Proposed Industrial Development Tonkin Industrial Park Bassendean

Northcorp Limited

Report and Recommendations
of the
Environmental Protection Authority

Environmental Protection authority
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i SUMMARY AND RECOMMENDATIONS

Northcorp Limited, the proponent, is a Western Australian company. It proposes to redevelop 42 ha of land bounded by Collier Road and Railway Parade, Bassendean, and a small wedge of land bounded by Scadden and Iolanthe Streets for subdivision as a commercial and industrial park.

A Public Environmental Report (PER) was submitted to the Environmental Protection Authority by the proponent in December 1988. The PER was released for an eight week public review period commencing on 14 December 1988 and concluding 8 February 1989. The Authority received 9 submissions.

The land was previously the site of a CSBP superphosphate works which operated for some sixty years and closed in 1970. During that time CSBP stockpiled raw materials and products on site and these contaminated the groundwater. Highly acidic groundwater has moved from the site towards the Swan River contaminating bore water in the Ashfield Flats area. The contaminated plume moves towards the east at a rate of approximately 20 m per annum and may therefore already have reached the river.

Upon decommissioning its plant, CSBP spread pyrite cinders and building rubble, over about the one fifth of the site which is the present dump. The site was then flattened.

The total volume of the waste approximates 150,000m^3 of which 130,000m^3 is pyrite cinders.

Initially the proponent planned to relocate all surface wastes onto the old pyrite dump on-site, sealing it with a blanket of red mud. The groundwater was to have been lowered below the deepest point of the contaminated materials by constructing a drain, thereby eliminating seasonal inundation from the contaminated material.

As a result of concerns over the long term management of the drainage system, the proponent subsequently amended the original proposal to a two stage development. Northcorp now intends to initially relocate all the surface wastes from the northern section of the site to the old pyrites cinders dump at the site's south eastern corner.

The decontaminated eastern section of the site will be developed as a light industrial park, but before the second stage is commenced all wastes will be removed from the site to a yet to be determined landfill site approved by the Health Department and the Environmental Protection Authority (EPA).

Northcorp has deposited a performance bond of five million dollars with the Town of Bassendean to ensure that adequate funding is available for removing the wastes off-site prior to commencement of the second stage of the development.

The major potential environmental impacts of this proposal are noise, dust and increased traffic flows. The proponent has made commitments to control noise and dust to the satisfaction to the EPA, and traffic flows are not expected to increase significantly as a result of the planned proposal.

The Authority therefore finds the proposal environmentally acceptable subject to the commitments made by the proponent and the recommendations of this report.

RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposal as outlined in Section 2.3 is environmentally acceptable subject to the commitments made by the proponent which include:

. all wastes, including pyrites cinders and building rubble will be removed from the site before the second stage of the development will take place;

. health of neither workers nor residents will be jeopardised;

. land-use and the environs of the site will not be compromised;

. no financial or environmental burden will result to any party in the long term;

. dust will be controlled at all times in consultation with the Department of Occupational Health, Safety and Welfare;

. water discharge from the site will be treated if necessary in consultation with the Swan River Trust and the Water Authority of Western Australia;

. all remedial action will be professionally supervised;

. services will be supplied to the site in a manner ensuring worker safety;

. the proponent will liaise with all relevant authorities during site cleanup.

RECOMMENDATION 2

The Environmental Protection Authority recommends that immediately after visible contaminants have been removed from the site, the proponent carries out appropriate soil testing to ensure that there is no significant contamination remaining. Parameters to be measured should include pH, and the following elements and compounds:

. mercury
. lead
. zinc
. copper
. arsenic
. fluoride, and
. total phosphorus (as P_2O_5)

The tests should be carried out to the satisfaction of the EPA.

1. INTRODUCTION

Northcorp Limited, the proponent is a Western Australian company. It proposes to redevelop 42 ha of land bounded by Collier Road and Railway Parade, Bassendean, and a small wedge of land bounded by Scadden and Iolanthe Streets for subdivision as a commercial and industrial park. The site is owned by Analed Pty Ltd in trust for the Northcorp Industrial Joint Venture comprising Esanda Finance Corporation Limited and Northcorp Limited.

The land was previously the site of a CSBP superphosphate works which operated for some sixty years and closed in 1970. During that time CSBP stockpiled raw materials and products on-site. In addition it deposited pyrite cinder wastes and treated scrubber fluids on-site resulting in groundwater contamination, mainly by acidic materials, and to a lesser extent, by heavy metals.

The contaminated groundwater has moved towards the Swan River contaminating bore water in the Ashfield Flats area. Results from monitoring indicate, however, that contamination was most severe while CSBP's plant operated, as groundwater leaving the site now is much less contaminated. These results also indicate that groundwater contamination was caused by sulphuric acid production and storage of superphosphate as well as by the dumping of pyrite cinders on-site.

Upon decommissioning its plant, CSBP spread pyrite cinders and building rubble over about the one fifth of the site which is the present dump. The site was then flattened.

The total volume of the waste approximates 150,000m^3 of which 130,000m^3 is pyrite cinders.

Initially the company proposed to relocate all surface wastes onto the old pyrite dump on-site and covering it with a blanket of red mud to reduce the percolation of rainwater through the cinders. The red mud blanket would also increase the pH of the soil solution thereby reducing the acidity of leachates.

The groundwater was to have been lowered below the deepest point of the contaminated materials by constructing a drain of sufficient capacity which would eliminate seasonal inundation.

A Public Environmental Report (PER) was submitted by the proponent in December 1988 to the Environmental Protection Authority. The Public Environmental Report was released for an eight week public review period commencing on 14 December 1988 and concluding 8 February 1989. The Authority received 9 submissions.

After the public review period ended it became clear that this proposal was unacceptable to the Town of Bassendean, as the Town Council would not assume responsibility for the long term management of the proposed drainage system as had been presumed by the proponent.

The proponent subsequently amended the original proposal to a two stage development. Northcorp now intends to initially relocate all the surface wastes from the northern section of the site to the old pyrites cinders dump at the site's south western corner.

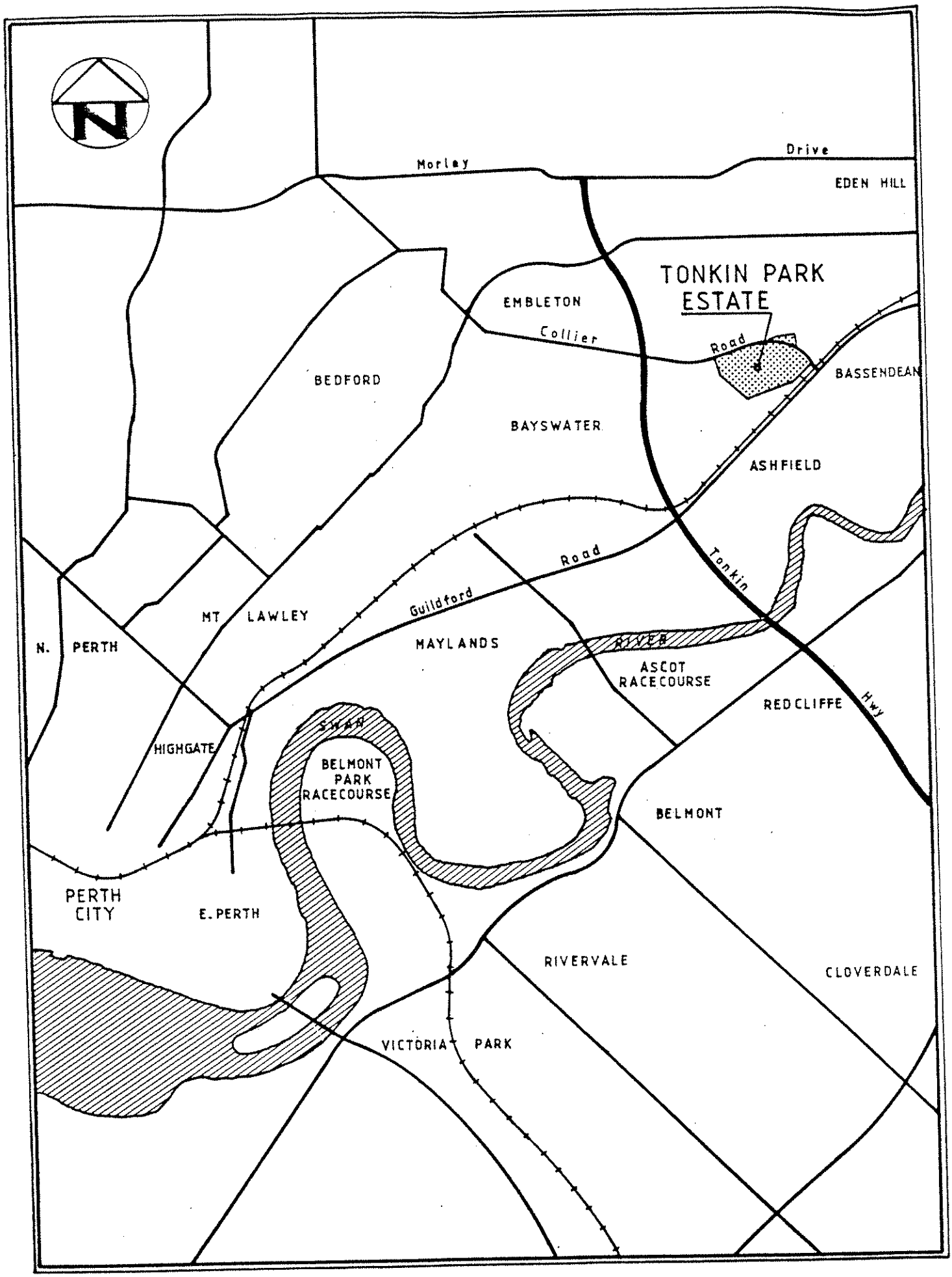

Figure 1. Location of Development Site.

The decontaminated area will be developed as a light industrial park but before the second stage is commenced, all wastes will be removed from the site to a yet to be determined landfill approved by the Health Department and the Environmental Protection Authority (EPA).

2. DESCRIPTION OF THE SITE AND THE PROPOSAL

2.1 THE SITE

The proposed site is located within an area of heavy industry in the Perth Metropolitan Region, and is surrounded by the established residential suburbs of Ashfield and Bassendean (Figure 1).

Boundaries of the site are shared with heavy industry to the west, south-west and east; general industrial land to the north and the residential suburbs of Ashfield adjacent to Guildford Road to the south.

The site has an area of 42 ha and is bounded by Collier Road to the north and east, Alice Street to the west, and a drain reserve and Railway Parade to the South. It also includes a 2.3 ha wedge of land to the north of Collier Road bounded by Scadden and Iolanthe Streets. The entire site is fenced.

2.2 THE ORIGINAL PROPOSAL

The proposal involves subdividing the site into 108 serviced blocks for an integrated mixture of manufacturing industries, light industries and service industries. Five percent of the area was to be set aside as public space as requested by the Town of Bassendean.

Northcorp's original proposal for rehabilitating the site included collecting all waste material and placing it over the deepest section of the pyrite dump. It also proposed to install a deep stormwater drainage system to lower the groundwater below the cinders dump. The dump would then be covered with a blanket of red mud to stabilise it. A one metre layer of sand was to be placed over the red mud blanket prior to development.

The drainage system within the Tonkin Industrial Park site would be handed over to the jurisdiction of the Town of Bassendean which would assume responsibility of its maintenance.

2.3 THE AMENDED PROPOSAL

The Town of Bassendean did not support this proposal as it would not accept responsibility for managing the proposed drainage system in perpetuity.

Consequently, the proponent amended the proposal to satisfy the Town of Bassendean. Northcorp now proposes to develop the Tonkin Industrial Park in two stages:

- Initially, surface waste material will be collected from the least contaminated, eastern section of the site and transported to the old pyrite cinders dump in the south west corner of the site.

- The cleared area will then be developed as the first stage of the industrial park.

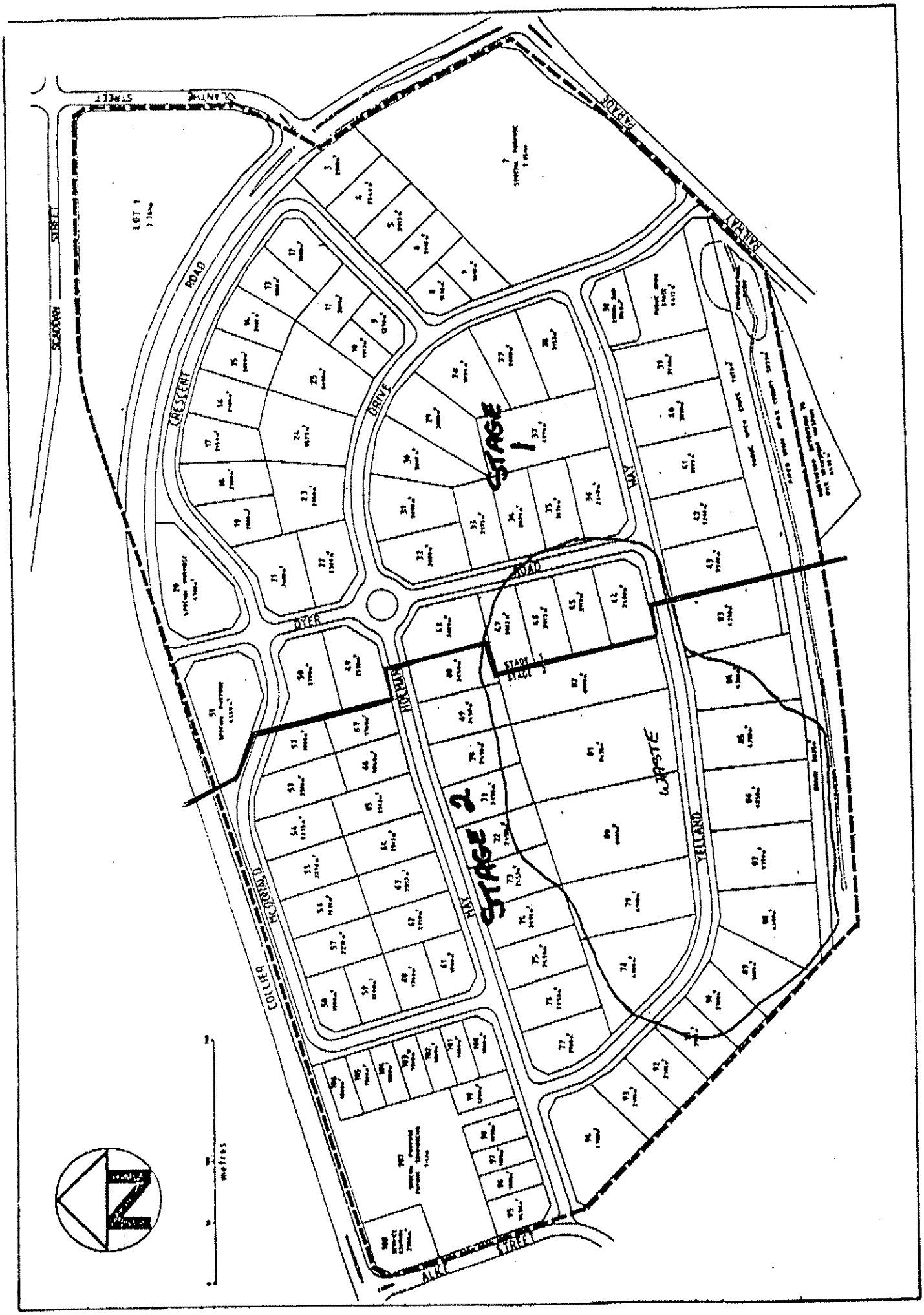

Figure 2. Tonkin Industrial Park, Bassendean.

The second stage of the development will not proceed until the pyrites cinders dump, along with all other wastes including building rubble, are relocated to a landill site licenced to receive the wastes. The Health Department is assisting the proponent to locate a suitable site.

To ensure that sufficient funding is available for cleaning up the site, and to show the proponents commitment to this undertaking, a Performance Bond of five million dollars has been deposited with the Town of Bassendean.

The proponent has made commitments to:

- remove all waste materials from the site. This will be done when groundwater beneath the site is lowest to minimise the need to handle saturated wastes;

- excavate and transport all waste materials to the landfill site. Materials will be removed to a depth where visual inspection shows that all wastes have been taken up. The soil will then be tested to ensure that the removal of contaminants is to the satisfaction of the Environmental Protection Authority;

- minimise dust generation by using water sprays and by minimising vehicle movements over contaminated areas of the site;

- after contaminated materials and rubble are removed, fill the resulting excavation with clean sand before development proceeds. This will be done to the satisfaction of the Town of Bassendean.

The Town of Bassendean takes the view that this alternative remedial treatment is a most suitable solution for the area's groundwater problems and fully supports the amended proposal.

3. POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED IN THE PER

3.1 NOISE AND DUST

Noise is not expected to reach nuisance levels at the boundaries of the site. It should also be noted that the site is adjacent to roads carrying heavy traffic and that it adjoins a noisy industrial area. Furthermore, the proponent is committed to controlling noise to the satisfaction of the Environmental Protection Authority.

Dust from the development will be controlled by the proponent by using water sprays when necessary. The proponent is committed to controlling dust at all times to the satisfaction of the Environmental Protection Authority and the Department of Occupational Health, Safety and Welfare.

3.2 TRAFFIC

The proposed estate is surrounded by sealed roads carrying heavy traffic. There will be no undue increase in traffic flow resulting from this development.

4. SUMMARY OF PUBLIC AND GOVERNMENT AGENCIES SUBMISSIONS

4.1 INTRODUCTION

Nine public and Government submissions on this proposal (mostly referring to groundwater issues), were received by the Environmental Protection Authority. Contributors are listed in Appendix 3.

4.2 REVIEW OF SUBMISSIONS

A number of topics were raised in submissions on the Public Environmental Report.

It should be noted, however, that Northcorp subsequently amended its proposal to the complete removal of contaminated soils from the site, thereby making many of the issues raised redundant.

Relevant submissions commented on:

. noise;

. dust; and,

. traffic.

Submissions received which have ceased to be relevant because of amendments to the proposal included:

. difficulties expected in excluding rainwater and groundwater from the pyrites dump;

. difficulties in lowering groundwater;

. loss of landscape amenity resulting from the visible cinders dump;

. requirements for additional water monitoring;

. supervision of the monitoring programme; and,

. the unwillingness of the Town of Bassendean to accept long term responsibility for managing the proposed drainage system.

The proponent's response to questions raised are given in Appendix 2.

5. ENVIRONMENTAL IMPACTS

5.1 GENERAL INTRODUCTION

The Authority has identified a number of issues associated with the proposal as having potential environmental impacts.

These include:

. dust and noise;

. traffic;

. site decontamination.

The proponent is committed to controlling dust to the satisfaction of the Environmental Protection Authority by using water sprays whenever necessary. Similarly, noise generated by this development will be within the limits designated by this Authority. Traffic levels are not expected to increase significantly as a result of this development.

RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposal as outlined in Section 2.3 is environmentally acceptable subject to the commitments made by the proponent which include:

- **all wastes, including pyrite cinders and building rubble will be removed from the site before the second stage of the development will take place;**
- **health of neither workers nor residents will be jeopardised;**
- **land-use and the environs of the site will not be compromised;**
- **no financial or environmental burden will result to any party in the long term;**
- **dust will be controlled at all times in consultation with the Department of Occupational Health, Safety and Welfare;**
- **water discharge from the site will be treated if necessary in consultation with the Swan River Trust and the Water Authority of Western Australia;**
- **all remedial action will be professionally supervised;**
- **services will be supplied to the site in a manner ensuring worker safety;**
- **the proponent will liaise with all relevant authorities during site cleanup.**

5.2 SITE DECONTAMINATION

The proponent undertakes to excavate contaminated materials and transport them to the landfill site. Visual inspection and soil tests will then ensure that all wastes have been taken up.

RECOMMENDATION 2

The Environmental Protection Authority recommends that immediately after visible contaminants have been removed from the site, the proponent carries out appropriate soil testing to ensure that there is no significant contamination remaining. Parameters to be measured should include pH, and the following elements and compounds:

- **mercury**
- **lead**
- **zinc**
- **copper**

. arsenic
. fluoride, and
. total phosphorus (as P_2O_5)

The tests should be carried out to the satisfaction of the Environmental Protection Authority.

6. CONCLUSIONS

Based on the information contained in the Public Environmental Report and additional information supplied by the proponent, the Environmental Protection Authority has concluded that the project is environmentally acceptable and recommends that it could proceed subject to the commitments given in the Public Environmental Report and the recommendations contained in this report.

APPENDIX 1

TONKIN PARK ENVIRONMENTAL ASSESSMENT

COMMITMENTS BY NORTHCORP AS PROPONENT

The objectives of remedial treatment of Tonkin Industrial Park will be that:

- The quality of groundwater flowing beneath the site will, in the long term, be returned to a state typical of groundwater in the Bassendean area.
- Health of either workers or residents will not be jeopardised.
- The intended land use of the site or its environs will not be compromised.
- No financial or environmental burden in the long term will result to any party.

The cleanup and development of the site will be undertaken in two stages as outlined in the Public Environmental Report.

The first stage of the cleanup and development involves the area of land that has been shown by site investigations to be contaminated with a thin surface veneer of pyritic material and other wastes.

The second stage of the cleanup and development involves the remainder of the land area which is known to have buried stockpiles of wastes that are in contact with, and contaminating groundwater beneath the site.

Northcorp Limited, as proponent, has entered into an agreement with the Town of Bassendean to undertake the cleanup and development in accordance with the following timetable.

Stage 1: Completion of stage 1 cleanup and development works within six months of obtaining Environmental Protection Authority, the Town of Bassendean, and all other Statutory Authority approvals to both the cleanup and development proposals. Failure to meet this commitment will result in the Town of Bassendean completing the necessary works.

Stage 2: Completion of stage 2 cleanup and development works by 31 December 1992 provided a suitable site is found to accept wastes from the Tonkin Park site and that satisfactory arrangements have been made for the ongoing management of the wastes at the disposal site. Failure of Northcorp Limited to meet this commitment will result in the Town of Bassendean completing the work provided a suitable disposal site can be found.

Northcorp Limited commits itself to the following for completion of Stage 1 of the development:

1. Northcorp Limited will take responsibility for ensuring that all works carried out as part of the site cleanup will be completed to the satisfaction of the Environmental Protection Authority and other relevant statutory authorities.

2. All works associated with the cleanup operation will be carried out to the direction and under the supervision of qualified and reputable professionals in the engineering and environmental fields acting as consultants to Northcorp Limited. Confirmation of the selected consultants will be subject to the approval of the Environmental Protection Authority.

3. Shallow deposits of waste materials to be cleaned up in Stage 1 of the proposal will be collected and placed over the deeper parts of the pyrites dump. These wastes will be collected during the initial stages of the site preparation phase of the Stage 1 development. The work will be carried out by a reputable earthmoving contractor under the supervision of Northcorp's consultants.

4. Subdivision and sale of land from Stage 1 will not occur until all wastes on these lands have been relocated to the satisfaction of the Environmental Protection Authority and other relevant authorities.

5. Dust control will form a key requirement in cleanup operations. During surface stripping of wastes before Stage 1 of the development there will be an extensive use of water sprays and vehicle movements will be minimised over contaminated areas of the site. Direction on and supervision of these activities will be provided by the consultants to Northcorp Limited. The work will be carried out by the selected contractor.

6. Northcorp Limited's consultants will confer with the Department of Occupational Health, Safety and Welfare with respect to working conditions on the site. In particular, precautions will be implemented to ensure that workers on the site are not subjected to undue risk as a result of the contaminated nature of the site. Procedures to ensure this commitment is met will be incorporated into contract conditions for the work and supervised by Northcorp Limited's consultants. Ongoing liaison with DOSHWA will be maintained for the duration of the work.

Northcorp Limited commits itself to the following for completion of Stage 2 of the development provided a satisfactory site can be nominated by others that will accept the wastes to be removed from the site.

7. Northcorp Limited will take responsibility for ensuring that all works carried out as part of the site cleanup will be completed to the satisfaction of the Environmental Protection Authority and other relevant statutory authorities.

8. All works associated with the cleanup operation will be carried out to the direction and under the supervision of qualified and reputable professionals in the engineering and environmental fields acting as consultants to Northcorp Limited. Confirmation of the selected consultants will be subject to the approval of the Environmental Protection Authority.

9. Cleanup of the site within Stage 2 of the development will be achieved by removal of all wastes from the site to an approval disposal facility. The location and nature of the disposal facility is yet to be determined and will be nominated by others. The cleanup work will be undertaken by an experienced and reputable earthmoving contractor to be selected by Northcorp Limited. All works will be to the direction and under the supervision of Northcorp Limited's consultants.

10. The cleanup work will be undertaken as far as practicable during winter months, consistent with the need to avoid handling wastes when groundwater levels are high (ie. at the end of winter). Water sprays will also be used to spray dust. This work will be carried out by the selected contractor to the direction and under the supervision of Northcorp Limited consultants.

11. Subdivision and sale of land in Stage 2 (as shown in Figure 1.3 of the Public Environmental Report) will not occur before remedial action is completed to the satisfaction of the Environmental Protection Authority and other relevant statutory authorities.

12. Dust control will form a key requirement in cleanup operations. Trucks will be covered after loading and during transport of the wastes and stringent hygiene standards will be maintained at all times. This work will be carried out by the selected contractor to the direction and under the supervision of Northcorp Limited's consultants.

13. Northcorp Limited's consultants will confer with the Department of Occupational Health, Safety and Welfare with respect to working conditions on the site. In particular, precautions will be implemented to ensure that workers on the site are not subjected to undue risk as a result of the contaminated nature of the site. Procedures to ensure this commitment is met will be incorporated into contract conditions for the work and supervised by Northcorp Limited's consultants. Ongoing liaison with DOSHWA will be maintained for the duration of the work.

14. Materials will be removed from the site until visual inspection by the consultants shows that all wastes have been removed. Soils will then be tested by an independent laboratory to ensure that there is no remaining significant contamination. Northcorp Limited's consultants will direct the contractor on the limits of excavation. All test results will be presented to the Environmental Protection Authority for inspection so that they are satisfied with the extent of waste removal prior to further treatment or development of the site.

15. Following completion of the removal of contaminated materials and subject to the Environmental Protection Authority's approval the resulting excavation will be backfilled with clean filling from a source approved by the Environmental Protection Authority. This work will be directed and supervised by Northcorp Limited's consultants.

16. Water discharged from the site into the Chapman Street drain during construction will, if necessary, be treated to ensure no deterioration of water quality occurs in the drain or the Swan River. The Swan River Management Authority and the Water Authority of Western Australia will be consulted to establish appropriate quality criteria. Northcorp Limited's consultants will design and ensure implementation of appropriate treatment measures. Monitoring of outflows at the point of discharge will be carried out to ensure compliance.

In all phases of the cleanup work for the Tonkin Park site Northcorp Limited commits itself to:

- Liaise with the relevant government departments including the Environmental Protection Authority; Water Authority of Western Australia; Geological Survey Department of Western Australia; State Planning Commission; Department of Occupational Health, Safety and Welfare; Health Department of Western Australia; and the Bassendean Town Council.

ANSWERS TO QUESTIONS ON THE TONKIN INDUSTRIAL PARK PER PUT BY THE TOWN OF BASSENDEAN

The following questions were raised by staff of the Town of Bassendean following their review of the original PER document. Many of the questions refer to the engineering solution presented in the PER document but are no longer applicable with the revised proposal to remove all waste from the site. Questions relevant to the revised proposal are answered in the following pages. Those questions that are no longer relevant are marked "NOT APPLICABLE".

QUESTION 1

Top of pipes and drain are above level of pyrites in the check head, this pushes water out of ground around the pipes area. Does this push up average water table height when there is a big head? Remember 8 hours of full compensation basin will cause extra backing up of drains which equals more recharge.

NOT APPLICABLE

QUESTION 2

Type of pipe and subsoil drain and resistance to acid, alkaline and any other pollutants.

NOT APPLICABLE

QUESTION 3

Groundwater contours - summer winter?; range 1m?

The groundwater contours given in Figure 3.3 were extracted from the Webb (1983) Report. They are supplied primarily to show the general direction of groundwater flow beneath the Tonkin Industrial Park site. As the Webb investigation was carried out in July it is assumed that the contours represent winter conditions.

QUESTION 4

Reasoning behind combined storm and subsoil as opposed separate subsoil. Advantages. Disadvantages.

NOT APPLICABLE

QUESTION 5

Flood cycle in 2-10 years vs 1-5 years. Comment on what happens in a higher intensity storm - where does flooding occur. Show proposed levels of roads (see also Recommendation 15).

NOT APPLICABLE

QUESTION 6

Maintenance of the subsoil drainage system? Who? Why? What?

NOT APPLICABLE

QUESTION 7

Monitoring - water quality, flow.

NOT APPLICABLE

QUESTION 8

Insurance, public liability for lead poisoning, arsenic etc for all workers.

An insurance policy will be taken out to cover all workers on the site against any accidents or illnesses that have resulted from working on the site. This is done to comply with the Department of Occupational Health, Safety and Welfare regulations.

QUESTION 9

Excavation and construction techniques.

Excavation and construction techniques will be similar to normal subdivisional methods. Procedures to control the movement of pyrites material within the site will be specified and included in the contracts.

QUESTION 10

Water seepage through sand and along top of alkaline blanket.

NOT APPLICABLE

QUESTION 11

Impervious layer over alkaline blanket, eg. a geotextile.

NOT APPLICABLE

QUESTION 12

Dates for digs and works to be done in summer?

The date of commencement for the development is dependent on the necessary approvals being granted from the relevant government agencies. If approval is granted by the Environmental Protection Agency and the Bassendean Town Council in the winter of 1989 it is expected that work will begin on-site for Stage 1 in spring and summer. Work on removal of pyrites will be timed to coincide as far as possible with the lowest watertable levels on site.

QUESTION 13

Are food crops and trees permissible on site?

With removal of wastes from the site it will be possible to grow food crops and trees on the site.

QUESTION 14

Sewer extension for lot north of Collier Road.

Sewers for the lot north of Collier Road will feed to the existing system.

QUESTION 15

Lot north of Collier Road on corner of Iolanthe Street. Show in plans and considerations.

The lot north of Collier Road is part of the Tonkin Industrial Park and is now shown on all the relevant plans.

QUESTION 16

Comment on isolated patches of sulphurous (yellow) stone and crumbly grey material (visual on site).

The isolated patches of sulphurous stone and crumbly grey material are the remnants of raw materials stockpiles. Tests indicate that these materials are rock sulphur and unburnt pyrites (refer p.9 of the PER).

QUESTION 17

Quantify 'collection of pyrites road base and other deposits to be dumped on main body. What is increase in height due to this together with the 1m fill.

The total volume of the pyrites road base and other surface deposits has not been quantified. However, from the evidence available the volume is not anticipated to be large enough to make relocation to the main dump difficult or significantly alter the slope of the dump.

QUESTION 18

Expand on action/reasons for investigating stormwater north of Collier Road (1.5 GRC Report Summary).

NOT APPLICABLE

QUESTION 19

Drain pipe size through POS?

Shown on Drawing 11843C/R1 Appendix 7.

QUESTION 20

Details of the flood path past the Railway Museum, to where?

The flood route follows the natural gradient of the land, along the railway reserve, to Ashfield Park.

The compensating basin to the east of the piped drain will be designed with very gradual sloping sides and will fill only when excessive rainfall occurs. It is intended, when dry, to be able to use this area as Public Open Space with landscaping enhancing this shallow depression.

QUESTION 21

Where are proposed observation bores.

NOT APPLICABLE

QUESTION 22

Questions on Commitments in Appendix. Substantiate commitments:

(a) Improve groundwater quality - qualify.

(b) Long term environmental burden in long term - how long will drain last, what happens at end of useful life?

(c) For dust control reasons woks are proposed in winter and water damp down. This is conflicting with water table and leaching problems!

(d) How is water to be treated that is discharged from site?

(e) This affects lot design - zero lot line prefer whole lot slopes to the street for:

a) stormwater flows
b) services not needing to go deep.

(f) Details of caveats are required before we can know if they will be effective. Please advise.

(a) It is the long term objective of the remedial treatment to return the quality of groundwaters flowing beneath the site back to a condition typical of those in the Bassendean area (see commitments section of the PER).

(b) NOT APPLICABLE

(c) It is anticipated that dust control measures will have a minimal effect on the rate of leaching occurring within the dump.

(d) NOT APPLICABLE

(e) Wherever possible lot earthworks will create lots with falls to the roads. The natural ground surface will prevent this on certain lots.

(f) Caveats will be finalised when the outcome of the PER is known. These will be to the satisfaction of the Bassendean Town Council.

QUESTION 23

How is the lot on the corner of Railway Parade and Collier Road to be serviced with sewer, especially considering there could be several thousand working on that site.

Refer to Drawing 11843C/S1, Appendix 7.

QUESTION 24

The proposed stormwater easement between the lots on McDonald Crescent and the large lot on the corner of Collier Road and Railway Parade should go through the large lot.

The easement has been relocated, refer to Drawing 11843C/R1, Appendix 7.

QUESTION 25

Easements to protect stormwater at rear of Yelland Way lots not backing onto drain reserve of the closed road. Dedication of the closed road for drainage purposes. Drainage service to lots in Yelland Way that back onto POS.

The drain at the rear of lots in Yelland Way will be within an easement. This is currently now shown on the Drawings but will be included in the final design.

QUESTION 26

Building envelopes (plan 11843 C/RS) not acceptable. The whole site must be available for development. 1m fill minimum over alkaline blanket. The above plan shows clearance down to 300mm. (Foundations are usually deeper than this; 300mm will need to be dug out for crossovers, car parks etc.)

The building envelopes shown are intended to represent the standard building setbacks.

QUESTION 27

Service trench areas into lots (plan 11843 C/WI) are only 0.2m deeper than fill of 1m.

The service trench depth has been derived from a minimum depth of services, eg. water, electricity and gas laid to service individual lot developments.

QUESTION 28

Figure 2.3. Was the sandpit filled? What with?

The sandpit was filled with wastes produced from acid production. These wastes have now been removed, however, leached residues remain on site.

QUESTION 29

P8, paragraph 4. Details of groundwater fluctuations? Is Figure 3.3 reflecting summer or winter or average? What are the detailed existing and proposed groundwater levels for summer and winter. How does this relate to existing and proposed ground levels.

Groundwater levels were recorded in winter for the Webb study thus it is presumed that the diagram represents winter groundwater levels. No attempt was made to produce a regional map of groundwater levels in the Northcorp Report.

QUESTION 30

Figure 3.4. What is the basis for the limit of wastes line in the north-east considering that there is an area of 3.2 ha with no trenches or samples taken? Same questions to the north and west but to lesser extents.

Trenching could only give an approximate picture of the lateral extent of the dump. The dotted line in Figure 3.4 is a line of best fit between trenches which intercepted pyrites and those which did not. Thus there is the possibility that waste material could be within or slightly outside this line. This will become apparent when the remedial work is carried out and will be taken into account during this work.

QUESTION 31

Who is the impartial third party that supervises on site works?

An impartial third party has yet to be selected to supervise the remedial action. The selection will be required to be approved of by the Bassendean Town Council.

QUESTION 32

P9, paragraph 4. The two measurements are not comparable.

The text has been altered to reflect this.

QUESTION 33

Table 3.5. The bore numbers TP1, TP2 etc. do not match the labels on Figure 3.2, BH1, BH2 etc. Why the big fluctuation in bore TP2? What are the RLs of the ground level at each bore? Would this then give us some generalisable groundwater contour information or are more bores required?

Bore numbers have been altered in the final copy. There is a big fluctuation in BH2 because the percolation of water down to the water tale in pyrite cinders is slower than in sands. Thus the water table in the dump is perched above what would normally be expected in the area.

A number of additional bores would be required to give a generalised idea of groundwater contours in the area. It was not considered necessary to obtain this information given the detailed information in the Webb Report.

QUESTION 34

P9, paragraph 6. Distance above the summer water table height is not relevant. Winter is.

Agreed.

QUESTION 35

The proposal has failed to address off-site impacts of the proposal, eg. cleanup of contaminated groundwater procedures? What do you propose to do to clean up groundwater (p13, Appendix 4).

Comments on existing groundwater pollution off-site are given on page 17 of the PER. The proponent is of the opinion that they are not responsible for pollution that was produced prior to their ownership of the land and thus does not propose any cleanup of contaminated waters downgradient of the site.

QUESTION 36

P10, 2nd paragraph. Sandpit. What is the extent of the former pit and impact of pollutants. What remedial action is needed? What relation does this have to Table 3.4 as indicated in the text.

Aerial photography has shown that the sandpit was relatively small and site inspection indicates that the minor wastes which were present have been removed. Heavy metals recorded in stained sands from the pit are most likely residues which have resulted from leaching of the waste material. It would be expected that minor amounts of leaching to the groundwater would occur from this material. Sands with a high metal content will be removed from this location.

QUESTION 37

P10, 1st paragraph. Liming ponds. Residue. What is the impact of pollutants. What remedial action is needed. What relation does this have to Table 3.4 as indicated in the text?

Liming pond residues contain elevated levels of heavy metals. The alkali nature of these wastes means that they are less likely to leach metals into the groundwaters. However health of people may be put at risk if they were to have prolonged contact with the material. For this reason and for complete site cleanup the material will be removed.

QUESTION 38

Figure 4 of Appendix 4. Rockwater Pty Ltd Report. Why was bore TP2A abandoned? What was the bore between TP1 and TP2 for?

TP2A was drilled as part of the program to investigate pollution of groundwaters beneath the dump. At the time of drilling the operator was unsure that he had reached the base of the aquifer as the layer of clay at its base was found to be relatively thin. Rather than continue on he decided to drill another hole adjacent to TP2A. This was developed as a bore and used to sample groundwater.

QUESTION 39

P12, Appendix 4. Rockwater. Is it proposed to reduce oxidation of the pyrites?

NOT APPLICABLE

QUESTION 40

P10, Appendix 4. Because of capillary action the 0.5m clearance between the water table and wastes is considered minimal. The GRC Report indicates clearance of 0.3m as resulting from the proposed table (P11, GRC).

NOT APPLICABLE

QUESTION 41

P11, GRC 6.1. More observation bores are recommended.

NOT APPLICABLE

QUESTION 42

P1, GRC. Items 12.5 and 1.6 should be addressed.

The groundwater investigation performed by Rockwater identified some pollution of waters that most likely did not originate on the Tonkin Industrial Park site. the proponent is satisfied that the pyrites dump is polluting the unconfined aquifer beneath the site and is prepared to remedy the problem but is of the opinion that their responsibility does not extend to other pollution problems in the area.

QUESTION 43

Paragraph 3. P2, GRC. Is it reasonable to assume zero recharge considering road verges and landscaping areas and leakage from the drainage system.

NOT APPLICABLE

QUESTION 44

P15, paragraph 5. What about works off site to rectify groundwater problems, both downstream and upstream.

Refer to Question 35.

QUESTION 45

P18. Disclaimer of responsibility for pollutants already in the groundwater is not accepted unless CSBP or the Government accept full responsibility and undertake to rectify the problems.

Refer to Question 35.

QUESTION 46

P20. Reference to "service/commercial activities" in paragraph 1 should be deleted.

The text now reflects this.

QUESTION 47

P20, paragraph 2. The proposed services trenches will hinder the flexi-lot principle. The flexi-lots approach has not been accepted by Council.

The flexi-lot approach is a readily accepted method of industrial site development. Lot sizes are tailored to a particular purchaser's requirements. The service trenches will not hinder this approach as development can occur over them.

QUESTION 48

P20, paragraph 5. The current zoning is being modified to exclude non-industrial uses unless they are incidental to an industrial process.

Land use will conform to present zoning. Any variation will require Council approval.

QUESTION 49

P20, paragraph 6. "Service Commercial" should read "Service Industry".

Service Commercial should read Service Industry.

QUESTION 50

P20, paragraph 7. Northcorp has agreed to the allocation of 59% POS in the vicinity of the Rail Museum.

Questions should read 5% not 59%. Public Open Space has been agreed to with Bassendean Town Council as per attached plan.

QUESTION 51

S6, p23, paragraph 2. "If there is no effective and practical means of ensuring all lots maintain a significant sealed area in the longer term"; then how can the longer term success of this drainage system be guaranteed? If significant flows of water do penetrate it will still percolate slowly through the blanket and/or create a new water table that will be almost at the surface level especially considering the sand fill is proposed to be only 300mm in places.

NOT APPLICABLE

QUESTION 52

P23. Many matters remain unresolved relating to the alkaline blanket. The whole proposal is dependent on this uncertainty.

NOT APPLICABLE

QUESTION 53

P24(f). 1m minimum.

NOT APPLICABLE

QUESTION 54

P25, paragraph 8. What is the effect downstream of lime dosing effluent water. P26, paragraph 2. Under what circumstances would outflow treatment be required. What action would be taken. Who would be responsible in the long term, WAWA?

NOT APPLICABLE

QUESTION 55

P27, paragraph 9. Practicality to be discussed.

NOT APPLICABLE

QUESTION 56

How will the subsoil drains be protected against contamination and blockage from oil and other industrial wastes put down the drainage system?

This is a normal situation in any industrial development. The use of a combined drainage system facilitates any cleaning and maintenance necessary. All entry points to the drainage system will be trapped to control inflowing water quality.

QUESTION 57

P29. No parameters are specified as to what is acceptable levels of pollutants and how much this maintenance will cost Council. Should Council accept this responsibility? How much should be set aside for the drainage system replacement and when will it need replacing. Paragraph 2 states that the Chapman Street drain should receive priority in maintenance. Does this mean that it is the weak link in the system and that it can not cope unless in perfect order?

NOT APPLICABLE

QUESTION 58

P29, paragraph 6. Please specify the approved landfill site referred to in various sections of the report. How does Council guarantee its use by service authorities and lot developers? (p27, paragraph 3) (p28, paragraph 6). All building rubble is to be removed to that site.

The Department of Health will need to be consulted before any material from the Tonkin Industrial Park is disposed of in an approved landfill site. The Department of Health will nominate the secure landfill to be used after they have been notified.

Removal of the rubbish which is intermingled with the pyrites will occur as part of the proposed site cleanup.

QUESTION 59

P29, paragraph 7 and p30. Surely monitoring of the groundwater should be done in perpetuity. This will be particularly important in 50 years plus when the system is likely to fail. The first sign of failure should not be a poisoned lake on the Ashfield Flats.

Is Bassendean prepared to take on the monitoring role in perpetuity?

What happens if the monitoring programme proves that the system is failing. What standards will be monitoring programme be measured against?

NOT APPLICABLE

QUESTION 60

P30. The location of the existing bores and proposed bores should be specified in relation to the proposed subdivision. How is access to the bores going to be guaranteed in perpetuity. How will the bores be protected during the development process?

What bores from outside the Tonkin Industrial Park are to be tested? What are the results of the tests done to date on these bores?

NOT APPLICABLE

QUESTION 61

P31 Conclusions. The viability of the proposed method of coping with the wastes is far from being proven.

NOT APPLICABLE

APPENDIX 3

LIST OF INDIVIDUALS AND ORGANISATIONS WHO MADE SUBMISSIONS

1. The Royal Australian Institute of Chemical Engineers.
2. The Department of Mines (Explosives and Dangerous Goods).
3. The Department of Mines (Chemistry Centre).
4. The Swan River Trust.
5. The Conservation Council of Western Australia.
6. Water Authority of Western Australia.
7. The Town of Bassendean.
8. Health Department of Western Australia.
9. Dr G A Christos
   1 Kathleen Street
   BASSENDEAN WA 6054