Debottlenecking of Ammonia Plant from 650 tpd to 745 tpd, Kwinana Industrial Area, Change to Environmental Conditions

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CSBP Limited

Section 46 Report and Recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1125
February 2004

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
13 Oct 03	**Level of Assessment set**	
4 Dec 03	**Final Proponent Document Submitted**	**7 weeks**
7 Jan 04	**Site Visit and Briefing by CSBP**	**5 weeks**
10 Feb 04	**Advice received from other agency**	**5 weeks**
23Feb 04	**EPA report to the Minister for the Environment**	**2 weeks**

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Contents

1. Introduction and background

The Minister for the Environment has requested the Environmental Protection Authority (EPA) to consider and provide advice under Section 46(3) of the *Environmental Protection Act 1986* (EP Act) on CSBP Limited's (CSBP) proposal to debottleneck their Ammonia Plant from 650 to 745 tonnes per day (tpd).

Background

In 1998, CSBP received approval to construct and operate a 650 tpd Ammonia Plant (Bulletin 885 and Statement 470). The Ammonia Plant was subsequently commissioned in April 2000.

In March 2003, the EPA provided advice in Bulletin 1094 (EPA, 2003) on changes to the environmental conditions to include ammonia input and export. These changes were subsequently adopted in Statement 624 which was issued on 16 May 2003.

In June 2003, CSBP advised the EPA of their proposal to debottleneck the Ammonia Plant from 650 tpd to 780 tpd in two stages. In July 2003, the Minister for the Environment requested that the EPA inquire into CSBP's proposed changes to the environmental conditions and report under Section 46 (3) of the EPA Act.

After further detailed consideration, CSBP has decided to proceed only with stage one of the debottlenecking proposal which would increase production from 650 to 745 tpd.

References are listed in Appendix 1. Environmental Condition Statement 624, published on 16 May 2003 is presented in Appendix 2. The recommended conditions and procedures and proponent's commitments are provided in Appendix 3.

2. The proposal

The proposal is to increase the nominal production capacity of the Ammonia Plant from 650 to 745 tpd. No new equipment would need to be installed but some existing components would be upgraded to improve efficiency and/or throughput to achieve the increased production capacity. CSBP are also seeking approval to allow access to alternative sources of water such as from the Kwinana Wastewater Recycling Plant (KWRP).

Table 1 summarises the key project characteristics of the approved project and proposed extension. A detailed description of the proposal is provided in Section 4 of the Section 46 referral document (CSBP, 2003).

Table 1: Summary of proposed project extension

Project characteristic	**Current approved project**	**Proposed extension**
Ammonia Production	650 tpd	745 tpd
Natural Gas Consumption	7.6 – 8.1 Petajoules/year	8.7 – 9.3 Petajoules/year
CO_2 emission	1200 tpd	1400 tpd
NOx emissions	350 kg/d	350 kg/d
Water Source	recirculated treated sub artesian water	recirculated sub artesian and/or superficial aquifer and/or KWRP and/or scheme water

3. Environmental factors

The debottlenecking results in the following changes:

Greenhouse gas – the plant is of modern efficient design (i.e. low greenhouse gas emissions per unit of ammonia) and with the increased ammonia production, there would be a proportionate increase in CO_2 emissions from 1170 to 1341 tpd. However, the EPA notes that the alternative of importing ammonia to meet the domestic demand would result in higher greenhouse gas emissions per unit of ammonia.

Air emissions – there would be a proportionate increase in NO_X from 243 to 279 kilograms per day (kg/d), however this is still within the 350 kg/d load limit imposed by the existing Department of Environmental Protection (DEP) Licence.

Risk – the Quantitative Risk Assessment (QRA) undertaken for the upgrade shows negligible change to the risk profile of the plant. The Department of Industry and Resources has advised that the QRA is acceptable.

Noise – detailed noise modelling shows there would be a negligible increase in noise levels.

Marine discharge of phosphorus/nitrogen – there would be a negligible increase in discharge and any increase is within the existing DEP Licence limits.

Having considered the above, it is the EPA's opinion that its inquiry into the proposed debottlenecking of the Ammonia Plant raises no significant environmental factors which require detailed evaluation.

As such, the EPA considers the proposal can be managed to meet its environmental objectives.

4. Conditions and commitments

Section 46(3) of the EP Act requires the EPA to report to the Minister for the Environment on whether or not the proposed changes to conditions or procedures should be allowed. In addition, the EPA may make recommendations as it sees fit.

Since the existing environmental conditions constrain the Ammonia Plant to 650 tpd, the conditions need to be revised to allow the increased production. The EPA notes the conditions were recently revised in May 2003 and only minor changes are needed to bring them up to date. As such, the EPA recommends that if the proposal by CSBP is approved for implementation, the existing Ministerial Conditions applied to the project (Statement 624 published on 16 May 2003), be subject to modifications necessary to:

- allow ammonia production of 745 tpd,
- allow alternative water sources.

The amended conditions and amended Consolidated Commitments statement are presented in Appendix 3.

5. Conclusion

This report is the response of the EPA to the Minister for the Environment's request that the EPA inquire into CSBP's proposed changes to the environmental conditions and report under Section 46 (3) of the EP Act.

The EPA notes that the debottlenecking of the Ammonia Plant raises no significant environmental matters, and as such, the EPA has prepared draft environmental conditions that would accommodate the increased ammonia production.

6. Recommendations

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

1. That the Minister notes that this report is pursuant to Section 46(3) of *the Environmental Protection Act 1986* and thus is limited to consideration of proposed changes to the original conditions.
2. The Minister notes that the proposed change is to enable CSBP to debottleneck the Ammonia Plant and increase production from 650 to 745 tpd.
3. The EPA recommends that the Minister considers the report that the proposal raises no significant environmental factors as set out in Section 3.
4. That the Minister notes that the EPA has concluded that the modified proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environmental provided there is satisfactory implementation by the proponent of the amended conditions, including the proponent's commitments, as set out in Section 4.
5. The Minister imposes the amended conditions, commitments and procedures recommended in Appendix 3 of this report.

Appendix 1

References

CSBP (2003). *Kwinana Ammonia Plant Debottlenecking Project*, CSBP, ATA Environmental, December 2003.

EPA (2003). *Kwinana Ammonia Project, Kwinana Industrial Area, Change to Environmental Conditions to Allow Ammonia Export*, Bulletin 1094, Government of Western Australia, March 2003.

Appendix 2

Statement of Environmental Conditions of Approval (16 May 2003)

Statement No.

MINISTER FOR THE ENVIRONMENT AND HERITAGE 000624

STATEMENT TO AMEND CONDITIONS APPLYING TO PROPOSALS (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA
(Including Storage*, Import* and Export of Ammonia)

Note: Asterisks indicate that these components have been included from the PROPOSED AMMONIA-UREA PLANT AT KWINANA (Statement No. 034)

Proponent: Wesfarmers CSBP Limited

Proponent Address: PO Box 345, Kwinana WA 6966

Assessment Number: 1468

Previous Assessment Numbers: 020 and 1140

Previous Statement Numbers: Statement No. 034 published on 2 August 1988, Statement No. 470 published on 18 March 1998.

Report of the Environmental Protection Authority: Bulletin 1094

Previous Reports of the Environmental Protection Authority: Bulletins 309 and 882.

The above proposals, with the exception of the manufacture of ammonia-urea (as referred to in Ministerial Statement No. 034 – See note 3 at the foot of this statement), are now subject to the following conditions and procedures which consolidate and replace all previous conditions and procedures relating to ammonia production, storage and import/export:

Procedural conditions

1 Implementation and Changes

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

Published on

16 MAY 2003

1-2 Where the proponent seeks to change any aspect of the proposals as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposals as documented in schedule 1 of this statement in any way that the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of the conditions in this statement.

3 Proponent Nomination and Contact Details

3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposals until such time as the Minister for the Environment and Heritage 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 proposals.

3-2 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 proposals 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 proposals shall also be provided.

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

4 Commencement and Time Limit of Approval

4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the modified proposals have been substantially commenced or the approvals granted in the statements published on 2 August 1988 and 18 March 1998 shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposals have been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the modified proposals beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposals 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 and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the modified proposals.

Environmental conditions

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

1. the implementation of the proposals as defined in schedule 1 of this statement;
2. evidence of compliance with the conditions and commitments; and
3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposals are implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

5-2 The proponent shall submit a performance review report every five years after the start of the operations phase, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;

2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;

3. significant improvements gained in environmental management, including the use of external peer reviews;

4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

5. the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Decommissioning Plans

6-1 Prior to construction, the proponent shall prepare a Preliminary Decommissioning Plan, which provides the framework to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The Preliminary Decommissioning Plan shall address:

1. rationale for the siting and design of plant and infrastructure as relevant to environmental protection, and conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;

2. a conceptual rehabilitation plan for all disturbed areas and a description of a process to agree on the end land use(s) with all stakeholders;

3. a conceptual plan for a care and maintenance phase; and

4. management of noxious materials to avoid the creation of contaminated areas.

6-2 At least six months prior to the anticipated date of decommissioning, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Decommissioning Plan designed to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

The Final Decommissioning Plan shall address:

1. removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;

2. rehabilitation of all disturbed areas to a standard suitable for the agreed new land use(s); and

3. identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

6-3 The proponent shall implement the Final Decommissioning Plan required by condition 6-2 until such time as the Minister for the Environment and Heritage determines, on advice of the Environmental Protection Authority, that the proponent's decommissioning responsibilities have been fulfilled.

6-4 The proponent shall make the Final Decommissioning Plan required by condition 6-2 publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7 Work Practices

7-1 Prior to commencement of construction, the proponent shall submit a written prescription for contractor work practices covering plant and pipeline construction and operation, to ensure that work practices are carried out at the level of international best practice, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

7-2 The proponent shall ensure that the prescription of work practices required by condition 7-1 is implemented, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

Notes

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

2 A Works Approval and Licence are required for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

3 The conditions applicable to the manufacture of ammonia-urea (Statement No. 034, Proposed Ammonia-urea Plant at Kwinana) are to be amended under Section 46 of the *Environmental Protection Act 1986* and issued as a separate statement.

Judy Edwards

Dr Judy Edwards MLA
MINISTER FOR THE ENVIRONMENT AND HERITAGE

16 MAY 2003

PROPOSALS

Schedule 1

The new ammonia plant will be located immediately to the east of the existing ammonia plant at the CSBP site, within the Kwinana Industrial Area (attached Figures 1 and 2).
The ammonia project involves construction and operation of:

- a new 650 tpd or 225,000 tpa ammonia plant; and
- ancillary equipment to support the ammonia plant including:
    - installation of a 25 tonne per hour (tph) natural gas fuelled steam boiler for use during plant start-up and shutdown operations;
    - "polishing water unit" to produce boiler quality feed water by treating demineralised water from an existing CSBP water treatment plant; and
    - a cooling water tower.

The plant will be integrated with a number of existing CSBP facilities during its operation (attached Figure 3).

This project includes import and export of ammonia, but does not include the transport and distribution of ammonia throughout the State. The preliminary layout of the components of the plant is shown in Figure 4 (attached).

The general arrangement of the plant will include the following sections:

1 reforming;
2 synthesis loop;
3 carbon dioxide removal;
4 heat exchange/cooling;
5 water polishing unit;
6 ammonia synthesis;
7 power generation;
8 process and motor control centre;
9 refrigeration;
10 groundwater bore; and
11 storage.

The main characteristics of the proposal are summarised in Table 1 (attached). The new ammonia plant will incorporate the Haldor Topsøe technology, for which a licence was made available to CSBP by Technipetrol SpA of Italy.

The process flow diagram (attached Figure 5) shows various stages of the ammonia production process, which include:

1 desulphurisation of natural gas feed (methane);
2 reforming of methane and steam to carbon monoxide and hydrogen;
3 shift conversion of carbon monoxide to carbon dioxide;
4 removal of carbon dioxide by absorption;
5 purification of "synthesis gas" by methanation;
6 compression of the "synthesis gas";
7 synthesis of ammonia from "synthesis gas"; and
8 refrigeration and storage of ammonia.

Following commissioning and stabilisation of the new plant, the existing plant will be shut down and in due course dismantled.

PROPOSAL TABLE AND FIGURES (Assessment No. 1468)

Table 1: Key Proposal Characteristics

Proposal Characteristics	Unit	Ammonia Plant (including storage and import/export)
Capacity	tonnes per day NH_3	650
	tonnes per annum NH_3	225,000
Natural Gas Consumption	Gigajoules/tonne NH_3	32 - 34
	Petajoules/year	7.4
Water Consumption	tonnes per day	6,000 (make-up)
Location	-	CSBP Kwinana
Gaseous emissions:		
NO_x (as NO_2)	kilograms/tonne NH_3	0.54
	kilograms/day	350
CO_2	tonnes/tonne NH_3	1.8
	tonnes per day	1,200
Fugitive Gases:-		
• NH_3	-	flared
• H_2	-	flared
Aqueous discharge:		
Cooling System (including polishing unit blowdown)	-	recirculating treated sub-artesian water
Flow	tonnes per day	2,100
Heat Load	-	mainly to atmosphere
Nitrogen	kilograms/day	6 - 10
Phosphorus	kilograms/day	6
Oily water	-	de-oiled to contain less than 30 parts per million of oil
Noise at boundaries	59 dB(A) at BP boundary	will comply with regulations
Ammonia storage	No.1 tank	10,000 tonnes
	No. 2 tank	30,000 tonnes
Ammonia transfers (import/export)	Transfers per calendar year	Maximum of 9 transfers

Figures (attached)

Figure 1 – Location map
Figure 2 – Ammonia plant location
Figure 3 – Project integration with existing CSBP facilities
Figure 4 – Ammonia plant layout
Figure 5 – Process flow chart

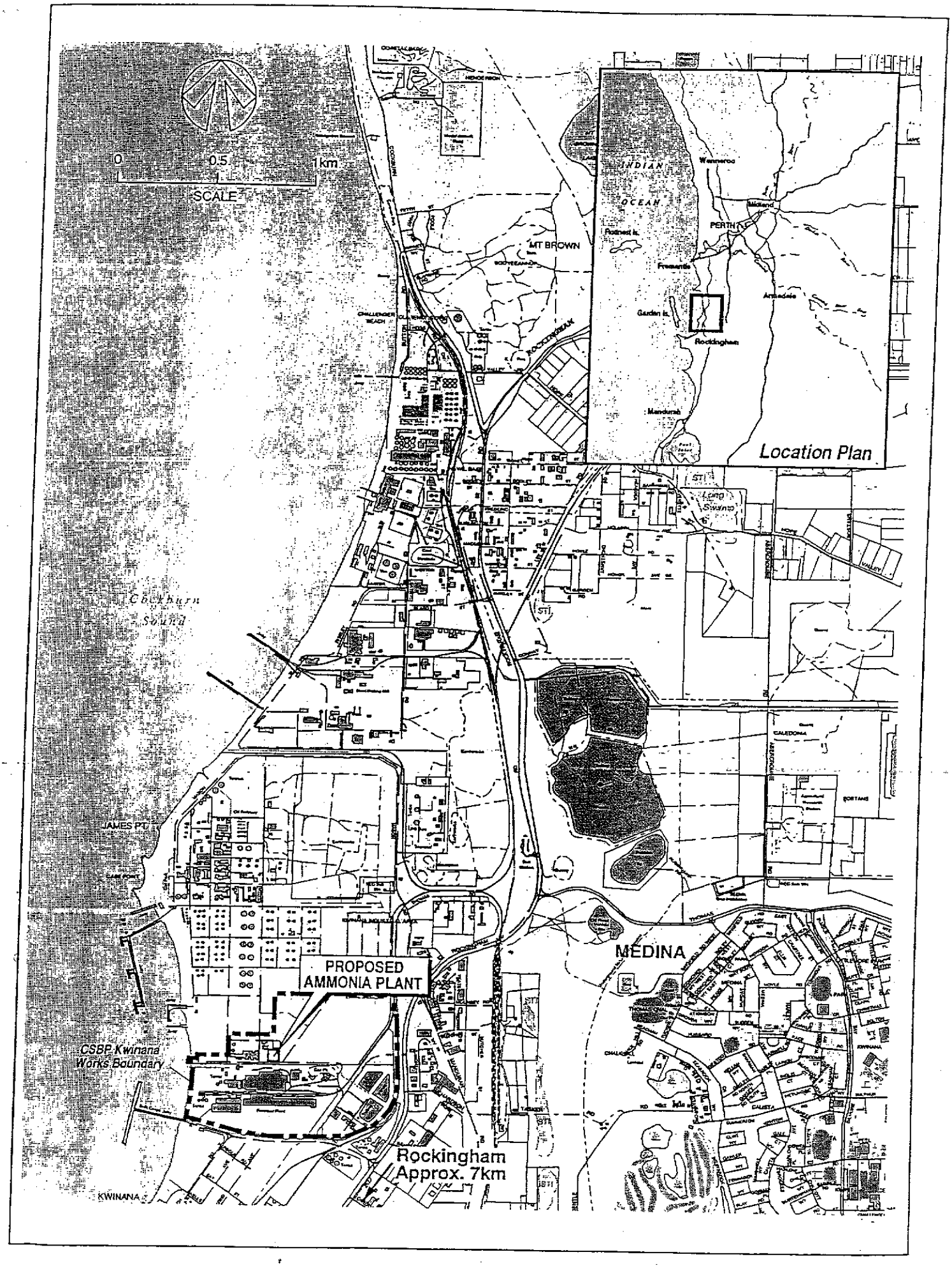


Figure 1. Location map.

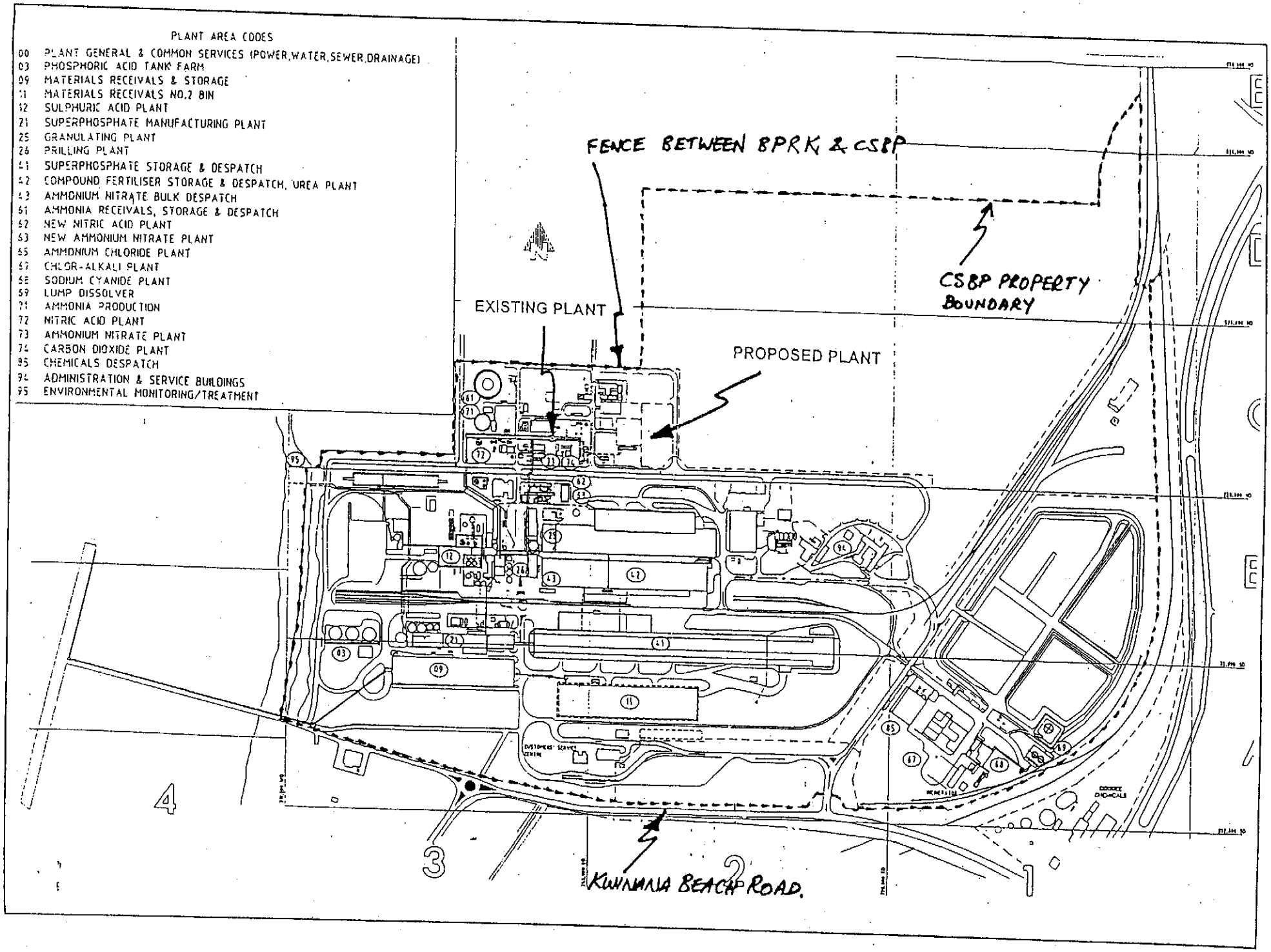


Figure 2. Proposed ammonia plant location

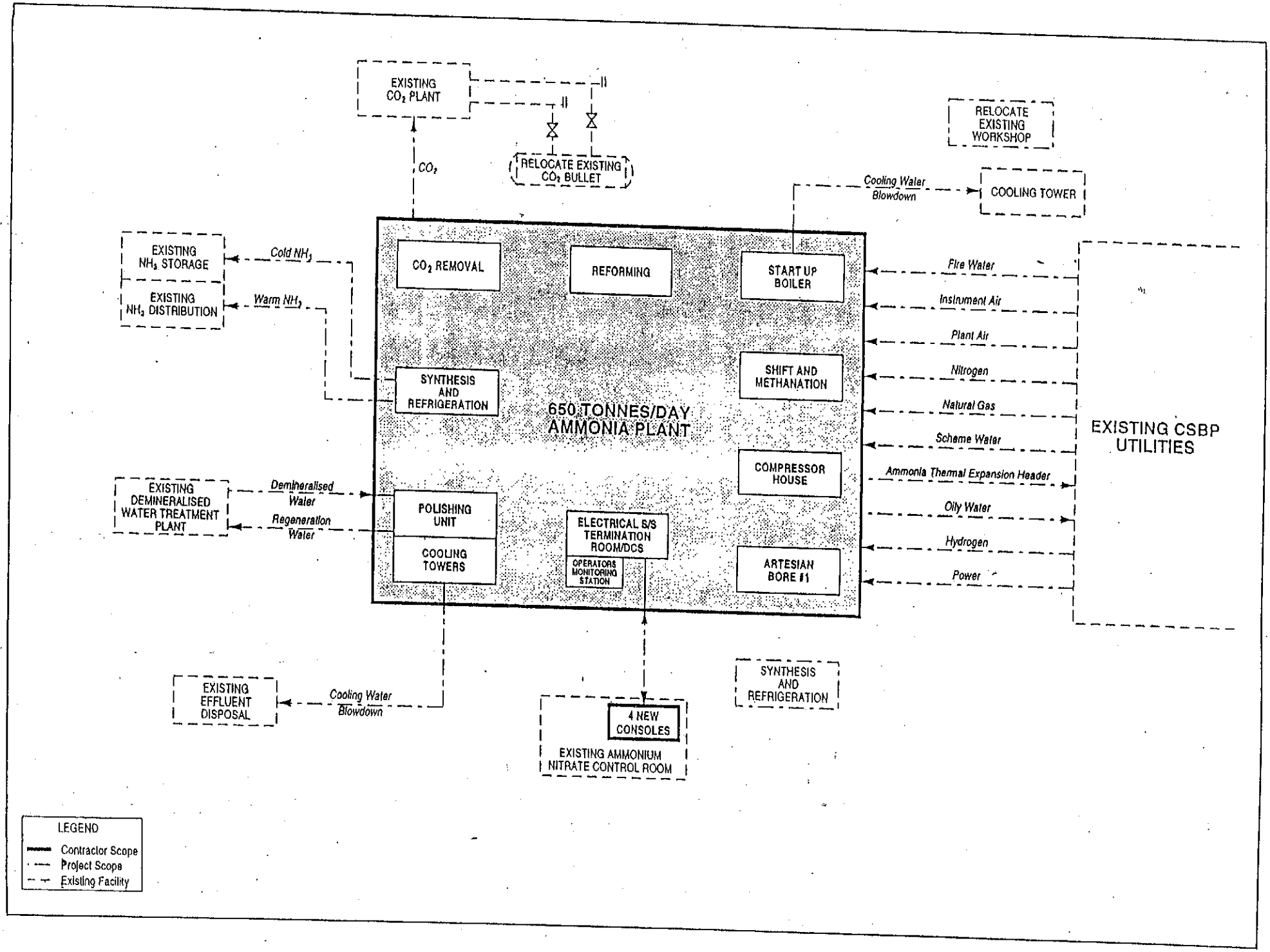


Figure 3. Project integration with existing CSBP facilities

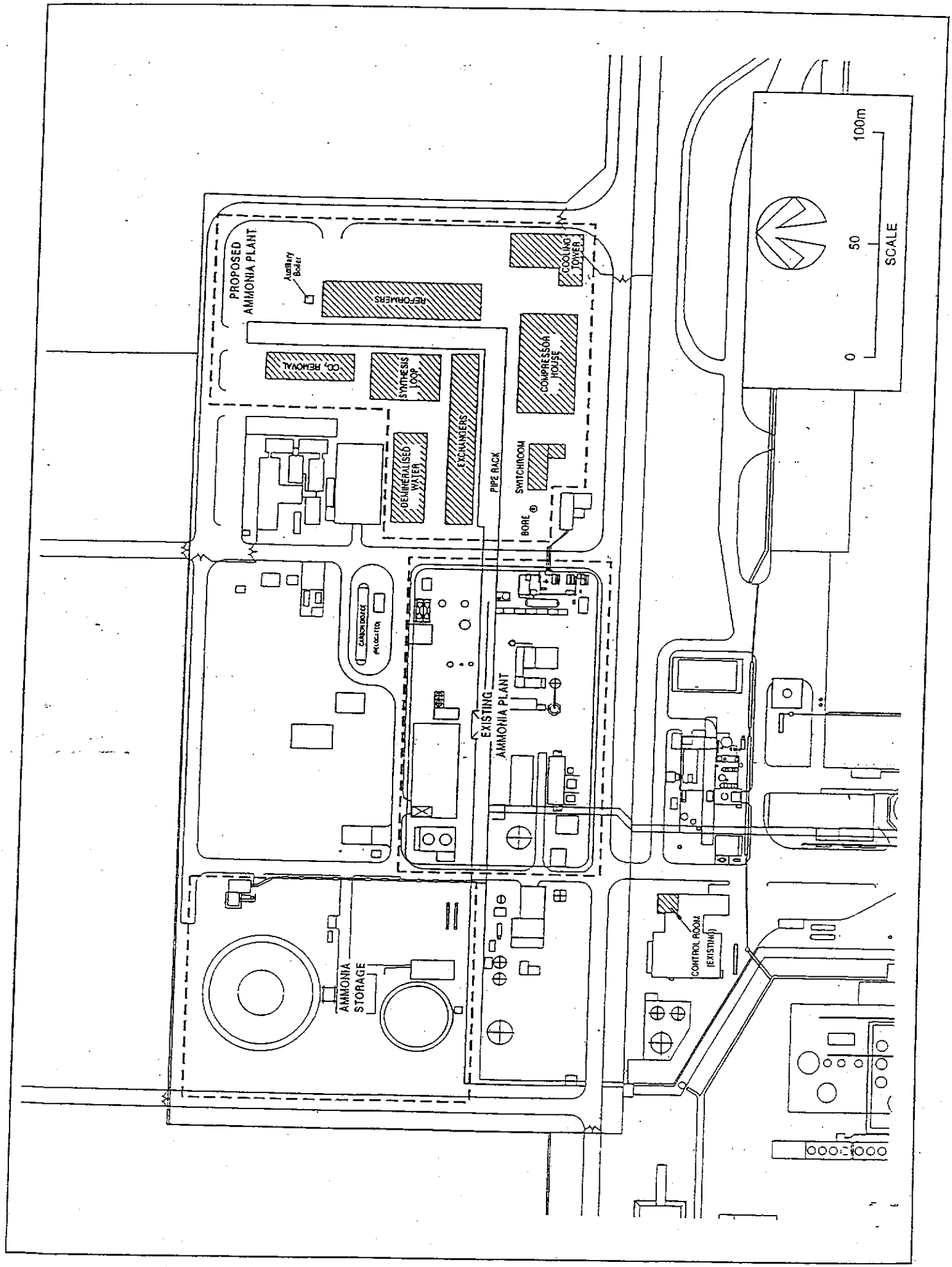
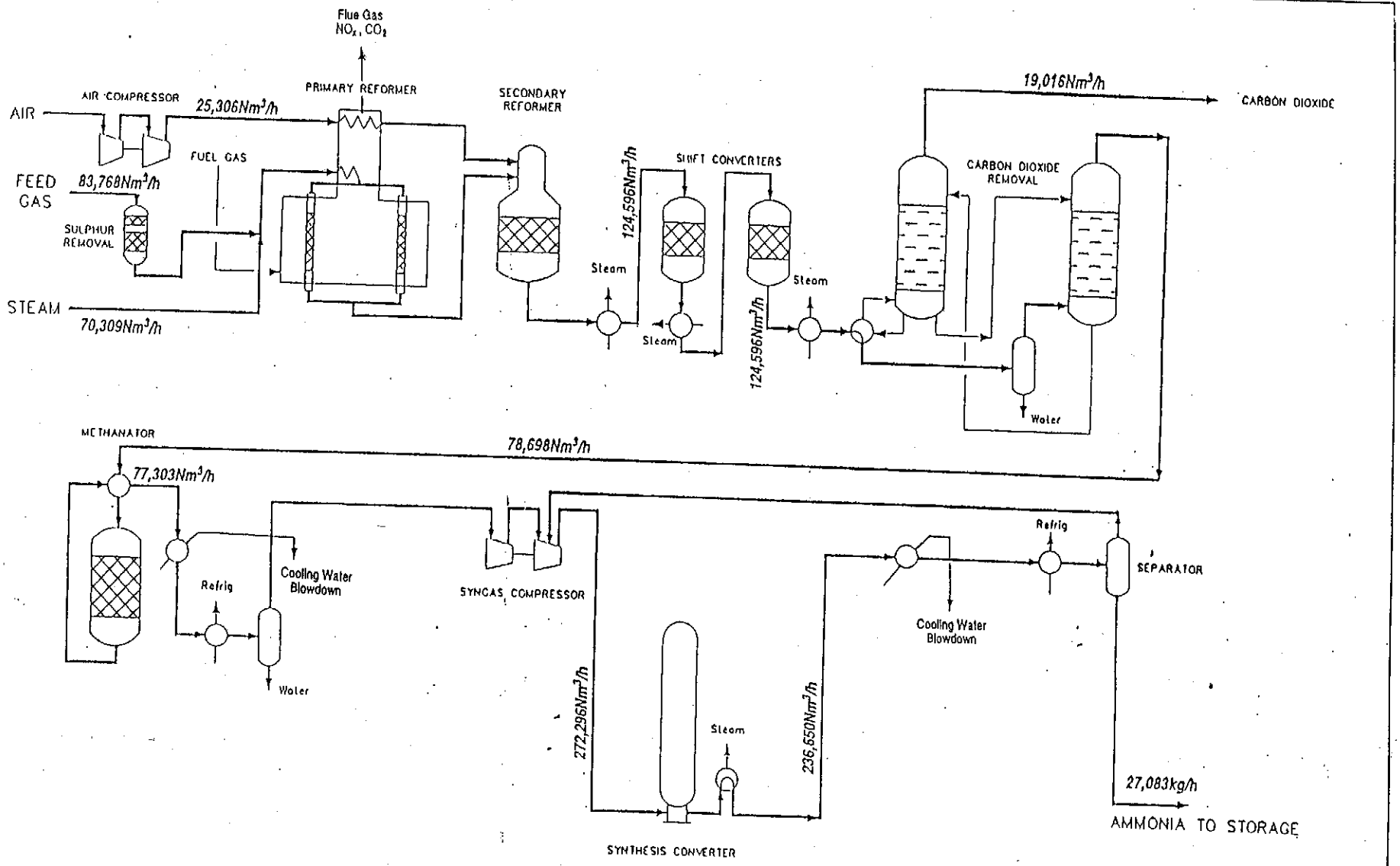


Figure 4. Proposed ammonia plant layout.



NOTES:

Nm^3/h denotes normal cubic metres per hour. (at 0°C, 760mmHg)

kg/h denotes kilograms per hour.

Data supplied by CSBP.

Figure 5. Process flow chart

Schedule 2

Proponent's Consolidated Environmental Management Commitments

26 March 2003

KWINANA AMMONIA PROJECT
KWINANA INDUSTRIAL AREA
(Assessment No. 1468)

WESFARMERS CSBP LIMITED

SCHEDULE 2

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA (Including Storage, Import and Export of Ammonia) – 26 March 2003 (Assessment No. 1468)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment and number;
- the objective of the commitment;
- the "action" to be undertaken by the proponent;
- the timing requirements of the commitment;
- the body/agency to provide technical advice to the Department of Environmental Protection; and
- the measurement/compliance criteria.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
Minimize the impacts of discharges of phosphorus and nitrogen from the plant.	To protect the biota and amenity of Cockburn Sound.	• By selecting processes and equipment which give rise to the lowest discharges of nitrogen and phosphorus. (The selection of cooling water treatment process is of particular significance). • By continuing the implementation of measures to reduce discharges from other sources on CSBP's Kwinana site.	• Before construction • By 1 January 2000		• Confirmation of advice on expected nitrogen and phosphorus discharges contained in the CER. • Monitoring and reporting site discharges as required under current licence conditions
Seek to reduce discharges of greenhouse gases from the plant.	To minimize the effects of global warming arising from the discharge of Greenhouse gases to the atmosphere.	• By implementing commercially viable opportunities to recover and reuse CO_2 discharged from the plant. • By incorporating, where practicable, advances in ammonia catalyst technologies which reduce the generation of CO_2 from the production of ammonia.	• Ongoing • Ongoing	Greenhouse Challenge Office (Federal Government).	• Include new ammonia plant in annual reporting of Greenhouse Gas inventories.
Ensure that noise generated from the Kwinana Ammonia Project will not exceed current regulations.	To maintain the amenity of nearby industrial, residential and recreational areas.	• By specifying the procurement of equipment which complies with current requirements. • By conducting noise surveys of the operating plant and implementing noise abatement measures if non-compliance is detected.	• Before construction • Within 6 months of commissioning		• Reporting of results of surveys and agreeing plans to achieve attenuation if required.
Minimize the risk to the community arising from the operation of the plant.	To protect the nearby communities from exposure to unacceptable levels of risk to health and safety.	• By preparing and implementing a comprehensive Safety Management System (SMS) for the operation of the plant. • By incorporating risk reduction measures recommended by Quantarisk into plant design.	• Before commissioning • Completed as at 1/1/1998	DoIR	• Approval of the SMS** by relevant authorities. • Regular independent audit of compliance with the SMS** reported to the DoIR.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
Minimize the risk to persons involved in construction of the plant from the operation of adjacent plants on the Kwinana site.	To protect the health and well being of people employed in the construction of the plant.	• By preparing and implementing a Construction Safety Management Plan.	• Before construction	DoIR	• Auditing and reporting as required by the plan.
Revise the preliminary risk assessment for the project.	To demonstrate compliance with EPA criteria at fenceline with BP and reduction of cumulative risk level for whole CSBP site.	• Revise preliminary risk assessment and include knock-on effects, loss of control releases, mitigation measures to meet ALARP*, sensitivity analysis with respect to probit equations and weather data.	• Before construction	DoIR	• The EPA's criteria for individual fatality risk off-site.
Conduct a final quantified risk assessment on the project.	To confirm that the final plant design meets EPA risk criteria and that there is a reduction in risk for the whole CSBP site.	• Conduct final risk assessment taking into account final plant design.	• Before commissioning	DoIR	• The EPA's criteria for individual fatality risk off-site.
Decommission the existing ammonia plant, following commissioning and stabilisation of the new plant.	To ensure that decommissioning is carried out in an environmentally acceptable manner.	• Prepare and implement a Decommissioning Management Plan.	• At least 6 months before decommissioning		• The EPA's requirement.
Limit ammonia import/export operations to no more than 9 transfers per annum.	To protect nearby industry, public recreation areas and communities from unacceptable safety impacts.	• Ensure effective testing and maintenance procedures in line with the SMS • Include in the Ammonia Safety Report	• Ongoing	DoIR	• No more than 9 operations in a calendar year.

GEND

As Low As Reasonably Practicable.
Safety Management System.
Ammonia Import/Export Sensitivity Analysis, Det Norske Veritas, January 2003

R – Consultative Environmental Review
R – Department of Industry and Resources
A – Environmental Protection Authority
S – Safety Management System

Appendix 3

Recommended Environmental Conditions and Proponent's Consolidated Commitments

Statement No.

STATEMENT TO AMEND CONDITIONS APPLYING TO PROPOSALS (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA
(Including Storage*, Import* and Export of Ammonia)

Note: Asterisks indicate that these components have been included from the PROPOSED AMMONIA-UREA PLANT AT KWINANA (Statement No. 64X)

Proponent: CSBP Limited

Proponent Address: PO Box 345, Kwinana WA 6966

Assessment Number: 1492

Previous Assessment Numbers: 020, 1140 and 1468

Previous Statement Numbers: Statement No. 034 published on 2 August 1988,
Statement No. 470 published on 18 March 1998,
Statement No. 624 published on 16 May 2003, and
Statement No. 64X published on XX February 2004.

Report of the Environmental Protection Authority: Bulletin 1125

Previous Reports of the Environmental Protection Authority: Bulletins 309, 882 and 1094.

The above proposals, with the exception of the manufacture of ammonia-urea (as referred to in Ministerial Statement No. 64X – See note 3 at the foot of this statement), are now subject to the following conditions and procedures which consolidate and replace all previous conditions and procedures relating to ammonia production, storage and import/export:

1 Implementation and Changes

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

1-2 Where the proponent seeks to change any aspect of the proposals as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposals as documented in schedule 1 of this statement in any way that the Minister for the Environment

determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of the approval of the Minister for the Environment.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

3 Proponent Nomination and Contact Details

3-1 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 proposals 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 proposals.

3-2 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 proposals 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 proposals shall also be provided.

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

4 Commencement and Time Limit of Approval

4-1 The proponent shall substantially commence the modified proposals within four years of the date of this statement or the approvals granted in the statements published on 2 August 1988 and 18 March 1998 shall lapse and be void.

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

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the modified proposals beyond four years from the date of this statement to the Minister for the Environment, prior to the expiration of the four-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposals 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 modified proposals.

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program and submit compliance reports to the Department of Environmental Protection which address:

1. the status of implementation of the proposals as defined in schedule 1 of this statement;

2. evidence of compliance with the conditions and commitments; and

3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

5-2 The proponent shall submit a performance review report every five years after the start of operations (August 2000), to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with the project; the targets for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;

2. the level of progress in the achievement of sound environmental performance over the last 5 years, including industry benchmarking, and the use of best available technology where practicable;

3. significant improvements gained in environmental management, including the use of external peer reviews where appropriate;

4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

5. the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Decommissioning Plans

6-1 Prior to construction, the proponent shall prepare a Preliminary Decommissioning Plan, which provides the framework to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The Preliminary Decommissioning Plan shall address:

1. rationale for the siting and design of plant and infrastructure as relevant to environmental protection, and conceptual plans for the removal or, if appropriate, retention of plant and infrastructure;

2. a conceptual rehabilitation plan for all disturbed areas and a description of a process to agree on the end land use(s) with all stakeholders;

3. a conceptual plan for a care and maintenance phase; and

4. management of noxious materials to avoid the creation of contaminated areas.

6-2 At least six months prior to the anticipated date of decommissioning, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Decommissioning Plan designed to ensure that the site is left in an environmentally acceptable condition to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The Final Decommissioning Plan shall address:

1. removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;

2. rehabilitation of all disturbed areas to a standard suitable for the agreed new land use(s); and

3. identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

6-3 The proponent shall implement the Final Decommissioning Plan required by condition 6-2 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's decommissioning responsibilities have been fulfilled.

6-4 The proponent shall make the Final Decommissioning Plan required by condition 6-2 publicly available, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

7 Work Practices

7-1 Prior to commencement of construction, the proponent shall submit a written prescription for contractor work practices in relation to environmental protection, covering plant and pipeline construction and operation, to ensure that work practices are carried out at the level of international best practice, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

7-2 The proponent shall ensure that the prescription of work practices required by condition 7-1 is implemented, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority", the Environmental Protection Authority will provide that advice to the Department of Environmental Protection for the preparation of written notice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the he Department of Environmental Protection.

Notes

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

2 A Works Approval and Licence are required for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

3 The conditions applicable to the manufacture of ammonia-urea have been amended under Section 46 of the *Environmental Protection Act 1986* and issued as a separate statement (Statement No. 64X, Proposed Ammonia-urea Plant at Kwinana).

Schedule 1

PROPOSALS

The ammonia plant is located immediately to the east of the old ammonia plant at the CSBP site, within the Kwinana Industrial Area (attached Figures 1 and 2).
The ammonia project involves construction and operation of:

- a 650 tpd (or 225,000 tpa) ammonia plant which will be debottlenecked to produce approximately 750 tpd (or approximately 275 000 tpa) of ammonia; and
- ancillary equipment to support the ammonia plant including:
    - installation of a 25 tonne per hour (tph) natural gas fuelled steam boiler for use during plant start-up and shutdown operations;
    - "polishing water unit" to produce boiler quality feed water by treating demineralised water from an existing CSBP water treatment plant; and
    - a cooling water tower.

The plant is integrated with a number of existing CSBP facilities during its operation (attached Figure 3).

This project includes import and export of ammonia through the Kwinana Ammonia Terminal, but does not include the transport and distribution of ammonia throughout the State. The layout of the components of the plant is shown in Figure 4 (attached).

The general arrangement of the plant includes the following sections:

1 reforming;
2 synthesis loop;
3 carbon dioxide removal;
4 heat exchange/cooling;
5 water polishing unit;
6 ammonia synthesis;
7 power generation;
8 process and motor control centre;
9 refrigeration;
10 groundwater bore; and
11 storage.

The main characteristics of the proposal are summarised in Table 1 (attached). The ammonia plant incorporates the Haldor Topsøe technology, for which a licence was made available to CSBP by Technipetrol SpA of Italy.

The process flow diagram (attached Figure 5) shows various stages of the ammonia production process, which include:

1 desulphurisation of natural gas feed (methane);
2 reforming of methane and steam to carbon monoxide and hydrogen;
3 shift conversion of carbon monoxide to carbon dioxide;
4 removal of carbon dioxide by absorption;
5 purification of "synthesis gas" by methanation;
6 compression of the "synthesis gas";
7 synthesis of ammonia from "synthesis gas"; and
8 refrigeration and storage of ammonia.

The old ammonia plant will be dismantled in due course.

PROPOSAL TABLE AND FIGURES (Assessment No. 1492)

Table 1: Key Proposal Characteristics

Proposal Characteristics	Unit	Ammonia Plant (including storage and import/export)
Capacity	tonnes per day NH_3	~750 nominal
	tonnes per annum NH_3	~275,000 nominal
Natural Gas Consumption	Gigajoules/tonne NH_3	32 – 35
	Petajoules/year	8.7 – 9.3
Water Consumption	tonnes per day	up to 6,000 (make-up) dependant on source
Location	-	CSBP Kwinana
Gaseous emissions:		
NO_X (as NO_2)	kilograms/tonne NH_3	0.374
	kilograms/day	350
CO_2	tonnes/tonne NH_3	1.8
	tonnes per day	1,400
Fugitive Gases:-		
• NH_3	-	flared
• H_2	-	flared
Aqueous discharge:		
Cooling System (including polishing unit blowdown)	-	recirculating treated sub-artesian water and/or superficial aquifer and/or Kwinana Wastewater Recycling Plant and/or scheme water
Flow	tonnes per day	
Heat Load	-	up to 2,100 depending on source mainly to atmosphere
Nitrogen	kilograms/day	
Phosphorus	kilograms/day	6 - 10
		6
Oily water	-	de-oiled to contain less than 30 parts per million of oil
Noise at boundaries	59 dB(A) at BP boundary	will comply with regulations
Ammonia storage	No.1 tank	10,000 tonnes
	No. 2 tank	30,000 tonnes
Ammonia transfers (import/export) through the Kwinana Ammonia Terminal	Transfers per calendar year	Maximum of 9 transfers

Figures (attached)

Figure 1 – Location map
Figure 2 – Ammonia plant location
Figure 3 – Project integration with existing CSBP facilities
Figure 4 – Ammonia plant layout
Figure 5 – Process flow chart

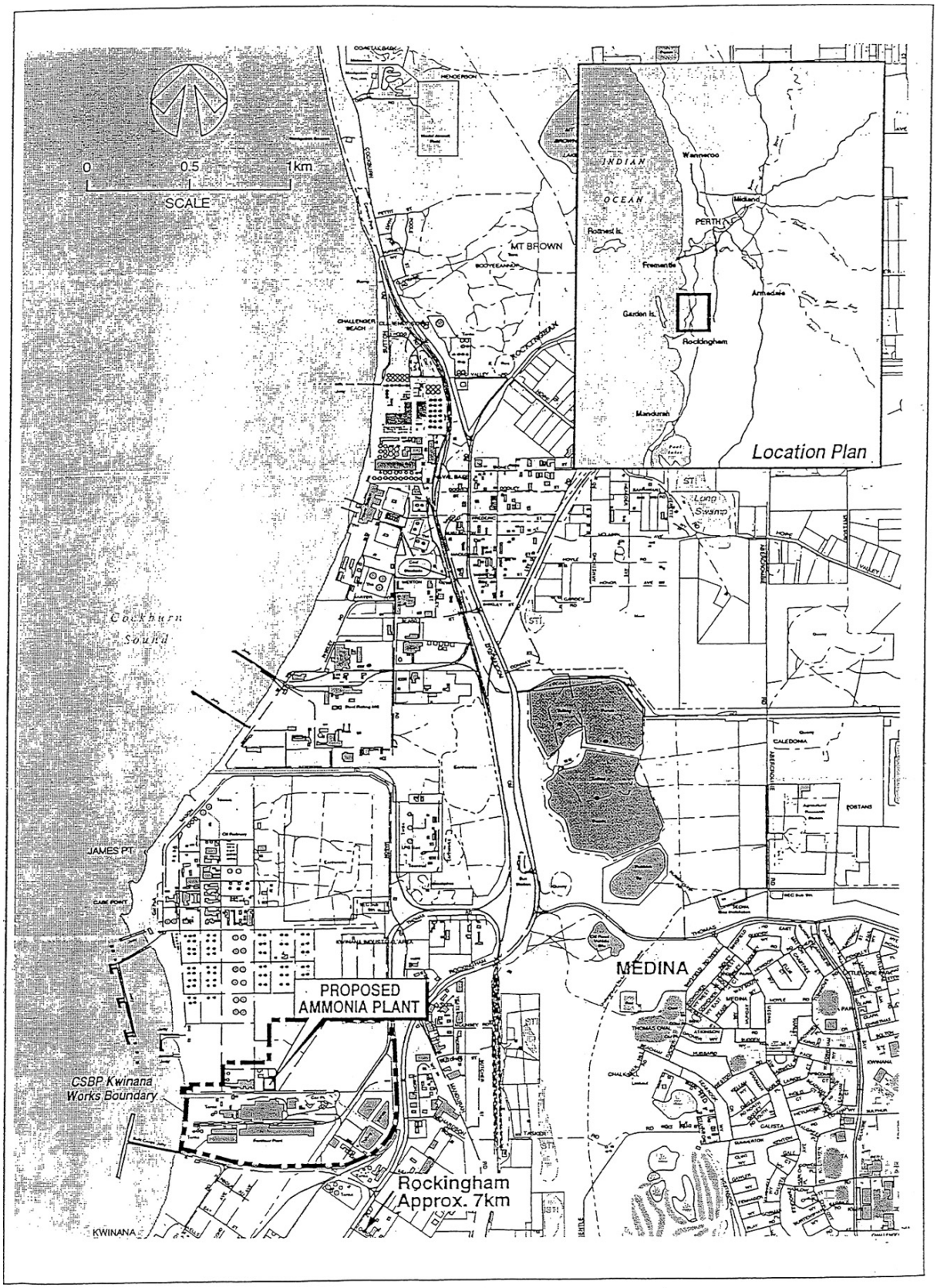


Figure 1. Location map.

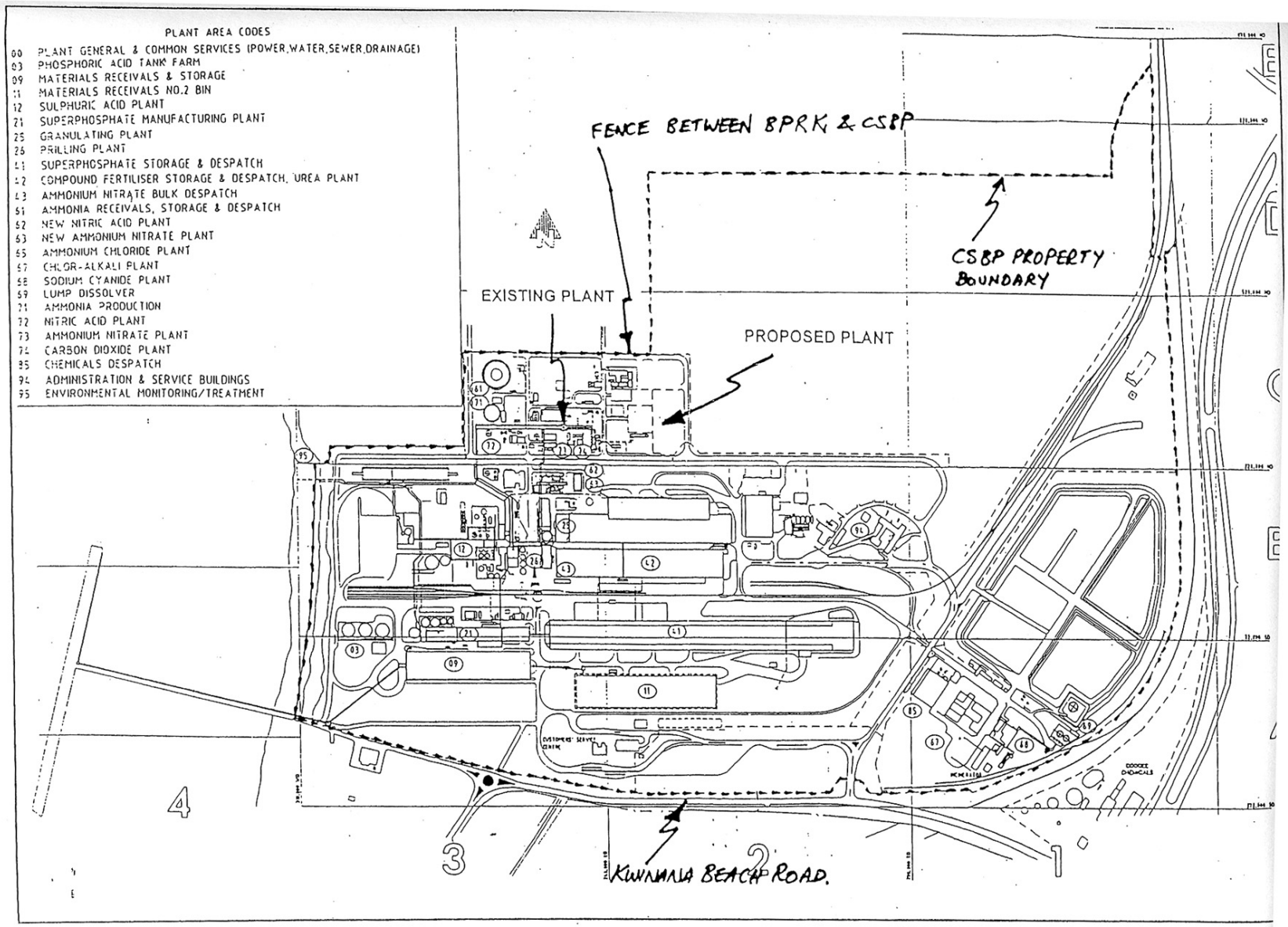
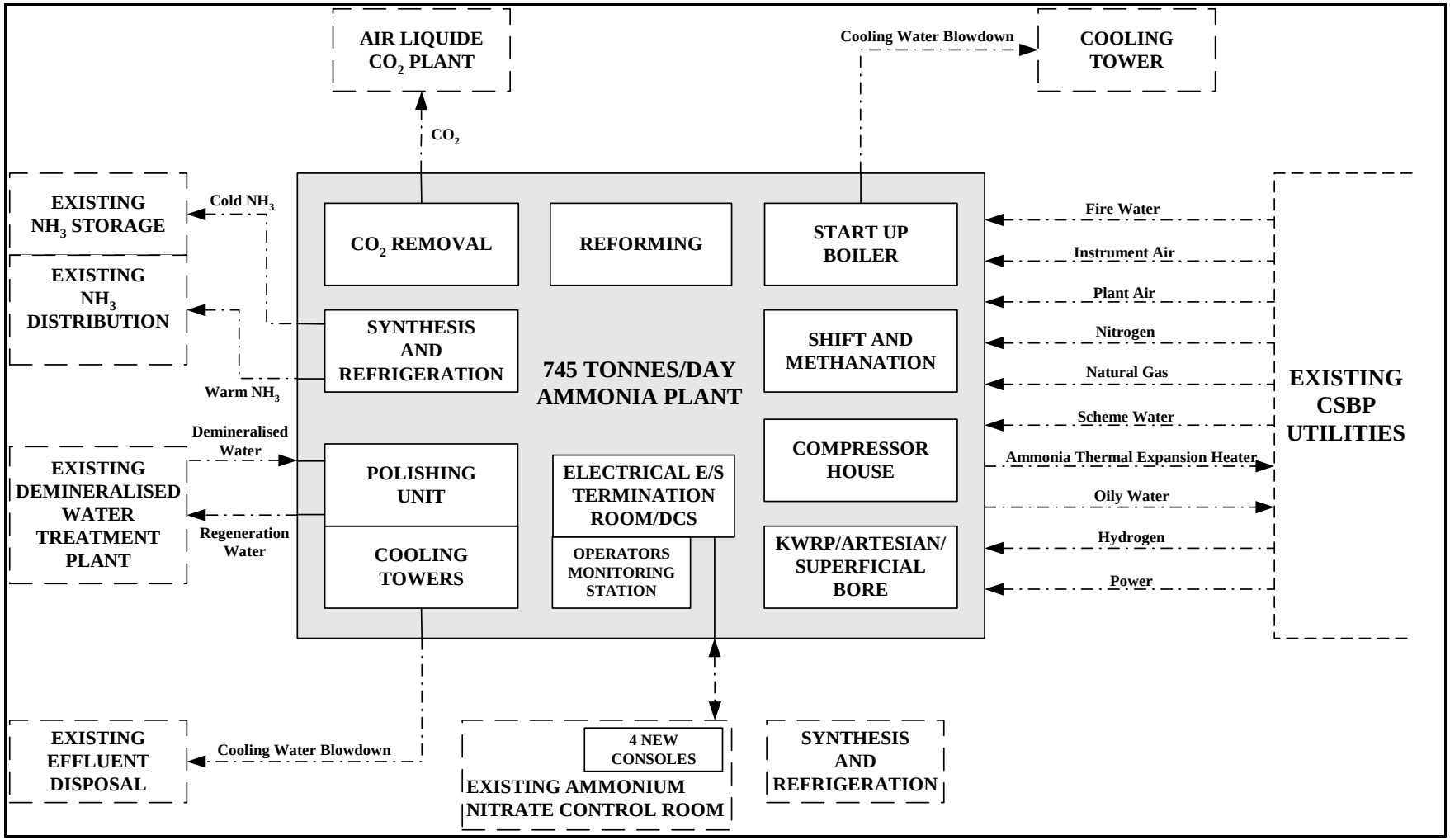


Figure 2. Proposed ammonia plant location.



PROJECT INTEGRATION WITH EXISTING CSBP FACILITIES

Figure 3

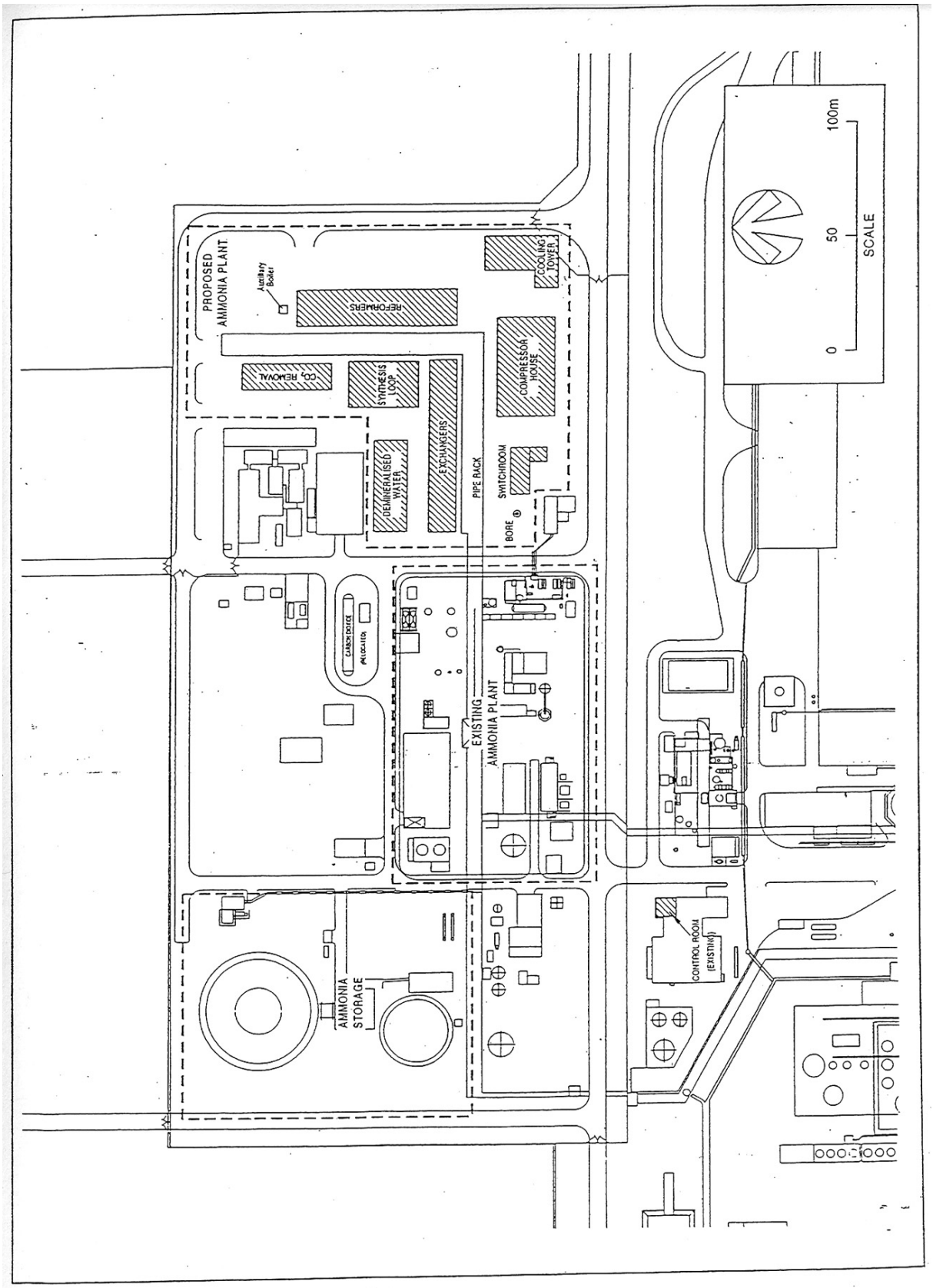
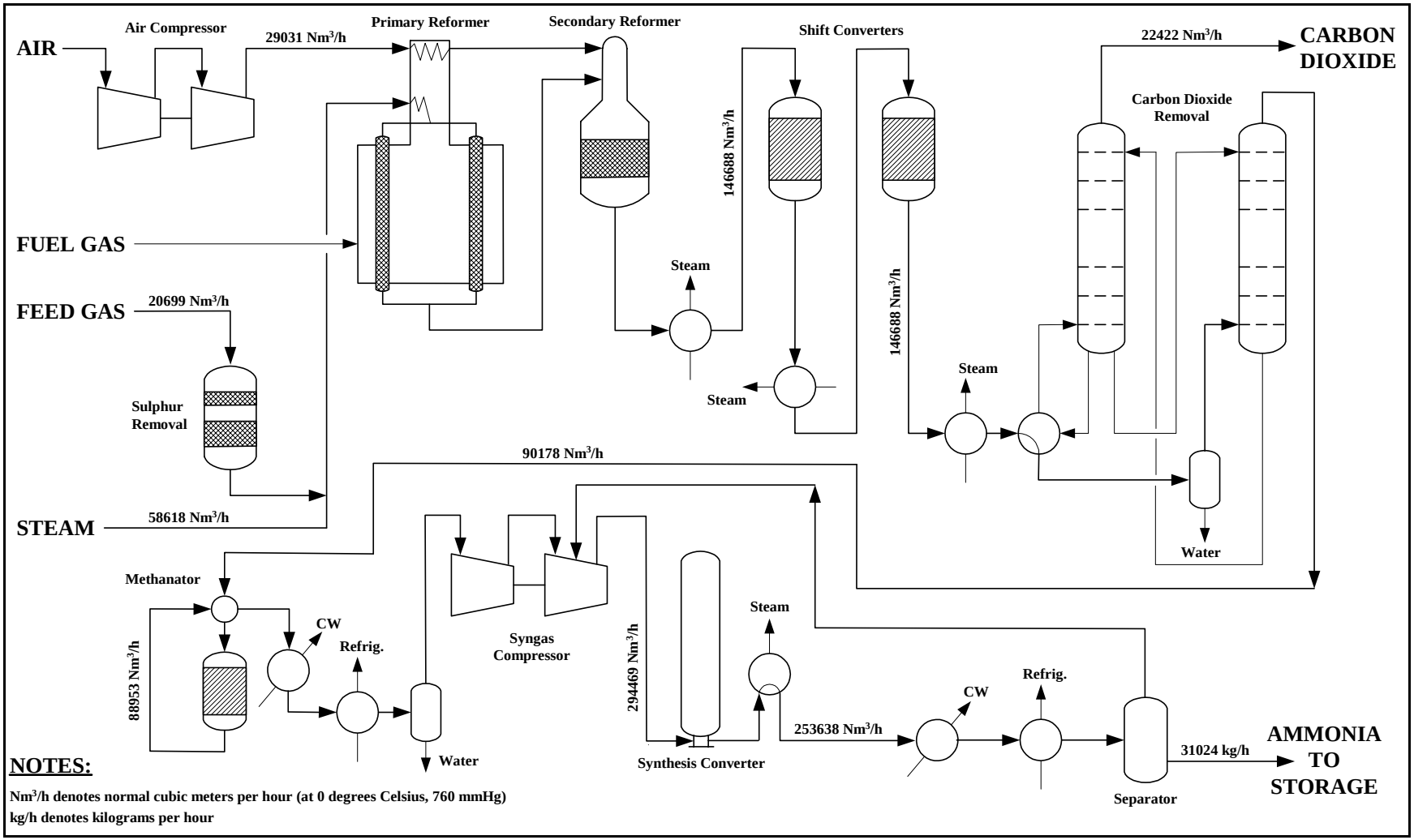


Figure 4. Proposed ammonia plant layout.



PROCESS FLOW CHART

Figure 5

Schedule 2

Proponent's Consolidated Environmental Management Commitments

26 March 2003

KWINANA AMMONIA PROJECT
KWINANA INDUSTRIAL AREA
(Assessment No. 1468)

WESFARMERS CSBP LIMITED

SCHEDULE 2

KWINANA AMMONIA PROJECT, KWINANA INDUSTRIAL AREA (Including Storage, Import and Export of Ammonia) – 26 March 2003 (Assessment No. 1468)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment and number;
- the objective of the commitment;
- the "action" to be undertaken by the proponent;
- the timing requirements of the commitment;
- the body/agency to provide technical advice to the Department of Environmental Protection; and
- the measurement/compliance criteria.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
1. Minimize the impacts of discharges of phosphorus and nitrogen from the plant.	To protect the biota and amenity of Cockburn Sound.	• By selecting processes and equipment which give rise to the lowest discharges of nitrogen and phosphorus. (The selection of cooling water treatment process is of particular significance). • By continuing the implementation of measures to reduce discharges from other sources on CSBP's Kwinana site.	• Before construction • By 1 January 2000		• Confirmation of advice on expected nitrogen and phosphorus discharges contained in the CER. • Monitoring and reporting site discharges as required under current licence conditions
2. Seek to reduce discharges of greenhouse gases from the plant.	To minimize the effects of global warming arising from the discharge of Greenhouse gases to the atmosphere.	• By implementing commercially viable opportunities to recover and reuse CO_2 discharged from the plant. • By incorporating, where practicable, advances in ammonia catalyst technologies which reduce the generation of CO_2 from the production of ammonia.	• Ongoing • Ongoing	Greenhouse Challenge Office (Federal Government).	• Include new ammonia plant in annual reporting of Greenhouse Gas inventories.
3. Ensure that noise generated from the Kwinana Ammonia Project will not exceed current regulations.	To maintain the amenity of nearby industrial, residential and recreational areas.	• By specifying the procurement of equipment which complies with current requirements. • By conducting noise surveys of the operating plant and implementing noise abatement measures if non-compliance is detected.	• Before construction • Within 6 months of commissioning		• Reporting of results of surveys and agreeing plans to achieve attenuation if required.
4. Minimize the risk to the community arising from the operation of the plant.	To protect the nearby communities from exposure to unacceptable levels of risk to health and safety.	• By preparing and implementing a comprehensive Safety Management System (SMS) for the operation of the plant. • By incorporating risk reduction measures recommended by Quantarisk into plant design.	• Before commissioning • Completed as at 1/1/1998	DoIR	• Approval of the SMS** by relevant authorities. • Regular independent audit of compliance with the SMS** reported to the DoIR.

COMMITMENT	OBJECTIVE	ACTION	TIMING	WHOSE ADVICE	MEASUREMENT/ COMPLIANCE CRITERIA
5. Minimize the risk to persons involved in construction of the plant from the operation of adjacent plants on the Kwinana site.	To protect the health and well being of people employed in the construction of the plant.	• By preparing and implementing a Construction Safety Management Plan.	• Before construction	DoIR	• Auditing and reporting as required by the plan.
6. Revise the preliminary risk assessment for the project.	To demonstrate compliance with EPA criteria at fenceline with BP and reduction of cumulative risk level for whole CSBP site.	• Revise preliminary risk assessment and include knock-on effects, loss of control releases, mitigation measures to meet ALARP*, sensitivity analysis with respect to probit equations and weather data.	• Before construction	DoIR	• The EPA's criteria for individual fatality risk off-site.
7. Conduct a final quantified risk assessment on the project.	To confirm that the final plant design meets EPA risk criteria and that there is a reduction in risk for the whole CSBP site.	• Conduct final risk assessment taking into account final plant design.	• Before commissioning	DoIR	• The EPA's criteria for individual fatality risk off-site.
8. Decommission the existing ammonia plant, following commissioning and stabilisation of the new plant.	To ensure that decommissioning is carried out in an environmentally acceptable manner.	• Prepare and implement a Decommissioning Management Plan.	• At least 6 months before decommissioning		• The EPA's requirement.
9. Limit ammonia import/export operations to no more than 9 transfers per annum.	To protect nearby industry, public recreation areas and communities from unacceptable safety impacts.	• Ensure effective testing and maintenance procedures in line with the SMS • Include in the Ammonia Safety Report	• Ongoing	DoIR	• No more than 9 operations in a calendar year.

LEGEND

* - As Low As Reasonably Practicable.
** - Safety Management System.
1 - Ammonia Import/Export Sensitivity Analysis, Det Norske Veritas, January 2003

CER – Consultative Environmental Review
DoIR – Department of Industry and Resources
EPA – Environmental Protection Authority
SMS – Safety Management System