Temporary Relocation of Total Waste Management's Evaporation Ponds to the Mungari Industrial Estate

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LandCorp

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
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Contents

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by LandCorp to relocate Total Waste Management's liquid waste evaporation ponds to the Mungari Industrial Estate in the Shire of Coolgardie.

Total Waste Management currently treats liquid waste at their facility to the north-west of the City of Kalgoorlie-Boulder. A number of complaints have been received from the local community over the past year regarding excessive odours from Total Waste Management's evaporation ponds. In response to this, LandCorp was approached to find an alternative site for the management of the liquid waste.

The recommended site is in the north-eastern corner of the Mungari Industrial Estate, located approximately 22km from Kalgoorlie along the Great Eastern Highway. The proposal involves the construction of six evaporation ponds (120m × 30m), with a combined capacity of 15 megalitres (ML).

Based on the information provided in the referral document the EPA considered that, while the proposal has the potential to affect the environment, it could be readily managed to meet the EPA's environmental objectives. Consequently, it was notified in the *West Australian* newspaper on 11/04/2005 that the EPA intended to assess the proposal at the level of Assessment on Referral Information (ARI).

The proponent has submitted a referral document setting out the details of the proposal, potential environmental impacts and appropriate commitments to manage those impacts. The EPA considers that the proposal as described can be managed in an acceptable manner, subject to these commitments and the EPA's recommended conditions being made legally binding.

The EPA has therefore determined under Section 40(1) of the Environmental Protection Act that the level of assessment for the proposal is Assessment on Referral Information, and this report provides the EPA advice and recommendations in accordance with Section 44(1).

Appendix 2 contains a draft works approval and licence for the proposal (prepared under Part V of the *Environmental Protection Act 1986*). These are included as a matter of information only and do not form part of the EPA's report and recommendations. Matters covered in the works approval and licence, and which have been taken into account by the EPA, appear in the body of this report.

2. The proposal

The proposal being assessed in this report is the construction and operation (on a temporary basis) of six evaporation ponds (120m × 30m) in the north eastern corner of the Mungari Industrial Estate in the Shire of Coolgardie (Figure 1).

The effluent to be evaporated at the Mungari site will be sourced from Total Waste Management's liquid waste treatment facility in Boulder. The effluent has a chemical oxygen demand (COD) in the range 20,000- 25,000 mg/L and a total dissolved solids (TDS) content ranging from 20,000 to 40,000 mg/L (GHD, 2005). The waste stream will comprise treated levels of wastes such as grease trap, oil wastes, paints and resins, organics, and acids remaining in the effluent following treatment (Table 2).

Total Waste Management estimate that the amount of effluent requiring evaporation will be approximately 10ML/year. Each pond has been designed with a capacity of 2.5ML, giving a combined maximum capacity of 15ML. Five ponds will be used during the operation, with the sixth affording additional capacity if required. The ponds are to be lined with a high-density polyethylene (HDPE) liner underlain by compacted clay. The proposed site plan is shown in Figure 2 below

Design specifications and construction of the ponds will be to the requirements set out in the works approval and licence managed under Part V of the *Environmental Protection Act 1986*.

The main characteristics of the proposal are summarised in Table 1 below.

Table 1: Summary of key proposal characteristics

Project Component	Description
Proponent	LandCorp
Location	North Eastern corner of Mungari Industrial Estate, approximately 22 km from the City of Kalgoorlie and 11km from Coolgardie along the Great Eastern Highway
Proposed Action	Construct and operate series of six evaporation ponds to evaporate treated effluent
Pond Capacity	6 × 2.5ML (combined capacity 15ML)
Expected volume of effluent	10ML/year
Pond Freeboard	300mm
Individual Pond Area	120m×30m
Excavation Depth	1000mm
Project lifetime	3 years
Pond Liner Type	Compacted clay underlying a HDPE liner
Effluent receival structure	Concrete discharge area connected to pond via above ground piping
Connection between ponds	Connected by pipe work at the freeboard level to minimize potential overflow
Expected cleared area	Approx 5 ha
Transport of effluent	Effluent transported by truck from TWM liquid waste treatment facility to Mungari site. Transport is subject to the *Environmental Protection (Controlled Waste) Regulations 2004.*

The potential impacts of the proposal are discussed by the proponent in the referral document (GHD, 2005).

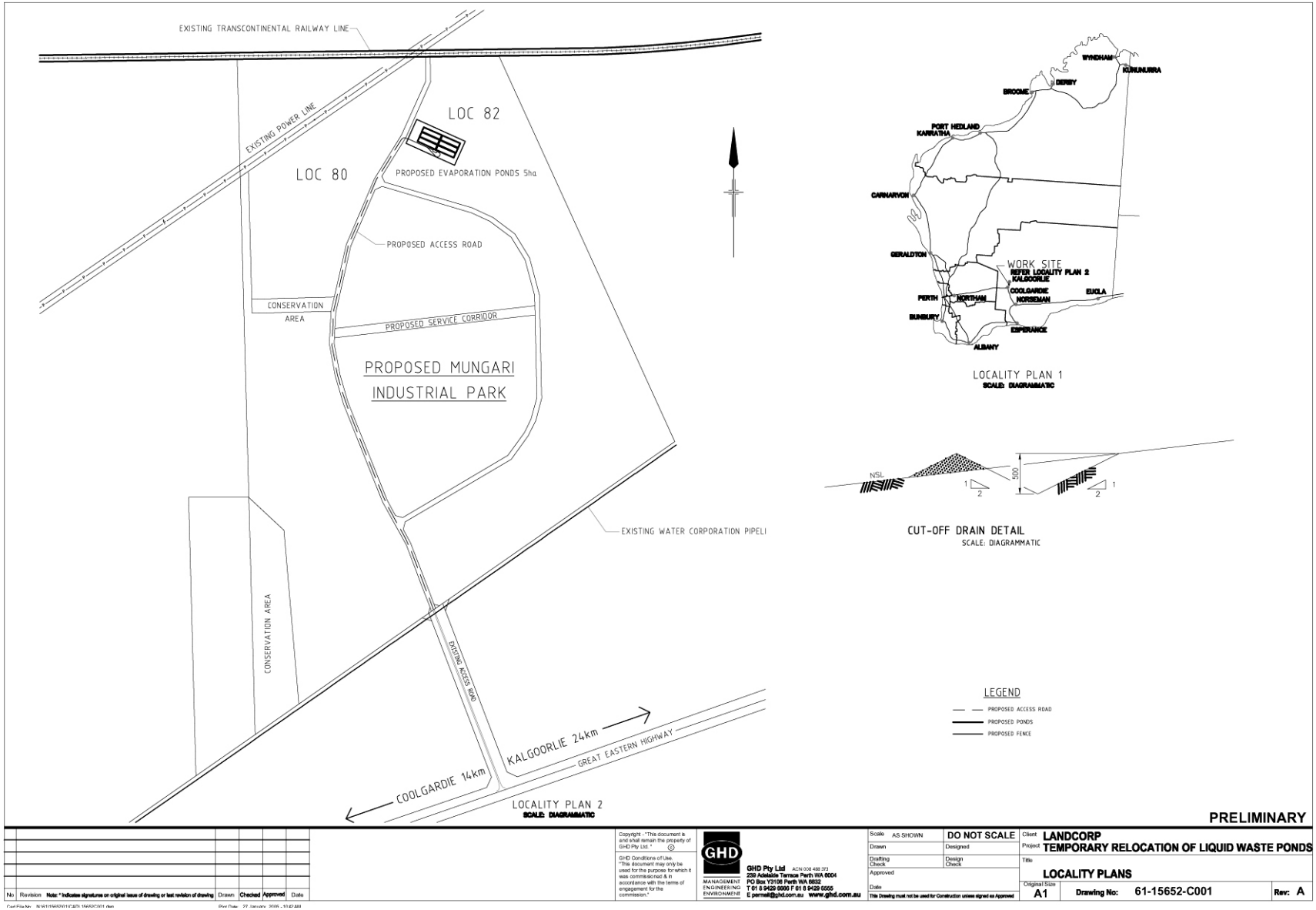

Figure 1: Location of the proposed evaporation ponds (GHD, 2005)

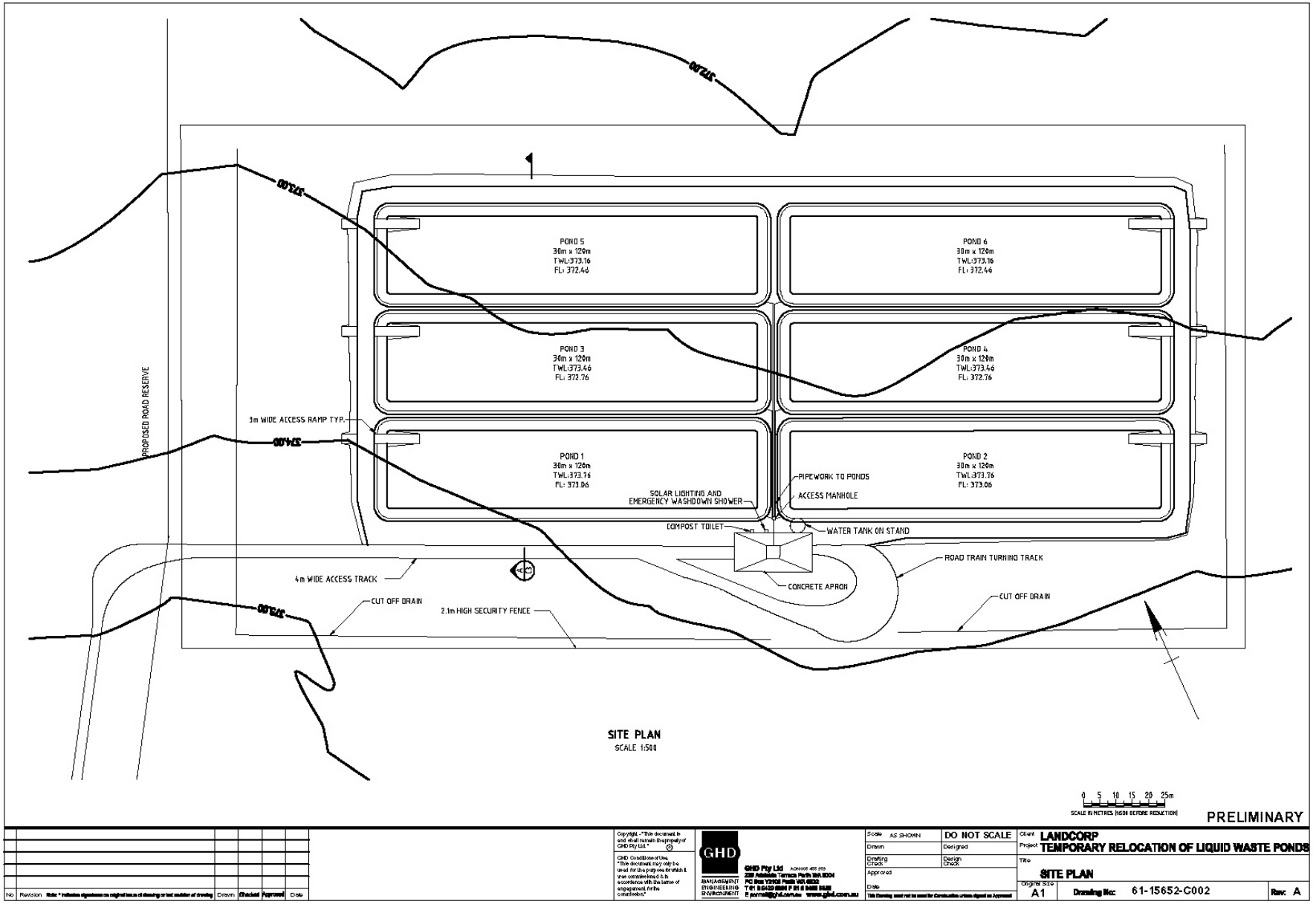

Figure 2: Proposed site plan (GHD, 2005)

3. Consultation

As part of the consultation process the proponent advertised the proposal in the *West Australian* and the *Kalgoorlie Miner* newspapers (6th December 2004) for a two week review period to allow the general public to make submissions on the proposal. The document was also made available electronically on the LandCorp website.

The proponent gave a presentation to the Kalgoorlie-Boulder Community Industry Reference Group (KBCIRG) on 19th January 2005. The nearby residents at the Kurrawang Christian Aboriginal Community were also informed of the proposal by letter and telephone and invited to submit their concerns.

Further details on the consultation and the issues raised by the stakeholders can be found in section 6 of the referral document (GHD, 2005).

The main issues raised by the community on the proposal are:

- Movement of odour to the Kurrawang Aboriginal Christian Community, as they are the nearest sensitive receptor to the proposed development;
- Number and permanency of the ponds;
- Quantity and type of wastes treated;
- Transport of waste and traffic increases;
- Potential for impact on groundwater;
- Possible odour problems could deter other industries from relocating to Mungari;
- Contingencies in place if cyclones make the Mungari site inaccessible.

The proponent has considered the issues raised and has addressed them in its referral document (GHD, 2005). These responses are summarised below:

- Ponds to be designed to reduce the likelihood of odour emissions;
- Buffer area around the ponds is consistent with the Core Consultative Committee on waste's recommended minimum distance between the source and the nearest sensitive land use (CCC, 2005). Further discussion of odour issues is contained in section 4.1 of this report;
- Six ponds to be constructed and the proposal is for a duration of three years. Extension of this period will require a separate approval;
- The quantity of waste treated is expected to be 10ML/year, and the types of wastes to be treated are contained in Table 2 of this bulletin.
- Although there are no known users of the hypersaline groundwater in the area, the proponent has committed to a drainage plan during construction.
- The proponent further commits to inspect the HDPE pond liner for leaks prior to each filling cycle and maintain 300mm of freeboard under normal operating conditions.
- The proponent will maintain a contingency pond at the current TWM site that can be utilised in the event that the Mungari site cannot be accessed.
- The proponent has committed to work with the Shire of Coolgardie to continue to consult with the community as the project progresses.

The EPA considers that the consultation process has been appropriate and that all reasonable steps have been taken to inform the community and key stakeholders on the proposed project.

4. Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following environmental factors are relevant to the proposal and require evaluation in this report:

- Odours
- Ground water and soil contamination

4.1 Odours

Description

Evaporation of effluent from the ponds could produce odours. The effluent is unlikely to be undergoing significant biological activity under most circumstances (GHD, 2004). It is not clearly understood why the ponds occasionally generate odour, but it is suspected that the temperature and salinity occasionally reach levels that are conducive to rapid biological activity. This may lead to the ponds quickly becoming anaerobic and generating odours related to sulphur compounds (GHD, 2004).

Relevant Site Characteristics:

The Mungari site was selected from a number of sites after consideration of the following factors to minimise odour generation (GHD, 2004; GHD 2005):

- Sufficient area to allow ponds with a large evaporative surface to be constructed;
- Sufficient distance from population centres;
- Industrial use zoning; and
- Proximity to the Great Eastern Highway allowing easy access for trucks to the site.

Assessment

The EPA's objective for this factor is to ensure that odours emanating from the proposed development do not adversely affect the welfare and amenity of other land users.

The EPA notes that temporarily relocating the ponds to the Mungari site has benefits in terms of managing potential odours. These include:

- The proposed location of the ponds is >3km from the nearest receptors at Kurrawang Aboriginal Christian Community (~5km) and Mungari Station (~3km). The EPA notes that the buffer area around the ponds is consistent with the Core Consultative Committee on waste's recommended minimum 3km from the nearest sensitive land use (CCC 2005, criterion 14). The Core Consultative Committee considers that a distance of 6km between the source

of odour and the sensitive land use is desirable, however the EPA further notes that this distance is recommended for hazardous waste facilities, and that the Mungari site will not accept hazardous wastes (GHD, 2005).

- Relocating the ponds allows for the depth of the ponds to be re-designed so that maximum evaporation rates can be achieved, reducing the impact of rainfall on the salinity of the pond and hence reducing the potential for rapid biological growth.
- Relocating the ponds allows for the depth of the ponds to be optimised such that a seasonally based thermocline is unlikely to develop. A well mixed pond is less likely to become anaerobic and produce odours.

The EPA expects that the proponent will apply best practice engineering design and that the facility will be operated using the best environmental practice management systems. The EPA notes that the odour is generally present on an intermittent basis (GHD, 2005). The EPA considers that the ~3km between the proposed project site and the nearest receptor is sufficient to minimise odour impacts.

The EPA notes that odour generation is regulated under section 51 of the general provisions of the *Environmental Protection Act 1986*, which states that:

The occupier of any premises who does not:

a) Comply with any prescribed standard for an emission; and
b) Take all reasonable and practical measures to prevent or minimise emissions from those premises,

Commits an offence.

Consequently, on advice from the DoE, the EPA notes that it is not necessary to include a condition under the Part V licence to regulate odour. However the EPA recognises the need for a contingency odour management plan to control intermittent odour problems in the event that they occur and cause a nuisance to surrounding landowners. The DoE has made a commitment in the Environmental Assessment Report for the proponent to work with the operator of the facility to develop and implement such a management strategy.

The EPA notes that there is a potential for possible future users of the industrial park to be impacted in the event that odour is generated in the ponds. To consider future users of the industrial area, the EPA recommends that the proponent undertake a review of the potential for odour generation after operation commences.

Summary

Having particular regard to the:

- The DoE's commitment to develop its own contingency plan for dealing with odour complaints should they occur;
- The separation distance of >3km between the proposed site and the nearest receptor; and
- The modified pond design to reduce the likelihood of the anaerobic conditions suspected to be the cause of nuisance odour events,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

4.2 Groundwater and Soil Contamination

Description

The EPA considers that construction and operation of the evaporation ponds at Mungari has the potential to contaminate groundwater from:

ii) Leaching of effluent through holes in the HDPE pond liner, and;

iii) Pond overflow due to excessive rainfall or overfilling of ponds.

Relevant Site Characteristics

Soils in the Mungari Industrial Estate are lateritic gravely sand material with larger rock material below a depth of 800mm. Pond construction requires excavation to a depth of 1000mm.

The proposed project area is semi-arid, with an annual rainfall of 271.4mm (GHD, 2005). The Mungari Industrial Estate drains to the east and west into ephemeral streams that run north and dissipate in flats and salt lakes north of the estate.

Groundwater in the area is hypersaline (250 000mg/L total dissolved solids), and is not used by either the domestic or agricultural sectors. The water table is expected to lie 15-20m below the surface. Groundwater flows from south to north across the proposed project area. Any spills would be likely to flow along or in the shallow topsoil horizon. There are no known users of the hypersaline groundwater.

Waste Characteristics

Total Waste Management treat three main types of waste at their facility: oily water waste, grease trap waste and plating waste. The proposed evaporation ponds will be used to evaporate the treated effluent from these wastes.

The estimated (pro-rata) quantities of liquid waste arriving at TWM (prior to treatment) are shown in Table 2 (GHD, 2005). It should be noted that depending on the type of waste received, between 10-30% is disposed of via landfill due to the fixation process.

Table 2: Estimated annual (pro-rata) quantities of untreated waste received by Total Waste Management

Category	Estimated Volume (Kilolitres/Year)	% Total Waste Received
Grease Trap	377.9	2.3
Paints and Resins	682.4	4.1
Oil Wastes	10 745.6	64.6
Organics	1 798.7	10.8
Acids	1 658.2	10.0
Alkalis	70.6	0.4
Chromium	122.5	0.7
Inorganics	910.4	5.5
Waste Water	273.2	1.6
Total	**16 639.5**	**100**

The effluent produced by the treatment process at TWM has a chemical oxygen demand (COD) in the range 20,000- 25,000 mg/L and a total dissolved solids (TDS) content ranging from 20,000 to 40,000 mg/L (GHD, 2005). Total waste management estimate the TDS in their existing ponds to be in the range 140,000-180,000 mg/L. The increase in TDS is due to the evaporation of waste water, which leaves behind the solid materials, resulting in the elevated concentration.

Assessment

The EPA's objective for this environmental factor is to maintain the quality of groundwater so that existing and potential uses, including ecosystem maintenance, are protected.

The EPA notes that the groundwater at the Mungari site is hypersaline and has no current known users. It is further noted that the water table is 15-20m below the surface.

Although there are no current users of the groundwater the EPA expects that the proponent will take all reasonable and practicable measures to minimise the potential impacts of the project on the current quality of the groundwater. The EPA expects that the ponds should be constructed using best practice engineering design and operated using the best environmental practice management systems. The EPA notes that the proponent has committed to the following:

- HDPE liner will be checked prior to each filling cycle to ensure that there are no leaks, and pipes will be visually inspected for leaks during discharge.
- The natural drainage channels of the site will be maintained, so the potential impacts on surface hydrology will be restricted to sheet flow (of particular concern during cyclones). The proponent will raise the edges of the ponds above ground level to prevent surface runoff entering and exiting the ponds.
- Only five of the six ponds are to be used for evaporation under normal operating conditions, with the sixth pond kept empty as a contingency. One pond is to be maintained at the Total Waste Management site to be used only when access to the Mungari site is compromised.
- The EPA notes that the proponent will maintain at least 300mm of freeboard in each pond under normal operating conditions. This allows sufficient pond capacity to minimise the risk of overflow caused by rainfall.
- There will be no chemicals stored on site and only a small quantity of fuel (<500 litres) will be kept for machinery. The EPA notes the proponent's proposed spill management actions in the referral document (Sections 4.3 and 4.8, GHD, 2005). If chemicals are required on site the proponent will construct a locked and bunded chemical storage area in compliance with the relevant Australian Standard.

It is the view of the EPA that factors relating to the pond design and everyday operation of the ponds can be managed via a works approval and licence issued under Part V of the *Environmental Protection Act 1986*. Hence conditions relating to groundwater monitoring, pollution control, and pond design (particularly in relation to pond edges and operational freeboard), and chemical storage have been addressed in the draft works approval and licence attached in Appendix 3. The EPA notes that groundwater will be monitored in accordance with conditions 5, 6 and 7 of the draft licence to ensure that the ponds do not leak and that chemical spills do not occur.

Summary

Having particular regard to the:

- Water table and hypersaline nature of the groundwater; and
- The DoE's proposed draft works approval and licence,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

5. Conditions and Commitments

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The proponent's commitments with respect to construction, operation and groundwater monitoring of the evaporation ponds will form the basis of management actions to be implemented through the works approval and licence under Part V of the *Environmental Protection Act 1986*. Since the implementation of this proposal can be readily managed by the DoE through the Part V process, the EPA does not believe any project-specific Ministerial conditions are warranted and as such, has not recommended any specific conditions. The general conditions that apply to this proposal are contained in Appendix 2 of this bulletin.

6. Other Advice

Pond Decommissioning

The EPA considers that decommissioning of the ponds should be addressed under Part V of the *Environmental Protection Act*.

The EPA considers that the proponent should consult with the DoE and give regard to a management strategy for the decommissioning of the ponds at the end of this period.

Transport

The EPA notes that transport of effluent from the treatment facility to the evaporation ponds can be regulated and managed under the *Environmental Protection (Controlled Waste) Regulations 2004*. These regulations provide for the licensing of carriers, drivers and vehicles involved in the transportation of controlled waste on public roads.

Flora

The EPA notes that the vegetation community in the Mungari Industrial Estate is well represented elsewhere in the Coolgardie Botanical District and that the clearing required for this proposal is unlikely to have significant impacts. However the EPA also notes that the vegetation type is not well represented in conservation parks and reserves and considers that this is an issue for consideration in future developments.

7. Conclusions

The EPA has considered the proposal by LandCorp to relocate Total Waste Management's liquid waste evaporation ponds to the Mungari Industrial Estate.

The EPA considers that the evaporation ponds at the existing facility have the potential to create odour. The EPA notes that the ponds have been redesigned to have a low potential to emit odour at the new facility, and further notes the large buffer distance between the Mungari site and the nearest sensitive receptors. It is the view of the EPA that odour can be managed under the general provisions of the *Environmental Protection Act 1986* in conjunction with a requirement that the proponent implement a contingency odour management plan to deal with the occurrence of excessive nuisance odours in accordance with the requirements of the DoE as outlined in the Environmental Assessment Report for this proposal.

The EPA also considers that there is potential for the ponds to leak or overflow and contaminate the groundwater in the Mungari area. It is the opinion of the EPA that factors relating to groundwater contamination and the pond design are best managed under Part V of the *Environmental Protection Act 1986*. The draft works approval and licence attached in appendix 2 outlines the conditions that the DoE will impose that are relevant to groundwater contamination.

The EPA has concluded that the proposal is capable of being managed in an environmentally acceptable manner under Part V of the *Environmental Protection Act 1986* such that it is most unlikely that the EPA's objectives would be compromised.

8. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for the relocation of Total Waste Management's liquid waste evaporation ponds to the Mungari Industrial Estate;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation of the DoE's Part V approval process outlined in appendix 3 of this bulletin.

Appendix 1

References

Core Consultative Committee on waste (CCC) (2005). *Final Site Selection Criteria*. Core Consultative Committee on waste, Government of Western Australia [Online]. Available: *http://www.3c.org.au/index.php*

Environmental Protection Authority (EPA) (2004). *Guidance for the Assessment of Environmental Factors: No 3- Separation Distances between Industrial and Sensitive Land Uses.* June 2004. Environmental Protection Authority, Government of Western Australia, Perth.

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Environmental Protection Authority (EPA) (2003). *Guidance for the Assessment of Environmental Factors: No 47- Assessment of Odour Impacts from New Proposals.* March 2002. Environmental Protection Authority, Government of Western Australia, Perth.

Environmental Protection Authority (EPA) (2004). *Guidance for the Assessment of Environmental Factors: No 51- Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.* June 2004. Environmental Protection Authority, Government of Western Australia, Perth.

Environmental Protection Authority (EPA) (2000). *Position Statement Number 2- Environmental Protection of Native Vegetation In Western Australia: Clearing of Native Vegetation, with particular reference to the Agricultural Area*. December 2000, Environmental Protection Authority, Government of Western Australia, Perth.

Environmental Protection Authority (EPA) (1993). *Proposed Heavy Industrial Park at Mungari, 26km south-west of Kalgoorlie- Report and recommendations of the Environmental Protection Authority.* March 1993. Bulletin 675. Environmental Protection Authority, Perth WA

GHD (2005). *Relocation of Total Waste Management's Evaporation Ponds to the Mungari Industrial Estate*. February 2005. Environmental Referral Document, Perth, WA

GHD (2004). *Total Waste Management- Relocation of Evaporation Ponds.* July 2004. Perth, WA.

Appendix 2:

Recommended Ministerial Environmental Conditions

Statement No.

RECOMMENDED ENVIRONMENTAL CONDITIONS

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

TEMPORARY RELOCATION OF TOTAL WASTE MANAGEMENT"S EVAPORATION PONDS TO THE MUNGARI INDUSTRIAL ESTATE

Proposal: The construction and operation (on a 3-year temporary basis) of six evaporation ponds (120m × 30m) in the north eastern corner of the Mungari Industrial Estate in the Shire of Coolgardie, as documented in schedule 1 of this statement.

Proponent: LandCorp

Proponent Address: Level 3, Wesfarmers House
40 The Esplanade
PERTH WA 6000

Assessment Number: 1556

Report of the Environmental Protection Authority: Bulletin 1167

The proposal referred to above may be implemented by the proponent subject to the following conditions:

1 Implementation

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

2 Proponent Nomination and Contact Details

2-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

2-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement

endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

2-3 The nominated proponent shall notify the Department of Environment of any change of contact name and address within 60 days of such change.

3 Commencement and Time Limit of Approval

3-1 The proponent shall substantially commence the proposal within five years of the date of this statement or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment will determine any dispute as to whether the proposal has been substantially commenced.

3-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment, prior to the expiration of the five-year period referred to in condition 3-1.

The application shall demonstrate that:

1.the environmental factors of the proposal have not changed significantly;

2.new, significant, environmental issues have not arisen; and

3.all relevant government authorities have been consulted.

Note: The Minister for the Environment may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

4 Works Approval

4-1 The proponent shall apply for a Works Approval for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

Notes

1 The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment over the fulfilment of the requirements of the conditions.

Schedule 1

The Proposal (Assessment No. 1556)

The proposal being assessed in this report is the construction and operation (on a temporary basis) of six evaporation ponds (120m × 30m) in the north eastern corner of the Mungari Industrial Estate in the Shire of Coolgardie (Figure 1).

The effluent to be evaporated at the Mungari site will have a chemical oxygen demand (COD) in the range 20,000- 25,000 mg/L and a total dissolved solids (TDS) content ranging from 20,000 to 40,000 mg/L (GHD, 2005).

Total Waste Management estimate that the amount of effluent requiring evaporation will be approximately 10ML/year. Each pond has been designed with a capacity of 2.5ML, giving a combined maximum capacity of 15ML. The ponds are to be lined with an HDPE liner underlain by compacted clay.

A detailed description of the proposal is provided in the referral document (GHD, 2005).

The site layout of the evaporation ponds is shown in Figure 2 below.

Table 1 – Key Proposal Characteristics

Element	Quantities/Description
Location	North Eastern corner of Mungari Industrial Estate, approximately 22 km from the City of Kalgoorlie and 11km from Coolgardie along the Great Eastern Highway
Proposed Action	Construct and operate series of six evaporation ponds to evaporate treated effluent
Pond Capacity	6 × 2.5ML (combined capacity 15ML)
Expected volume of effluent	Approximately10ML/year
Pond Freeboard	300mm
Individual Pond Area	120m×30m
Excavation Depth	Approximately 1m
Project lifetime	Approximately 3 years
Pond Liner Type	Compacted clay underlying a HDPE liner
Effluent receival structure	Concrete discharge area connected to pond via above ground piping
Connection between ponds	Connected by pipe work at the freeboard level to minimize potential overflow
Expected cleared area	Approximately 5 hectares

Figures (attached)
Figure 1 – Evaporation Pond location
Figure 2 – Preliminary Site Plan

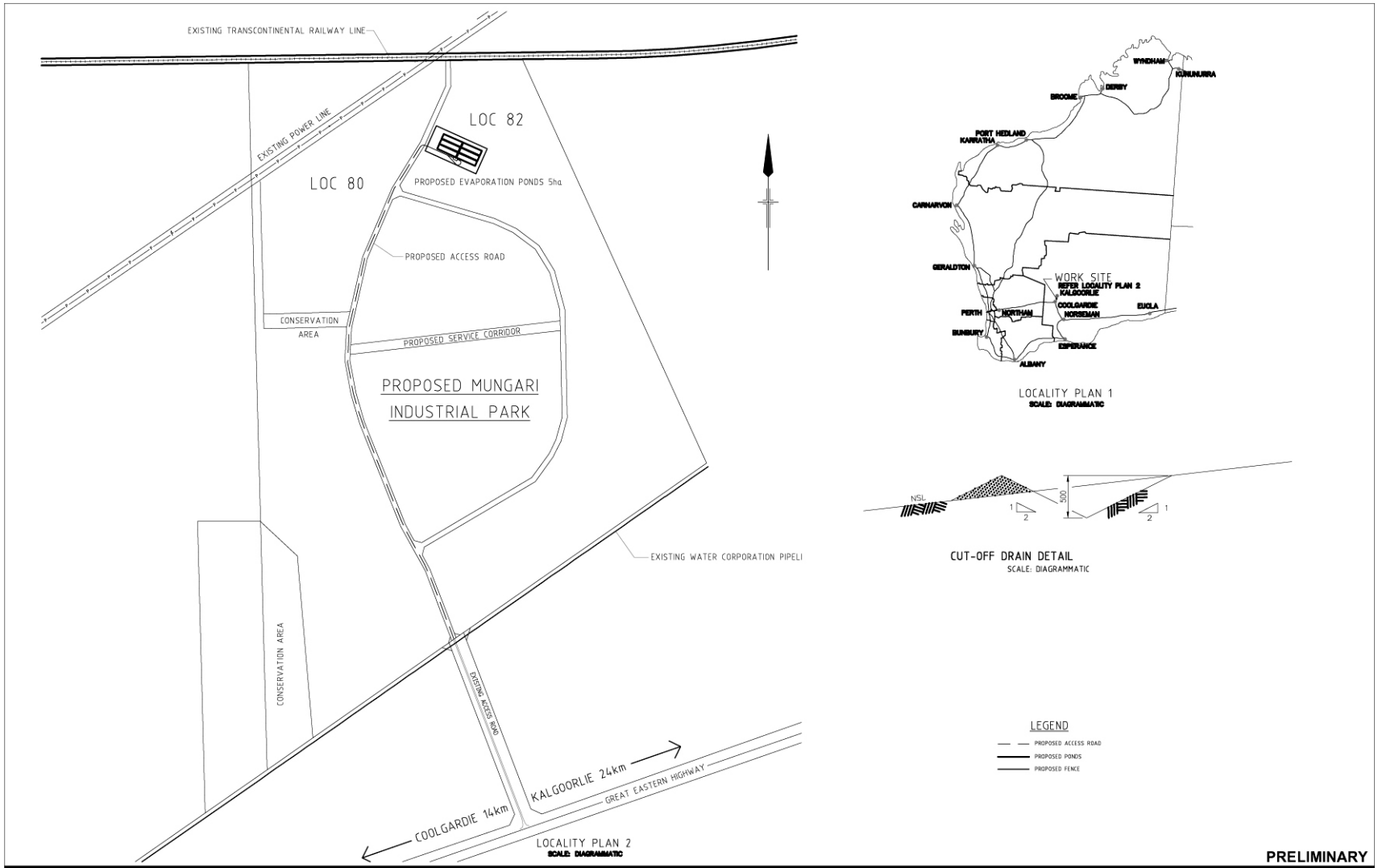


Figure 1: Evaporation Pond Location

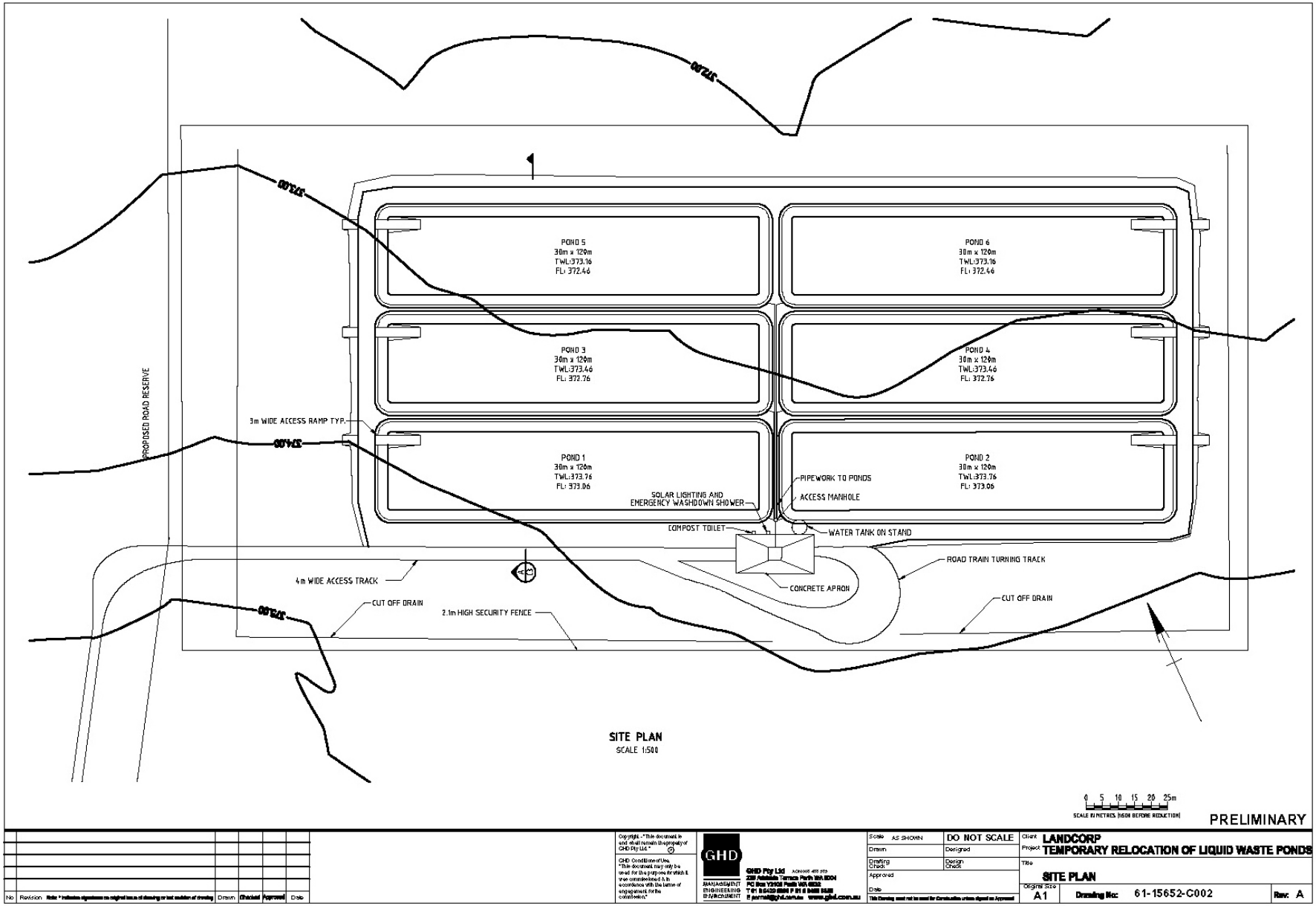


Figure 2: Preliminary Site Plan

Appendix 3:

Draft Department of Environment's Works Approval and Licence

Draft Works Approval

CONDITIONS OF WORKS APPROVAL

DEFINITIONS

In these conditions of works approval, unless inconsistent with the text or subject matter:

"Director" means Director, Environmental Management Division of the Department of Environment for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986*;

"Director" or "Department of Environment" for the purpose of correspondence means-

Program Manager, Goldfields
Swan Goldfields Agricultural Region
Department of Environment
Viskovich House
377 Hannan Street — Telephone: (08) 9021 3243
KALGOORLIE WA 6430 — Facsimile: (08) 9021 3529

“environmentally hazardous chemicals” means acids, cyanide, fuel, oil or other hydrocarbons in locations that are likely, if released to degrade the environment.

GENERAL CONDITIONS

GENERAL CONSTRUCTION AND OPERATIONAL DESCRIPTION

G1 The works approval holder shall construct the works in accordance with the works approval application dated --/--/---- and supporting documentation (Ref: LandCorp, Relocation of Total Waste Management’s Evaporation Ponds to the Mungari Industrial Estate, February 2005 authored by GHD Pty Ltd). In circumstances where these details and commitments are inconsistent with any other condition of this works approval, the condition of the works approval shall prevail.

The works referred to in this condition relate to any work on or in relation to the premises which (a) causes the premises to become a prescribed premises or (b) may cause, increase or alter the discharge of waste or the emission of noise, odour or electromagnetic radiation.

COMPLIANCE DOCUMENT

G2 The works approval holder shall, upon completing works associated with this project as outlined in the works approval application dated --/--/---- and supporting documentation, prior to commissioning the works, supply to the Director, documents certifying that all works approval conditions have been complied with for the completed components. These documents shall be signed by an authorised officer of LandCorp and Total Waste Management Pty Ltd together with the printed name and position of that person within the company, and preferably will contain the company seal.

AIR POLLUTION CONTROL CONDITIONS

DUST - GENERAL REQUIREMENT

A1 The works approval holder shall take all practicable measures to prevent the generation of visible dust from all materials handling operations, stockpiles, open areas and transport activities on the premises.

WATER POLLUTION CONTROL CONDITIONS

CHEMICAL STORAGE

W1 The works approval holder shall store environmentally hazardous chemicals in accordance with Australian Standard 1940-1993.

Environmentally hazardous chemicals shall be stored in accordance with the requirements for the storage of flammable and combustible liquids as detailed in the Australian Standard 1940-1993e

W2(a) The works approval holder shall immediately recover, or remove and dispose of, liquid resulting from spills or leaks of environmentally hazardous chemicals. The disposal of environmentally hazardous chemicals should be in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.

W2(b) The works approval holder shall report to the Director any spills of environmentally hazardous chemicals greater than 250L to the environment within 24 hours or the next working day

W2 (c) The works approval holder shall keep a record of any incident, including the loss of environmentally hazardous chemicals to the environment smaller than 250L, and provide a summary of each incident in their compliance document.

W3 The works approval holder shall sink monitoring bores, screened in the superficial aquifer, at the locations marked in attachment 2. The monitoring bores shall be designed in order to sample or measure:

- standing water levels (SWL)
- pH;
- total dissolved solids (TDS);
- total nitrogen (Kjeldahl and nitrite/nitrate);

- total phosphorus;
- heavy metals;
- cyanide;
- oil and grease;
- total petroleum hydrocarbons (TPH).

W4 The works approval holder shall construct and maintain facilities to divert stormwater run-off away from the evaporation ponds to minimise the threat of accidental loss of stored matter due to flooding or erosion.

SEVERANCE

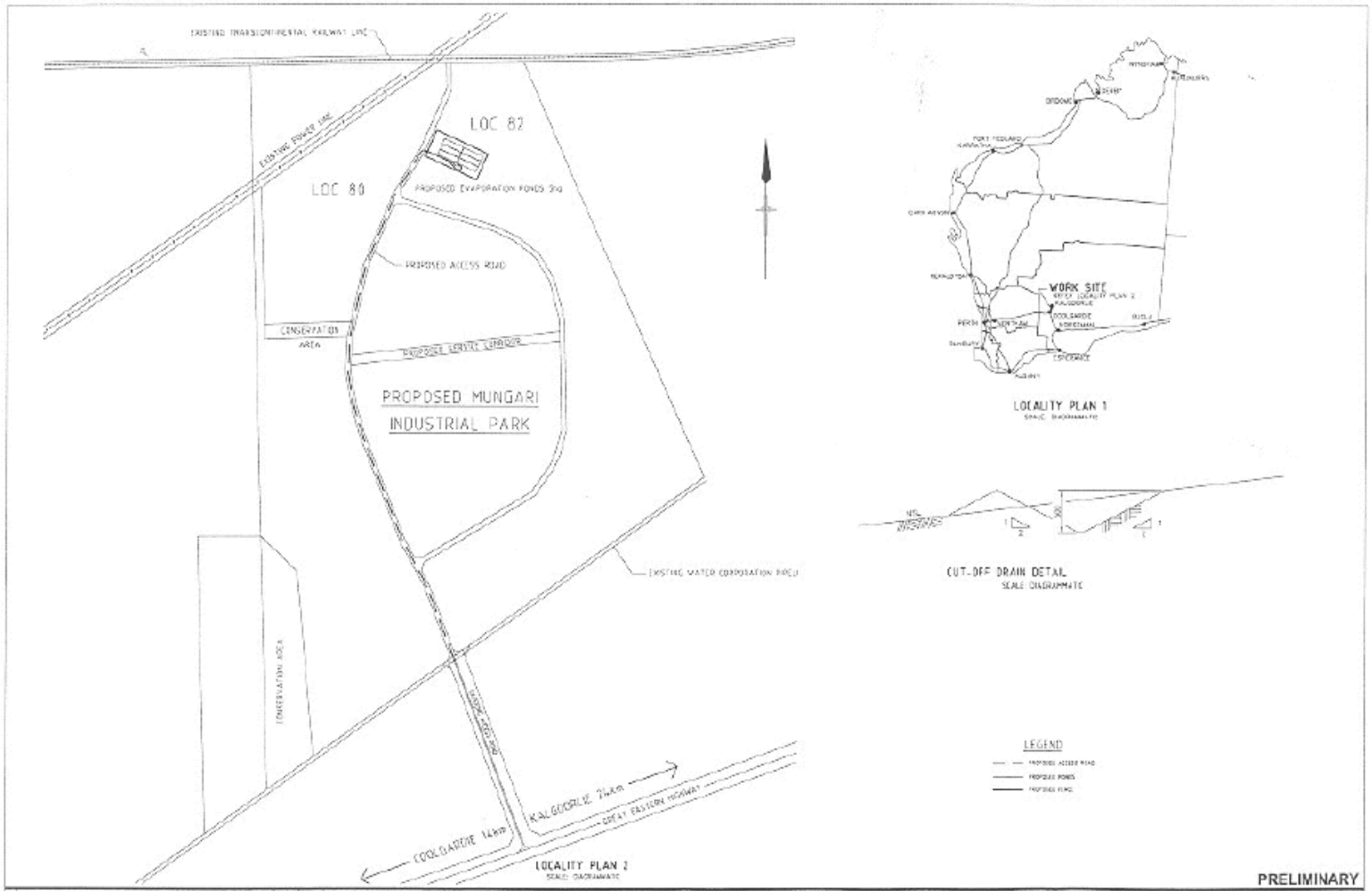
It is the intent of these works approval conditions that they shall operate so that, if a condition or a part of a condition is beyond my power to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within my power to impose and are not otherwise *ultra vires* or invalid.

.....

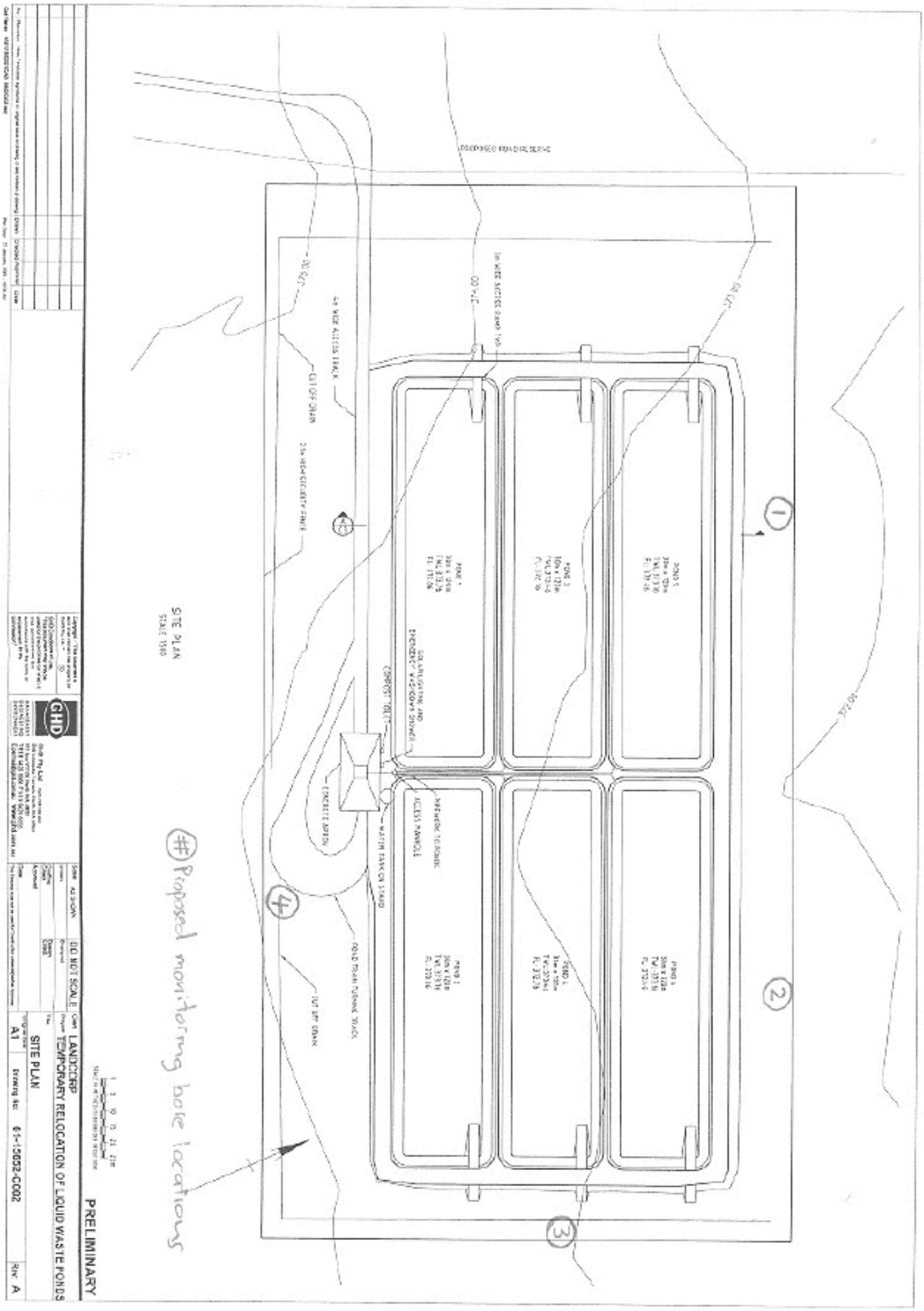
Officer delegated under Section 20
of the *Environmental Protection Act 1986*

Date of Issue:

ATTACHMENT 1



ATTACHMENT 2



DRAFT LICENCE FOR A PRESCRIBED PREMISES

LICENCE FOR A PRESCRIBED PREMISES

Pursuant to Section 57 of the Environmental Protection Act 1986

The Licensee is required to act in accordance with the conditions described in this licence. Under Section 58 of the Environmental Protection Act 1986 it is an offence to contravene a licence condition.

LICENCE DETAILS

Licence number:

File number:

Commencement date:

Expiry date:

LICENSEE

LandCorp
Locked Bag 5
Perth Business Centre PLB WA 6849
and;

Total Waste Management (ABN XXX)
Celebration Road
BOULDER WA 6432

PREMISES

Total Waste Management
Mungari Industrial Estate
Lot 100 on Plan 220062
Mount Burgess, WA, 6429

PRESCRIBED PREMISES CATEGORIES

Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Description	Capacity
61	Liquid Waste Facility	More than 100 tonnes per annum

ENDORSEMENT

Officer delegated under Section 20 of the *Environmental Protection Act 1986*
Name:

Title: Regional Manager

Region:

Issue date:

CONDITIONS OF LICENCE

GENERAL CONDITIONS

MAINTENANCE

1 The licensee shall manage the evaporation ponds in a manner such that uncontaminated stormwater runoff shall not enter the wastewater treatment ponds or cause the erosion of outer pond embankments

2 The licensee shall manage the evaporation ponds such as there is no discernible seepage loss.

3 The licensee shall manage the evaporation ponds such that the minimum top of embankment freeboard of 300mm is maintained in each of the evaporation ponds.

4 The licensee shall manage the evaporation ponds such that vegetation (emergent or otherwise) shall be prevented from growing in the pond wastewaters or on the inner pond embankments.

MONITORING CONDTIONS

GROUNDWATER

5 The licensee shall, every 6 months commencing prior to commissioning of the evaporation ponds, take measurements of standing water levels (SWL) and collect a representative sample of groundwater from each of the monitoring bores shown on Attachment 2. Concentrations of the following parameters shall be determined:

(i) pH;
(ii) total dissolved solids (TDS);
(iii) total nitrogen (Kjeldahl and nitrite/nitrate);
(iv) total phosphorus;
(v) heavy metals;
(vi) cyanide;
(vii) oil and grease;
(viii) total petroleum hydrocarbons (TPH).

With the exception of pH, all measurements are to be reported in milligrams per litre (mg/L).

6 The licensee shall collect all representative water samples in condition 5 in accordance with Australian Standard 5667.1, 1998, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.

7 *The licensee shall submit all representative water samples to a laboratory with current NATA registration for the analyses specified for analysis in accordance with the current "Standard Methods for Examination of Water and Wastewater-APHA-AWWA-WEF".*

REPORTING CONDITIONS

8 The licensee holder shall report to the Director any spills of environmentally hazardous chemicals greater than 250L to the environment within 24 hours or the next working day

9 The licensee shall provide to the Director by, 1 July each year, an annual environmental report containing data collected over the previous financial year (1 June to 30 May). The report shall contain:

- monitoring data required by condition 5 of this licence. This data shall be presented in tabular and graphical format and include historical readings;
- data on the volumes of wastewater received at the premise by month;
- data on volumes of sludge transported to Boulder for re-treatment;
- an explanation of the monitoring results with respect to the environmental impacts of the project;
- any changes to site boundaries, location of groundwater monitoring bores, surface drainage channels and on-site or off-site impacts or pollution.
- a summary of any incident, including the loss of environmentally hazardous chemicals.

DEFINITIONS

In these conditions of licence, unless inconsistent with the text or subject matter:

"Director" means Director, Environmental Management Division of the Department of Environment for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986*;

"Director" or "Department of Environment" for the purpose of correspondence means-

Program Manager, Goldfields

Swan Goldfields Agricultural Region

Department of Environment
Viskovich House

377 Hannan Street
3243
KALGOORLIE WA 6430
Telephone: (08) 9021 3529
Facsimile: (08) 9021 3529

"environmentally hazardous chemicals" means acids, cyanide, fuel, oil or other hydrocarbons in locations that are likely, if released to degrade the environment.

ENDORSEMENT

Officer delegated under Section 20 of the *Environmental Protection Act 1986*
Name:

Title: Regional Manager

Region: ELLAM ST

Issue date:

Appendix 4

Summary of identification of relevant environmental factors

Preliminary Environmental Factors	**Proposal Characteristics**	**Government Agency and Public Comment (referral document)**	**Identification of Relevant Environmental Factors**
BIOPHYSICAL			
Terrestrial Flora	Approximately 5ha of vegetation to be cleared for ponds and associated infrastructure. Vegetation community well represented in the Coolgardie area. No Declared Rare or Priority species found on site. No Declared weeds found on site. No TECs present in the Mungari area.	**Department of Environment** The project is not likely to have significant impacts on flora.	Two species formerly listed as rare (*Eremophila parvifolia* and *Ptilotus holosericeus)* now listed as not threatened. EPA Guidance Statement 51 gives a guide to the necessary levels of flora and vegetation survey. The EPA considers that this proposal can be satisfactorily assessed using a Level 1 Survey. EPA Position Statement No. 2 (section 4.3) outlines the factors considered by the EPA in addition to those in the column to the left. None of these factors are likely to be a concern for the proposed development. Consequently the EPA considers that this factor does not require further evaluation. It is worth noting that under Schedule 6, section 2(a) of the *Environmental Protection Act 1986*, a clearing permit is not required for the proposed development as the EPA formal assessment process and decision authorises the clearing. Vegetation community well represented in the Coolgardie area, but not in conservation reserves or parks. While this is a concern, the EPA considers that the clearing required in this proposal is unlikely to have significant impacts and the EPA considers that this factor does not require further evaluation.
Terrestrial Fauna	A number of significant fauna species have the potential to be recorded in the	**Department of Environment** Proponent's fauna survey does not give enough information to determine if impacts of development on fauna can be managed.	EPA Guidance Statement 56 gives a guide to the necessary levels of terrestrial fauna survey. The EPA considers that this proposal can be satisfactorily assessed using a Level 1 Survey.

	vicinity of the site, however none were recorded in the study.	**Member of the Public** The ponds have the capacity to attract bird life. How will this be addressed?	The proponent's fauna survey does not give sufficient information to determine if the impacts of development on fauna can be managed, however the EPA considers that the impacts on fauna are likely to be minimal given that: - the construction area is small relative to the surrounding vegetated area; and - a 1.8m fence constructed around the evaporation ponds will prevent terrestrial fauna using the effluent as a water source. It should also be noted that the project area is zoned industrial and the evaporation ponds are consistent with this use. The proponent advises that similar projects in the area are not known to have an adverse effect on avifauna. The existing evaporation ponds at the TWM facility are not known to have caused a problem for birds. The proponent advises that fauna deaths and injuries will be monitored and reported and action will be taken on this issue if birds are found to be using the ponds. The EPA considers that this factor does not require further evaluation.

POLLUTION			
Atmospheric emissions	No significant emissions are expected during operation of the ponds. Dust emissions during construction will need to be	**Department of Environment** Dust management objectives do not mention protecting surrounding vegetation from dust.	Current sulphur dioxide and dust levels in the Mungari Industrial Estate were measured by the proponent and found to be within the relevant standards. Emissions are not expected to be a concern during operation of the ponds. The proponent has included a dust management strategy (during construction) in the referral document. Dust management is dealt with in the DoE works approval.

	controlled.		The EPA considers that this factor does not require further evaluation.
Solid and liquid waste disposal	A small volume of hypersaline slurry will accumulate in each pond after evaporation.	**Member of the Public** Concerned regarding backloading of concentrated slurry to TWM in Kalgoorlie-Boulder **Member of the Public (2 submissions)** Concerned that the amount of waste will increase/ concerned about the quantity of waste.	Waste slurry will be collected and transferred back to the TWM site at Kalgoorlie-Boulder for chemical fixation and disposal in an approved landfill. In the referral document the proponent advises that there is no intention to increase the amount of waste being treated The EPA considers that this factor does not require further evaluation.
Surface water and groundwater	The site will accept 10ML/year of treated effluent for 3 years.	**Member of the Public** Concerned about potential for impact on groundwater **Department of Environment** Cyclones may cause sheet flows of stormwater runoff. It is recommended that the pond edges be raised to ensure the runoff does not enter the ponds causing them to overflow. **Department of Environment** Has the site been inspected for old mine shafts/prospecting pits etc? Any areas where depressions or poorly compacted soils exist should be refilled with granular material, moisture conditioned and compacted in appropriate layers to achieve bearing capacity equivalent to undisturbed soils. Rocks and roots should be grubbed out in 20cm layer then area graded, moisture conditioned and rolled.	Groundwater at the site is approximately 20m below the surface and hypersaline. HDPE liner above compacted clay to prevent leaks. HDPE pond liner will be inspected by the operator prior to each filling cycle to ensure that there are no leaks. 300mm of freeboard has been allowed in each pond to prevent overflow during high rainfall events. In addition the ponds are to be connected by pipes at the freeboard level to allow overflow to spread across all six ponds. The ponds will be elevated (bunded) above the ground level to prevent surface runoff entering the ponds. Thorough geotechnical site inspection is recommended by the EPA prior to construction. A condition to sink groundwater bores and conduct monitoring is included in the works approval. The EPA considers that the potential for groundwater contamination is a relevant environmental factor in this proposal.

		Department of Environment Some monitoring of groundwater (monitoring bores) should be put in place to ensure the integrity of the HDPE liner.	
Noise and Vibration	Some noise and vibration will occur due to the low level of construction. Trucks utilising the facility are likely to be the major source of noise during operation of the facility.	No specific concerns were raised in the submissions that were received.	Nuisance noise will be managed in accordance with the *Environmental Protection (Noise) Regulations 1997.* Given the large distance to the nearest noise sensitive receptors, noise is not considered by the EPA to be a relevant environmental factor.
Odour	Existing ponds at TWM facility have occasionally caused odours. There is a potential for this to occur at the proposed facility.	**Member of the public (3 submissions)** The Kurrawang Aboriginal Christian Community are too close to the planned development (5-6kms) and they have not been consulted. **Department of Environment** The proponent needs to produce an odour management plan including contingencies to deal with excessive odours in the event that they cause a nuisance to surrounding landowners.	The Core Consultative Committee on waste recommends a minimum 3km (6km desirable) buffer between hazardous waste facilities and the nearest sensitive receptor. The proposed development will not accept hazardous waste. The EPA is satisfied that Kurrawang Aboriginal Christian Community is well outside the 3km buffer. The EPA notes that the proponent has taken steps to contact the Kurrawang community and that the community has had adequate time to raise any concerns. The proponent will develop an odour management plan in consultation with the DoE. The EPA considers that the potential for odour generation is a relevant environmental factor in this proposal

SOCIAL SURROUNDINGS			
Risk and Hazards	Operation of the evaporation ponds will not lead to any significant	**Member of the Public** Concerned at the possibility of trespass **Member of the Public**	No chemicals are likely to be stored on site. If chemicals are required a locked and bunded chemical storage area will be constructed in accordance with the relevant Australian Standard as outlined in the draft works approval.

	increase in risk levels	Increased risk due to transport of toxic wastes **Member of the Public** What provisions are made by TWM and/or LandCorp when road closures stop the transport of waste liquids? Where will there be storage for the closure period?	1.8m fencing including drowning warning signs around the ponds will reduce the risk of trespass. Trucks visiting the TWM facility will be backloaded with effluent for transport to Mungari. Hence likely to be negligible increase in traffic due to the proposed development. Only treated wastewater will be transported to the evaporation ponds, which is not classified as toxic or hazardous. Transport of waste is regulated under the *Environmental Protection (Controlled Waste) Regulations 2004.* Provision has been made on the existing TWM site for one storage pond for contingency purposes. This will be used when access to the Mungari site is unavailable. The EPA considers that this factor does not require further evaluation.
Aboriginal culture and heritage	No known Aboriginal Heritage sites on the proposed site	No specific concerns were raised in the submissions that were received.	Aboriginal heritage surveys have been undertaken and results indicate that it is unlikely that any Aboriginal sites are located in the project area. Two sites have been identified in Mungari Industrial Park but these are unlikely to be impacted. The referral document contains a contingency management plan for unknown Aboriginal heritage sites. The EPA considers that this factor does not require further evaluation.
Non-indigenous heritage	There are no known non-indigenous heritage sites located within the project area.	No specific concerns were raised in the submissions that were received.	The EPA considers that this factor does not require further evaluation.
Visual amenity	No expected visual impacts	No specific concerns were raised in the submissions that were received.	The site is located approx 1.5 km from the main road and >3km from nearest residents. Visual impacts unlikely. The EPA considers that this factor does not require further evaluation.