

Pilbara to goldfields gas pipeline

**Wesminco Oil Pty Ltd, Western Mining Corporation Ltd,
Normandy Pipelines Pty Ltd and BHP Minerals Pty Ltd**

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin 760
October 1994**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 11 November 1994.

Environmental Impact Assessment Process Timelines

Date	Timeline commences from receipt of full details of proposal from proponent for public review	Time (weeks)
27.6.94	Proponent's document released for Public Comment	
22.8.94	Public Comment Period closed	8
29.8.94	Issues raised during Public Comment Period summarised by DEP and forwarded to the Proponent	1
14.9.94	Proponent's response received	3
28.10.94	EPA report released	6

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Summary

The Goldfields Gas Pipeline Joint Venture participants propose to construct a buried pipeline from near Onslow to Kalgoorlie, via Newman in the eastern Pilbara. The pipeline would transmit gas from the existing Dampier to Perth gas pipeline to the Pilbara and Goldfields regions, initially for power generation at minesites owned by the participants. Six lateral buried pipelines would be constructed from the main pipeline to deliver gas to the proposed gas-fired power stations at the minesites. The pipeline would have the capacity for other developments by energy consumers along the route in the future.

The proponent described the project and the management of the associated environmental issues in a Public Environmental Review, which resulted in seventeen submissions from government agencies and the public. From the assessment of the available documentation, including the issues raised in submissions, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- overall environmental acceptability of the pipeline corridors;
- protection of Wanjarri Nature Reserve, if this route is chosen;
- environmental management, particularly during construction and commissioning;
- rehabilitation techniques, especially for environmentally sensitive areas which could not be avoided; and
- impact on land holders.

The Environmental Protection Authority notes the general acceptance of the project by the communities and land holders along the proposed pipeline corridors and, also, by the government agencies and public which made submissions, except for concerns about the potential corridor through Wanjarri Nature Reserve in the northern Goldfields. The Environmental Protection Authority concluded from a consideration of the environmental factors that the pipeline project could be acceptably managed as described in the proponent's documentation. Noting the satisfactory experience of government energy and environmental management agencies with other pipeline projects throughout Australia, the EPA concludes that the Pilbara to Goldfields gas pipeline project would be environmentally acceptable, subject to the satisfactory implementation of the recommendations below.

The main environmental concern was the potential impact of placing the pipeline through Wanjarri Nature Reserve, near Mt Keith in the northern Goldfields region, which is the proponent's preferred corridor. If this route is chosen, some 47 hectares of the 53,000 hectare reserve would be directly disturbed. Wanjarri is an A Class nature reserve for the conservation of plants and animals and is the only nature reserve in the region. Surveys have shown that Wanjarri has the richest vertebrate fauna for an arid zone reserve in Western Australia and has an important role to play in the conservation of biodiversity and the ecology of the region. Hence, Wanjarri Nature Reserve is considered to have a high conservation status, which the Environmental Protection Authority believes should not be compromised by the pipeline project.

The proponent identified an alternative corridor which would avoid the Reserve, but it is not preferred for geotechnical, economic and safety reasons, and there are also some environmental constraints. To support their preference for putting the pipeline through the Reserve, the proponent committed to minimising the environmental impact by:

- choosing a pipeline easement through the Reserve which is acceptable to the National Parks and Nature Conservation Authority (as landowner) and the Department of Conservation and Land Management (as land manager);
- using special clearing and rehabilitation techniques, and environmental management procedures, as agreed with the Department of Conservation and Land Management; and
- achieving final rehabilitation objectives, as agreed with the Department of Conservation and Land Management, which reflect the purpose of an A Class Nature Reserve.

In acknowledging that there would be a temporary loss to the conservation estate if the Wanjarri route were chosen, the proponent committed to preserve the biodiversity of the disturbed area and enhance the conservation status of Wanjarri Nature Reserve by:

- rehabilitating the pipeline easement;
- providing ecological replacement of land impacted by the pipeline (for example, by rehabilitation of a similar area of degraded land within the Reserve or by facilitating an addition of land to the Reserve), in consultation with the Department of Conservation and Land Management;
- funding a Management Plan for the entire Reserve;
- working with the Department of Conservation and Land Management on aspects of the management of the Reserve (such as fencing and other park development and maintenance work), providing research support during construction, and the potential use of inspection facilities (aerial reconnaissance); and
- development of a plan of recommended conservation strategies, in consultation with the Department of Conservation and Land Management, to manage the surrounding pastoral land in a complementary manner (for example, stock and feral animal control, bushfire control and erosion control).

The Environmental Protection Authority notes that the National Parks and Nature Conservation Authority opposes the pipeline through the A Class Reserve in-principle because of the conflict with the conservation objectives of the Reserve, and because of the loss of conservation values and integrity of this important regional reserve.

However, in considering the balance between the NPNCA's principle, the potential environmental impact of the pipeline project, and the proponent's management commitments to preserve the biodiversity of the disturbed area, and consideration of the Commonwealth's paper on Biodiversity and the Australian Mining Industry Council's paper on Managing to Conserve Biodiversity, the Environmental Protection Authority concludes that putting the pipeline through the Reserve is acceptable in this case because there should be a net environmental benefit to Wanjarri Nature Reserve, through the implementation of the environmental conditions and commitments.

The Environmental Protection Authority considers that the proponent should use special rehabilitation techniques to ensure that the standard of rehabilitation achieves the conservation objectives of Wanjarri Nature Reserve. Also, the EPA considers that the environmental management procedures for the pipeline project should reflect the environmental sensitivity and high conservation status of the Reserve.

The Environmental Protection Authority concludes that a detailed report is required to address the final pipeline route, rehabilitation techniques, environmental management procedures and the proponent's commitments on ecological replacement, if the pipeline route through Wanjarri Nature Reserve is chosen.

The Environmental Protection Authority notes that the Goldfields Gas Pipeline Agreement Act, 1994, includes a requirement for an Environmental Management Programme to address the management of the entire pipeline project. The EPA considers that this Environmental Management Programme, which will address some details of environmental management should be to the technical requirements of the Environmental Protection Authority.

Summary of Recommendations	
1	<ul style="list-style-type: none"> • The proposal, as described in the Public Environmental Review and supplementary documentation, is environmentally acceptable subject to: the recommendations in this report and the proponent's environmental management commitments.
2	<ul style="list-style-type: none"> • If the pipeline corridor through Wanjarri Nature Reserve is chosen, prior to construction, the proponent shall provide detailed information in a report on a final pipeline route within the corridor, rehabilitation techniques, environmental management procedures and strategies to implement the proponent's commitments to preserve the biodiversity and protect the conservation values and integrity of the Reserve. This report should meet the Environmental Protection Authority's requirements.

1. Introduction and background

The participants in the Goldfields Gas Transmission Joint Venture (GGTJV) propose to construct and operate a buried pipeline to transport natural gas from the Northwest Shelf through the Eastern Pilbara, Northeastern Goldfields and Eastern Goldfields of Western Australia to Kalgoorlie and Kambalda. The main pipeline would be about 1400km long and would have six lateral pipelines to supply gas-fired power stations at Newman, Mt Keith, Leinster, Kalgoorlie, Kalgoorlie Nickel Smelter and Kambalda (Figure 1). The pipeline would have the capacity to provide for further developments by energy consumers in these areas in the future.

The three participants in the GGTJV and designated proponent of the main pipeline are: Westminco Oil Pty Ltd, Normandy Pipelines Pty Ltd and BHP Minerals Pty Ltd. The three proponents of the six laterals are: BHP Minerals Pty Ltd (Newman lateral), Western Mining Corporation Ltd (Mt Keith, Leinster, Kalgoorlie Nickel Smelter and Kambalda laterals) and Normandy Pipelines Pty Ltd (Kalgoorlie lateral).

The concept of a natural gas pipeline linking the gasfields in the Northwest of the State to the Eastern Pilbara and Goldfields was identified by the Government in 1993. In April 1993, the Government invited expressions of interest from potential proponents to build, own and operate a pipeline and any associated compression and distribution facilities.

The GGTJV entered into the Goldfields Gas Pipeline Agreement Act in March 1994 to enable the pipeline project to proceed, subject to environmental approvals and final feasibility studies. The project was referred to the Environmental Protection Authority (EPA) and a level of assessment of Public Environmental Review (PER) was set and subsequently advertised on 12 March 1994.

The final guidelines for the PER were provided to the GGTJV on 30 March 1994 and it was released for public and government agency comment on 22 June 1994 for 8 weeks.

The key objectives for assessment of the proposal were considered to be :

- to provide broad advice, considering the extent of the project, about the environmental constraints and issues along the proposed pipeline corridors, including the laterals;
- to decide if the proponent's preferred corridors would allow the pipeline project to be implemented with an acceptably low level of environmental impact;
- to identify specific management techniques for any environmentally sensitive areas which could not be avoided; and
- to identify approval and regulatory processes for the construction, commissioning and operation phases of the pipeline project.

The selected corridors with the various options are shown on Figure 1 and the GGTJV is seeking environmental approval for all options. The GGTJV has, however, indicated a preferred corridor (Ashburton option 1 and Ashburton corridor; Mt Keith East option), but is carrying out further feasibility studies, including seeking environmental approval, before making a decision.

1.1 List of acronyms

For convenience, the Environmental Protection Authority's report has used acronyms for the commonly repeated phrases shown in Table 1 below:

Table 1. List of acronyms

GGTJV	Goldfields Gas Transmission Pty Ltd Joint Venture
EPA	Environmental Protection Authority
DEP	Department of Environmental Protection
CALM	Department of Conservation and Land Management
NPNCA	National Parks and Nature Conservation Authority
DRD	Department of Resources Development
AHC	Australian Heritage Commission
CCNT	Conservation Commission of the Northern Territory
NT Gas	Northern Territory Gas Pty Ltd; operators of the Amadeus Basin to Darwin gas pipeline
DOMEWA	Department of Minerals and Energy of Western Australia
PER	Public Environmental Review; level of assessment and documentation required under the Environmental Protection Act 1986
SECWA	State Electricity Commission of Western Australia
EMP	Environmental Management Programme

2. Summary description of proposal

The proposal which is the subject of this assessment report was described in a Public Environmental Review document prepared on behalf of the GGTJV by Dames and Moore Pty Ltd (PER, 1994), following guidelines issued by the Department of Environmental Protection (DEP). The proposal includes the following main components or phases:

- the selection of 5km wide corridors, with various options in the Pilbara and Northwestern Goldfields, for the construction of a main buried pipeline and narrower corridors (up to 500m) for six lateral buried pipelines;
- the selection and surveying of a 30m wide pipeline easement within the corridors;
- the construction phase;
- the rehabilitation phase;
- the commissioning phase; and
- the operation phase.

There are two options for the take-off point from the Dampier to Bunbury gas pipeline: the State Electricity Commission of Western Australia's (SECWA) compressor stations 1 or 2. The GGTJV's preferred option is from compressor station 1 (Ashburton option 1), which is supported by SECWA for cost reasons (Figure 1).

The Ashburton corridor is preferred over the Fortescue corridor for economic, engineering and access reasons. The two corridors join just south of Newman and head south towards Kalgoorlie; lateral corridors to Newman are shown on Figure 1 coming from each main corridor. Just north of Wiluna there are two potential corridors: the Mt Keith East and West options; each with a lateral corridor into Mt Keith nickel mine. The preferred corridor is the Mt Keith East option because of economic, engineering and safety reasons. The two main corridors, each with a lateral corridor into Leinster, join just south of Leinster and the corridor proceeds south to Kalgoorlie, with lateral corridors into Kalgoorlie, the Kalgoorlie Nickel Smelter and Kambalda.

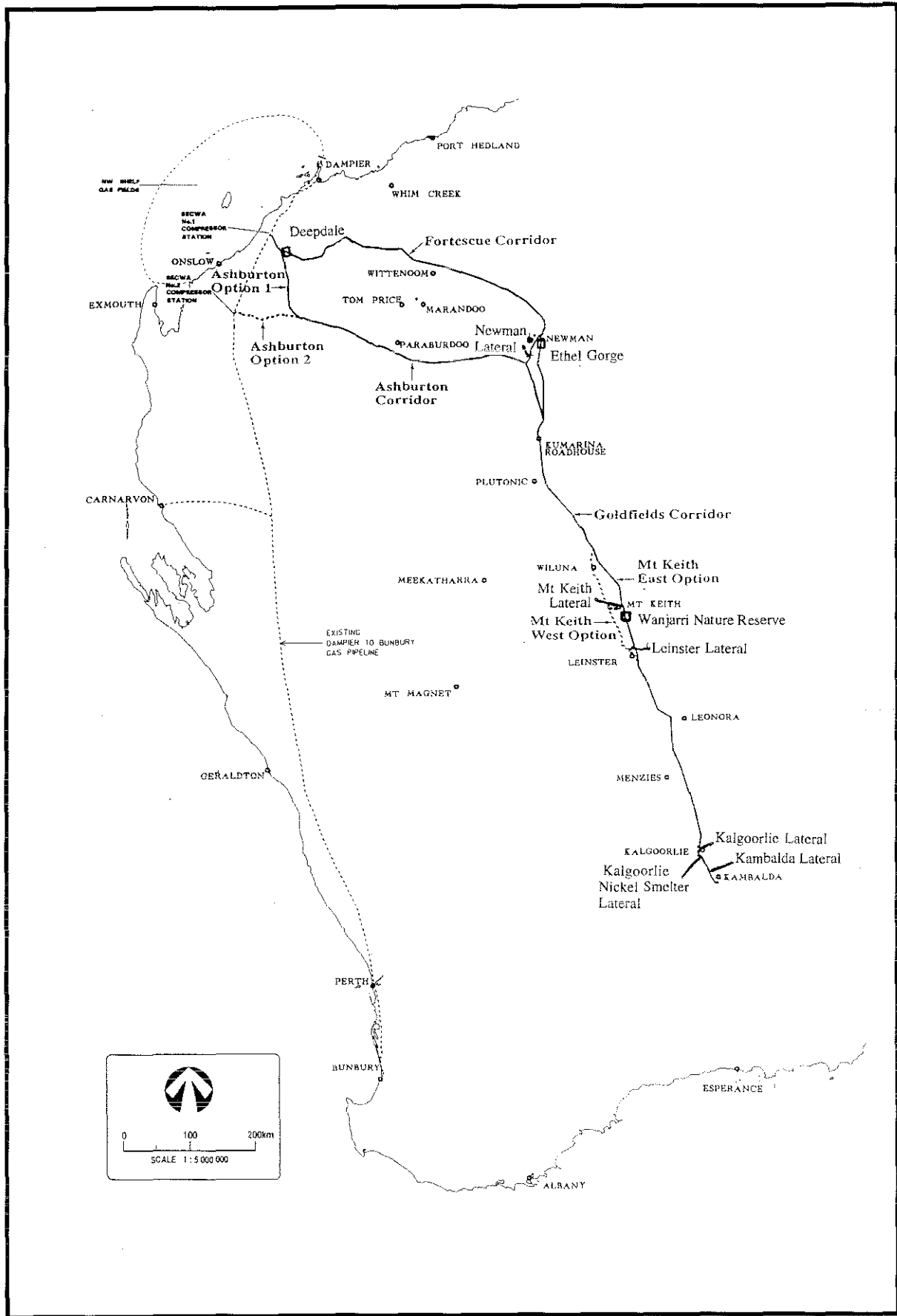


Figure 1. Location of corridors - Pilbara to Goldfields gas pipeline.

The selection of a pipeline easement (30m wide) within the 5km wide corridor would precede the construction phase and would involve some ground or vegetation disturbance as a line-of-sight surveyed line was established. The construction phase would involve the clearing or flattening of vegetation on the easement and the stripping of topsoil from parts of the easement (trenchline and, possibly, the working side). A trench 1.2m deep and 0.8m wide would then be excavated, the pipeline buried and the trench backfilled. Specific construction techniques are required for river crossings, rocky areas and for existing infrastructure crossings (roads, railways, etc). Pipeline infrastructure such as mainline valves, compressor stations, etc, would also be constructed. Construction camps for the workforce would be set up and moved along the corridor as necessary.

The rehabilitation phase immediately follows the backfilling of the trench and involves the spreading of the stockpiled subsoil, topsoil and vegetation and the construction of erosion control structures, as necessary. Specific structures to stabilise the trench and protect the pipeline from damage would also be installed at this stage, if required, such as a mound (crown) over the trench and rock armouring of river banks.

The commissioning and operation phases involve the pressure testing of the pipeline, commissioning of compressor stations, installation of communications and control systems and on-going maintenance work. The pressure testing programme, known as hydrotesting, involves filling sections of the pipeline with water and, hence, involves the management of a water supply and disposal system.

A description of the existing environment was provided in the PER. With the exception of the Deepdale area, Ethel Gorge and Wanjarri Nature Reserve, the GGTIV selected corridors which avoided environmentally sensitive areas which, typically, have numerous constraints. The Deepdale area and Ethel Gorge are in the non-preferred Fortescue corridor, whereas Wanjarri Nature Reserve is in the preferred Mt Keith East corridor.

A detailed description and discussion of the proposal, the existing environment and environmental issues and management is contained in the Public Environmental Review. The proponent has made numerous commitments in the PER and supplementary documentation to address the environmental management of the pipeline project; the key commitments which would be audited by the DEP are consolidated in Appendix 4 of this report.

3. Environmental impact assessment process

The environmental impact assessment process for this proposal followed the Administrative Procedures, 1993, for the Environmental Protection Act, 1986, as shown in the flow chart in Appendix 1. Seventeen submissions were received on the Public Environmental Review and the list of submitters appears as Appendix 3. A summary of issues raised in submissions and the proponent's response to those issues appears in Appendix 2 .

In addition to following the administrative procedures, officers of the Department of Environmental Protection undertook the following related activities shown in Table 2.

Limitation

This assessment has been undertaken using information currently available. The information has been provided by the proponent in the Public Environmental Review and supplementary documentation (in response to guidelines issued by the DEP), by DEP officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies and by contributions from Environmental Protection Authority members.

Table 2. Assessment process

Date	Activity	Outcome
26 April 1994	Meeting with GGTJV and consultants Dames & Moore (D&M)	Agreement on timetable and associated developments
3 May	Meeting with Chairman (EPA), Exec. Dir. (DRD), GGTJV	Update on progress and agreement on responsibility and level of assessment for associated developments
13 May	Meeting with GGTJV and DRD	Agreement on separate, concurrent assessment of gas fired power stations
25 May	Meeting with GGTJV and D&M	Discussion on progress of PER
8 June	Meeting with GGTJV and D&M	Review of draft PER
15 June	Meeting with GGTJV and D&M	Review of final draft PER
13 July	Meeting with DRD and D&M	Discussion on Environmental Management Programme
11 August	Briefing of EPA by GGTJV	Information briefing on project
8 September	EPA Environmental Assessments Committee meeting with DEP officers and CALM officer	Main environmental factors identified; consideration of the option of traversing Wanjarri Nature Reserve
6 October	EPA Environmental Assessments Committee meeting with DEP officers	Discussion of draft Report and Recommendations
17 October	Site visit to Wanjarri Reserve by EPA board members, DEP officer, proponent, CALM officers, NPNCA member, DRD officer	Consideration of the option of traversing Wanjarri Nature Reserve; agreement on commitment to ecological replacement
20 October	EPA meeting	Approval of report and recommendations

The Environmental Protection Authority recognises that further studies and research may affect the conclusions. Accordingly, the EPA considers that, 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 after a new referral (Recommended Environmental Condition 5).

4. Evaluation

The Environmental Protection Authority has reviewed the available information relating to the proposal described in the Public Environmental Review document. Following consideration and evaluation of this information, as discussed below, the Environmental Protection Authority recommends approval of the proposal:

Recommendation 1

The Environmental Protection Authority concludes that the proposal by Wesminco Oil Pty Ltd, Normandy Pipelines Pty Ltd, BHP Minerals Pty Ltd and Western Mining Corporation Ltd to construct and operate a buried gas pipeline from the Pilbara to the Goldfields, including six lateral pipelines, is environmentally acceptable. In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- overall environmental acceptability of the pipeline corridors;

- **protection of Wanjarri Nature Reserve, if this route is chosen;**
- **environmental management, particularly during construction and commissioning;**
- **rehabilitation techniques, especially for environmentally sensitive areas which could not be avoided; and**
- **impact on land holders.**

Accordingly, the EPA recommends that the proposal, as described in the Public Environmental Review and supplementary documentation, could proceed subject to:

- **the recommendations in this report; and**
- **the proponent's environmental management commitments (Appendix 4).**

This recommendation is reflected in Recommended Environmental Conditions 1, 2 and 4 included in Section 6 of this report. Other environmental factors were considered to be adequately addressed by the proponent in the PER and supplementary documentation. The main environmental factors, with conclusions and recommendations for management, if necessary, are discussed below.

4.1 Overall environmental acceptability of the pipeline corridors

4.1.1 Objective

To ensure that sufficient physical, biological, archaeological and other investigations were carried out to enable the pipeline corridors to be chosen which would avoid most, if not all, environmentally or culturally sensitive areas and, hence, allow the buried pipeline to be constructed with minimal environmental disturbance.

4.1.2 Evaluation framework

Technical information

The corridor selection process is described in the PER. The GGTJV reported that it conducted extensive investigations, including low level flying and spot landings along the possible 5km wide corridors, and that it consulted with all relevant Local and State Government agencies and other interested parties with responsibilities for environmental, cultural and land tenure matters. The selection of the corridors was based on the following criteria:

- minimum distance and cost without compromising safety;
- least disturbance to existing land uses and potential future interests (mineral resources, urban development, etc);
- least environmental disturbance;
- location of viable gas supplies;
- location of expected gas demand centres;
- avoidance of environmentally sensitive areas (National Parks and Nature Reserves, Aboriginal heritage sites and other reserves for various purposes, etc), if possible;
- location of potential sites for associated facilities; and
- avoidance of difficult terrain (rocky areas, river crossings, salt lakes, etc).

The GGTJV reported that, within the corridors, there were three environmentally sensitive areas, Deepdale, Ethel Gorge and Wanjarri Nature Reserve, which had a combination of constraints, and numerous significant habitats. These areas and habitats are discussed in detail in a subsequent section.

The GGTJV reported that specific, detailed investigations concerning Aboriginal archaeological and ethnographic matters are on-going under the relevant legislation. The GGTJV provided a summary in the PER of the current status concerning investigations into Aboriginal matters and described the on-going approval and management processes. The corridor selection strategy is designed to allow the identification of a 30m wide easement, within the chosen corridor, which avoids Aboriginal sites and concerns. The EPA notes that the Office of Traditional Land Use has completed its evaluation process and made its recommendation to the Minister for Aboriginal Affairs (B Wood, DRD, *pers. comm.*).

The proposed corridors, with the options as described in the PER, are shown in Figure 1. The corridors have already been agreed under Clause 7 of the Pipeline Agreement Act so that the provisions of the Petroleum Pipelines Act, 1969 could be satisfied. However, possible variations to the proposed corridors are provided for, with agreement between the Joint Venturers and the Minister for Mines, based on final feasibility studies, including environmental investigations.

Public submissions

Several submissions provided information about two environmentally sensitive areas along the corridors: wilderness areas along the Ashburton corridor, which was not identified by the proponent, and the Wanjarri Nature Reserve on the Mt Keith East corridor option. The areas along the Ashburton corridor are recorded on the Australian Heritage Commission's National Wilderness Inventory as having high wilderness quality.

Agencies consulted

The EPA received advice about the corridor selection process and environmental management of other pipelines throughout Australia from local and interstate sources (Table 3). In addition, several DEP officers have had previous experience with pipelines such as the Dampier to Perth gas pipeline, the Tubridgi gas pipeline, the Griffin gas pipeline and the Amadeus Basin to Darwin gas pipeline. Advice from these sources was used by the EPA in the evaluation of the corridor selection process and environmental issues.

Table 3. Agencies consulted

SECWA	T Rakai, Manager Pipeline Maintenance
CCNT	B Struck, Senior Environmental Engineer (formerly Pipeline Engineer, NT Dept. Mines)
NT Gas	D Puddick, Pipeline Maintenance Engineer

4.1.3 Evaluation

The following factors were taken into consideration when evaluating the corridor selection process and the environmental acceptability of the proposed corridors: scope of biophysical, cultural and land tenure information currently available; results of detailed surveys carried out by the GGTJV in compiling the PER; and information provided by the relevant land management agencies and individuals in submissions.

The EPA notes that, apart from the four areas indicated in the PER and submissions, there were no other conflicts with existing land holders or environmentally sensitive areas brought forward. Advice from the agencies consulted indicated that an effective, comprehensive corridor selection process was carried out which would allow a pipeline easement to be selected that should result in minimal environmental disturbance. The Wanjarri area is discussed in detail in section 4.2 and briefly below, along with the other three environmentally sensitive areas.

Deepdale area

The main environmental issue at Deepdale is the potential impact of the pipeline on the complex relationship between the drainage system, vegetation and animal communities, particularly

where the pipeline would cross the Robe River. The GGTJV has reported that, if the Fortescue corridor is chosen, it would be able to align the pipeline easement at a safe distance from existing infrastructure and avoid river pools, sensitive vegetation and animal habitats.

Ethel Gorge

The main environmental issue at Ethel Gorge is the potential impact of the pipeline on existing infrastructure (road, railway line, dam), because it is in a confined area, and ensuring the pipeline easement avoids Aboriginal heritage sites in the area. The GGTJV has reported that, if the Fortescue corridor is chosen, it would separate the pipeline easement from other infrastructure as much as possible and implement engineering measures, such as reinforced tunnels, to ensure the integrity of all infrastructure. The pipeline easement would avoid all Aboriginal heritage sites.

Wanjarri Nature Reserve

The main environmental issue at Wanjarri is its status as an A Class Nature Reserve, vested with the National Parks and Nature Conservation Authority (NPNCA). Wanjarri is the only nature reserve in the northern Goldfields (Figure 1). The proposal involves the direct disturbance and rehabilitation of 47ha of the 53,000ha of the Reserve. The GGTJV made additional submissions concerning Wanjarri Nature Reserve to supplement and clarify the information in the PER and to make additional environmental management commitments (Appendix 5). The GGTJV acknowledge that the conservation status of the Nature Reserve is high and, if this corridor is chosen, propose to take special care to minimise the environmental impacts and is committed to preserve the biodiversity of the disturbed area and enhance the conservation status of the Reserve.

Wilderness areas - Ashburton corridor

The Australian Heritage Commission (AHC) provided a map of the wilderness areas in the western Pilbara grading from high to low quality and advised that it would be better for the pipeline easement to avoid areas of high wilderness quality (M Brouwer, AHC, *pers. comm.*). The Wilderness Inventory was compiled using satellite imagery, and the gradation in wilderness quality is based primarily on distance to man-made features. Other factors, such as disturbance by humans, land tenure, grazing pressure and feral animal degradation are not taken into account.

The wilderness quality criterion used to compile the Inventory is different to the International Union for the Conservation of Nature's (IUCN) definition of wilderness - "large areas of unmodified or slightly modified land, and/or sea, retaining its natural character and influence without permanent or significant habitation, which is protected and managed so as to preserve its natural condition". The Environmental Protection Authority considers that constraints to the pipeline route because of wilderness quality should be based on the IUCN's definition because it takes a greater range of factors into account. No such areas have been identified along the pipeline corridors.

Conclusions

The Environmental Protection Authority concludes that the corridor selection process effectively identified corridors which would allow a pipeline easement to be chosen that avoids or minimises the potential impacts on both environmentally or culturally sensitive areas. Hence, all corridors, including both the main and the lateral corridors, as shown in the PER, are considered to be environmentally acceptable.

In the Pilbara, the EPA considers that both the Ashburton and the Fortescue corridors would be environmentally acceptable, noting that special management measures would be used in the Deepdale and Ethel Gorge areas, if the Fortescue corridor is chosen.

In the Goldfields, the EPA concludes that both the Mt Keith West corridor option in the Goldfields and the Mt Keith East option would be environmentally acceptable, subject to the recommendation in this report about the protection of Wanjarri Nature Reserve, if that corridor

is chosen, because the EPA considers that there should be a net environmental benefit from the proponent's environmental management commitments.

4.2 Protection of Wanjarri Nature Reserve

4.2.1 Objective

To ensure that, if this corridor is chosen, the management of the pipeline project preserves the biodiversity of the disturbed area and enhances the conservation values and integrity of Wanjarri Nature Reserve.

4.2.2 Evaluation framework

Technical information

CALM advised the EPA that Wanjarri Nature Reserve (A Class; No.30897) is notable as the only conservation reserve in the northern Goldfields, as well as having the richest vertebrate fauna for an arid zone nature reserve in Western Australia. CALM conclude that Wanjarri is an important conservation resource in the northern Goldfields for the following reasons:

- as a benchmark against which to compare the impacts of grazing (and mining activity) on the rangelands of the region;
- as an ecological model to measure resilience and vegetation succession when grazing is removed; and
- as an extremely valuable conservation reserve, which has rare animal (Mulgara) habitats and has an important role in education, research and nature tourism.

The NPNCA and CALM provided the following advice about the pipeline project:

- oppose in-principle the pipeline easement through an A Class Nature Reserve;
- conclude that the construction of the pipeline would impact on the nature conservation values and affect the management and integrity of the Reserve;
- note that it may set a precedent for possible further pipelines to traverse the Reserve;
- request that, if the route is approved and chosen, a detailed environmental management plan be prepared in consultation with CALM; and
- propose that, if the route is chosen, an integrated land management model for the Nature Reserve and adjacent pastoral lands be developed to enhance the conservation status and integrity of the Reserve.

The EPA notes that the GGTJV's reasons for preferring the Mt Keith East corridor option over the Mt Keith West option are:

- the geotechnical conditions would be easier for construction and rehabilitation;
- less potential conflicts with existing and proposed infrastructure, possible mineral deposits and Aboriginal archaeological and ethnographic concerns;
- the presence of significant environmental constraints along the Mt Keith West option (listed in Appendix D1 of the PER; including declared rare plants, geographically restricted plants, sensitive animal habitats and erodible land systems); and
- the main pipeline would be about 3km shorter and the lateral to Mt Keith minesite would be 7km shorter, which means cheaper construction costs.

In the PER, the GGTJV discussed the environmental issues raised by the proposed corridor through Wanjarri Nature Reserve. In additional submissions to the EPA (Appendix 5), the GGTJV acknowledged the high conservation status of Wanjarri Nature Reserve and accepted that a detailed methodology for selection of a pipeline easement within the corridor would be agreed with CALM. The GGTJV stated that "it would address avoidance of specific habitats,

crossing of water courses, vegetation clearing, the requirement for specialist consultants and management of the construction workforce, prior to final easement survey".

The GGTJV committed to minimising the overall impact by:

- choosing a pipeline easement through the Reserve which is acceptable to the NPNCA and the CALM;
- using special clearing and rehabilitation techniques, and environmental management procedures, as agreed with CALM; and
- achieving final rehabilitation objectives, as agreed with CALM, which reflect the purpose of the Reserve.

In acknowledging that there would be a temporary loss to the conservation estate, the GGTJV committed to preserve the biodiversity of the disturbed area and enhance the conservation status of the Reserve by:

- rehabilitating the pipeline easement;
- providing ecological replacement of land impacted by the pipeline (for example, rehabilitation of a similar area of degraded land within the Reserve or by facilitating an addition of land to the Reserve), in consultation with CALM;
- funding a Management Plan for the entire Reserve;
- working with CALM on aspects of the management of the Reserve (such as fencing and other park development and maintenance work), providing research support during construction, and the potential use of inspection facilities (aerial reconnaissance); and
- development of a plan of recommended conservation strategies, in consultation with CALM, to manage the surrounding pastoral land in a complementary manner (for example, stock and feral animal control, bushfire control and erosion control).

The EPA notes that the GGTJV, in consultation with CALM and the Department of Agriculture, has carried out a preliminary survey for a pipeline easement within the corridor through the Reserve which avoids the most sensitive areas. Detailed mapping of the land systems and ecosystems by the Department of Agriculture and CALM was carried out to assist in the selection of a pipeline easement, if the Mt Keith East corridor is chosen (H Pringle, Dept. of Agriculture, *pers. comm.*).

4.2.3 Evaluation

The EPA accepts that the environmental impacts during pipeline construction can normally be managed to be temporary and relatively insignificant, subject to satisfactory rehabilitation. This conclusion is based on the advice of the agencies consulted with experience on existing buried pipelines throughout Australia. In assessing the potential impacts on the conservation values of Wanjarri Nature Reserve, the EPA noted CALM's specific concerns shown below:

- (1) an increase in edge effects;
- (2) an increase in dust during construction;
- (3) possible interruption to surface sheetflow;
- (4) possible introduction of weeds ;
- (5) possible increased visitation;
- (6) disturbance to biological monitoring sites;
- (7) disturbance to animal habitats;
- (8) possible creation of numerous access tracks;
- (9) disturbance to plant and vegetation systems; and
- (10) setting a precedent which could allow further pipelines through the Reserve.

The EPA notes the GGTJV's commitments to a range of measures to minimise the environmental impact, including:

- selection of a route based on the Department of Agriculture's land management hazards mapping and in agreement with CALM;
- restricting the easement width to 20m;
- retention of significant trees and shrubs on the easement;
- reinstatement of drainage systems;
- rehabilitation to ensure rapid revegetation;
- access during construction restricted to the authorised work areas along the easement;
- no permanent access tracks (inspection would be done by aerial reconnaissance); and
- no pipeline infrastructure located in the Reserve (line-of-sight markers and two cathodic protection points would be the only above ground indication of the buried pipeline).

The EPA notes the GGTJV's commitments to measures to preserve the biodiversity of the disturbed areas and enhance the conservation status of the Reserve, including:

- rehabilitation of the pipeline easement;
- ecological replacement of land disturbed by the pipeline (for example, by rehabilitation of a similar area of degraded land or by facilitating a land addition to the Reserve);
- funding a Management Plan for the entire Reserve;
- surveying, clearing and fencing along 10km of the northern boundary;
- feral animal control on adjacent land;
- bushfire control on adjacent land;
- development of a plan relating to complementary clearing, management of access roads, control of erosion and control of watering points on adjacent land;
- support for scientific research during construction (funding of specific research programmes, providing accommodation and access to trench);
- maintenance of regional access roads;
- potential use of equipment (during construction and inspection activities) for aerial reconnaissance, park maintenance and development.

The EPA notes that the area of the pipeline easement (47ha) would be very small in comparison to the area of Wanjarri Nature Reserve (53,000ha) and, subject to satisfactory rehabilitation, the EPA considers that the overall environmental impact could be acceptably managed. The EPA notes the in-principle opposition to the pipeline traversing the Nature Reserve and also notes the specific concerns of CALM and the NPNCA about protecting the conservation values of the Reserve.

The EPA notes Commonwealth Department of the Environment, Sport and Territories' paper on Biodiversity and its value (DEST, 1993), on the importance of the conservation of biodiversity and the mining industry's paper on Managing to Conserve Biodiversity (AMIC, 1994). Those papers relate to a draft National Biodiversity Strategy which focuses on the issues and conservation benefits of integrated land management for new and existing reserves and their surrounding areas.

Conclusions

The Environmental Protection Authority concludes that a detailed report is required to address the final pipeline route, rehabilitation techniques, environmental management procedures and the proponent's commitments on ecological replacement, if the pipeline route through Wanjarri Nature Reserve is chosen. This report should be approved before the start of construction, and be to the requirements of the Environmental Protection Authority, on advice of the Department of Conservation and Land Management.

The Environmental Protection Authority concludes that, if the Mt Keith East option is chosen, the protection of Wanjarri Nature Reserve could be achieved, subject to satisfactory rehabilitation, on-going environmental management and the proponent's commitments, which should enhance the conservation status of the Reserve. The EPA believes that these measures should result in a net environmental benefit to the Reserve in terms of an integrated land management model as described in the National Biodiversity Strategy.

The timeframe for the satisfactory rehabilitation of the pipeline easement could be affected by the climate and, based on evidence from other pipelines, it could take ten years or more before satisfactory restoration is achieved and the visual evidence of the disturbance is insignificant. The EPA considers that the GGTJV should be responsible for the rehabilitation of the pipeline easement through Wanjarri Nature Reserve to the satisfaction of CALM to standards appropriate to the conservation objectives, or purpose, of an A Class nature reserve.

Recommendation 2

The Environmental Protection Authority concludes that a pipeline easement through Wanjarri Nature Reserve is environmentally acceptable and recommends that, prior to construction, the proponent provides a report which includes detailed information on the final location of the pipeline easement within the corridor, rehabilitation techniques, environmental management procedures and strategies to implement the proponent's environmental management commitments to preserve the biodiversity of the Reserve, to the requirements of the Environmental Protection Authority, on advice of the Department of Conservation and Land Management.

This recommendation is reflected in Recommended Environmental Condition 3 included in Section 6.

4.3 Environmental management, particularly during construction and commissioning

4.3.1 Objective

To ensure that the GGTJV's environmental management of the pipeline project, particularly during the construction and commissioning phases, is effective such that there are no unacceptable environmental impacts. The EPA notes that the major potential impacts from the gas pipeline proposal would occur during the construction and commissioning phases when most ground disturbance occurs. Environmental management is also required during the operation of the pipeline, though the EPA accepts that the potential environmental impacts are much less significant.

4.3.2 Evaluation framework

Technical information

The EPA notes that the integrity and safety of the pipeline would be administered by the Department of Minerals and Energy under the Petroleum Pipelines Act, 1969. The EPA also notes that the Goldfields Gas Pipeline Agreement Act, 1994, requires the GGTJV to provide detailed proposals on aspects of the pipeline project including: water supply; electricity supply; construction and permanent road access; temporary works in relation to the construction and testing of the pipeline; construction accommodation and ancillary facilities for the Joint Venturers workforce; other special work sites; arrangements for access to the pipeline by Third Parties; use of local labour, professional services, manufacturers, suppliers, contractors and materials; and an environmental management programme for rehabilitation and the protection and management of the environment.

The Agreement Act was developed in consultation with relevant government agencies and is administered by the Department of Resources Development. The EPA notes that the DEP were involved in consultations with DRD regarding the environmental provisions of the Agreement Act, notably Clauses 6, 9, 10, 14 and 34, and that this would provide the framework and a mechanism for the environmental management of the pipeline project.

The EPA notes that the Minister for the Environment's approval would specify that the proposal be implemented according to the description and commitments in the Public Environmental Review and supplementary documentation. The EPA considers that the detailed environmental management of the pipeline project would require input from relevant government environmental management agencies.

4.3.3 Evaluation

The main potential impacts from the proposal would occur during the construction and commissioning phases due to ground disturbance. The EPA notes that the GGTJV is committed to the preparation of a detailed EMP for the entire pipeline project, pursuant to the Agreement Act, and, also, notes that the integrity of the pipeline is largely dependent upon successful rehabilitation. The EPA considers that the EMP should be developed to its requirements so that the details of environmental management can effectively be incorporated into the framework and mechanism of the Agreement Act provisions.

In the PER, the GGTJV outlined the rehabilitation techniques and environmental management procedures which would be required during the construction and commissioning of the pipeline. Many activities and aspects of the construction and commissioning phases need on-site environmental management, including: surveying of the pipeline easement, location of access tracks, construction camps, stockpile areas, borrow pits, infrastructure, river crossings, water supply, public amenity and liaison, native fauna and stock management and disposal of hydrotest water.

Considering that the GGTJV hire contractors to do the construction and commissioning of the pipeline, the EPA considers that it is important that close control by the GGTJV on the contractors be implemented to ensure that the GGTJV's approved techniques, procedures and policies are implemented effectively. The EPA notes that the staff of the GGTJV have considerable expertise in the management of the construction and operation of other gas pipelines throughout Australia. The GGTJV reported in the PER that the on-ground environmental management of the operation would be directed by GGTJV environmental officers and that the techniques and procedures detailed in the EMP would be linked to the contractual obligations of the contractors.

Conclusions

The EPA concludes that the environmental management of the pipeline project, as described in the Public Environmental Review and supplementary documentation, could be effectively managed under an environmental management programme. The EPA notes the requirement for an Environmental Management Programme under the Agreement Act and considers that, subject to this Programme being to the requirements of the Environmental Protection Authority, the environmental management of the pipeline project should be adequate to minimise the environmental disturbance. A procedural statement has been included in the Recommended Environmental Conditions to ensure the effective and timely functioning of the role of the Environmental Protection Authority within the framework of the Agreement Act.

4.4 Rehabilitation techniques for environmentally sensitive areas

4.4.1 Objective

To ensure that environmentally sensitive areas and significant habitats, with regard to plants, vegetation systems, animal habitats and erodibility, have specific rehabilitation techniques implemented to minimise the environmental impacts from the pipeline project.

4.4.2 Evaluation framework

Technical information

In the PER, the GGTJV identified various significant habitats and environmentally sensitive areas along the pipeline corridors based on the following criteria:

- the relative frequency or size of representation of the habitat or vegetation type in the corridor and adjacent areas;
- species richness;
- the conservation status of species;
- the presence of resources critical to the survival of sensitive plants and animals;
- sensitivity to disturbances including erosion and fire;
- regenerative capacity after disturbance;
- erodibility of land systems;
- potential effects due to disturbance of drainage systems;
- cultural concerns; or
- a combination of the above.

The significant habitats and the proposed management techniques are tabulated in Table 4.

In addition to these significant habitats, the GGTJV identified three environmentally sensitive areas which had a combination of constraints: the Deepdale area, Ethel Gorge and Wanjarri Nature Reserve; these areas have been discussed previously.

In the PER, the GGTJV outlined the rehabilitation techniques and environmental management procedures which would be used in these areas and habitats, if these areas could not be avoided. The GGTJV reported that it would provide details of the appropriate techniques in an EMP following further investigations and consultation with government agencies and land holders. The overall objective of the rehabilitation of the pipeline easement and ancillary disturbances is to restore the area to a stable landform with vegetation which is compatible with surrounding ecosystems.

If the Fortescue corridor, containing the Deepdale and Ethel Gorge areas, is chosen, the EPA accepts that the easement could avoid the most sensitive areas or that special engineering techniques could be used to mitigate impacts and ensure safety, such as reinforced tunnels under roads and railways.

Agencies consulted

The EPA received advice from local and interstate sources about the rehabilitation of other pipelines throughout Australia. That advice indicated that satisfactory rehabilitation had generally been achieved to minimise the disturbance to ecosystems and ensure the integrity of the pipeline. However, it was noted that extreme climatic events had occurred at times resulting in erosion and exposure of some pipelines which had necessitated extensive maintenance.

Table 4. Significant habitats

Habitats	Management techniques
Watercourses and permanent pools	avoid or minimise disturbance; reinstate creek crossings to withstand extreme flood events
Ephemeral wetlands	avoid or minimise disturbance; restore drainage conditions
Yellow sand plains and heath vegetation	avoid or minimise disturbance; respread vegetation
Sand ridges or linear dunes	restore landform; erosion control measures
Breakaways	survey for sensitive flora and fauna; avoid sensitive areas
Rocky terrain	avoid or minimise disturbance; restore habitat
Self-mulching clays	avoid or minimise disturbance;
Salt lake margins	survey for sensitive flora and fauna; avoid sensitive areas
Dense <i>Acacia</i> sp. stands in depressions	avoid or minimise disturbance; respread vegetation
Snakewood (<i>Acacia xiphophylla</i>) communities	avoid or minimise disturbance; respread vegetation
Isolated <i>Eucalyptus</i> sp. stands	avoid or minimise disturbance; respread vegetation
<i>Eucalyptus</i> sp. woodlands on the Coolgardie Plateau	avoid or minimise disturbance; respread vegetation
<i>Eromophila appressa</i> ms. habitats	avoid disturbance; respread vegetation
<i>Grevillea inconspicua</i> habitats	avoid disturbance; seek Ministerial permission to take, if necessary; respread vegetation
Pebble-mound mouse habitats	avoid disturbance
Mulgara habitats	avoid disturbance

4.4.3 Evaluation

The GGTJV's proposed rehabilitation procedures have previously been used and found to be satisfactory on other pipelines, particularly in Western Australia and the Northern Territory. The EPA notes, however, that revegetation is affected by climatic conditions and that some linear easements in arid zones are still visible after 20 years (B Struck, CCNT, *pers. comm.*) and that parts of the Dampier to Perth gas pipeline are still visible after 6 years (T Rakai, SECWA, *pers. comm.*). The EPA accepts that the integrity of the pipeline and, hence, the rehabilitation of the easement, is very much in the proponent's interests.

The GGTJV identified three environmentally sensitive areas and the significant habitats tabulated above as potentially requiring special rehabilitation or management techniques, if the areas cannot be avoided. The EPA considers that the techniques that would be used, as briefly described in the PER, are appropriate for the regions to be traversed by the Pilbara to Goldfields gas pipeline. The EPA notes that the details of the rehabilitation techniques and environmental management procedures would be provided in an EMP, pursuant to the Agreement Act, and include detailed information about aspects such as: crowns over the trench, crown breaks, contour banks, river crossings, management of borrow pits, access tracks, construction camps, water supplies and other techniques/components of the pipeline project.

The EPA considers that the use of crowns should be carefully controlled to avoid drainage shadow effects, particularly on Mulga communities.

Conclusions

The EPA concludes that the implementation of appropriate rehabilitation techniques and environmental management procedures, as agreed between the GGTJV and relevant government agencies during the development of the Environmental Management Programme, should allow the satisfactory rehabilitation of the pipeline easement to appropriate objectives. The EPA considers that the rehabilitation objectives for Wanjarri Nature Reserve should be agreed with CALM. The EPA notes that the rehabilitation would be monitored and that, during the operations phase, maintenance would be implemented, as required, using appropriate techniques.

4.5 Impact on land holders

4.5.1 Objective

To ensure that the impact of the pipeline project on land holders, in both the short and long terms, are managed to an acceptably low level of environmental disturbance.

4.5.2 Evaluation framework

Technical information

The GGTJV has reported that major parts of the corridors are on pastoral leases, with the rest of the corridors being on Vacant Crown Land, designated Crown Land (stock routes, road reserves) or, for the Mt Keith East corridor option, on a nature reserve. In the PER, the GGTJV reported that it had consulted with the land holders and potentially interested parties within and near the pipeline corridors. The potential impacts on pastoral leases are related to: stock security, disturbance to pastoral activities, temporary obstruction of access and general disturbance from noise and dust.

Other land uses include nearby towns, mining tenements, existing infrastructure, stock routes and a conservation reserve. The GGTJV reported that all potentially affected land holders were contacted and arrangements made to restrict the disturbance to an acceptable level. The potential effects on Wanjarri Nature Reserve have been discussed previously.

4.5.3 Evaluation

The EPA notes that the major disruption to existing land holders occurs during the construction phase in the vicinity of the pipeline trench, which is normally open at any point for 2-4 weeks; hence, the effects on the pastoral activities of adjacent land holders are generally localised and temporary. As well as pastoral activities, in excess of 100 mining tenements are traversed by the pipeline corridors.

The EPA did not receive any submissions which raised concerns about potential impacts on existing land holders which had not been addressed in the PER and supplementary documentation. The EPA notes that the Shire of Leonora expressed concern about a potential increase in truck movements through the town. The GGTJV indicated that it would be considering both the options of rail and road transport for the supplies of pipeline materials to the pipeline project.

The EPA notes that the GGTJV would implement management techniques such as:

- strategically placed cross-overs for stock movements;
- breaks in the pipe string for access; and
- liaison with the land holder concerning the timing and location of both party's activities.

The EPA considers that the temporary, disruptive impacts during the construction phase could be managed to an acceptably low level of impact on pastoral activities.

In the long term, the restriction of land use over the pipeline easement relates to the prohibition of any activities which could damage the pipeline, such as trenching or post-hole digging, as well as the dedication of land to the pipeline support facilities (compressor stations, etc). The EPA notes that construction would be of limited duration and the area of the pipeline easement and ancillary facilities would be a negligible proportion of the pastoral leases (and other land). Existing activities such as grazing and access across the easement could continue with little disruption subject to effective communication between the proponent and other land users.

Conclusions

The Environmental Protection Authority concludes that the construction and operation of the Pilbara to Goldfields gas pipeline should be manageable with an acceptably low environmental impact on the affected land holders, in both the short and long terms. The EPA notes that future land holders would be made aware of the location of the pipeline easement and the safety considerations involved by relevant government land management agencies such as the Departments of Land Administration and Minerals and Energy.

5. Conclusions

Following review of the proponent's Public Environmental Review and supplementary documentation, the issues raised in the public submissions, advice received from both government departments and interstate agencies, relevant literature and the proponent's environmental management commitments, the Environmental Protection Authority concludes that:

- the route selection process effectively identified corridors which would allow a pipeline easement to be chosen that avoids or minimises the potential impacts on environmentally or culturally sensitive areas;
- If the route through Wanjarri Nature Reserve is chosen, the EPA concludes that the potential impact on the Reserve could be acceptably managed and that the proponent's environmental management commitments should result in a net environmental benefit to the Reserve in respect to the conservation of biodiversity;
- the environmental management of the pipeline project, as described in the Public Environmental Review, could be effectively implemented under the Minister for the Environment's conditions of approval, the Environmental Management Programme provision of the Goldfields Gas Pipeline Agreement Act, 1994, and the Petroleum Pipelines Act, 1969, subject to adequate consultation with the Environmental Protection Authority and relevant land management agencies;
- the implementation of appropriate rehabilitation techniques, as agreed between the GGTJV and relevant government agencies during the development of an Environmental Management Programme, should allow satisfactory rehabilitation of the pipeline easement and ancillary disturbed areas; and
- the construction and operation of the Pilbara to Goldfields gas pipeline should be manageable with an acceptably low environmental impact on the affected land holders along the pipeline route, in both the short and long terms.

The EPA notes that:

- the decommissioning of the pipeline would be to the requirements of the Australian Standard: Pipelines - Gas and Liquid Petroleum Code (AS 2885-1987) (administered by the Petroleum Division of the Department of Minerals and Energy);

- the nominated proponent is legally responsible for compliance with the environmental conditions; no transfer of proponent can occur without approval for the nomination of a replacement proponent (Recommended Environmental Condition 4); and
- an implementation and auditing system has been developed which requires the proponent to advise the EPA on how it would meet the requirements of the environmental conditions and commitments of the project (Recommended Environmental Condition 6).

6. Recommended environmental conditions

Based on its assessment of this proposal and recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate:

1 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 1-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

- 2-1 In implementing the proposal, the proponent shall fulfil the relevant commitments made in the Public Environmental Review and ancillary documentation and the schedule of environmental management commitments which would be audited, consolidated in EPA Bulletin 760 as Appendix 4, provided that the commitments are not inconsistent with the conditions or procedures in this statement. (A copy of the schedule of consolidated commitments is attached).

3 Wanjarri Nature Reserve

Wanjarri Nature Reserve is an important conservation reserve in the northern Goldfields.

- 3-1 If the pipeline route through Wanjarri Nature Reserve is chosen, the proponent shall manage the project to protect the conservation values and integrity of the Reserve.
- 3-2 If the pipeline route through Wanjarri Nature Reserve is chosen, prior to the construction of the pipeline easement through Wanjarri, the proponent shall prepare a report, in consultation with the Department of Conservation and Land Management, to achieve the objectives of condition 3-1.
This report shall provide detailed information on:
- the final location of the pipeline easement within the corridor;
 - rehabilitation techniques;
 - environmental management procedures; and
 - strategies to implement the proponent's commitments to preserve the biodiversity and protect the conservation values and integrity of the Reserve.
- 3-3 The proponent shall implement the measures in the report, required by condition 3-2, during all phases of the pipeline project, to the satisfaction of the Environmental Protection Authority, on advice of the Department of Conservation and Land Management.

4 Proponent

These conditions legally apply to the nominated proponent.

- 4-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

5 Time Limit on Approval

The environmental approval for the proposal is limited.

- 5-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

6 Compliance Auditing

To ensure that these environmental conditions and commitments are met, an audit system is required.

- 6-1 The proponent, in consultation with the Department of Environmental Protection, shall prepare an Audit Programme, which includes requirements for the preparation of periodic Compliance Reports.
- 6-2 The proponent shall subsequently implement the Audit Programme required by condition 6-1.

Procedures

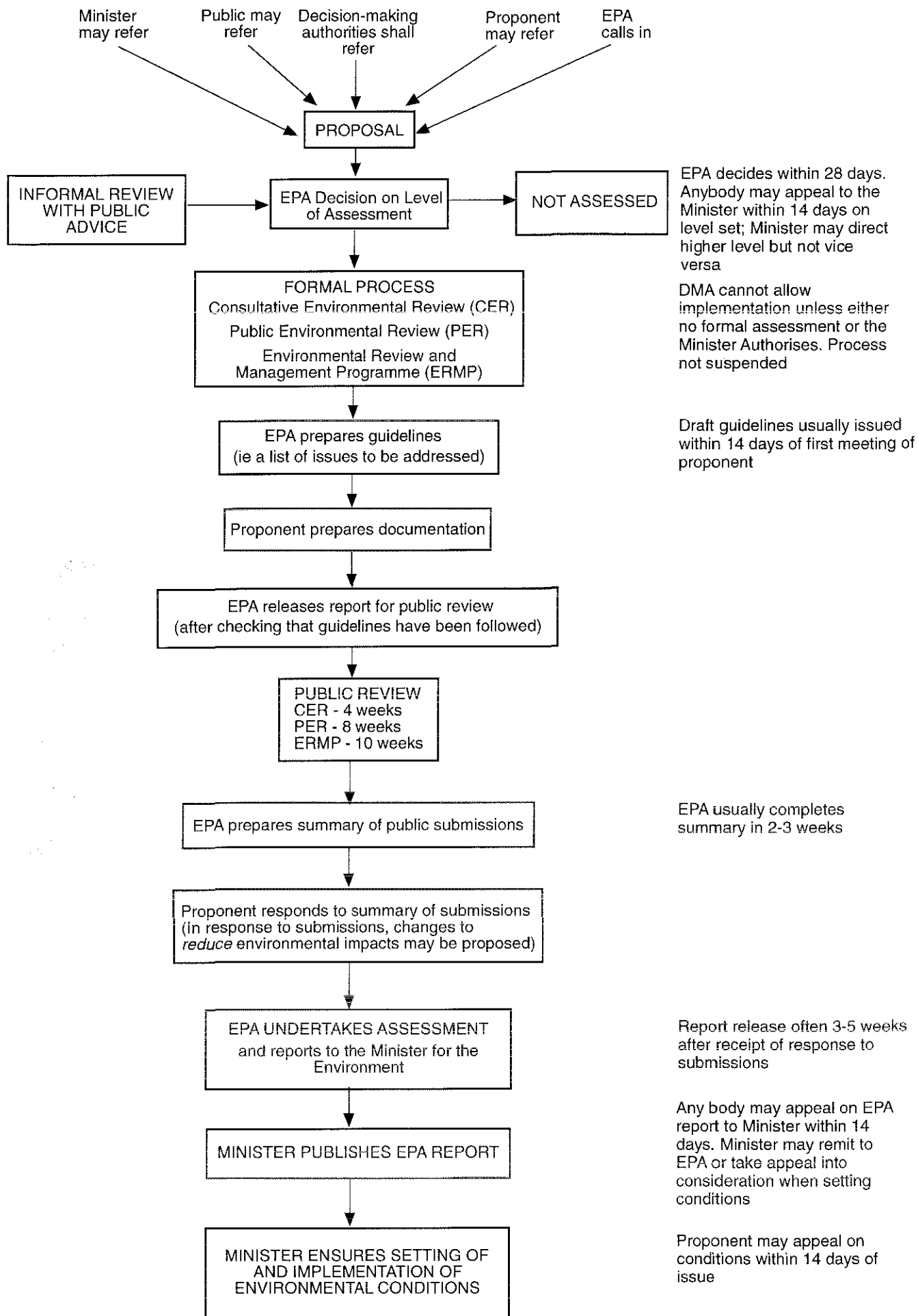
- 1) The Department of Environmental Protection is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.
- 2) If the Department of Environmental Protection, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.
- 3) For the purpose of ensuring that the details of environmental management for the entire pipeline project are acceptable, the proponent shall ensure that the Environmental Management Programme, required for the Goldfields Gas Pipeline Agreement Act, 1994, also conjointly meets the technical requirements of the Environmental Protection Authority.

7. References

- Public Environmental Review, 1994. Goldfields Gas Pipeline, July 1994. Goldfields Gas Transmission Joint Venture, Perth WA.
- Department of the Environment, Sport and Territories, 1993. Biodiversity and its value. Biodiversity Series, Paper No.1. DEST, Canberra.
- Australian Mining Industry Council, March 1994. Managing to Conserve Biodiversity. AMIC, Dickson, ACT.

Appendix 1

Environmental Impact Assessment Flow Chart



Appendix 2

Summary of submissions and Proponent's response

RESPONSES TO PUBLIC SUBMISSIONS

1.0 WANJARRI

ISSUE:

Concern has been expressed about the proposal to route the pipeline through the Wanjarri Nature Reserve.

RESPONSE:

1.1 Alternate Routes

Part of this concern appears due to the perception that a full assessment has not been undertaken of alternative routes. The Mt. Keith west option was in fact fully assessed and has considerable disadvantages, including significant economic, operational and environmental constraints. Reference to Department of Minerals and Energy Mining Tenement Plans shows a large number of mining tenements which directly reflect the mineralisation in this area. Impacts from existing mines, future proposals and infrastructure eg. water pipelines, power lines and roads in addition to the probability of locking up mineral resources is a significant issue on the western route. The eastern route has very little mineralisation and hence few of these associated impacts.

The Mt. Keith west option also has significant environmental issues which favour the alternate route. Amongst these are the recording of considerable individuals of the Cue Grevillea, *Grevillea inconspicua* which is a declared rare flora species. The western escarpment of the Barr Smith range contains complex break-aways which have considerable aesthetic values. Pipeline construction would require several transacts of this escarpment and while restoration can be undertaken, it is of some aesthetic impact.

The shorter eastern route together with the shorter lateral pipelines into Mt. Keith and Leinster will generally have less environmental affect than the longer western route and lateral pipelines. As the eastern route also traverses less areas of rock, restoration and revegetation will be more readily achieved.

A 26 kilometre section of cleared but abandoned water pipeline route can also be utilised on the eastern option, further minimising new environmental impacts.

Consultations between the proponent and Aboriginal groups in the area identified extensive areas which are of significance to Aboriginal people. This was suggested to include areas of the Barr Smith escarpment as mentioned above.

Route selection within Wanjarri

Following discussions with the Kalgoorlie Regional Office of the Department of Conservation and Land Management (CALM) the proponent has commissioned the Department of Agriculture, Western Australia, Rangeland Management Division to examine and plot specific land systems within the Wanjarri reserve. This exercise identified land systems with particular sensitivities and soil erosion potential. In addition topographical and drainage features were also highlighted.

Based on the above, a modified route through Wanjarri Nature Reserve has been adopted in consultation with the Department of Agriculture. Reference to the attached plan clearly shows sensitive land forms at the north and south ends of the Wanjarri Nature Reserve. These comprise the Gransal land systems which in turn comprise weathered granite, break-away country and fragile kaolinitic and a duplex soil. These are recognised as having high erosion potential and low potential for revegetation. The revised route has avoided both of these sites. In addition the revised route has reduced lengths of the pipeline route which traverse water course and drainage crossings. This will result in reduced potential for stream bank erosion.

The revised route is further east of the initial proposed route and as such places the pipeline further downstream in the drainage catchment area. This achieves a significantly less overall potential impact from any soil erosion issues.

The revised route also removes the pipeline location from the proximity of the Wanjarri Field Study Centre which may have perceived aesthetic impacts. The revised route also reduces contact with the Ballimore land system which comprises extensive sand dune and Hummock grasslands. This reduces potential for wind erosion on sand dunes.

The proponent's Site Environmental Officer will accompany the route surveyors during survey of the route through the Wanjarri Nature Reserve. In this manner, small deviations can be implemented which avoid sensitive areas, moderate to dense vegetation stands, any rare flora, potential habitats of the mulgara, specific drainage issues and other features which may be identified in the field. Input from the Department of Conservation and Land Management in Kalgoorlie has been requested on this final route survey.

1.2 Protection of Conservation Values

The proponent recognises that Wanjarri is the only conservation reserve in the north eastern goldfields and as such is the only arid zone nature reserve in the region. The proponent also recognises that, since the nature reserve has been destocked and feral animals controlled, flora aversity and regeneration is superior to adjacent stocked properties.

The limited impact and highly localised nature of pipeline construction results in minor impacts to broadacre landscapes. Reduced vegetation clearing to 20 metres and retention of significant trees and shrubs where possible will be undertaken as part of construction. This will be fully addressed in the Environmental Management Plan.

Measures undertaken as part of the restoration and rehabilitation phase of pipeline construction include extensive measures to achieve soil stability and preparation of a satisfactory seed bed for regrowth. Reinstatement of all drainage courses including minor drainage lines, erosion control banks, top soil respreading, relief of compacted areas are part of the site specific restoration procedures which will be employed.

The proponent has undertaken to assist in the funding of a Management Plan for the Reserve. Issues to be covered by the Management Plan have been determined by CALM and arrangements are in place to proceed with the Management Plan upon authorisation by CALM.

Specific advice from CALM and the Department of Agriculture, Rangelands Management Division will be included in the Environmental Management Plan and restoration specifications.

1.3 Associated Facilities and Management

Siting of facilities associated with the pipeline project have been and will be specifically avoided within the Wanjarri Nature Reserve. These include campsites, stock pile sites, communication towers, mainline valves, compressor stations, additional access tracks, borrow pits and extra work areas. The Field Study Centre will be placed off limits to construction personnel and the Field Study Centre access road will not be available by use for construction personnel unless specifically authorised by CALM. Visitation by construction personnel to other areas within the Wanjarri Nature Reserve will also be discouraged. Signposting at the northern and southern boundaries on the Wanjarri Nature Reserve on the pipeline route will advise of the nature reserve and management precautions.

The route of the pipeline will more specifically avoid flora, fauna and rangeland monitoring sites which currently exist.

There are no proposals for additional lateral pipelines to other mining ventures. The lateral pipeline to service Mt. Keith and Leinster are documented in the PER and do not affect Wanjarri. While the region is consequently adequately catered for, any future proposals for lateral pipelines would have to be fully assessed by the Department of Environmental Protection.

1.4 Protection of Reserve Integrity

The proponent understands that Wanjarri Nature Reserve is surrounded by pastoral leases owned by mining companies. The proponent also understands that some of these pastoral properties have active feral animal eradication programs.

While GGT does not have any influence on the management of these properties, it is facilitating discussion between its joint venture partners, other mining companies and CALM on the land use conservation and management concepts in the north east Goldfields particularly adjacent to Wanjarri. The implementation of appropriate management strategies on the adjoining Pastoral Leases has the potential to significantly enhance the conservation values of the Wanjarri Nature Reserve.

1.5 Wanjarri Wilderness Values

The proponent understands the value of isolation and the wilderness concept to the Wanjarri Nature Reserve and its importance to the Wanjarri experience. While construction of the pipeline will have very short term and localised impacts to visitation within the construction corridor, the project itself will not detract from the wilderness and isolation of Wanjarri Nature Reserve. Active construction will take place through the Reserve for approximately three to four months and prior to, and following this, there will be occasional visits from surveyors and restoration inspection personnel etc. Restrictions on alternate access other than the east pipeline route will ensure that visitation by construction personnel will be avoided.

2.0 WILDERNESS VALUES

ISSUE:

The Ashburton corridor passes through an area of high wilderness quality as shown on the National Wilderness Inventory map. Is it feasible to avoid the area? if not what impacts would the pipeline have and what special measures would be required to protect the wilderness values?

RESPONSE:

Wilderness values are affected by the proximity of man-made structures and the consequent introduction of other induced effects. The construction of a buried pipeline through the Ashburton corridor will have minimal effect on the wilderness value of the region. Detailed inspection of the Inventory map shows that the pipeline route in fact avoids the bulk of the areas shown as "Higher Wilderness" quality.

Following construction of the pipeline, the right of way will be rehabilitated according to the procedures agreed with CALM, APB, local shires and land owners. The pipeline will generally follow existing tracks through the corridor and additional structures associated with the pipeline will be minimal. Compressor stations (contained within a fenced area of 100m x 100m) will be initially located at the beginning of the line on the Dampier to Perth pipeline adjacent to the existing compressor station and at the take-off point to a lateral pipeline into Newman. Provision has been made for further compressor stations to be installed at approximately 170km intervals and for mainline valves (in a man-proof enclosure 20m x 20m) at approximately 80km intervals. These facilities are considered insignificant in terms of the area involved. No permanent tracks over the pipeline are planned along this section of the pipeline.

The Ashburton route is further from the Karijini National Park than the alternative northern route and as such will have less impact on the wilderness value of the Park and its surrounds. The pipeline route is located entirely within existing pastoral lease lands and consequently is already subject to grazing by sheep and cattle. The area is further subjected to feral animal grazing impacts from goats and horses. The combined impact of the pastoral activities and the feral animals will have a greater devaluation on the wilderness values than the impact of the pipeline after its installation and restoration.

GGT will select the final route, taking into consideration local effects. The overall impact on wilderness values along the total length of pipeline will be insignificant.

3.0 REVEGETATION SUCCESS

ISSUE:

What measures would be necessary and practical to manage the adverse impact of feral and stock animals on the revegetation of the easement and associated disturbed areas, such as borrow pits?

RESPONSE:

The impacts of grazing from feral animals including stock animals on revegetation of the easement and associated disturbed areas such as borrow pits can retard successful regeneration and soil stability. The only means of controlling feral and stock animals on these areas comprises either fencing or surface treatment. Since feral animals including stock are present along the whole pipeline route, fencing would require that both sides of the easement be fenced for the entire 1,400 kilometres. Notwithstanding the practicalities and expense involved this would not be acceptable to pastoralists and other land holders including mineral tenement holders and would be counter productive in terms of environmental impact.

A further method to discourage use of disturbed areas by animals is to provide extremely rough surface treatments to discourage access by animals. While this has been reported to be successful in some circumstances, it provides a totally unsatisfactory surface for regeneration including soil erosion and seed bed preparation.

The most successful manner of managing the adverse impact of feral and stock animals grazing on the right of way revegetation is to ensure that the right of way regrowth is compatible with the surrounding areas. Encouraging abnormal regrowth on the right of way by watering or other techniques may, in fact, be counter productive as it could encourage selective grazing. The most successful restoration program ensures that the right of way is restored and maintained in a stable condition so that upon rainfall, the right of way will revegetate in a manner compatible with the adjacent area. In certain fragile land systems, regrowth specific revegetation techniques may be necessary to ensure stability and prevent erosion. In the above circumstances, it may be necessary to provide temporary fencing around specific sites to prevent animal grazing.

4.0 ENVIRONMENTAL MANAGEMENT PROGRAM

ISSUE:

The detailed management programs in the EMP need to be developed in consultation with the relevant conservation and land management agencies. What is the mechanism for this to be facilitated?

RESPONSE:

All relevant conservation and land management agencies were consulted during the preparation of the Public Environmental Review. Their views were incorporated in the management strategies identified in the PER. Consultation has continued from that time and their further comments incorporated in the draft EMP. The draft EMP will be prepared in consultation with CALM and DRD and their requirements incorporated in the final document.

The EMP will be prepared in accordance with the requirements of the Goldfields Gas Pipeline Agreement Act, 1994.

5.0 WEEDS

ISSUE:

Concern has been expressed about the possible spread of weeds, both "declared" and "undeclared", which would require the implementation of specific management measures, particularly during the construction phase; what specific measures are required and how would they be implemented?

RESPONSE:

The PER has concentrated on "declared" weeds which are listed under the Agriculture and Related Resources Act. These weeds are considered to pose a threat to agriculture and in particular pastoral activities in the pipeline project area.

The principal weed species of concern to the APB include the Safion thistle, Parkinsania and Mesquite. In addition, CALM has expressed concern about Rubidock, Capel Bush and Buffell Grass. Other noxious weed species may be present but are not considered to be of particular significance and are listed in the PER.

In addition, the incidence of "environmental" weeds has been raised as an issue which may effect conservation and native flora although they are not a threat to agriculture. Such an example is buffell grass which is a valuable pasture species but is known to exclude native grasses. It may also effect fire characteristics.

Ward's weeds (*Carrichtera annua*) is noted to dominate extensive areas of disturbed sites in the Kalgoorlie region and to compete with annuals.

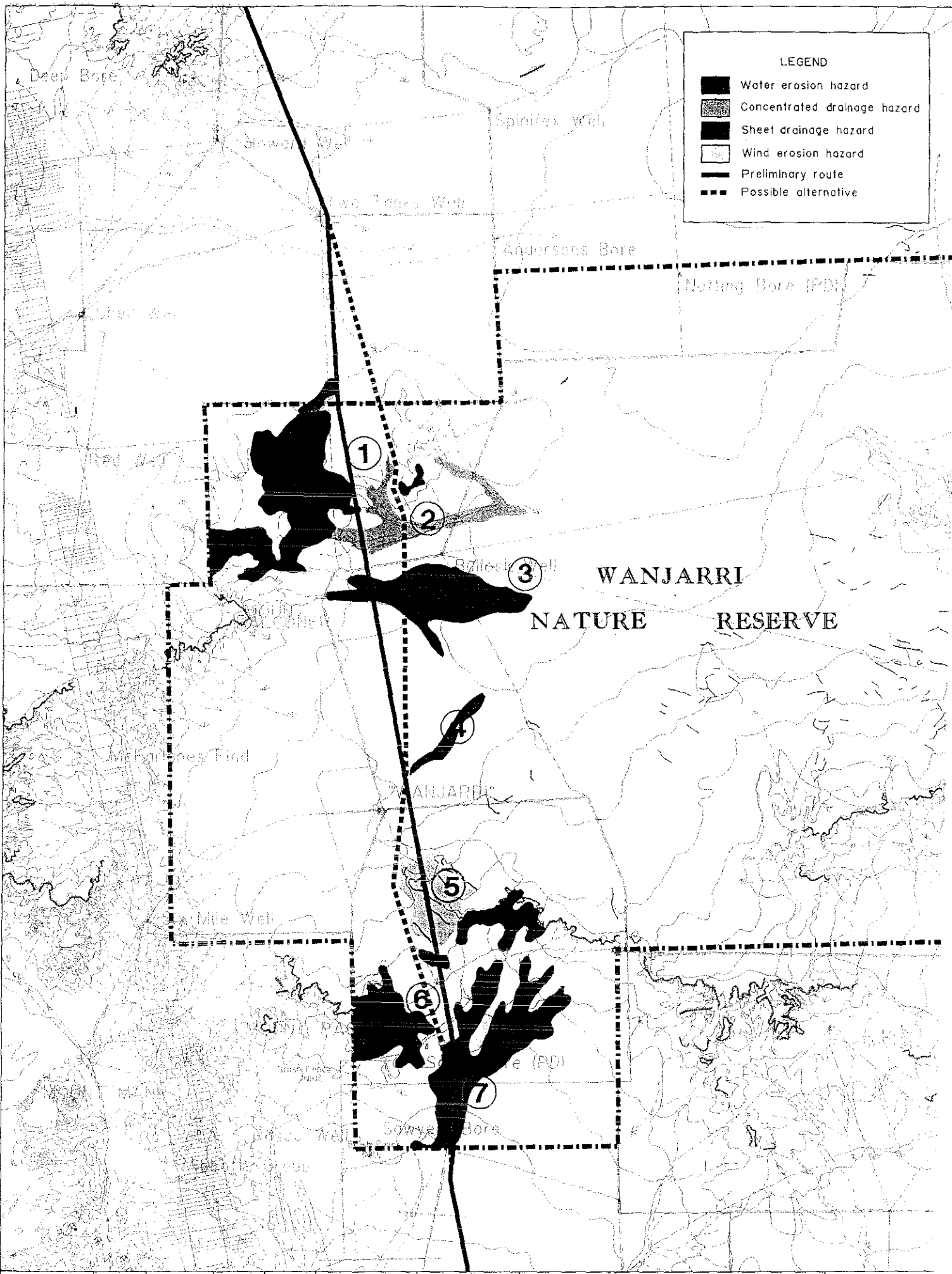
The pipeline project will adopt management strategies to prevent the introduction and control and spread of weeds. These will include:

- identification and avoidance where practicable, of areas known to be infested with noxious weeds;
- vehicle hygiene measures during the construction phase in those areas known to be affected by noxious weeds. These measures may include washing down machinery before it enters clean areas;
- preventing the transport of any top soil along the pipeline route. The intention is that top soil will be replaced in the same areas from which it was stripped. In this manner, spread off seed material in top soil will not occur;
- disturbed areas infested with noxious weeds will be inspected following rehabilitation to monitor the presence of weed species. Noxious weeds will be treated.

While the proponent recognises the potential of other species, specifically buffell grass as an environmental weed, the grass is particularly valuable as a pasture species and in stabilising particular land surfaces eg. creek and stream banks. While rehabilitation procedures following construction will not include reseedling with buffell, there is no intention to control the wide spread occurrence of buffell grass throughout the pastoral area.

The comments from WANPARA on control of Wards weed are noted. While construction is likely to be from north to south and thereby minimise the spread of this species, there is no intention to use material which could contain a seed bank of the weed eg. mining mullock. Furthermore no affected soil material would be transported along the easement pipeline route to non-infested zones.

If after restoration and revegetation certain areas are considered to be significantly infested with problem weed species, the proponent would undertake spraying or other eradication measures in consultation with the appropriate authorities.



LEGEND

- Water erosion hazard
- Concentrated drainage hazard
- Sheet drainage hazard
- Wind erosion hazard
- Preliminary route
- Possible alternative

**WANJARRI
NATURE RESERVE**

SCALE 1:100 000			PROPOSED GGT GAS PIPELINE LAND MANAGEMENT HAZARDS WANJARRI NATURE RESERVE FIGURE 1	NUMBER
DRAWN	DUNNART (WA) PTY LTD			GGT200-0-0124
DATE	10 SEPT 1994			
DESIGNED	HUGH PRINGLE			
APPROVED	R J HILLS			
GOLDFIELD GAS TRANSMISSION PTY LTD		ACN 004 875 24	REV:	

Appendix 3

List of submitters

Department of Resources Development
National Parks and Nature Conservation Authority
Department of Conservation and Land Management
Main Roads Western Australia
Water Authority of Western Australia
Office of Traditional Land Use
State Electricity Commission of Western Australia
Department of Minerals and Energy
Department of Land Administration
Aboriginal Affairs Planning Authority
Department of Aboriginal Sites
Australian Heritage Commission
Western Australian Naturalists' Club Inc.
Royal Australasian Ornithologists Union
WA National Parks and Reserves Association Inc.
Shire of Leonora
Ms H Blythe, Kalgoorlie resident

Appendix 4

Proponent's environmental management commitments

The following commitments are made to ensure that the pipeline proposal proceeds in an environmentally acceptable manner.

Main Pipeline

Westminco Oil Pty Ltd, Normandy Pipelines Pty Ltd and BHP Minerals Pty Ltd

• Commitment 1

The Proponent will prepare and submit an Environmental Management Programme pursuant to the Goldfields Gas Pipeline Agreement Act, 1994, which will include issues specified by the Minister for the Environment's Conditions, within six months of approval of the pipeline route.

• Commitment 2

The Proponent will assist in funding a management plan for Wanjarri Nature Reserve, in consultation with the NPNCA and CALM, if the final route alignment passes through Wanjarri.

• Commitment 3

The Proponent will fulfil all management strategies and commitments described in the PER in accordance with applicable State legislation to standards and procedures as agreed with the State.

• Commitment 4

In addition to rehabilitating the pipeline easement, the Proponent will provide the ecological replacement of land of a similar area to that impacted by the pipeline easement within Wanjarri Nature Reserve (for example, by rehabilitation of an equivalent area of degraded land within the Reserve or by facilitating an addition of land to the Reserve), in consultation with and in a manner satisfactory to the Department of Conservation and Land Management.

• Commitment 5

The Proponent will develop a plan of recommended conservation strategies, in consultation with the Department of Conservation and Land Management, which are intended to enhance the conservation status of Wanjarri Nature Reserve, within one year of the commissioning of the pipeline.

Lateral Pipelines

BHP Minerals Pty Ltd makes the following commitment for the Newman lateral pipeline:

•Commitment 1

The design, construction, environmental management, rehabilitation and operational standards and procedures to be applied to the Newman lateral will be the same as for the main pipeline.

Western Mining Corporation Ltd makes the following commitment for the Leinster, Mt Keith, Kalgoorlie Nickel Smelter and Kambalda lateral pipelines:

•Commitment 1

The design, construction, environmental management, rehabilitation and operational standards and procedures to be applied to the Newman lateral will be the same as for the main pipeline.

Normandy Pipelines Pty Ltd makes the following commitment for the Kalgoorlie lateral pipeline:

•Commitment 1

The design, construction, environmental management, rehabilitation and operational standards and procedures to be applied to the Newman lateral will be the same as for the main pipeline.

Appendix 5

Proponent's additional submissions and commitments on Wanjarri Nature Reserve

GGT



G O L D F I E L D S
G A S
T R A N S M I S S I O N

GOLDFIELDS GAS TRANSMISSION PTY LTD

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WEST PERTH WA 6005
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WEST PERTH 6872

Telephone: +61 9 482 2461
Facsimile: +61 9 481 5305

DCH:RNS:L-761

10 August 1994

The Chief Executive Officer
Department of Environmental Protection
141 St. Georges Terrace
PERTH WA 6000

Attn: Mr Jim Treloar

Dear Sir,

**RE: GOLDFIELDS GAS PIPELINE
PUBLIC ENVIRONMENTAL REVIEW**

Following liaison with the Department of Conservation and Land Management officers in Perth and Kalgoorlie during the public review period on the above, we provide the following additional information on the proposal and the PER for your information.

The PER document considered Wanjarri Nature Reserve in the assessment process with respect to the entire pipeline route from the Pilbara to Kalgoorlie. Some conclusions reached in the PER were based on comparison with the conservation estate elsewhere and on selected extracts from publications. We have undertaken further assessment of Wanjarri on a regional basis with the assistance of additional information from CALM.

GGT acknowledges that Wanjarri is the only conservation reserve in the North-eastern Goldfields. When compared with adjacent properties and other pastoral leases in the Goldfields and Murchison, Wanjarri has been assessed as 75% "good" condition whilst only 2% is in "poor" condition. Wanjarri was found to have considerably better general condition of vegetation and soils than average. Since Wanjarri has been destocked, there has been an improvement in pasture conditions on the reserve. Furthermore, with dewatering, the resulting reduced grazing pressure has further assisted rangeland recovery. In comparison, most of the other areas in the Goldfields have an ongoing

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problem with stocking, feral animals and degrading rangeland condition. We note that this allows the establishment of biological survey and rangeland survey sites in Wanjarri to provide rangeland benchmarks throughout the region and as an ecological model and a valuable conservation reserve.

It has been noted that the Mulgara has been recently recorded from Wanjarri; the only conservation reserve in the North-eastern Goldfields to record this mammal. Hence, Wanjarri offers the opportunity to ensure the regional survival of this species since it is the only conservation reserve in the North-eastern Goldfields with Mulgara habitat.

We are advised that records from the field station demonstrate that Wanjarri is an important reserve for eco-tourism, bird watchers and for environmental education. GGT recognises this and believes that this is an important role and will encourage management of the reserve for this purpose during the project.

We acknowledge that it may have been preferable to use the term "vegetation condition" or "resource condition" instead of "conservation status" and to specifically state that this comment was made in reference to the pipeline investigation corridor only. The proponents appreciate CALM's concern that the PER comment, without these clarifications, may appear to understate the conservation value of the Wanjarri Nature Reserve.

The PER acknowledges the importance of the permanent biological survey sites and field study centre in Wanjarri. The pipeline route will be selected to specifically avoid these features. Furthermore, ground reconnaissance with CALM staff (or specialist consultants as necessary) will be undertaken to locate the final route of the pipeline in areas within the investigation corridor to keep to an absolute minimum the impacts following restoration. Preliminary route selection by GGT has already been aimed at avoiding areas of moderate or heavy vegetation, rock outcrops and geographical features such as drainage lines. A detailed methodology for selection of a final route will be agreed with CALM's Kalgoorlie Region. It would address avoidance of specific habitats, crossing of water courses, vegetation clearing, the requirement for specialist consultants and management of construction workforce. This process will be undertaken prior to final route survey.

During construction, access would be provided only along the right-of-way. Any additional temporary or permanent access through the reserve would be agreed with CALM. Following construction and during the operational phase, access along the right-of-way will be discouraged by vehicle barrier mounds, restored drainage channels and, where necessary, barrier fencing. There will be no requirement for a permanent access track along the pipeline right-of-way.

The pipeline will not require any above ground facilities in the Wanjarri Nature Reserve. This includes valves, compressor stations, communication facilities and scraper stations. As advised in the PER, the laterals for Mt. Keith and Leinster are not planned to pass through Wanjarri Nature Reserve.

GGT recognises the ongoing management resources and efforts of the CALM Kalgoorlie Region toward the Wanjarri Nature Reserve and the benefits as outlined above. The Environmental Management Plan currently under preparation will address management of construction and restoration of the pipeline with specific guidelines for Wanjarri. A draft of this EMP will be forwarded to CALM for comment. It is expected that the EMP would integrate with a future Wanjarri Management Plan. Furthermore, GGT is committed to assistance in the preparation, and fair and reasonable funding, of this Management Plan for CALM.

GGT confirms that impacts as a result of pipeline construction are minor. Restoration will be undertaken to further reduce these impacts and avoid soil degradation and provide suitable habitat and vegetation rehabilitation. Due to the sensitive nature and conservation value of Wanjarri, additional and specific rehabilitation measures will be required in consultation with CALM.

In the interim, a detailed methodology of pipeline surveys is being prepared with specific reference to CALM's requirements for survey through Wanjarri.

A number of general issues have also been raised by CALM on the PER and we have undertaken further assessment of these.

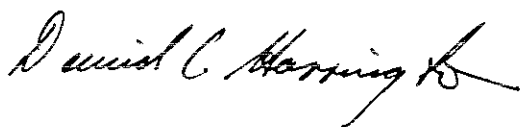
The proponent will assist CALM in assessing, and undertaking salvage of, sandalwood resources along the pipeline route.

Specific comments on habitats, species records and regional presence have been addressed with CALM. Other issues including details in restoration of drainage lines, weed and fire management have been researched elsewhere and will be addressed in the Environmental Management Plan.

In conclusion, following further assessment and data from CALM and our consultants, GGT acknowledge the high value of Wanjarri Nature Reserve in the North-eastern Goldfields for conservation, eco-tourism, rangeland management and environmental education. GGT will endeavour to ensure that these values are maintained and enhanced wherever possible.

Should you require any clarification on the above do not hesitate to contact the undersigned.

Yours faithfully,



David C Harrington
Lands & Environment Officer

cc. Department of Conservation and Land Management; Attn: Mr Norm Caporn



GOLDFIELDS GAS PIPELINE

WANJARRI NATURE RESERVE

ENVIRONMENTAL MANAGEMENT PROPOSALS

Goldfields Gas Transmission Pty Ltd
Ground Floor
28-42 Ventnor Avenue
West Perth WA 6005
12 October 1994

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1. Environmental benefits of the pipeline project
2. Regional Route Location Mt. Keith and Leinster area
3. Optimum route through the Mt. Keith and Leinster area
4. Management of impacts in Wanjarri Nature Reserve
5. Environmental Management

1. Environmental Benefits of the Pipeline Project

In addition to the obvious economic benefits resulting from the pipeline, the project will also assist in reducing environmental impacts as follows:

- Impacts associated with current power generation and usage.
- Replacement of diesel based power generation - reduction of greenhouse gas emissions. (Conforms with the overall government strategy with respect to greenhouse gas abatement.)
- Reduce the risk of pollution from fuel leaks and spillage.
- Reduce the need for large road trains on country roads with the attendant emissions, dust, noise, safety and traffic impacts.

2. Regional Route Location

Given a need to supply gas to the Mt. Keith and Leinster mining region, it is essential that the main pipeline be located within the area. The preferred route runs south from Kumarina to the east of Plutonic and Mt. Green and then passes near the load centres in Wiluna, Mt. Keith and Leinster. The corridor continues southwards before following a south-easterly direction from Sturt Meadows near Leonora adjacent to Lake Raeside system. The corridor heads south from a point approximately 13 kilometres north-west of Leonora and then follows a south-easterly direction to Kalgoorlie.

Between Wiluna and Leinster, the presence of Lake Way, the topography, geology, mining activity and sacred sites dictate an East or West deviation.

3. Optimum Route - Goldfield Region

Given the need to locate the pipeline within the region, there are only two viable route options ie.

- Mt. Keith - west option

Proceeding west of Wiluna the Mt. Keith west option basically parallels the Leonora to Peak Hills stock route, crossing the Barr Smith range north-west of Mt. Keith and then traversing the Lake Miranda system before turning south-west to rejoin the main Goldfields corridor south of Leinster.

- Mt. Keith - east option

Commencing just south of the Canning stock route to the north-east of Wiluna, the Mt. Keith east option passes to the east of Mt. Keith and traverses the Wanjarri Nature Reserve. From here the route runs in a south-easterly direction passing approximately seven kilometres east of Leinster to rejoin the main Goldfields corridor.

The Mt. Keith east option is preferred over the Mt. Keith west option for the following reasons.

- The eastern corridor is approximately three kilometres shorter.
- The pipeline trenching will be easier due to less rock.
- Pipeline construction will be easier due to flatter terrain conditions and avoidance of break-away country.
- The eastern corridor avoids significant greenstone belts between Wiluna and Leinster and will have less impact on current and future mineral developments. This will consequently reduce potential for third party interference with the pipeline and avoid mineral sterilization and/or relocation.
- The eastern route will require shorter lateral pipelines (10km shorter) to the load centres of Mt. Keith and Leinster.

In addition to the foregoing economic benefits there are also significant environmental issues which favour the eastern route. Among these are:

- The recording of considerable individuals of the Cue Grevillea, *Grevillea inconspicua* west of the escarpment of the Barr Smith range.
- Utilisation of the 26 kilometre section of cleared and abandoned water pipeline right-of-way on the eastern route.
- Avoidance of significant archaeological and ethnographic sites along the western route (including Lake Miranda).
- Avoidance of break-away country (Barr Smith range etc.).
- Shorter main and lateral pipelines generally has less environmental effect.
- Lower environmental impact and quicker rehabilitation because of easier construction conditions.

4. Impacts in the Wanjarri Nature Reserve

In basic terms there are no impacts from the construction or operation of the pipeline through the Wanjarri reserve which cannot be managed satisfactorily. The limited impact and highly localised nature of pipeline construction results in minor impacts to broad acre landscapes.

Reduced vegetation clearing (to generally 20 metres) and the retention of significant trees and shrubs where possible will be undertaken as part of construction management.

Restoration and rehabilitation will include extensive measures to achieve the required soil stability and the preparation of a satisfactory seedbed for regrowth.

Reinstatement of all drainage courses including minor drainage lines, erosion control banks, top soil resspreading, relief of compacted areas will all be part of the site specific restoration procedures which will ensure appropriate rehabilitation.

No significant above-ground facilities will be located within the nature reserve and access will be restricted to authorised work areas. No permanent access will be required along the pipeline route with routine inspection being carried out by aerial reconnaissance.

The adoption of the modified Department of Agriculture (Hugh Pringle) route (and any minor adjustments required by CALM) will ensure that the pipeline will traverse land systems which can be readily restored in accordance with the project management rehabilitation strategies.

In short there are no environmental imperatives which would justify the adoption of the less favourable western route option.

5. Environmental Management

While, as previously stated, the adverse impacts of the pipeline traversing the reserve are minimal, the following environmental management is proposed for Wanjarri.

- GGT will fund the preparation of a Management Plan for the Wanjarri Nature Reserve.

This management plan will not only address short term management strategies but will also address both site specific and regional conservation strategies which will have long term benefit to the conservation values of the reserve.

- Western Mining Corporation has committed to provide 10 kilometres of clearing, survey and fencing along the northern boundary of the reserve.
- The Proponent will develop a plan of recommended conservation strategies, in consultation with the Department of Conservation and Land Management, which are intended to enhance the conservation status of Wanjarri nature Reserve, within one year of the commissioning of the pipeline.
- Support for scientific research during construction (funding of research programs - accommodation in construction camps and access to open pipeline trench etc. for pit trapping).
- Assistance with management and maintenance of access roads.
- Potential use of pipeline resources ie. aerial reconnaissance, maintenance equipment etc.

In view of the fact that 0.09% (47 ha of pipeline easement in 53,000 ha) of the reserve will be affected by the pipeline construction and the construction management strategies that will be employed to ensure appropriate rehabilitation, the nett environmental benefits resulting from the construction of the pipeline and the specific benefits to Wanjarri far outweigh any adverse environmental effects.

By contrast the more difficult construction conditions on the Western route and the greater length of both the main and lateral pipelines will have a greater environmental impact with no discernible benefit.



GOLDFIELDS GAS TRANSMISSION PTY LTD

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BTW:RNS:RL-2314
C/F: 5.10.2.3

26 October 1994

Chairman
Environmental Protection Authority
Westralia Square
141 St. Georges Terrace
Perth WA 6000

Dear Sir,

RE: GOLDFIELDS GAS PIPELINE

We refer to previous correspondence and discussion with the Authority and the Department of Environmental Protection regarding the natural gas pipeline and in particular to the pipeline traversing the Wanjarri Nature Reserve. Following further discussions with the Authority and CALM we wish to confirm that the proponent is prepared to make the following commitments to ensure that the pipeline proposal proceeds in an environmentally acceptable manner.

Commitment 1

The Proponent will prepare and submit an Environmental Management Programme pursuant to the Goldfields Gas Pipeline Agreement Act 1994, which will include issues specified by the Minister for the Environment's Conditions, within six months of approval of the pipeline route.

Commitment 2

The Proponent will assist in funding a management plan for Wanjarri Nature Reserve, in consultation with the NPNCA and CALM, if the final route alignment passes through Wanjarri.

Commitment 3

The Proponent will fulfil all management strategies and commitments described in the PER in accordance with applicable State legislation to standards and procedures as agreed with the State.

Commitment 4

In addition to rehabilitating the pipeline easement, the Proponent will provide the ecological replacement of land of a similar area to that impacted by the pipeline easement within Wanjarri Nature Reserve (for example, by rehabilitation of an equivalent area of degraded land within the Reserve or by facilitating an addition of land to the Reserve), in consultation with and in a manner satisfactory to the Department of Conservation and Land Management.

Commitment 5

The Proponent will develop a plan of recommended conservation strategies, in consultation with the Department of Conservation and Land Management, which are intended to enhance the conservation status of Wanjarri nature Reserve, within one year of the commissioning of the pipeline.

Yours faithfully,



Bruce Winterford
Project Lands Manager