less than that estimated on the basis of Darcy's Law. Sealing of treatment lagoons by organic matter is well established in the literature. This sealing results from both physical blocking of the soil surface layer by organic particulates and blocking of the soil pores deeper in the soil by bacterial slimes. For this reason, as stated in the CER, the leakage is expected to be less than that calculated from the laboratory permeability testing; probably only one-half. Other features are likely to result in reduced permeability – for example, Darcy's Law ignores viscosity effects (very great in the final lagoon).

Even at the worst-case level calculated, the leakage increases the salinity of Dardadine Creek by less than 1%.

30 How will the proponent return leakage from the lagoons to the ponding system? Will the design of the lagoons take into account the increase of summer storms due to greenhouse gases?

If excess leakage is detected the proponent would take the following actions:

- establish the source of leakage, by inspection or geophysical methods
- seal the leak in situ, perhaps by using bentonite
- bypass and empty the lagoon and excavate and replace the compacted clay liner.

Each lagoon will probably have one or more dividers to facilitate both sludge removal and leak rectification.

If significant leakage continued whilst these actions were being taken, the proponent would excavate a hole or trench through the sandy topsoil and equip this with a pump to return the wastewater to the lagoon. If leakage was detected only in one of the deep monitoring bores the proponent would construct another bore with suitable packing and screening to allow pumping to capture the wastewater.

At this stage, prediction of possible increased frequency and intensity of summer storms due to the greenhouse effect is not on a sufficiently firm theoretical basis to allow detailed consideration in the design but the 0.6 m freeboard provides a safety factor. The lagoon walls can easily be raised to provide more freeboard if rainfall intensities change sufficiently to make this necessary.

WASTEWATER TREATMENT – FERTILIZATION

31 Is the proponent aware that as no impact or site has been described or identifyed for fertilizer water exports, no export would be approved by the Water Authority until sites and likely impacts are identified.

Yes. The proponent believes that commitment No. 15 (which requires EPA approval of the proposed area of land to be used) satisfies this requirement.

32 There is no discussion on phosphorus and its application rate. Nitrogen application rates are likely to be toxic to pasture and native species. Discuss and justify. What effects will the grease, protein and detergent in effluent have on pasture?

The total phosphorus concentration in the dehairing wastewater is expected to be approximately 40 mg/L. Settling, lime precipitation, and dilution with rinsing and bating water is expected to reduce the concentration to the range 5–10 mg/L. The New South Wales tanneries at Casina and Aberdeen have concentrations of 9 and 7 mg/L phosphorus in their effluents. Applying fertilizer as proposed in the CER would add will only 2 kg of P/hectare: continued application of superphosphate would be necessary.

These concentrations may be inadequate to maintain full biological activity in the treatment lagoons, since phosphorus will be progressively incorporated in microbial cells and so be removed from the wastewater. It may be necessary to provide supplementary phosphorus to the lagoon system to overcome this potential difficulty. Monitoring of lagoon water quality will reveal whether this is so or not.

To provide security of operations, especially at start up, Deras has purchased a 30 ha area to which the company will apply fertilizer. Since submission of the CER document, the proponent has obtained agreement in principle from neighbouring farmers to use both aqueous fertilizer and suitable solid wastes over a maximum of

6,500 ha of land.

While not all this land may be utilized, it is clear that nitrogen application loading can be reduced substantially from those quoted in the CER. The proponent is aware that nitrogen application rates in the range 75-250 KgN/ha/a would give a good boost to pasture or crops without running risks of burning grass or increasing nitrate levels in groundwaters.

It is presumed that the Shire, which has agreed to promote these activities, would interest the Department of Agriculture in assessing useful application rates.

Protein, grease, and detergent have no deleterious affects on pasture. This is most conclusively demonstrated by reference to the overland flow method of sewage treatment.

33 Is the proponent aware that nitrogen can build-up in the surface soil and cause long term problems if not managed properly.

34 Is the proponent aware that a large percentage of the N proposed for spray irrigation is in the ammonium and ammonia forms. If so, why has it made comparisons with between this effluent and that for abattoirs? Is the proponent aware that ammonia/ammonium is likely to cause toxic effects to pasture and especially native species at concentrations stated in the CER.

35 Is the proponent aware that the application of 580 kg/ha/year of N to the tannery site pasture could cause long-term problems such as soil acidification, inhibition of denitification (under anaerobic conditions) and plant growth, and non-wetting of soils.

No comparison with abattoir disposal systems was made. However, the proponent is aware from the testing carried out at the Aberdeen tannery in New South Wales that excessive application of effluent can cause soil acidification. At Aberdeen 175–200 m^3/day is applied to 8 ha and the soil pH has decreased to 3.8.

At Casino where the application rate is similar to that proposed at Darkan the soil pH after seven years was still normal and ranged from 5.5 to 6.5.

It is understood that non-wetting may possibly be caused by excess plant material accumulating on the surface if the pastures are not grazed or mown. At Casino the pastures are grazed and the investigation after seven years found that an organic layer of approximately 75 mm had developed on the surface of the soil but that there was no evidence of surface clogging or resultant effluent run off. The effluent contains detergents which would act to overcome any non-wetting tendency in the soil.

It is considered that the application of this fertilizer to a much greater area (see response to question 32) would overcome these reservations.

36 Will flash flooding or dry winters affect the spray irrigation program?

As described in the CER, the Dardadine Creek has a substantial catchment upstream of the site (Section 4.1.5). Flash flooding might occur if extreme volumes of rain were to fall on this area. The lower (north-west) corner of the proposed fertilized area is some 6–8 m elevated above the Dardadine Creek. The highest points at the eastern side of the area, are more than 25 m above the creek. If flash flooding occurred in the creek, it is conceivable that part of the lowest lying land would be under water for a few hours. This might not affect the fertilization programme depending on the amount of rain which had fallen at the site. Flash floods are of brief duration.

During a dry winter it would be desirable both to apply less fertilizer (the lagoons would be able to accommodate the extra water since rainfall would be contributing a lesser amount) and to apply fresh water to maintain grass growth.

The detailed design of the fertilizer water disposal system will consider (as is normal) the ten-year reoccurrence wet and dry years. The conceptual water balance in Appendix E shows that in an average year the surface sands have capacity to absorb at least 100 mm more rain during the winter months before becoming saturated. During individual days of heavy rainfall the wastewater can be directed to the anaerobic pond without adverse consequences.

37 Is the proponent aware that problems of high salinity at germination could emerge with annual pastures? What will the proponent do to ensure this does not occur?

38 Whilst the proponent has proposed no management of pasture for the irrigated area, is the proponent aware that high saline water could cause problems to plants through foliar salt accumulation.

39 Is the proponent aware that there is an advantage in establishing and watering perennial vegetation which can survive summer drought, there are a number of trees and shrubs that could survive the salt levels and summer conditions without irrigation. Soil salt levels would need to be monitored to ensure against salt buildup, however.

It is believed that the greatly expanded availability of land, as described in response to question 32, would provide insurance against these possibilities.

40 The CER states that tanneries elsewhere irrigate effluent. Give specific examples and performances achieved and justify the application method proposed.

CSIRO advised the proponent in October 1989 that there are three wet blue tanneries operating in New South Wales and all of them dispose of effluent onto land. CSIRO have for some year been advocating such a practice. Initially all of these had odour problems but these have been overcome by modifying the systems. The proponent

has visited the tanneries at Casino and Aberdeen.

At Casino the tannery treats 500,000 hides annually and disposal of its effluent by sprinkler irrigation (after screening) onto 79 ha year round. The system applies 91 mm of effluent annually to kikuyu pastures. The nitrogen load is 590 kg/ha/annum. After fifteen years of irrigation the pasture is still in excellent condition. This site has the advantage of an annual rainfall of 1,000 mm with rain in every month. The proposed system at Darkan was modelled on the Casino operation with an application of 30 mm over five months when the average rainfall is 400 mm.

The tannery at Aberdeen treats 200,000 hides annually and disposes of all its effluent offer aerated pond treatment by spray irrigation over 8 hectares of pastures. Run-off occurs and this is directed into evaporation ponds. The system is basically an overland flow treatment system to reduce BOD nitrogen and phosphorus before evaporative ponding. The system was applying 750 mm annually of wastewater with a TDS of 12,900 mg/L. The pasture was not particularly healthy and the pH of the subsoil was 3.8. This experience was not used to model the proposed system.

41 If the proponent finds that spray irrigation is not successful, that will the proponent do with its wastewater? Will the proponent pursue the recycling of wastewater so as to minimize the volume of effluent disposal

If distribution of the waste water with fertilizer value tis not successful the proponent would modify its operations as follows:

- arrange to distribute the wastewater over a larger area of land (see question 32);
- construct additional lagoons to dispose of the wastewater by evaporation;
- reduce the proportion of certain wastewater streams in the fertilizer water; the remainder would be treated in the lagoon system.

Recycling of the wastewaters to be used as fertiliser is not feasible.

42 If land degradation or salt scarring occurs, will the proponent rehabilitate the land and if so, how? If the neighbours have their watering facilities degraded (from any type of leachate), will the proponent compensate affected landowners.

Land degradation and salt scouring is likely to occur only if there are areas of shallow top soil within the proposed fertilizer area. The preliminary design has avoided known areas of shallow top soil and this practice will be continued in the design of the detailed layout.

If significant land degradation occurs because of shallow topsoil, the proponent would rest the area and allow natural recovery, leach the area with copious fresh water, or would excavate the affected area and replace the topsoil to a greater depth.

The proponent has undertaken to moniter the water quality in Mr. D. south's dams, immediately west of the site, and to renovate them or to supply water from the palaeochannel for stock if these are affected. Other landowners cannot be affected.

43 Given the potential for non-wetting of the soil to occur, is the proponent prepared to establish a cut-off drain along the northern boundary of the pasture to be irrigated.

The farmers who own the land to the north of the site, Messrs. G. & J. King, are keen to accept fertilizer on their pasture. Logically, a drain is not required. Instead, an extension of the pipework onto this land would be made.

44 Where will the dam/earthworks be on site as recommended by Rockwater?

The detailed design will give consideration to the need to construct a small dam in the north-west corner of the fertilized area to capture any seepage or run-off produced by small storms. The dam currently on this area is not well located.

45 Is it possible to keep wastewater streams from the processing of chilled and salted hides separate? If so, what are the constituent concentrations of these two streams? If chilled hide wastewater streams are less saline, then the salinity effects on irrigated pastures may be reduced by only using these wastewaters.

The salt from brine-curved hides appears only in the washing waters, (CER: Sections 5.2.1, 5.2.2 and 6.2.1). It is proposed to keep all of this water separate. No washing water would be used as fertilizer (Figure 6.3).

If only green or chilled hides were being washed in a particular batch, the washing wastewater would contain only the salt in the water supply. This water could be used as a fertilizer or from time to time for irrigation of ornamental plantings (Commitment 22) to reduce the use of fresh water for this purpose. Normally, it would pass to the anaerobic lagoon. Some characteristics are shown in the CER: Table H-1.

46 The CER states that the SIROLIME process may not be appropriate for a tannery located in a rural setting where irrigation is possible. Will the proponent use the SIROLIME process in order to reduce the BOD and nitrogen content (including NH_4, NO_3 and Total-N) in wastewater for irrigation? The SIROLIME process may allow the separation and collection of hair for use off site in soil amendment. It may also reduce the amounts of BOD and nitrogen (all forms) in the irrigated wastewater and potential toxicity to pasture crops and vegetation in the nearby reserve. The migration of nitrate into surface waters and groundwaters may also be reduced if the nitrogen content of the irrigated wastewaters can be significantly reduced. How might

the SIROLIME process effect the major ion content of the irrigated wastewaters?

The CER states that the SIROLIME process has little value for beam houses in rural location where plenty of land is available for the treatment facilities. Please refer to the response to Question 13 for more details.

Use of hair for 'soil amendment' is very similar to land application of the nitrogen and BOD content of the dehairing wastewater, since these characteristics of the wastewater originate from denatured hair. The application method proposed is more convenient for pasture since this cannot be ploughed during the growing season. Very little of the nitrogen in dehairing wastewater is as ammonia; nearly all is proteinous substances. Ammonia in the fertilizer water originates from the deliming step. No nitrate would be in the wastewater. Little change to the major ion content of the irrigated water would occur if the SIROLIME process were used.

ODOURS

47 During the assessment of the proposed Boyanup Tannery the proponent stated that a Tannery need not smell. Why should this tannery smell?

As stated in the CER (Section 7.3) the only unpreventable source of odour would occur during desludging of the anaerobic lagoon. This would be of brief duration and would be necessary only after periods of years. Deras would inform nearby residents before undertaking this action, and would not undertake it unless it were necessary (i.e. the lagoon was accumulating sufficient sludge that odour generation from the lagoon was becoming a possibility or that treatment efficiency was declining). Carrying out this operation during spring would reduce the odour to the minimum possible.

48 Why should evaporation ponds generate odour?

It is hoped that the evaporation lagoons would not generate odour. South African experience, referenced in the CER, was that this was not a serious problem. Nevertheless, there is potential for this to occur, as a result of density stratification. Incoming water (whether from precipitation or the preceding lagoon in the series) to each lagoon would be considerably less saline and hence less dense than that resident in the lagoon. This results in creation of a layer of water, in contact with sludge, which has hindered access to atmospheric oxygen. Similar circumstances at a number of sewage treatment plants (e.g. in Whyalla) have led to widespread odours.

49 The proponent details a plant of action to be taken in the case of odour. Who will trigger this plan of action?

The tannery management, prompted if necessary by the Shire or nearby residents. It is pointed out that the tannery administration office would be very close to the lagoon system, in contrast to nearby residents who are at least 3 km distant. Therefore, the

tannery management and staff would be affected more severely, and prior to, local residents and so undertake necessary action promptly.

50 Would the proponent grow bushes around the ponds to help disperse odours?

It is important to the evaporation lagoon's performance that wind flow across the lagoons is not impeded by nearby vegetation. This is both so that evaporation is not hindered, and that the facultative and evaporation lagoons are as well-mixed and aerated as possible. It is considered poor practice to plant bushes close to lagoons, for these reasons..

If artificial dispersion of odour were necessary from time to time it would be better to erect temporary barriers of wind-break netting which could be removed when problems had been corrected. However, the proponent is commited to avoid odour problems.

SOLID WASTE

51 What is the proposed life-span of the tannery and how many tonnes of solid waste will be disposed of on site during its lifetime? How many hectares would be left for waste disposal after construction of the various facilities? Will the proponent commit to not seeking alternative sites in the Shire of West Arthur?

It is proposed that the tannery operate for twenty-five to thirty years.

The maximum quantity of solid waste requiring disposal, at worst on-site (refer also Questions 61 and 62) is estimated as follows:

	Quantity (t)		
Type of waste	Daily	Annual	Lifetime
organic and lime waste	5	1,300	38,000[2]
lagoon sludges	N/A	N/A	0–750
chrome sludge[1]	0.2	50	1,500

1 see question 63

2 thirty year lifetime maximum

N/A not applicable

These figures are very uncertain, since no account has been taken of either possible changes to the process or probable use of organic and lime waste as fertilizers (up to 4 t/d could be so used). Some other possibilities for beneficial use of wastes are

described in the CER. This would result in much less than 38,000 of solid waste being buried on-site.

Approximately nine hectares of the land south of the tannery building (CER; Figure 8.1) could be used for solid waste burial. The proponent and Shire plan to manage solid waste burial so that rapid decomposition of organic waste occurs-even if this were not done, the area available would be sufficient to store all the waste. Chrome sludges would be stored in a small dedicated facility in this area.

The proponent has been at some pains to obtain approval in principle from the authorities to avoid having to use other sites for solid waste landfilling—a commitment to this end would be unnecessary! However, salt sludges would not be buried within the Shire of West Arthur - or anywhere else without approval from the EPA. Deras has commited itself to proper disposal of salt sludges.

5 2 Has the proponent told neighbours that no solid waste dumping would take place on site and if so why is it proposed?

The proponent has never stated that no solid waste burial would take place on site. It has explained to the community, through discussions and documentation, that burial of solid waste with high fertilizer quality and also inert wastes may be an acceptable disposal method, but this would be discussed with and approved by various government agencies.

Deras has informed neighbouring farmers that solid waste with high concentrations of salt, (i.e. salt sludge from the evaporation lagoons) would not be disposed of by burial, although temporary storage of salt sludge on-site was proposed as an option.

5 3 Why will the Shire not take solid waste?

The Shire has stated that acceptance of Deras's solid waste into its own facility would shorten the life of this disposal site, by up to one-third.

5 4 Is the proponent prepared to set aside part of its property so that the Shire of West Arthur can use that part of the sire for a solid waste disposal area?

Yes, the proponent is prepared to set aside part of its property so that the Shire of West Arthur can use that part of the site for a solid waste disposal area. However, the proponent would insist that only wastes from the tannery are disposed there.

5 5 Has the proponent received written agreement from the Shire of West Arthur, that the Shire will take ultimate responsibility for the management and integrity of the solid waste disposal on the proponents property?

Yes.

56 If agreement is reached between the proponent and the Shire regarding the use of paper of the proponent's site for solid waste disposal, will the Shire of West Arthur ultimately (at some future time) gazette that part of the site used for that purpose?

57 Is the Shire of West Arthur aware that if the Shire takes on responsibility for an annexed area on site for solid water disposal that it will have to monitor the site for leachate and be prepared to recover it if necessary?

Yes. A letter from the Shire relevant to these and the previous three questions attached.

58 Is the proponent prepared to have putresible solid wastes such as fleshings rendered rather than burning them? Salted fleshings can be rendered to produce tallow, but it may be necessary to install a wet-rendering plant as a meatworks may not accept these fleshings.

59 For a meatwork to accept green fleshing, rapid transport to a nearby meatworks is necessary. It this transport facility available?

60 Problems associated with the disposal of putrescribe solids wastes may be alleviated through the on-site rendering of fleshing including the salted material, since other rendering works in the region will probably not accept these materials. Will the proponent establish in house rendering facilities? The CER estimates that each hide will yield about 1 kg of fleshing whereas experience from other Australian tanneries indicates that this yield may vary between 1 and 5 kg/hide. How will much higher fleshing yields affect proposed disposal practices?

The proponent has no objections to establishing a rendering plant at the site. However, the proponent points out that most of the objectionable odours from abattoirs originate from the rendering plants, and the proponent has committed to avoiding odours. Also, the Shire and community wish to rezone the land 'rural plus special use for tannery' (CER; Section 1.4 and 4.3.2) and it is uncertain whether a rendering plant can be regarded as essential to a tannery.

In the proposal described in the CER, most fleshings would be returned for rendering. Return would be in the same refrigerated container rig used to collect hides.

Brine-cured hides were assumed to have be 'pre-fleshed' at the abattoirs before curing. The weight of fleshings *requiring burial* would be as stated in the CER. During washing (Section 5.2.2) salt would be removed from these fleshings, which would enable them to decompose readily after burial.

61 Has the proponent considered ploughing suitable solid waste into the ground so it could be used as a fertilizer? If so where?

62 Is the proponent prepared to use organic-rich solid waste as an agricultural waste fertilizer? If so, what exactly will be the proponent's method of usage/disposal.

In the CER (Section 6.8.1, 6.8.3, 6.8.4, 6.10) use of suitable solid waste as fertilizer (organic-rich or not) was proposed as an option.

Disposal in this way on the proponents own land is not proposed. The area receiving fluid fertilizer does not require more, the area used for solid waste burial drains to a neighbours dam. Disposal into the superficial sands there might lead to nitrate leaching to these dams. In any event, the proponent plans to grow pasture in these areas, not to plough the land.

As stated in the CER (Section 4.2.1, 4.3.2) farmers in the region use annual pasture species for grazing sheep. Only a small proportion of the land is used for grain production or otherwise is ploughed. Therefore, not all farmers may wish to use these wastes as fertilizers, since they may not be able to apply them properly. However, Deras would make such waste available to any who did wish to use it, and would encourage others to consider the benefits of such use. Already with the assistance of the Shire, more than 5,600 ha has been made available on nearby farms.

It is presumed farmers would plough this waste into the top 10–15 cm of soil. This could be done during summer, when no crop was growing.

63 How and where does the proponent intend to dispose of chemical containers, salt sludge, chrome trimmings and chrome sludge? Where will the chromium sludge drying beds be? Will the chromium content of the deposits in the ponds cause sludge disposal problems?

Chemical containers would be cleaned of residue (by washing or as appropriate) and then returned for reuse, used to hold chrome study for burial, or disposed in the Shire tip. Other solid wastes from the tannery, such as domestic wastes from offices and the tearoom would be disposed in the Shire tip. A bin would be used to hold such waste until sufficient had accumulated.

Salt sludge would be disposed in a manner acceptable to the EPA, as stated in the CER. This would possibly be to an internal salt lake. Another possibility, if the composition of this sludge is suitable, would be to use it as a salt-lick–some 400 tonnes/annum are used locally.

In the CER, it was stated that chrome sludge and tanned trimmings would be disposed of by a licensed disposal operator. Since this review was released, the authorities have decided that:

- this option is not favoured, and
- it would be acceptable to dispose chrome sludge on-site by burial in the area to the south of the tannery buildings.

The proponent has agreed to do so.

Sludge drying beds, which would be small, would be located under cover immediately adjacent to the tannery buildings.

The disposal of sludge from the facultative lagoons, if this is necessary, would not be affected by any chrome accumulation. This sludge would be buried similarly to other solid waste, including chrome sludge.

64 What alternative disposal practices will the proponent adopt if the burial of solid wastes on-site causes contamination of water supplies on adjoining properties?

65 Will the proponent make a commitment on construction and security of the trenches for burial of solid waste? Has the proponent or Shire Tannery Committee assured neighbours that there would be a buffer zone on the tannery side of the hill so that waste and salt would not come through to the adjacent property?

All solid waste would be disposed of in accordance with the model health by laws and subject to the approval of the local health surveyor.

The proponent has already made a commitment to dispose of all solid waste in a manner satisfactory to the EPA and is prepared to extend this to a commitment to the construction and security of the trenches if considered necessary. The proponent is also committed to altering any of its operations if monitoring reveals any adverse effects.

MONITORING

66 What measures will be taken to monitor leachate from solid waste disposal trenches, irrigated pastures and lagoons?

67 Would the proponent be prepared to involve the Shire and other members of the community in reporting the results of its monitoring programme?

68 Does the proponent intend commencing operations before monitoring facilities are in place?

In Commitment 15 the proponent has undertaken to submit and implement a

monitoring programme to the satisfaction of the EPA prior to construction of the facilities.

In Section 8.3 details are given of the monitoring program to measure leachate from the solid waste disposal area irrigated pasture and lagoons. Figure 8.1 shows the location of the interception trench and the twelve shallow and two deeper bores to bedrock proposed to be constructed for monitoring purposes.

It is proposed that the monitoring facilities be constructed prior to the tannery commencing operations and samples to establish base line conditions. The proponent has already reached agreement with the Shire to set up a Tannery Monitoring Committee involving the shire and local landowners. All results of monitoring will be reported to this Committee.

69 Will the proponent employ full-time staff to monitor the wastewater treatment processes and the wastewater disposal facilities including the irrigation areas? It is understood that similar size tanneries in the eastern states employ three to four staff to monitor these activities.

Yes, if 'monitoring' includes 'operation'. At least two employees would be used to carry out disposal of solid wastes, inspection of lagoons, operation and maintenance of pre-treatment facilities, and maintenance of travelling irrigation equipment. Other employees would be trained in this work so that they could stand in during vacation or sick leave periods. At certain times (e.g. loading of salt) casual labour or contractors would be needed.

70 Is the proponent prepared to establish monitoring bores, and if necessary, recovery bores, down-slope from the evaporation lagoons and the spray irrigation area and monitor them to the satisfaction of the EPA?

71 Is the proponent prepared to monitor the soil pH and groundwater to the satisfaction of the EPA?

The proponent is already committed (Commitment 16) to submit and implement a monitoring program to the satisfaction of the EPA.

The proponent has proposed (Section 8.3 and Figure 8.1) 12 shallow and two deep monitoring bores and a trench to monitor ground water movement from the evaporation lagoons, solid waste disposal area and the fertilized area. These would be monitored at monthly intervals during the first few years of operation and water levels and conductivity recorded. Analysis for critical salts would be carried out prior to commissioning and annually thereafter or immediately any significant changes in conductivity occur.

SOCIAL

72 Social impact commitments made in the text of the CER are not consolidated into a summary of commitments. These include local employment and the use of local services. Will the proponent make firm commitments in regard to the social impacts of the development and if so what are those commitments?

The proponent had received conflicting instructions about whether to make social commitments in the same format as those regarding protection of the physical environment. The proponent is prepared to make the following commitments:

The proponent will endeavour to maximize employment from within the local community with respect to this project. Results of these efforts will be reported to the Shire of West Arthur upon commissioning of the tannery.

The proponent will endeavour to maximize the use of services from within the local community with respect to this project. Results of these efforts will be reported to the Shire of West Arthur on an annual basis or as otherwise agreed.

73 What will be the number of unskilled jobs required in the first year?

Approximately ten.

74 What number of apprenticeships will be available?

The proponent has already contacted the CES (Coolie) for information on employment schemes and apprenticeships. Since the submission of the CER, Deras has been informed that the leather industry is not yet a recognized trade in Australia, hence Deras will not be able to offer an official apprentice programme. The proponent will offer accredited training which will be recognized within the leather industry. Such training will be available to all machine operators, selectors and process workers, estimated to be eight employees in the first year of production, and thirteen at maximum production.

75 How many administrative/office staff will be required?

It is anticipated that five to eight administrative/office staff will be required for management/clerical duties from commissioning to maximum capacity.

76 A number of submissions request involvement by the Shire and the local community in the monitoring of the impacts of the development. Will the proponent commit to involving he Shire and local community in the monitoring program. How will the proponent implement the program?

Yes, the proponent will commit itself to involving the Shire and local community in the monitoring programme

The proponent has already started discussions with the Shire of West Arthur to set up a Tannery Monitoring Committee (TMC) involving the Shire and local community. Such a committee would be formed and would have timely meeting to discuss the results of monitoring. The timing of such a programme would be structured in conjunction with the monitoring programme.

77 ***The CER indicates that a study on the socio-economic effects of the establishment of the tannery has been proposed. What role will the proponent play in this study?***

The socio-economic study would be compiled by the TMC or the Shire, and the proponent would gladly assist such studies by making available the appropriate information.

80 ***Traffic along Hillman–Dardadine Road will increase and upgrading of the road will be necessary. Who will be responsible for funding the road improvements? Who will be responsible for construction and maintenance?***

The proponent has already started discussions with the Shire Council about the upgrading of roads. The Hillman-Dardadine Road is of a good standard which will not require upgrading. Shield Road, which provides access to the proposed tannery site, will need to be upgraded to a standard equal to that of the Hillman–Dardadine Road. The upgrading of this road was to be undertaken by the Shire in the foreseeable future. Deras will assist the Shire with the applications to the Main Roads Department for the sanctioning of funds for the upgrading of the respective roads to the required standards. It is expected that with the increased usage of these roads, approvals will be forthcoming.

81 ***How will the proponent ensure that the delivery and the removal of goods will not occur when the school bus is in operation?***

The proponent 'would do its best to arrange delivery and removal of goods when the school bus was not in operation', (4.17). Deras believes that it will be unlikely that the transportation of goods to and from the tannery will coincide with the operation of the school bus, as it is not envisaged that transportation of goods will occur between the times of 8.00–9.00 a.m. and 3.00–4.00 p.m.

With the distances the goods will be transported, and the time needed for loading and unloading goods from the vehicles, the majority of transportation is expected to occur in the middle of the day. However, the situation would be discussed with suppliers, so that suitable arrangements for deliveries and pickup could be made.

82 ***Chapter 7 outlines responsibilities which the proponent will assume as a neighbouring landowner. Will the proponent commit to undertaking these responsibilities?***

The proponent is commited ~~is commited~~ to being a good neighbour, and hopes it will be regarded in a like manner.

OTHER ISSUES

83 Is the proponent aware that farmers in the Blackwood catchment area are trying to reduce salinity problems? Is the proponent aware of the Landcare District Committee and the Ribbon of Blue monitoring and National Landcare Programs? If so, does it understand how its the proposal may conflict with these programs? Will the proponent communicate with the Landcare District Committee and consider its concerns?

The proponent is aware that farmers in the Blackwood catchment area are trying to reduce salinity problems. It is also aware of the National Landcare and Ribbons of Blue monitoring programs.

The wastewater disposal system for the tannery has been designed to minimize any increase in the salinity of the Blackwood River or its tributaries. Contact has been made with Mr D. Johnston, Chairman of the Darkan Landcare District Committee, who has advised that the committee is aware and supportive of the proposal.

The Landcare Districk Committee forsees no problem so long as the Shire is involved in waste disposal and is informed of monitoring results.

84 Will the proponent describe its proposed tree planting program and has it contacted that local CALM officer regarding this program?

The proponent is giving consideration to planting rapid growing eucalyptus to capture any seepage from the fertilized area. Finalization of these plans has been deferred pending receipt of the comments by the Water Authority who have been pursuing this improvement.

When the area required has been finalized the local CALM officer and Land Care Group will be contacted.

85 Will the tannery have a fire truck on site given its commitment to the community on fire and chemicals?

The proponent has made commitments to the community in issues of fire and chemicals. Deras will do its utmost to minimize the existing fire risk, making available adequate numbers of fire extinguishers in the tannery building and surroundings. Deras does not propose to have a fire truck on site but there will be reliable supply of freshwater. A stand pipe, on the irrigation site, will be suitable for hose attachments and could be made available for fire fighting purposes as required.