Proposed updating and reopening of the Toodyay Abattoir at Lot 590 Church Gully Road, Toodyay

Johnson and Staszewski

Report and recommendation
of the Environmental Protection Authority

Environmental Protection Authority
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Summary and recommendation

Johnson and Staszewski, the proponents and owners of the Toodyay Abattoir, propose to refurbish the abattoir to Commonwealth meat export standards. The capacity of the abattoir will be a maximum of 500 sheep per day. Wastewater will be treated using normal biological treatment ponds and treated water will be disposed of by irrigation on the property and on an adjacent 688ha farm if necessary. All waste solids will disposed of off-site to a rendering works on a daily basis.

The level of assessment was set at Public Environmental Review (PER) in August 1989 and in October 1990 the PER was submitted to the Environmental Protection Authority for assessment. During the public review period, the proponents held a public open day at the abattoir. Five people attended and no environmental concerns were expressed to the Authority.

The Authority has assessed the potential environmental impacts of the proposal described in the PER, and utilising additional information supplied by the proponents and several Government agencies.

There is no major potential environmental problem with this proposal. However, the biological treatment ponds, methods of wastewater and solid waste disposal, and general monitoring are identified as priorities in the on going management of the proposal. The proponents have addressed these issues comprehensively by making an extensive list of commitments to the satisfaction of the Environmental Protection Authority (Appendix 1). The Minister can make these commitments legally-binding if he approves the proposal.

The Environmental Protection Authority considers the proposal to be environmentally acceptable subject to the proponents being required to fulfil commitments given (Appendix 1).

Recommendation 1

The Environmental Protection Authority concludes that the proposal, as described in the Public Environmental Review and modified by the proponents in response to questions raised during the assessment, is environmentally acceptable and recommends that the proposal could proceed, subject to the commitments given by the proponents (listed in Appendix 1 of this Report) which include:

- **overall compliance with the Authority's requirements;**
- **management of wastewater treatment and disposal;**
- **solid waste management and disposal;**
- **dust, odour and noise;**
- **monitoring;**
- **remedial action if waste management procedures fail;**
- **rehabilitation;**
- **decommissioning;**
- **reporting to the Environmental Protection Authority; and**
- **transfer of ownership.**

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

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

1. Introduction

The proposal is to update the existing Toodyay Abattoir to comply with Local, State and Federal Government requirements, including meeting all Environmental Protection Authority and other relevant government department requirements. The proposed changes to the existing abattoir will ensure that it meets the current Australian Code of Practice for Construction and Equipment of Abattoirs.

The proponents, G J Johnson and V Staszewski of Walliston, Western Australia, purchased the Toodyay Abattoir in February 1988. The abattoir is located at Lot 590 Church Gully Road (also known as Lot 89 Coondle Estate), approximately 14 km north of Toodyay (Figures 1a and 1b). The site is located in a rural area but is approximately 0.5 km from a farmlet subdivision which was rezoned after the abattoir commenced operations.

The abattoir commenced operations in March 1974 with a capacity to process 500 sheep per day, and temporarily ceased operating in May 1987. At the time of closure, the abattoir was subject to a Works Order from the Health Department of Western Australian, which required upgrading of facilities to meet the current Australian Code of Practice for Construction and Equipment of Abattoirs (Department of Primary Industry, 1986). Whilst operating, the abattoir was never in breach of its local or state government requirements and no environmental complaints were received by the Environmental Protection Authority, Water Authority of Western Australia or the Shire of Toodyay.

During its operation the abattoir operated under a non-conforming use right. The Shire is presently considering rezoning the site from "Rural 6" to "Special abattoir use".

2. The proposal

2.1 Site selection

Before selecting the site, the proponents looked at sites in the Shire of Murray, Owen Anchorage-South Fremantle Area, Midland, Shire of Northam, Shire of Gingin and the Shire of Toodyay.

Most of the sites with existing abattoirs have major environmental problems associated with them. Factors such as insufficient long term tenure, inadequate industry/residential buffering capacity, poor soil types for pond sealing and nutrient retention, and potential pollution of groundwaters, rivers and estuaries have precluded selection of many the sites.

The two most suitable sites available to the proponents were around the Shire of Northam and the proposed site at Toodyay. Both areas contain copious amounts of clay soil which can be used for building anaerobic, facultative and aeration biological wastewater treatment ponding systems and for the irrigation of treated wastewater. The climate is also suitable for wastewater disposal via evaporation.

The major advantage of the proposed site at Toodyay is that an abattoir has operated on the site for 14 years with no major environmental problems or complaints being recorded against it during its operation. The site has non-conforming use rights for the purpose of operating an abattoir and it has its own proven water supply. An additional 688 ha of land on the neighbouring property are available to the proponent to dispose of treated wastewater.

2.2 Site description

All of the site has been cleared (Figure 2) with most of it sloping towards a gully. The site is located in a large sub-catchment of the Avon River catchment system which is brackish and only suitable for stock purposes.

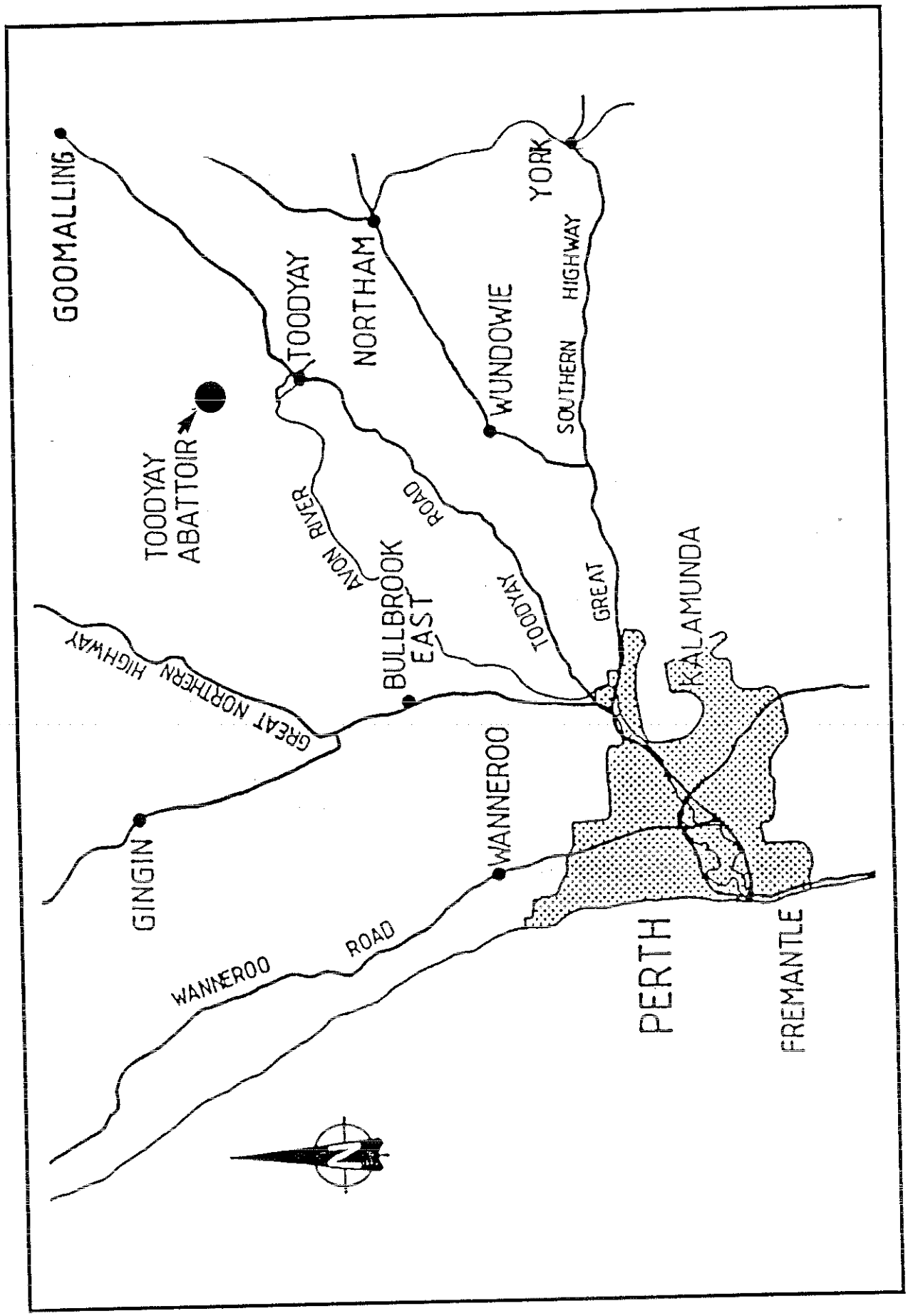

Figure 1a: Regional location of Toodyay Abattoir (from PER)

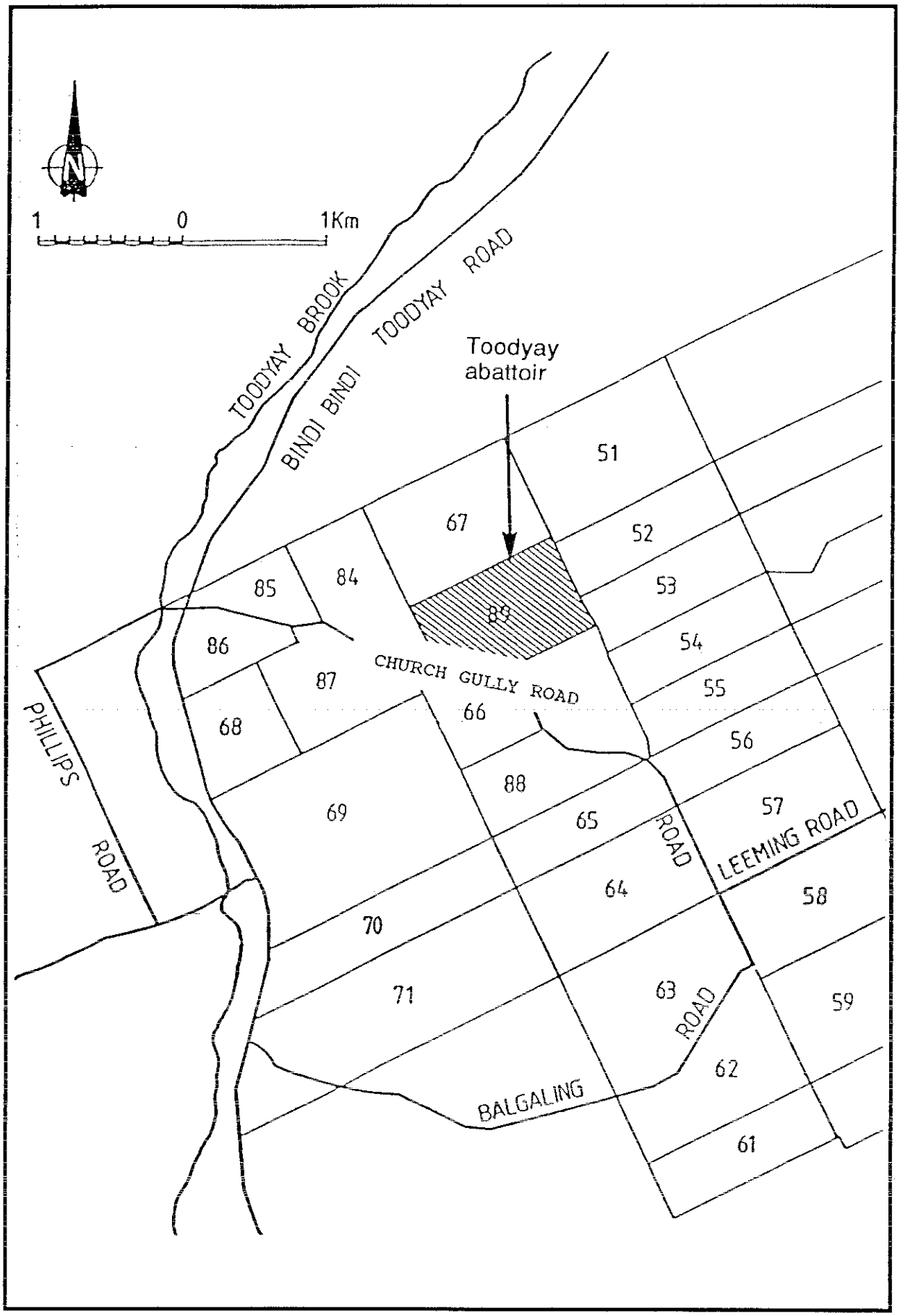

Figure 1b: Location of Toodyay Abattoir (from PER)

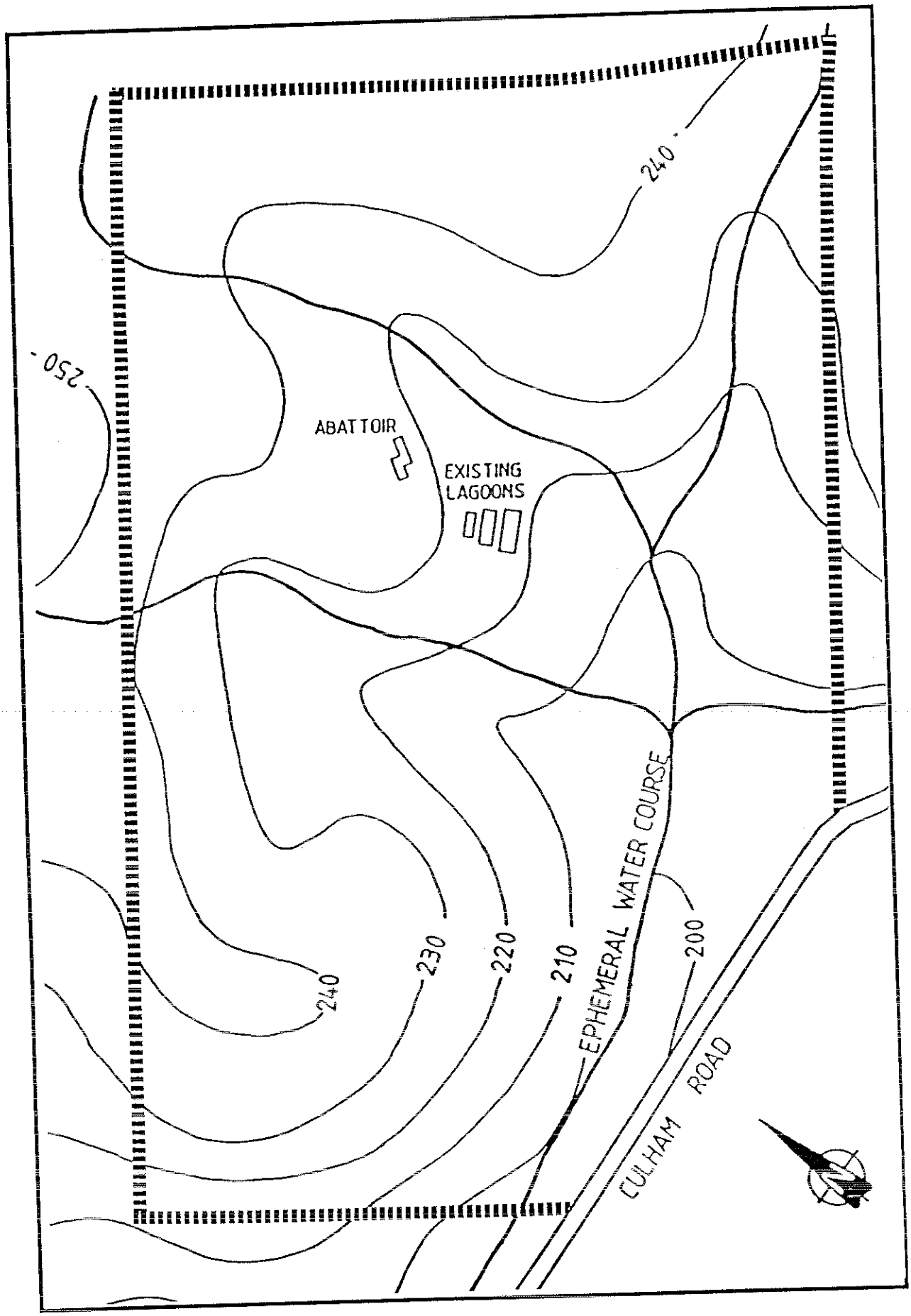

Figure 2: Site plan of existing abattoir (from PER)

The soils in the area are predominantly kaolinitic clays derived from granitic bed-rock. These clay-rich soils have a permeability in the order of 1 x 10^{-9} metres per second. This is one order of magnitude better than required to classify the soil as being impermeable and hence is suitable for the establishment of secure biological treatment ponds. The clay profile extends to 7 m and is adequate for the engineering of secure biological wastewater treatment ponds. Additionally, the high adsorptive phosphorus capacity of the underlying clay should ensure against any phosphorus related nutrient problems in the downstream water courses.

A number of buildings and three waste treatment ponds, together with the services necessary to run the abattoir are already on site.

2.3 Slaughtering operations

The proposed abattoir is small by Western Australian standards, with the maximum slaughter capacity of 500 sheep per day being the same as previous operations. Initially, however, the abattoir will only slaughter an average of 300 sheep per day.

Sheep will be unloaded and held in a concrete-floored and roofed area. Slaughtering will consist of stunning, stickling, bleeding, dressing and chilling. After slaughter the carcasses will be processed to chilled and frozen meat. Skins will be collected from the site and sold green on a daily basis. Edible and inedible offal will be removed off-site on a daily basis. No rendering will take place in the abattoir.

The abattoir is expected to operate for 300 days per year and provide up to 20 permanent jobs. The proponents intend to commence upgrading the abattoir immediately all relevant approvals have been received.

2.4 Waste treatment and disposal procedures

2.4.1 Solid wastes

Solid wastes will be generated in the sheep receival and holding areas (200 kg/day), offal (500 kg/day), screened washings from paunch collection (6 t/day), solids accumulated in screens and floor grates (3.6 t/day) and solids build-up in the lagoon system.

All solid waste will be removed off-site. Solid waste from the sheep holding yards will be dry to moist and will be disposed of on a daily basis for sale as fertiliser. Solids collected from the floor of the offal area will be moist to wet. They will be disposed of with the offal to Tallowman, a rendering works, on a daily basis. Solids recovered from screens and grates will be disposed of with offal. Solids from cleaning the pond system every 5 to 10 years will also be disposed of to Tallowman because of the high fat content.

2.4.2 Liquid wastes

Water usage by the abattoir will approximate wastewater production. Based upon previous abattoir experience, the proponents estimate that the water consumption will be 30 m^3 per day, assuming a 300 sheep per day slaughter rate, 40 kg Live Weight Killed of sheep (LWK) per day, and 2.5 m^3 water per tonne LWK. Wastewater production by each part of the process is shown in Table 1, the bulk of which is in the dressing and offal cleaning stages. Domestic wastewater from the toilets and showers will be segregated and discharged to a septic tank.

Principal constituents in the wastewater are listed in Table 2. High Biological Oxygen Demand (BOD5) and grease values are a function of the nature of the slaughtering process which generates large amounts of animal blood and tissue.

Table 1. Shows a breakdown of the wastewater production in percentage (%) and volume (m^3/day)

Source	% Mean	% Range	Volume
Boilers/washdown*	7	6-8	1.9
Slaughtering	5	3-7	1.4
Dressing	48	39-58	13
Offal cleaning	40	34-46	11
Stockyard**	No wastewater		
Cooling water from refrigerants#	No wastewater		
Domestic wastewater +	No wastewater to lagooning system		

* By-products will not be processed on site

** Treated wastewater will most likely be used for washdown of stock holding area

\# Coolant water will evaporate and not enter the waste stream

\+ $3m^3$ of water used for domestic purposes will be discharged to a standard septic tank (as for the farmlet subdivision across Cullam Road).

Table 2. Wastewater constituent concentrations found in abattoir wastewater effluent and predicted values for the Toodyay Abattoir after screening and primary settling

	Wastewater Concentration			Daily Load (kg/d)
Constituent	Minimum Value (mg/L)	Maximum Value (mg/L)	Mean Value (mg/L)	
Biochemical Oxygen Demand (BOD5)	830	2,500	1,500	40.5
Suspended Solids (SS)	670	2,000	1,000	27.0
Oil and Grease	360	800	600	16.2
Total Nitrogen	36	160	100	2.7
Total Phosphorus	12	40	20	0.5

Wastewater from the abattoir will be treated in anaerobic and facultative lagoons. This is a standard treatment system which is employed at most abattoirs in Australia which do not use ocean outfalls and it was used successfully at the existing abattoir until 1987. Suspended solids in the anaerobic lagoons break down under reducing conditions to produce odorous gases which, in properly designed biological treatment systems, are metabolised by bacteria, prior to their release to the atmosphere as relatively harmless gases (ie carbon dioxide and ammonia).

It is proposed to build two new anaerobic lagoons about 3 to 4m deep, with a freeboard of 0.5m and a capacity of 200m³. These would be located closer to the abattoir than the existing lagoon and further away from Cullum Road. Using USEPA recommendations and assumptions of 40.5kg BOD5 per day (1500mg/L) and 20 days for treatment, the proponents estimate the organic load discharge to the facultative lagoon to drop to 10kg BOD5 per day (368mg/L).

A further 85% reduction in BOD5 levels and a significant reduction in bacteria concentrations are expected in the facultative lagoons. The proponents intend to build new lagoons for this purpose, with similar dimensions to the existing ones (1.8m deep, 1136m² in area) which are to be retained as additional capacity and are designed to have a minimum retention time of 25 days.

The proponents intend constructing at least one lagoon for storage of wastewater, which will be sufficient for at least three months production. As a result of the public review process, the Authority has been advised by the Water Authority that the proposed freeboard of 0.3m (twice the depth of rain resulting from a 100 year 72 hour storm) should be increased to 0.6m. The long retention time of stored wastewater in the lagoon (75 days) should result in further reductions in BOD5 and bacteria.

The treated wastewater will be disposed of by irrigation on pasture owned by the proponents (64ha) and on a neighbouring property (688ha). In consultation with the Authority, the proponents have formulated maximum irrigation loading criteria for the critical contaminants (Table 3). Given the anticipated concentrations of the treated wastewater exiting the facultative lagoons, the limiting constituent is BOD5, which requires an area of 13ha for irrigation. The intention is to irrigate the properties using a truck fitted with a distributor bar. Only relatively flat areas where the ground water table is deeper than 1m will be irrigated. Approximately 5400m³ of wastewater will be disposed of each year.

Table 3: Irrigation areas required to satisfy loading criteria for wastewater flow of 27 m³/d

Criterion	Loading limit	Concentration (mg/L)	Required area (ha)
BOD5	30kg/ha/a	55	13
Nitrogen	500kg/ha/a	100	1.6
Phosphorus	60kg/ha/a	20	3

2.5 Water minimisation strategies

The proponents have adopted various strategies to minimise the use of the scarce water resource in the area, which lead to a consequent reduction in the volume of wastewater to be treated and disposed of. This has resulted in a predicted usage of 2.5m³ per t LWK, which compares favourably with that in older abattoirs, where usage rates are as high as 5m³ per t LWK.

Procedures to be used by the proponent to minimise water usage include:

- all hoses will be fitted with "spring loaded guns" to ensure that they cannot remain running and produce excessive wastewater;
- spray sterilisers will be fitted with switches controlled by infra-red lights so that they operate only when required ;
- the abattoir will use the modern compressed air and water technique to wash down the carcases to minimise water use;
- all floor drains will be fitted with grates to prevent large solids from reaching the wastewater biological treatment lagoons;
- the abattoir has been designed to allow for easy cleaning by dry broom and scraper before washdown; and
- it is likely that stockyard washdown will be carried out using recycled treated wastewater.

3. Public consultation and submissions

The proponents have notified all of the surrounding landowners regarding the proposed refurbishment and reopening of the abattoir.

An open day was held at the abattoir, with representatives from the Shire of Toodyay, Social Impact Unit, Environmental Protection Authority and local media in attendance. Five members of the public attended and no environmental concerns were expressed to the Environmental Protection Authority.

No submissions were received from the public during the public review period. Letters of advice were received from the Health Department of Western Australia and the Water Authority of Western Australia (neither of which raised any major environmental issues) and these have been passed on to the proponents.

The Shire is fully supportive of the project.

4. Potential environmental impacts, monitoring and management

4.1 General

In considering the Public Environmental Review, the Authority gave particular attention to the biological treatment ponds, methods of wastewater and solid waste disposal, and general monitoring.

The proponents have addressed these issues comprehensively by making an extensive list of commitments to the satisfaction of the Authority (Appendix 1). The Minister for the Environment can make these commitments legally-binding if he approves the proposal.

The Authority considers the proposal to be environmentally acceptable subject to the proponents being required to fulfil commitments given (Appendix 1).

Recommendation 1

The Environmental Protection Authority concludes that the proposal, as described in the Public Environmental Review and modified by the proponents in response to questions raised during the assessment, is environmentally acceptable and recommends that the proposal could proceed subject to the commitments given by the proponents (listed in Appendix 1 of this Report) which include:

- **overall compliance with the Authority's requirements;**
- **management of wastewater treatment and disposal;**
- **solid waste management and disposal;**
- **dust, odour and noise;**
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- **rehabilitation;**
- **decommissioning;**
- **reporting to the Environmental Protection Authority; and**
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4.2 Dust, noise and odour

Some odour will occur in the immediate surroundings of the abattoir. However, due to the proponents' commitment to dispose of all solid wastes (except pond sludge) on a daily basis and because of the buffer zone between the proposed abattoir and the closest dwelling, odour is unlikely to be a problem. The wastewater treatment system has the potential to cause odour.

Given the level of wastewater treatment committed to by the proponent however, BOD (biological oxygen demand) levels should not cause odours during treatment or sludge clean-out and drying.

Operating hours are stated to be 7.00 am to 3.00 pm, Monday to Friday, with about 20 small vehicles (mostly from the local community) entering and exiting the property during these times. Stock trucks and meat export trucks will make deliveries once per day. The proponents have given a commitment that all machinery with a potential to cause nuisance noise levels will be enclosed to ensure that noise levels satisfy the Neighbourhood Annoyance Regulations. It is not expected that noise will reach nuisance levels at the property boundaries, however, the proponents will monitor noise at night and weekends and will take appropriate action, if necessary, to minimise noise to the satisfaction of the Authority. Given the distance of dwellings from the proposed abattoir and its times of operation, it is highly unlikely that noise would be a problem.

The proponents recognise that dust should be controlled at all times and have made a commitment to do this to the satisfaction of the Authority. However, dust is unlikely to be a problem as all stock will be unloaded and held on concrete floored areas which will be regularly washed down. In addition, if traffic creates dust problems on the approach road, the proponent is committed to sealing the road. Dust due to soil erosion is unlikely as most of the site will be irrigated and remain rural in use.

4.3 Solid waste disposal

Solid waste from noxious animal-based industries has the potential to generate odour and disease, due to bacterial action during degradation. All solid waste with such a potential must be managed on a daily basis. The proponents intend to dispose of such wastes off site and on a daily basis and have made a commitment to obtain the approval of the Authority for the method and location of solid waste disposal prior to commissioning the plant. In addition, the proponents will, three months prior to commissioning the plant, submit a solid waste disposal plan to the Authority and to the Authority's satisfaction, which will include a nominated Gazetted land fill site for the abattoir waste.

4.4 Wastewater treatment and disposal

Potential adverse environmental impacts of the wastewater treatment systems are volume overload, spillage, or leakage leading to contamination of the surface or ground waters; incomplete BOD treatment (due to overloading) leading to odour generation; and excessive nutrient enrichment or BOD loading of the soil by the irrigation system. The proponents have made comprehensive commitments to ensure that the system is designed, constructed, maintained, operated and monitored to the satisfaction of the Authority, in an endeavour to reduce the likelihood of this occurring. The rationale used by the proponents to develop pond dimensions and retention times in order to reduce the BOD to specified levels clearly demonstrates that they have a good understanding of the biological systems involved.

The proponents will use a recognized water/wastewater contractor to design and install the integrated treatment and disposal system. Prior to construction, the proponents intend to supply to this Authority and the Water Authority of Western Australia details on the exact location and design details of the wastewater ponds.

Should failure of the wastewater treatment system occur, the proponents will take immediate remedial action to the satisfaction of the Authority. The proponents have made a commitment to keep sufficient spare parts to ensure immediate repair to the aerators, the electrical system and other key elements of the system.

In the event of pond leakage, the proponents are prepared, upon direction of Environmental Protection Authority, to line the pond with a plastic liner, to the satisfaction of the Water Authority of Western Australia and the Environmental Protection Authority. They will also ensure that storm water run-off from areas adjacent to the ponds will not enter the treatment system.

The minimum area for irrigation (13 ha) is significantly less than the 64 ha property. In the unlikely event that their property cannot absorb the nutrient impact, the proponents have obtained consent from the neighbouring farmer to broad irrigate the treated wastewater over level areas of his 688 ha property. Should neither of these options be available to the proponents, they are prepared to build an evaporation pond to dispose of the wastewater, to the satisfaction of the Authority.

Prior to irrigation of the wastewater on to the property, the proponents will submit to the Authority a chemical analysis of the treated water for approval. Treated wastewater will only be irrigated on site if it complies to the Authority's requirements for nitrogen and phosphorus.

To detect any potential pollution of the environment at an early stage, the proponents will submit for approval and subsequently implement to the Authority's satisfaction (and on advice from the Water Authority of Western Australia) a comprehensive monitoring programme. This will include baseline studies, parameters to be measured, sampling times and locations, and reporting times to the Authority.

The Authority concludes that the issue of wastewater treatment and disposal, although of major environmental importance, has been adequately addressed in the project design and covered by the commitments of the proponents and therefore should not cause an unacceptable environmental impact.

4.5 Tree planting and nutrient removal

To reduce the visual impact traditionally associated with abattoirs, the proponents intend to landscape the site with trees and shrubs. A landscaping plan will be submitted to the Authority for approval three months prior to commissioning.

Part of the landscaping plan is to establish a zone of Tasmanian bluegum or similar species around the abattoir and down slope of the wastewater ponds. Apart from aesthetics, the main functions of the trees will be: the interception of contaminants in the ground water in the event of wastewater leakage or spoilage; uptake and export of nutrients and water from the irrigation of treated wastewater; and lowering of the water table to ensure against soil salinity and soil erosion.

Although the proponents intend using irrigated pasture as the principal method of absorbing and exporting off-site the nutrients and salts contained in the treated wastewater, the proposed tree plantation offers an additional mechanism to control the release of this material to the environment.

5. Conclusions

Based on the information supplied in the PER and additional information supplied by the proponents during the assessment, the Environmental Protection Authority concludes that the project could proceed subject to the commitments given by the proponents in the PER and to the Authority's recommendation in this report.

The proposed wastewater treatment and disposal system is technically sound and, given the proponents' commitments to management, monitoring and correction of any detected faults, should ensure no unacceptable environmental impact from groundwater contamination or odour.

Apart from pond sludge, all solid waste will be disposed of off-site on a daily basis in a manner satisfactory to the Authority. Hence, the proper management of solid waste should not cause any environmental problem.

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

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

Appendix 1

Proponents' list of environmental management commitments

List of commitments

Those that can be administered under Part V of the Environmental Protection Act 1986 have an asterisk against them. The remainder can be implemented using Ministerial Conditions.

General commitments

1. The proponents will adhere to the proposal as assessed by the Environmental Protection Authority and will fulfil the commitments made below.

2. The abattoir will be constructed and operated according to all relevant Government statutes and agencies' requirements, and to the satisfaction of the Environmental Protection Authority:

Wastewater management commitments

3.* The proponents will build a fully integrated wastewater, solid waste, noise and odour treatment and disposal system which will be designed and installed by a recognised water/wastewater treatment contractor to the satisfaction of the Environmental Protection Authority. The system will be operated by the proponents and monitored by the consultant to the satisfaction of the Environmental Protection Authority and all relevant Authorities.

4. Prior to construction of the wastewater treatment ponds, the proponents will supply to the Environmental Protection Authority and the Water Authority of Western Australia details of their exact location and design and have those details approved by the Environmental Protection Authority and the Water Authority of Western Australia.

5.* Prior to commissioning the plant, evaporative lagoons will be constructed to dispose of treated wastewater and will be operated subsequently to the satisfaction of the Environmental Protection Authority.

6.* In the event of pond leakage, the proponents, upon direction from either the Environmental Protection Authority or the Water Authority of Western Australia, will immediately line the leaking pond with a plastic liner to the satisfaction of the Environmental Protection Authority and the Water Authority of Western Australia.

7. All wastewater treatment lagoons will be constructed to have at least 0.3 m freeboard so as to be able to cope with a "once in 30 years storm event".

8.* The proponents will ensure that the water level in the wastewater treatment ponds will be maintained to the satisfaction of the Environmental Protection Authority and the Water Authority of Western Australia.

9.* The proponents will take immediate remedial action should failure of the wastewater treatment system occur and will carry out such action to the satisfaction of the Environmental Protection Authority and all relevant Authorities.

10.* To cope with equipment failure, the proponents will keep sufficient spares for immediate repair to the aerators, the electrical system and other key elements of the system. In such an event the proponents will advise the Environmental Protection Authority and will take steps in the event of major failure to construct holding lagoons to the satisfaction of the Environmental Protection Authority and relevant authorities as quickly as possible.

11. The proponents will ensure that storm water run-off from areas adjacent to the ponds will not enter the wastewater treatment pond system.

12.* If, due to some unseen circumstance, the disposal of treated wastewater by irrigation did not meet the Environmental Protection Authority's requirements, the proponents will build an evaporation pond for wastewater disposal and this will be done to the satisfaction of the Environmental Protection Authority.

Monitoring

14.* Prior to construction, the proponents will submit and subsequently implement a monitoring programme to the satisfaction of the Environmental Protection Authority and on the advice from the Water Authority of Western Australia. The monitoring programme will include:

- initial baseline sampling period to determine whether impacts are presently occurring;
- parameters to be measured;
- sampling sites and times;
- reporting times to Environmental Protection Authority, and
- a commitment to modify the environmental management programme, if necessary, to reduce the impact of pollution, to the satisfaction of the Environmental Protection Authority.

15*. All samples taken in the monitoring programme will be analysed in a laboratory acceptable to Environmental Protection Authority. In the event that the monitoring programme indicates that an adverse environmental impact is occurring or developing, the proponents will alter the abattoir operation or introduce additional environmental management controls as necessary to reduce the impact to an acceptable level.

Solid waste

16. The proponents will dispose of all solid wastes off-site, and will obtain the approval of the Environmental Protection Authority for the method and location of solid waste disposal prior to commissioning the plant.

17. The proponents will, three months prior to commissioning, submit a solid waste disposal plan to the Environmental Protection Authority to the satisfaction of the Environmental Protection Authority. This plan will nominate a Gazetted landfill site which will accept abattoir waste and be to the satisfaction of the Environmental Protection Authority.

18*. The proponents will have a permanent member of staff living on site. If dead animals are delivered to the abattoir they will be removed from the site within 24 hours and disposed of to the satisfaction of the Environmental Protection Authority.

Dust, odour and noise

19*. The proponents will ensure that dust, odour and noise will be controlled at all times to the satisfaction of the Environmental Protection Authority.

20*. The proponents will seal any area used by traffic including the access road to the abattoir if it is deemed by the Environmental Protection Authority that traffic is causing a dust problem.

21*. The proponents will monitor noise at night and weekends and will take appropriate action, if necessary, to minimise noise to the satisfaction of Environmental Protection Authority.

22. All machinery with a potential to cause nuisance noise levels will be enclosed to ensure that noise levels satisfy the Neighbourhood Annoyance Regulations.

Irrigation of wastewater: nutrients and disease

23*. Before the proponents irrigate wastewater onto their property they will provide the Environmental Protection Authority with a chemical analysis of the treated water and have it approved for irrigation by the Environmental Protection Authority. Additionally, the proponents will have approved by Environmental Protection Authority, the area of land to be irrigated, prior to commissioning the plant.

Other commitments

24. The proponents will not use treated wastewater for any purpose relating to the dressing of meat. Before they use such water for washing down stock holding areas, approval would be sought from the Health Department of Western Australia and the Environmental Protection Authority. All such wash down water would be recycled back into the wastewater treatment system.

25. The proponents will control insects and weeds around the wastewater treatment system, including the lagoons, any sludge drying facilities or temporary stock holding areas, to the satisfaction of the Environmental Protection Authority, the Health Department of Western Australia and the Shire of Toodyay.

26. The proponents will, three months before commissioning the plant, submit a landscaping plan (tree planting) to the Environmental Protection Authority, and have it approved by the Environmental Protection Authority, with the purpose of retaining the amenity of the area.

27*. The proponents will modify their pollution control operations, if they cannot meet their licence conditions, so that environmental impacts are reduced to a level acceptable to the Environmental Protection Authority.

28. The proponents will be responsible for decommissioning the plant and rehabilitating the site and its environs, to the satisfaction of the Environmental Protection Authority.

29. The proponents will, at least six months prior to decommissioning, prepare a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority.

30. The proponents will not transfer ownership, control or management of the project, without prior consultation and arrangements being made which are to the satisfaction of the Environmental Protection Authority and the Minister for the Environment.

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

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

1. Introduction

The proposal is to update the existing Toodyay Abattoir to comply with Local, State and Federal Government requirements, including meeting all Environmental Protection Authority and other relevant government department requirements. The proposed changes to the existing abattoir will ensure that it meets the current Australian Code of Practice for Construction and Equipment of Abattoirs.

The proponents, G J Johnson and V Staszewski of Walliston, Western Australia, purchased the Toodyay Abattoir in February 1988. The abattoir is located at Lot 590 Church Gully Road (also known as Lot 89 Coondle Estate), approximately 14 km north of Toodyay (Figures 1a and 1b). The site is located in a rural area but is approximately 0.5 km from a farmlet subdivision which was rezoned after the abattoir commenced operations.

The abattoir commenced operations in March 1974 with a capacity to process 500 sheep per day, and temporarily ceased operating in May 1987. At the time of closure, the abattoir was subject to a Works Order from the Health Department of Western Australian, which required upgrading of facilities to meet the current Australian Code of Practice for Construction and Equipment of Abattoirs (Department of Primary Industry, 1986). Whilst operating, the abattoir was never in breach of its local or state government requirements and no environmental complaints were received by the Environmental Protection Authority, Water Authority of Western Australia or the Shire of Toodyay.

During its operation the abattoir operated under a non-conforming use right. The Shire is presently considering rezoning the site from "Rural 6" to "Special abattoir use".

2. The proposal

2.1 Site selection

Before selecting the site, the proponents looked at sites in the Shire of Murray, Owen Anchorage-South Fremantle Area, Midland, Shire of Northam, Shire of Gingin and the Shire of Toodyay.

Most of the sites with existing abattoirs have major environmental problems associated with them. Factors such as insufficient long term tenure, inadequate industry/residential buffering capacity, poor soil types for pond sealing and nutrient retention, and potential pollution of groundwaters, rivers and estuaries have precluded selection of many the sites.

The two most suitable sites available to the proponents were around the Shire of Northam and the proposed site at Toodyay. Both areas contain copious amounts of clay soil which can be used for building anaerobic, facultative and aeration biological wastewater treatment ponding systems and for the irrigation of treated wastewater. The climate is also suitable for wastewater disposal via evaporation.

The major advantage of the proposed site at Toodyay is that an abattoir has operated on the site for 14 years with no major environmental problems or complaints being recorded against it during its operation. The site has non-conforming use rights for the purpose of operating an abattoir and it has its own proven water supply. An additional 688 ha of land on the neighbouring property are available to the proponent to dispose of treated wastewater.

2.2 Site description

All of the site has been cleared (Figure 2) with most of it sloping towards a gully. The site is located in a large sub-catchment of the Avon River catchment system which is brackish and only suitable for stock purposes.

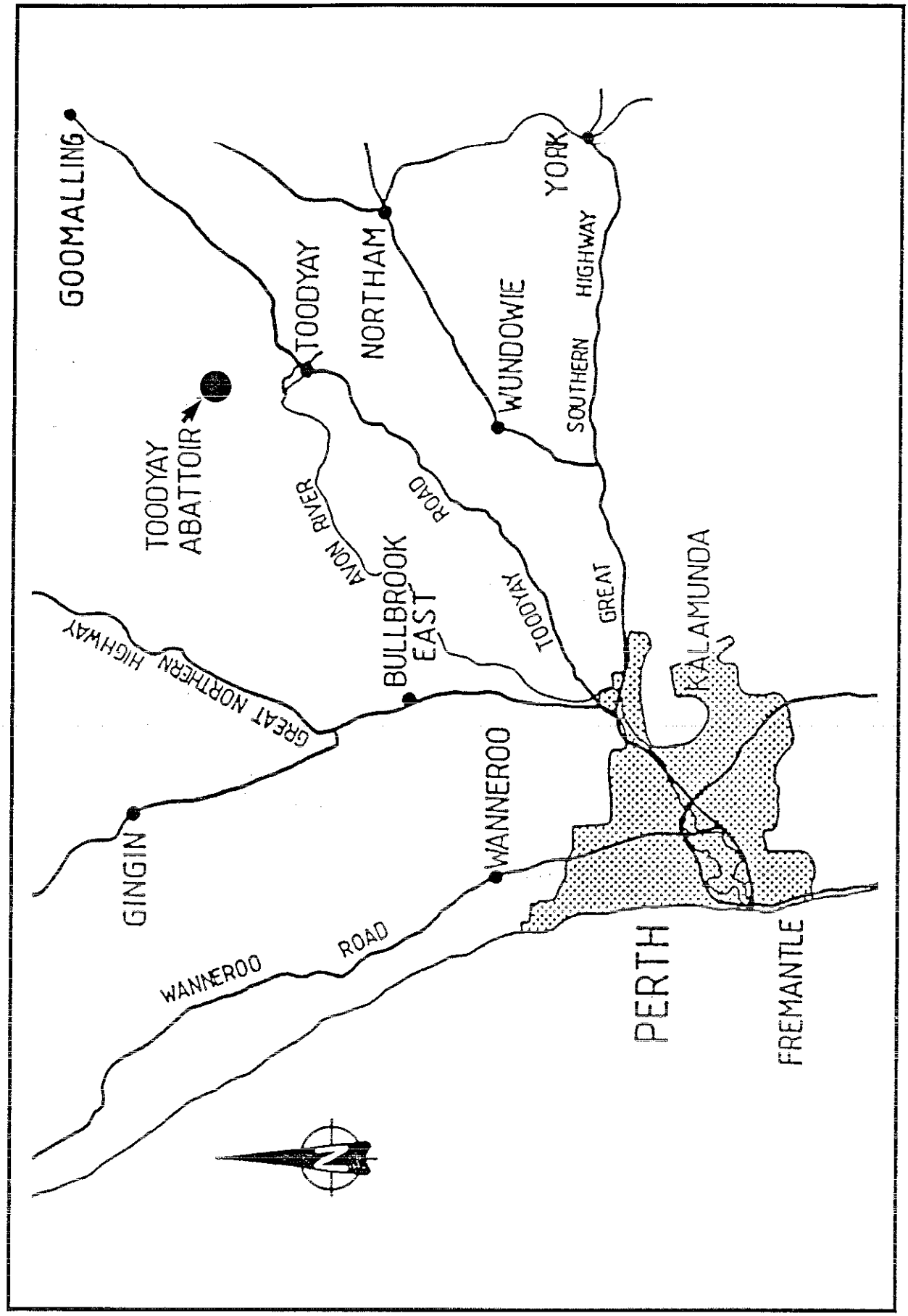


Figure 1a: Regional location of Toodyay Abattoir (from PER)

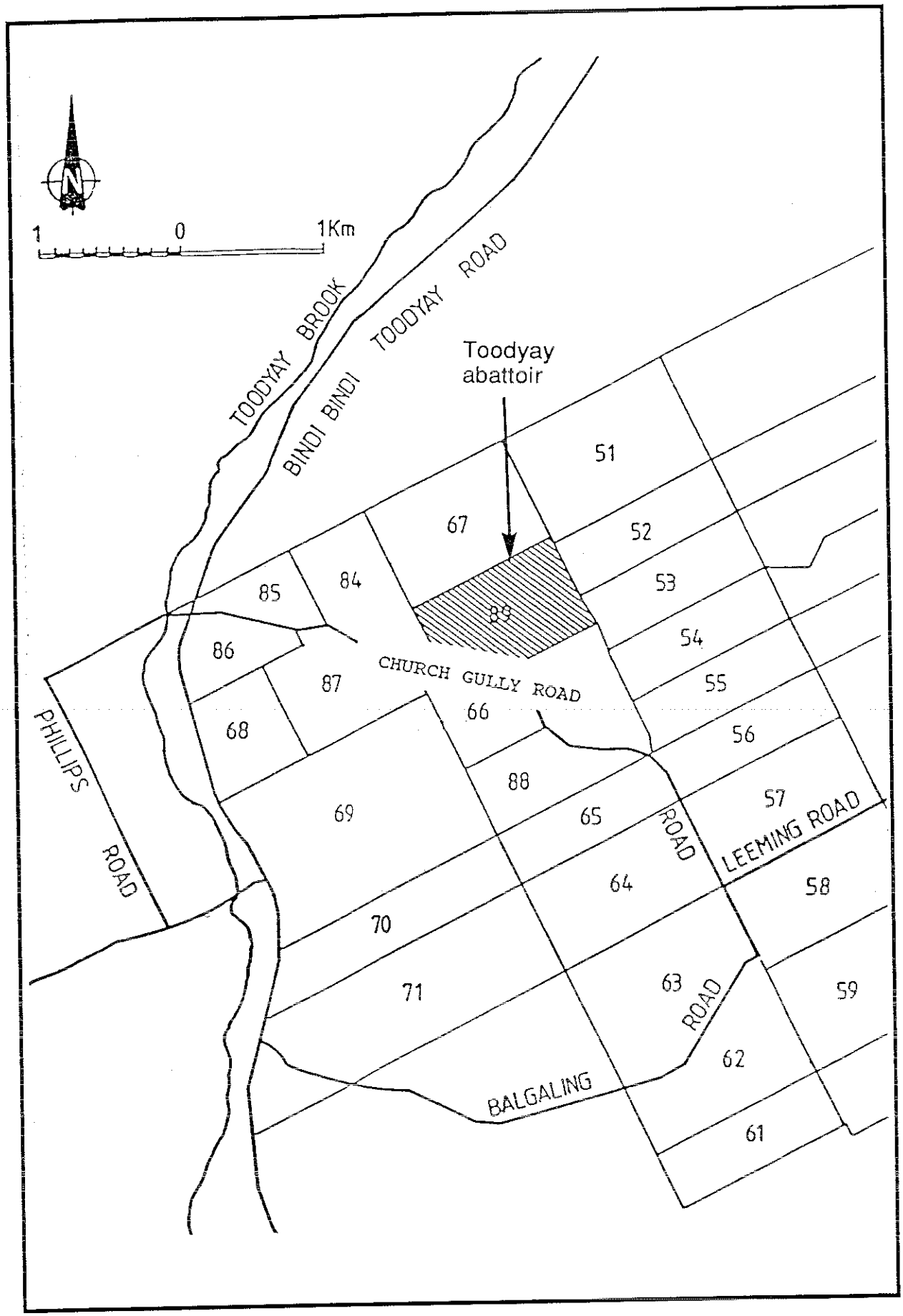


Figure 1b: Location of Toodyay Abattoir (from PER)

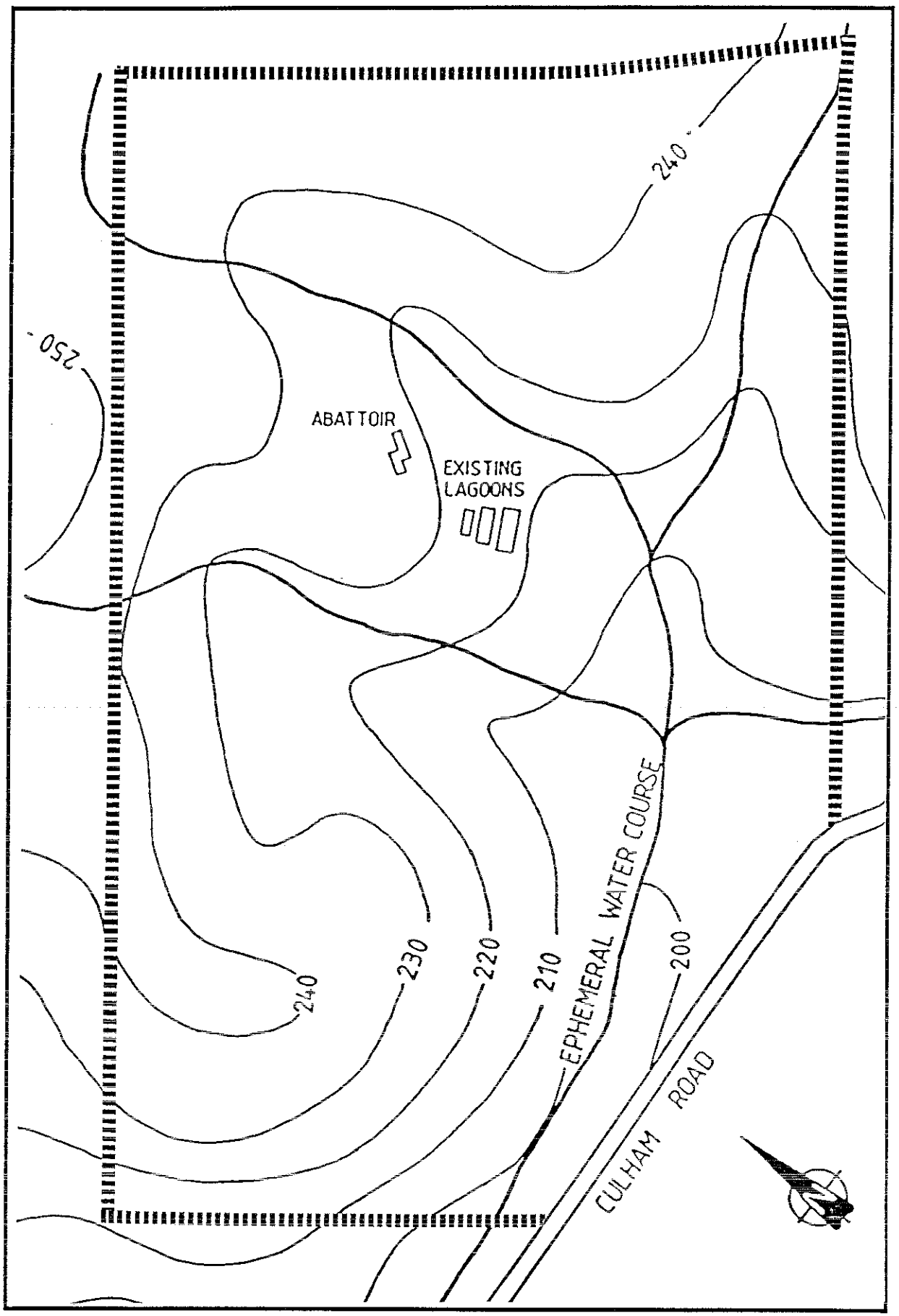


Figure 2: Site plan of existing abattoir (from PER)

The soils in the area are predominantly kaolinitic clays derived from granitic bed-rock. These clay-rich soils have a permeability in the order of 1 x 10^{-9} metres per second. This is one order of magnitude better than required to classify the soil as being impermeable and hence is suitable for the establishment of secure biological treatment ponds. The clay profile extends to 7 m and is adequate for the engineering of secure biological wastewater treatment ponds. Additionally, the high adsorptive phosphorus capacity of the underlying clay should ensure against any phosphorus related nutrient problems in the downstream water courses.

A number of buildings and three waste treatment ponds, together with the services necessary to run the abattoir are already on site.

2.3 Slaughtering operations

The proposed abattoir is small by Western Australian standards, with the maximum slaughter capacity of 500 sheep per day being the same as previous operations. Initially, however, the abattoir will only slaughter an average of 300 sheep per day.

Sheep will be unloaded and held in a concrete-floored and roofed area. Slaughtering will consist of stunning, stickling, bleeding, dressing and chilling. After slaughter the carcasses will be processed to chilled and frozen meat. Skins will be collected from the site and sold green on a daily basis. Edible and inedible offal will be removed off-site on a daily basis. No rendering will take place in the abattoir.

The abattoir is expected to operate for 300 days per year and provide up to 20 permanent jobs. The proponents intend to commence upgrading the abattoir immediately all relevant approvals have been received.

2.4 Waste treatment and disposal procedures

2.4.1 Solid wastes

Solid wastes will be generated in the sheep receival and holding areas (200 kg/day), offal (500 kg/day), screened washings from paunch collection (6 t/day), solids accumulated in screens and floor grates (3.6 t/day) and solids build-up in the lagoon system.

All solid waste will be removed off-site. Solid waste from the sheep holding yards will be dry to moist and will be disposed of on a daily basis for sale as fertiliser. Solids collected from the floor of the offal area will be moist to wet. They will be disposed of with the offal to Tallowman, a rendering works, on a daily basis. Solids recovered from screens and grates will be disposed of with offal. Solids from cleaning the pond system every 5 to 10 years will also be disposed of to Tallowman because of the high fat content.

2.4.2 Liquid wastes

Water usage by the abattoir will approximate wastewater production. Based upon previous abattoir experience, the proponents estimate that the water consumption will be 30 m^3 per day, assuming a 300 sheep per day slaughter rate, 40 kg Live Weight Killed of sheep (LWK) per day, and 2.5 m^3 water per tonne LWK. Wastewater production by each part of the process is shown in Table 1, the bulk of which is in the dressing and offal cleaning stages. Domestic wastewater from the toilets and showers will be segregated and discharged to a septic tank.

Principal constituents in the wastewater are listed in Table 2. High Biological Oxygen Demand (BOD5) and grease values are a function of the nature of the slaughtering process which generates large amounts of animal blood and tissue.

Table 1. Shows a breakdown of the wastewater production in percentage (%) and volume (m^3/day)

Source	% Mean	% Range	Volume
Boilers/washdown*	7	6-8	1.9
Slaughtering	5	3-7	1.4
Dressing	48	39-58	13
Offal cleaning	40	34-46	11
Stockyard**	No wastewater		
Cooling water from refrigerants#	No wastewater		
Domestic wastewater +	No wastewater to lagooning system		

* By-products will not be processed on site

** Treated wastewater will most likely be used for washdown of stock holding area

\# Coolant water will evaporate and not enter the waste stream

\+ $3m^3$ of water used for domestic purposes will be discharged to a standard septic tank (as for the farmlet subdivision across Cullam Road).

Table 2. Wastewater constituent concentrations found in abattoir wastewater effluent and predicted values for the Toodyay Abattoir after screening and primary settling

	Wastewater Concentration			Daily Load (kg/d)
Constituent	Minimum Value (mg/L)	Maximum Value (mg/L)	Mean Value (mg/L)	
Biochemical Oxygen Demand (BOD5)	830	2,500	1,500	40.5
Suspended Solids (SS)	670	2,000	1,000	27.0
Oil and Grease	360	800	600	16.2
Total Nitrogen	36	160	100	2.7
Total Phosphorus	12	40	20	0.5

Wastewater from the abattoir will be treated in anaerobic and facultative lagoons. This is a standard treatment system which is employed at most abattoirs in Australia which do not use ocean outfalls and it was used successfully at the existing abattoir until 1987. Suspended solids in the anaerobic lagoons break down under reducing conditions to produce odorous gases which, in properly designed biological treatment systems, are metabolised by bacteria, prior to their release to the atmosphere as relatively harmless gases (ie carbon dioxide and ammonia).

It is proposed to build two new anaerobic lagoons about 3 to 4m deep, with a freeboard of 0.5m and a capacity of 200m³. These would be located closer to the abattoir than the existing lagoon and further away from Cullum Road. Using USEPA recommendations and assumptions of 40.5kg BOD5 per day (1500mg/L) and 20 days for treatment, the proponents estimate the organic load discharge to the facultative lagoon to drop to 10kg BOD5 per day (368mg/L).

A further 85% reduction in BOD5 levels and a significant reduction in bacteria concentrations are expected in the facultative lagoons. The proponents intend to build new lagoons for this purpose, with similar dimensions to the existing ones (1.8m deep, 1136m² in area) which are to be retained as additional capacity and are designed to have a minimum retention time of 25 days.

The proponents intend constructing at least one lagoon for storage of wastewater, which will be sufficient for at least three months production. As a result of the public review process, the Authority has been advised by the Water Authority that the proposed freeboard of 0.3m (twice the depth of rain resulting from a 100 year 72 hour storm) should be increased to 0.6m. The long retention time of stored wastewater in the lagoon (75 days) should result in further reductions in BOD5 and bacteria.

The treated wastewater will be disposed of by irrigation on pasture owned by the proponents (64ha) and on a neighbouring property (688ha). In consultation with the Authority, the proponents have formulated maximum irrigation loading criteria for the critical contaminants (Table 3). Given the anticipated concentrations of the treated wastewater exiting the facultative lagoons, the limiting constituent is BOD5, which requires an area of 13ha for irrigation. The intention is to irrigate the properties using a truck fitted with a distributor bar. Only relatively flat areas where the ground water table is deeper than 1m will be irrigated. Approximately 5400m³ of wastewater will be disposed of each year.

Table 3: Irrigation areas required to satisfy loading criteria for wastewater flow of 27 m³/d

Criterion	Loading limit	Concentration (mg/L)	Required area (ha)
BOD5	30kg/ha/a	55	13
Nitrogen	500kg/ha/a	100	1.6
Phosphorus	60kg/ha/a	20	3

2.5 Water minimisation strategies

The proponents have adopted various strategies to minimise the use of the scarce water resource in the area, which lead to a consequent reduction in the volume of wastewater to be treated and disposed of. This has resulted in a predicted usage of 2.5m³ per t LWK, which compares favourably with that in older abattoirs, where usage rates are as high as 5m³ per t LWK.

Procedures to be used by the proponent to minimise water usage include:

- all hoses will be fitted with "spring loaded guns" to ensure that they cannot remain running and produce excessive wastewater;
- spray sterilisers will be fitted with switches controlled by infra-red lights so that they operate only when required ;
- the abattoir will use the modern compressed air and water technique to wash down the carcases to minimise water use;
- all floor drains will be fitted with grates to prevent large solids from reaching the wastewater biological treatment lagoons;
- the abattoir has been designed to allow for easy cleaning by dry broom and scraper before washdown; and
- it is likely that stockyard washdown will be carried out using recycled treated wastewater.

3. Public consultation and submissions

The proponents have notified all of the surrounding landowners regarding the proposed refurbishment and reopening of the abattoir.

An open day was held at the abattoir, with representatives from the Shire of Toodyay, Social Impact Unit, Environmental Protection Authority and local media in attendance. Five members of the public attended and no environmental concerns were expressed to the Environmental Protection Authority.

No submissions were received from the public during the public review period. Letters of advice were received from the Health Department of Western Australia and the Water Authority of Western Australia (neither of which raised any major environmental issues) and these have been passed on to the proponents.

The Shire is fully supportive of the project.

4. Potential environmental impacts, monitoring and management

4.1 General

In considering the Public Environmental Review, the Authority gave particular attention to the biological treatment ponds, methods of wastewater and solid waste disposal, and general monitoring.

The proponents have addressed these issues comprehensively by making an extensive list of commitments to the satisfaction of the Authority (Appendix 1). The Minister for the Environment can make these commitments legally-binding if he approves the proposal.

The Authority considers the proposal to be environmentally acceptable subject to the proponents being required to fulfil commitments given (Appendix 1).

Recommendation 1

The Environmental Protection Authority concludes that the proposal, as described in the Public Environmental Review and modified by the proponents in response to questions raised during the assessment, is environmentally acceptable and recommends that the proposal could proceed subject to the commitments given by the proponents (listed in Appendix 1 of this Report) which include:

- **overall compliance with the Authority's requirements;**
- **management of wastewater treatment and disposal;**
- **solid waste management and disposal;**
- **dust, odour and noise;**
- **monitoring;**
- **remedial action if waste management procedures fail;**
- **rehabilitation;**
- **decommissioning;**
- **reporting to the Environmental Protection Authority; and**
- **transfer of ownership.**

4.2 Dust, noise and odour

Some odour will occur in the immediate surroundings of the abattoir. However, due to the proponents' commitment to dispose of all solid wastes (except pond sludge) on a daily basis and because of the buffer zone between the proposed abattoir and the closest dwelling, odour is unlikely to be a problem. The wastewater treatment system has the potential to cause odour.

Given the level of wastewater treatment committed to by the proponent however, BOD (biological oxygen demand) levels should not cause odours during treatment or sludge clean-out and drying.

Operating hours are stated to be 7.00 am to 3.00 pm, Monday to Friday, with about 20 small vehicles (mostly from the local community) entering and exiting the property during these times. Stock trucks and meat export trucks will make deliveries once per day. The proponents have given a commitment that all machinery with a potential to cause nuisance noise levels will be enclosed to ensure that noise levels satisfy the Neighbourhood Annoyance Regulations. It is not expected that noise will reach nuisance levels at the property boundaries, however, the proponents will monitor noise at night and weekends and will take appropriate action, if necessary, to minimise noise to the satisfaction of the Authority. Given the distance of dwellings from the proposed abattoir and its times of operation, it is highly unlikely that noise would be a problem.

The proponents recognise that dust should be controlled at all times and have made a commitment to do this to the satisfaction of the Authority. However, dust is unlikely to be a problem as all stock will be unloaded and held on concrete floored areas which will be regularly washed down. In addition, if traffic creates dust problems on the approach road, the proponent is committed to sealing the road. Dust due to soil erosion is unlikely as most of the site will be irrigated and remain rural in use.

4.3 Solid waste disposal

Solid waste from noxious animal-based industries has the potential to generate odour and disease, due to bacterial action during degradation. All solid waste with such a potential must be managed on a daily basis. The proponents intend to dispose of such wastes off site and on a daily basis and have made a commitment to obtain the approval of the Authority for the method and location of solid waste disposal prior to commissioning the plant. In addition, the proponents will, three months prior to commissioning the plant, submit a solid waste disposal plan to the Authority and to the Authority's satisfaction, which will include a nominated Gazetted land fill site for the abattoir waste.

4.4 Wastewater treatment and disposal

Potential adverse environmental impacts of the wastewater treatment systems are volume overload, spillage, or leakage leading to contamination of the surface or ground waters; incomplete BOD treatment (due to overloading) leading to odour generation; and excessive nutrient enrichment or BOD loading of the soil by the irrigation system. The proponents have made comprehensive commitments to ensure that the system is designed, constructed, maintained, operated and monitored to the satisfaction of the Authority, in an endeavour to reduce the likelihood of this occurring. The rationale used by the proponents to develop pond dimensions and retention times in order to reduce the BOD to specified levels clearly demonstrates that they have a good understanding of the biological systems involved.

The proponents will use a recognized water/wastewater contractor to design and install the integrated treatment and disposal system. Prior to construction, the proponents intend to supply to this Authority and the Water Authority of Western Australia details on the exact location and design details of the wastewater ponds.

Should failure of the wastewater treatment system occur, the proponents will take immediate remedial action to the satisfaction of the Authority. The proponents have made a commitment to keep sufficient spare parts to ensure immediate repair to the aerators, the electrical system and other key elements of the system.

In the event of pond leakage, the proponents are prepared, upon direction of Environmental Protection Authority, to line the pond with a plastic liner, to the satisfaction of the Water Authority of Western Australia and the Environmental Protection Authority. They will also ensure that storm water run-off from areas adjacent to the ponds will not enter the treatment system.

The minimum area for irrigation (13 ha) is significantly less than the 64 ha property. In the unlikely event that their property cannot absorb the nutrient impact, the proponents have obtained consent from the neighbouring farmer to broad irrigate the treated wastewater over level areas of his 688 ha property. Should neither of these options be available to the proponents, they are prepared to build an evaporation pond to dispose of the wastewater, to the satisfaction of the Authority.

Prior to irrigation of the wastewater on to the property, the proponents will submit to the Authority a chemical analysis of the treated water for approval. Treated wastewater will only be irrigated on site if it complies to the Authority's requirements for nitrogen and phosphorus.

To detect any potential pollution of the environment at an early stage, the proponents will submit for approval and subsequently implement to the Authority's satisfaction (and on advice from the Water Authority of Western Australia) a comprehensive monitoring programme. This will include baseline studies, parameters to be measured, sampling times and locations, and reporting times to the Authority.

The Authority concludes that the issue of wastewater treatment and disposal, although of major environmental importance, has been adequately addressed in the project design and covered by the commitments of the proponents and therefore should not cause an unacceptable environmental impact.

4.5 Tree planting and nutrient removal

To reduce the visual impact traditionally associated with abattoirs, the proponents intend to landscape the site with trees and shrubs. A landscaping plan will be submitted to the Authority for approval three months prior to commissioning.

Part of the landscaping plan is to establish a zone of Tasmanian bluegum or similar species around the abattoir and down slope of the wastewater ponds. Apart from aesthetics, the main functions of the trees will be: the interception of contaminants in the ground water in the event of wastewater leakage or spoilage; uptake and export of nutrients and water from the irrigation of treated wastewater; and lowering of the water table to ensure against soil salinity and soil erosion.

Although the proponents intend using irrigated pasture as the principal method of absorbing and exporting off-site the nutrients and salts contained in the treated wastewater, the proposed tree plantation offers an additional mechanism to control the release of this material to the environment.

5. Conclusions

Based on the information supplied in the PER and additional information supplied by the proponents during the assessment, the Environmental Protection Authority concludes that the project could proceed subject to the commitments given by the proponents in the PER and to the Authority's recommendation in this report.

The proposed wastewater treatment and disposal system is technically sound and, given the proponents' commitments to management, monitoring and correction of any detected faults, should ensure no unacceptable environmental impact from groundwater contamination or odour.

Apart from pond sludge, all solid waste will be disposed of off-site on a daily basis in a manner satisfactory to the Authority. Hence, the proper management of solid waste should not cause any environmental problem.

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

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

Appendix 1

Proponents' list of environmental management commitments

List of commitments

Those that can be administered under Part V of the Environmental Protection Act 1986 have an asterisk against them. The remainder can be implemented using Ministerial Conditions.

General commitments

1. The proponents will adhere to the proposal as assessed by the Environmental Protection Authority and will fulfil the commitments made below.

2. The abattoir will be constructed and operated according to all relevant Government statutes and agencies' requirements, and to the satisfaction of the Environmental Protection Authority:

Wastewater management commitments

3.* The proponents will build a fully integrated wastewater, solid waste, noise and odour treatment and disposal system which will be designed and installed by a recognised water/wastewater treatment contractor to the satisfaction of the Environmental Protection Authority. The system will be operated by the proponents and monitored by the consultant to the satisfaction of the Environmental Protection Authority and all relevant Authorities.

4. Prior to construction of the wastewater treatment ponds, the proponents will supply to the Environmental Protection Authority and the Water Authority of Western Australia details of their exact location and design and have those details approved by the Environmental Protection Authority and the Water Authority of Western Australia.

5.* Prior to commissioning the plant, evaporative lagoons will be constructed to dispose of treated wastewater and will be operated subsequently to the satisfaction of the Environmental Protection Authority.

6.* In the event of pond leakage, the proponents, upon direction from either the Environmental Protection Authority or the Water Authority of Western Australia, will immediately line the leaking pond with a plastic liner to the satisfaction of the Environmental Protection Authority and the Water Authority of Western Australia.

7. All wastewater treatment lagoons will be constructed to have at least 0.3 m freeboard so as to be able to cope with a "once in 30 years storm event".

8.* The proponents will ensure that the water level in the wastewater treatment ponds will be maintained to the satisfaction of the Environmental Protection Authority and the Water Authority of Western Australia.

9.* The proponents will take immediate remedial action should failure of the wastewater treatment system occur and will carry out such action to the satisfaction of the Environmental Protection Authority and all relevant Authorities.

10.* To cope with equipment failure, the proponents will keep sufficient spares for immediate repair to the aerators, the electrical system and other key elements of the system. In such an event the proponents will advise the Environmental Protection Authority and will take steps in the event of major failure to construct holding lagoons to the satisfaction of the Environmental Protection Authority and relevant authorities as quickly as possible.

11. The proponents will ensure that storm water run-off from areas adjacent to the ponds will not enter the wastewater treatment pond system.

12.* If, due to some unseen circumstance, the disposal of treated wastewater by irrigation did not meet the Environmental Protection Authority's requirements, the proponents will build an evaporation pond for wastewater disposal and this will be done to the satisfaction of the Environmental Protection Authority.

Monitoring

14.* Prior to construction, the proponents will submit and subsequently implement a monitoring programme to the satisfaction of the Environmental Protection Authority and on the advice from the Water Authority of Western Australia. The monitoring programme will include:

- initial baseline sampling period to determine whether impacts are presently occurring;
- parameters to be measured;
- sampling sites and times;
- reporting times to Environmental Protection Authority, and
- a commitment to modify the environmental management programme, if necessary, to reduce the impact of pollution, to the satisfaction of the Environmental Protection Authority.

15*. All samples taken in the monitoring programme will be analysed in a laboratory acceptable to Environmental Protection Authority. In the event that the monitoring programme indicates that an adverse environmental impact is occurring or developing, the proponents will alter the abattoir operation or introduce additional environmental management controls as necessary to reduce the impact to an acceptable level.

Solid waste

16. The proponents will dispose of all solid wastes off-site, and will obtain the approval of the Environmental Protection Authority for the method and location of solid waste disposal prior to commissioning the plant.

17. The proponents will, three months prior to commissioning, submit a solid waste disposal plan to the Environmental Protection Authority to the satisfaction of the Environmental Protection Authority. This plan will nominate a Gazetted landfill site which will accept abattoir waste and be to the satisfaction of the Environmental Protection Authority.

18*. The proponents will have a permanent member of staff living on site. If dead animals are delivered to the abattoir they will be removed from the site within 24 hours and disposed of to the satisfaction of the Environmental Protection Authority.

Dust, odour and noise

19*. The proponents will ensure that dust, odour and noise will be controlled at all times to the satisfaction of the Environmental Protection Authority.

20*. The proponents will seal any area used by traffic including the access road to the abattoir if it is deemed by the Environmental Protection Authority that traffic is causing a dust problem.

21*. The proponents will monitor noise at night and weekends and will take appropriate action, if necessary, to minimise noise to the satisfaction of Environmental Protection Authority.

22. All machinery with a potential to cause nuisance noise levels will be enclosed to ensure that noise levels satisfy the Neighbourhood Annoyance Regulations.

Irrigation of wastewater: nutrients and disease

23*. Before the proponents irrigate wastewater onto their property they will provide the Environmental Protection Authority with a chemical analysis of the treated water and have it approved for irrigation by the Environmental Protection Authority. Additionally, the proponents will have approved by Environmental Protection Authority, the area of land to be irrigated, prior to commissioning the plant.

Other commitments

24. The proponents will not use treated wastewater for any purpose relating to the dressing of meat. Before they use such water for washing down stock holding areas, approval would be sought from the Health Department of Western Australia and the Environmental Protection Authority. All such wash down water would be recycled back into the wastewater treatment system.

25. The proponents will control insects and weeds around the wastewater treatment system, including the lagoons, any sludge drying facilities or temporary stock holding areas, to the satisfaction of the Environmental Protection Authority, the Health Department of Western Australia and the Shire of Toodyay.

26. The proponents will, three months before commissioning the plant, submit a landscaping plan (tree planting) to the Environmental Protection Authority, and have it approved by the Environmental Protection Authority, with the purpose of retaining the amenity of the area.

27*. The proponents will modify their pollution control operations, if they cannot meet their licence conditions, so that environmental impacts are reduced to a level acceptable to the Environmental Protection Authority.

28. The proponents will be responsible for decommissioning the plant and rehabilitating the site and its environs, to the satisfaction of the Environmental Protection Authority.

29. The proponents will, at least six months prior to decommissioning, prepare a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority.

30. The proponents will not transfer ownership, control or management of the project, without prior consultation and arrangements being made which are to the satisfaction of the Environmental Protection Authority and the Minister for the Environment.

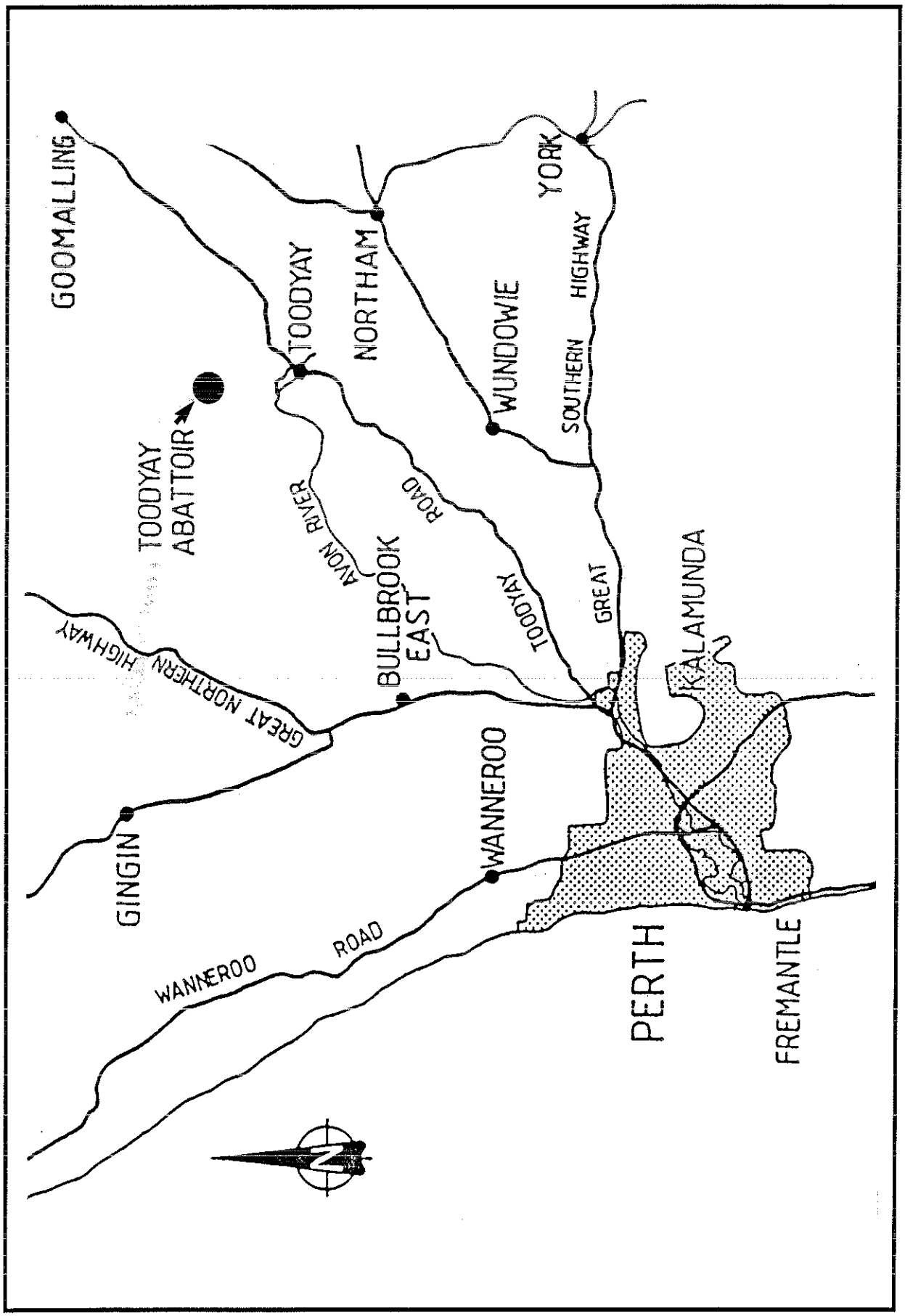
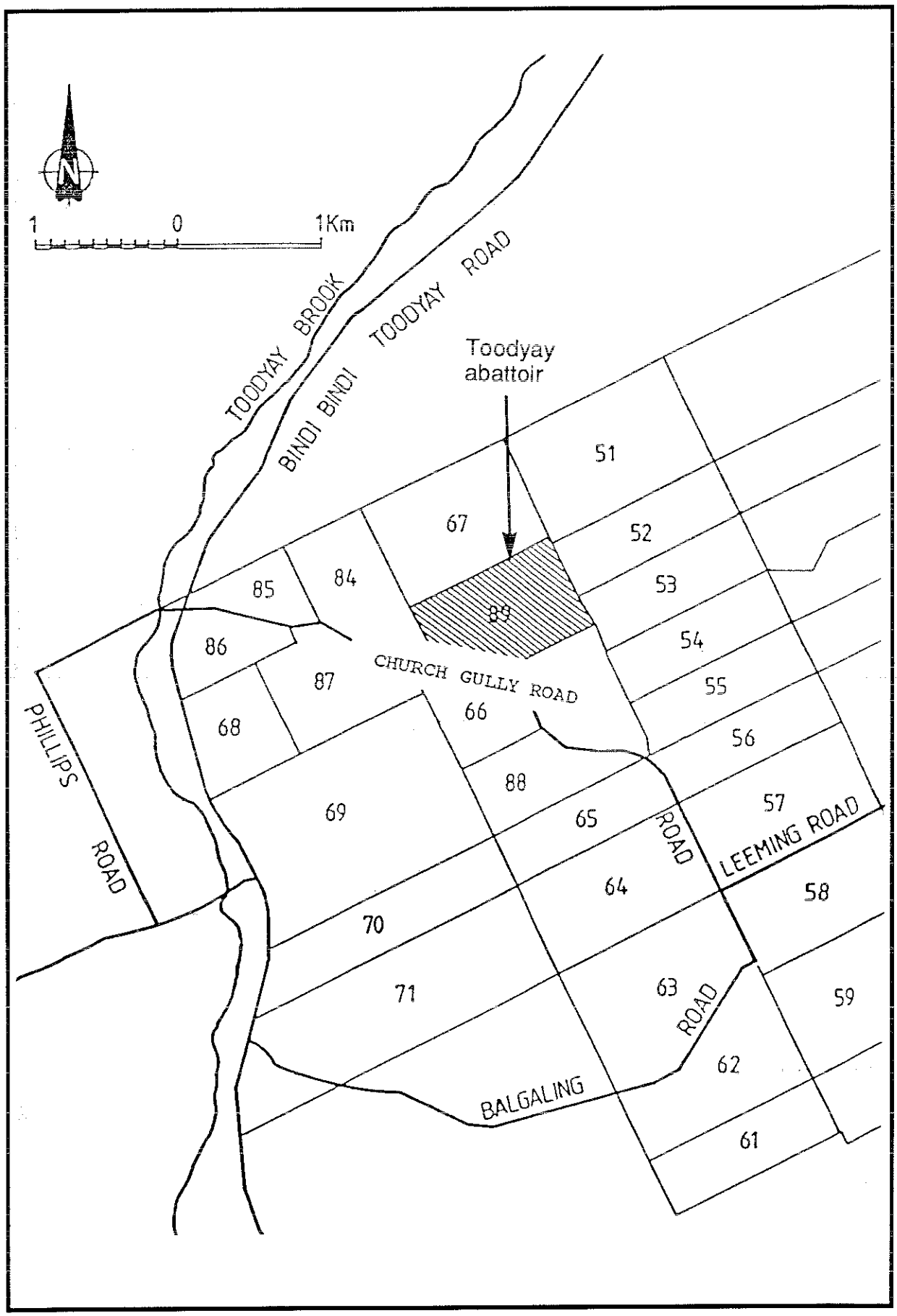


Figure 1a: Regional location of Toodyay Abattoir (from PER)



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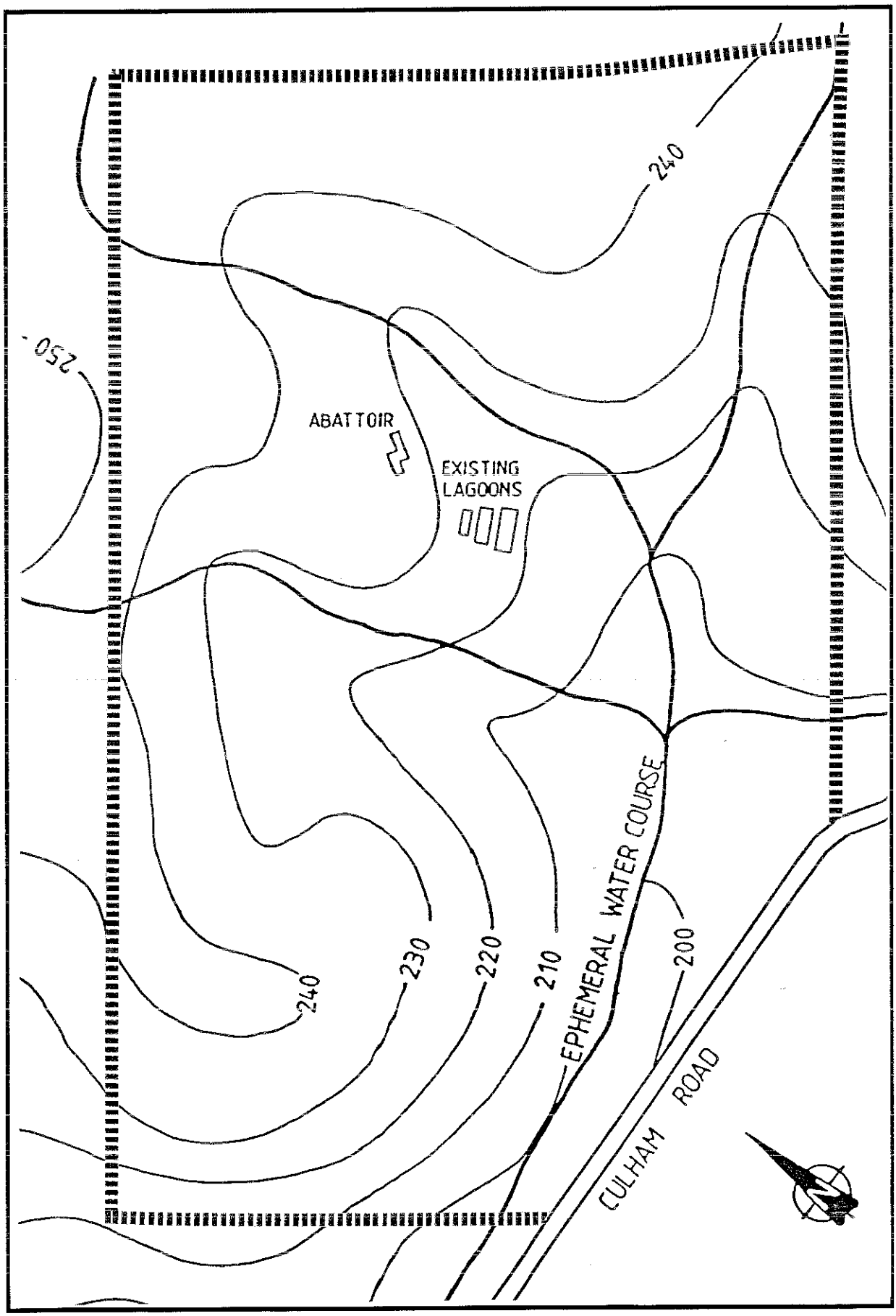

Figure 2: Site plan of existing abattoir (from PER)

Proposed updating and reopening of the Toodyay Abattoir at Lot 590 Church Gully Road, Toodyay

Johnson and Staszewski

Report and recommendation
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 570
August 1991

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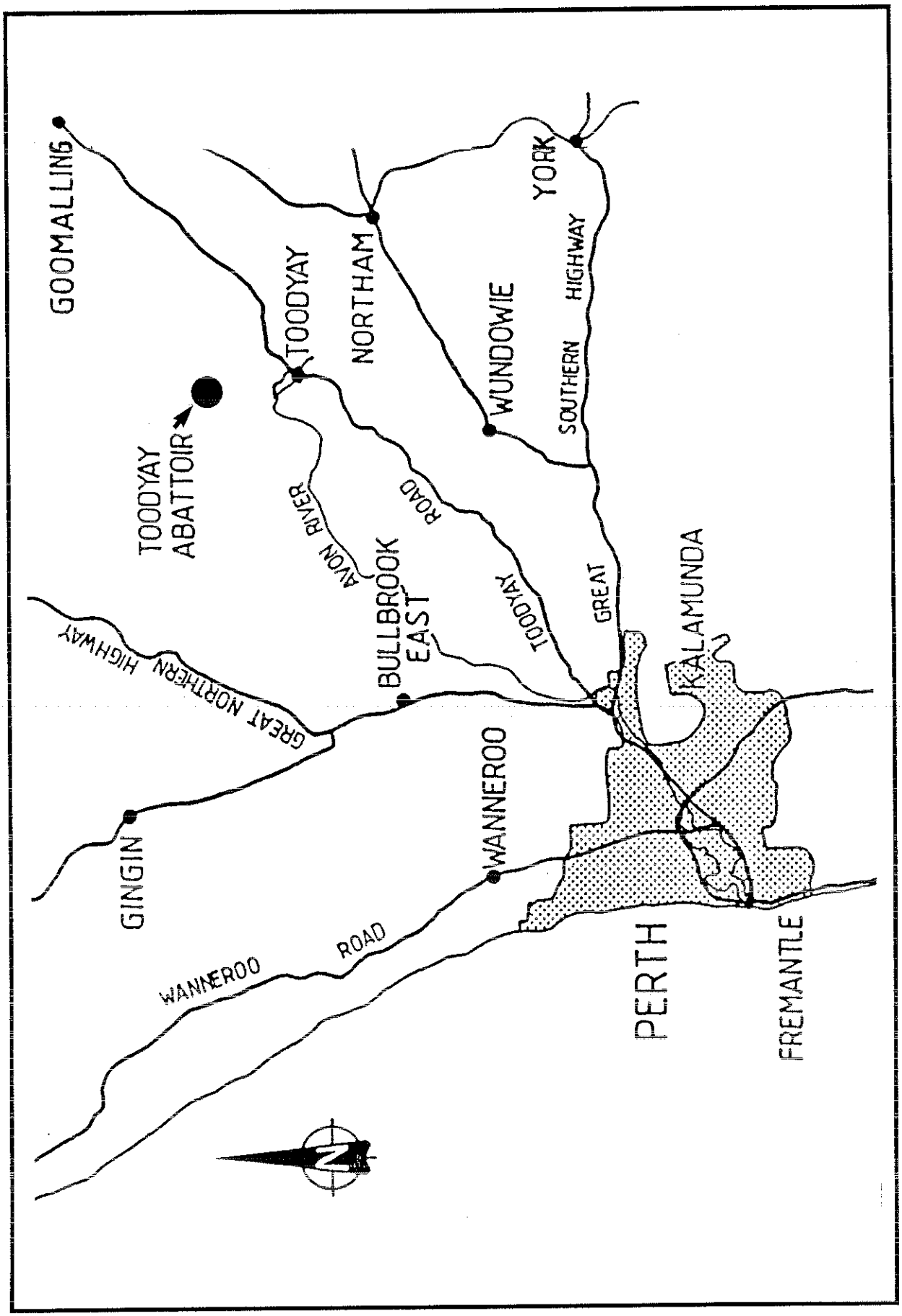

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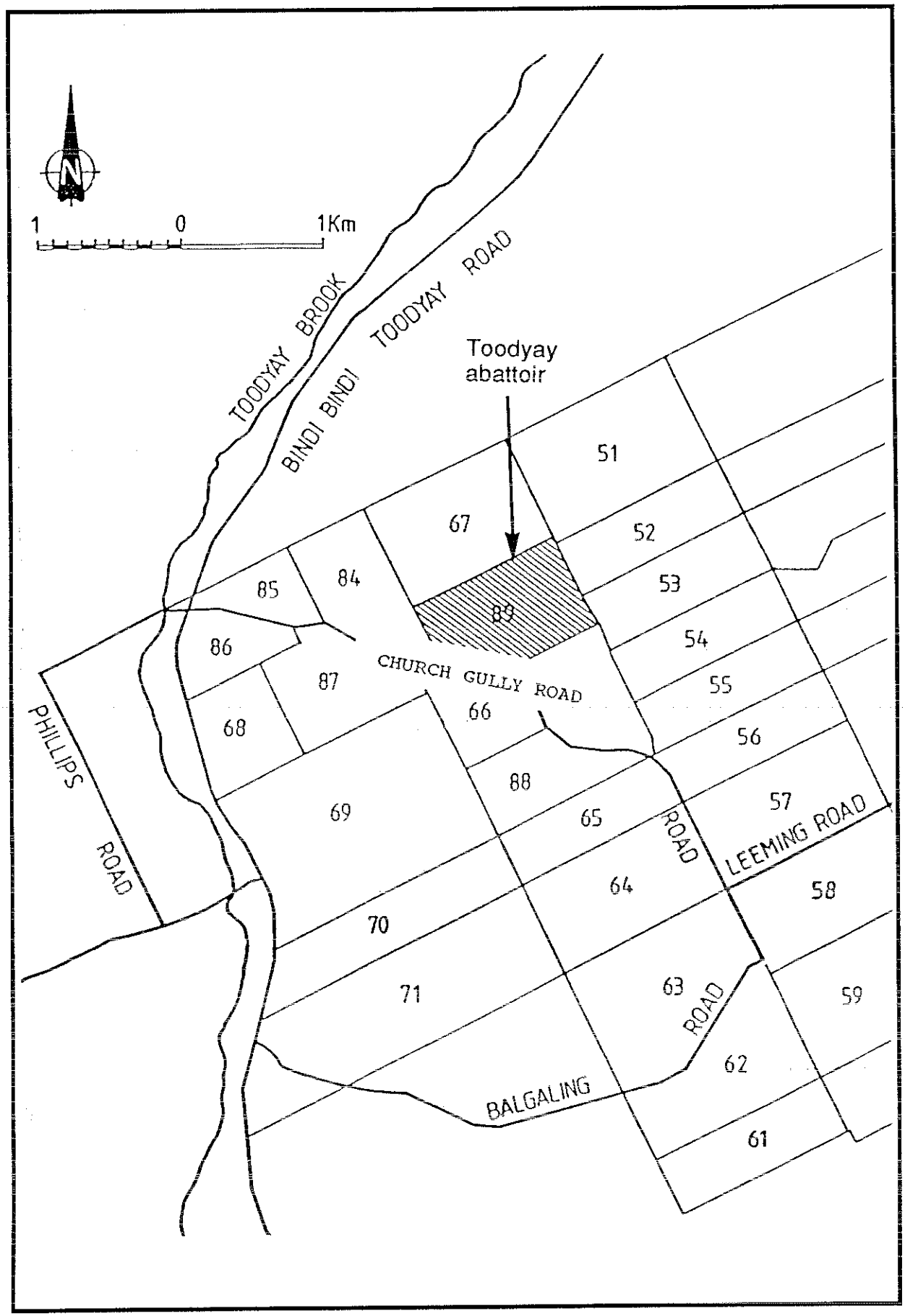

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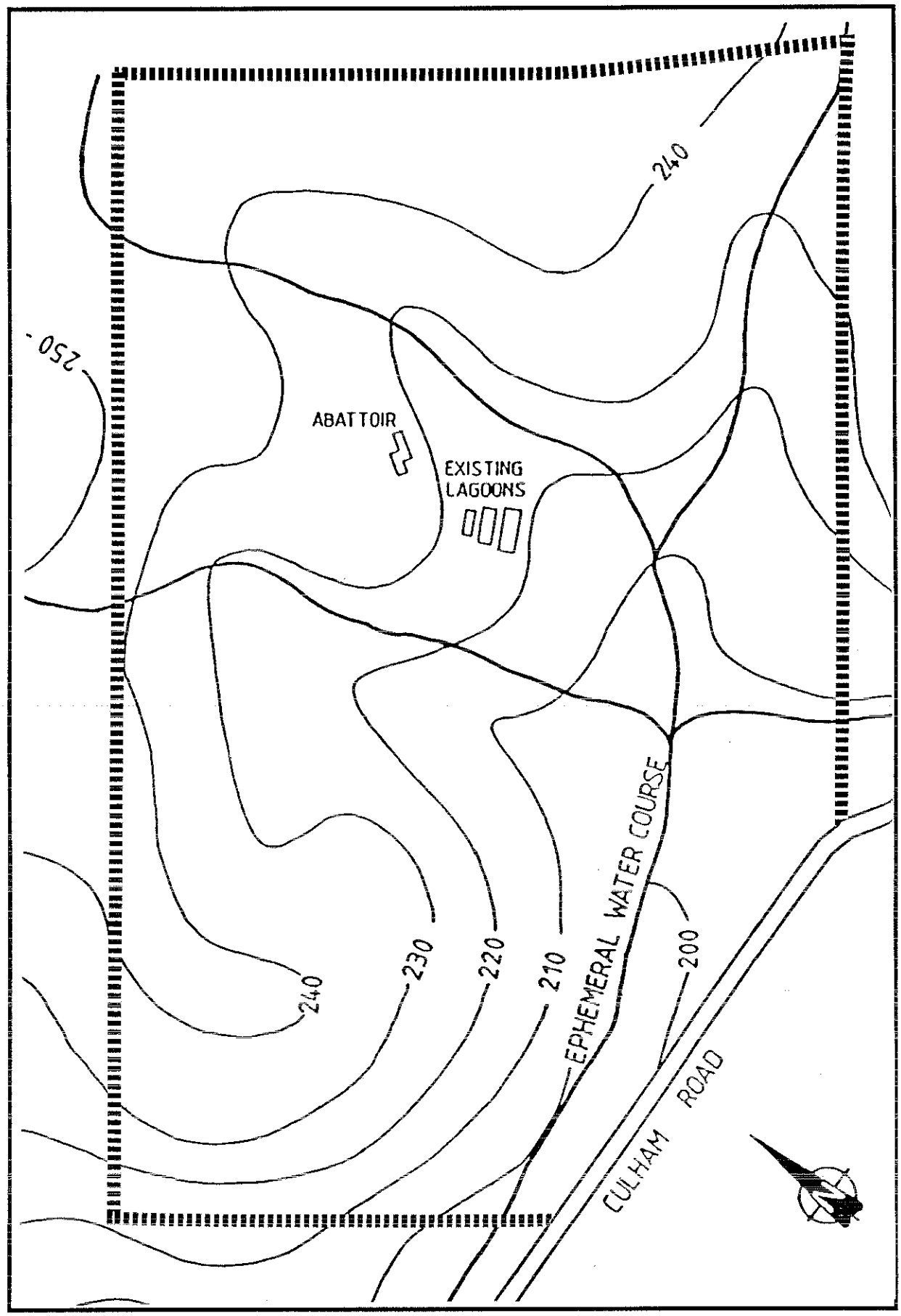

Figure 2: Site plan of existing abattoir (from PER)