

Sodium cyanide plant debottlenecking

**Australia Gold Reagents Pty Ltd
Proposed changes to environmental conditions**

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 727
December 1993**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of a proposed change to environmental conditions set by the Minister for the Environment in June 1990 and subsequently amended in March 1991.

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

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

APPEALS

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

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

ADDRESS

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

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 23 December 1992.

1. Background

In June 1990 the Minister for the Environment issued his Statement that a proposal by Australian Gold Reagent's Pty Ltd to debottleneck its sodium cyanide plant at Kwinana to a capacity (annual rolling average) of 40,000 tonnes/annum sodium cyanide could be implemented (Appendix 1).

Subsequently the proponent sought clarification of Environmental Condition 5 (Appendix 1). This Condition refers to the timing of the debottlenecking of the existing plant (stage 1) and the approved, but as yet unbuilt, duplicate sodium cyanide plant (stage 2).

Pursuant to Section 46(1) of the Environmental Protection Act, the Minister for the Environment requested the Environmental Protection Authority (EPA) to inquire into and report on a change to Environmental Condition 5.

The EPA advised the Minister (EPA Bulletin 450) that it was environmentally acceptable to "debottleneck" stage 1 only of Australian Gold Reagent's sodium cyanide plant at Kwinana, without further constraint associated with the Kwinana Integrated Emergency Management System.

The Minister for the Environment accepted EPA's recommendation and issued an amendment, dated 15 March 1991, to the original Statement (Appendix 2).

2. The proposal

Australian Gold Reagents has now requested changes to Conditions 1 and 5 of the amended statement of 15 March 1991. The first change relates to Condition 1 which restricts the original plant and duplicate plant (as yet unbuilt) from each producing more than 20,000 t/a sodium cyanide solution as described in the Consultative Environmental Review. The proponent now proposes to debottleneck both plants so that each plant can produce up to 35,000 t/a.

The second change relates to Condition 5 which restricts the duplicate plant (stage 2) from being debottlenecked until the key emergency response provisions of the Kwinana Integrated Emergency Management System are in place.

Pursuant to Section 46(1) of the Environmental Protection Act, the Minister for the Environment has requested the EPA to inquire into and report on the proposed changes to Environmental Conditions 1 and 5 (Appendix 1).

3. EPA's assessment

The EPA has always held the view that the major environmental issue relating to the sodium cyanide plant was the element of off-site risk to other industries, residences and recreational areas. EPA has advised the proponent that, should a competent risk study indicate that risk associated with debottlenecking fall within the EPA's risk criteria for the above, EPA would find debottlenecking acceptable. Accordingly, the proponent submitted a satisfactory risk study which supports the proposal. In reaching its conclusion, the EPA sought comment from the Department of Minerals and Energy, Department of Resource Development and the Town of Kwinana.

Comments from the Department of Minerals and Energy and the Department of Resources Development support the proposal. The Town of Kwinana raised the issue of civil emergency response to protect the public in the case of an accident and the protection of the public using the adjacent areas of Kwinana Beach and Wells Park.

With respect to Condition 1, the EPA believes that it is acceptable to debottleneck the existing and duplicate (but as yet unbuilt), sodium cyanide plants, as there should be an overall reduction in individual and cumulative risk. This is because the ammonia feed pipeline, the

main generator of risk, will be re-engineered in manner which will generate a lower level of risk.

EPA recommends Condition 1 be changed to permit each sodium cyanide plant to be debottlenecked to the proposed annual rolling average capacity of up to 35,000 t/a sodium cyanide solution

Recommendation 1

The Environmental Protection Authority considers the debottlenecking of the original plant and duplicate (as yet unbuilt) sodium cyanide plant to allow each plant to produce up to 35,000 t/a sodium cyanide solution is environmentally acceptable.

Accordingly, the Environmental Protection Authority recommends that Condition 1 include the following:

"The proponent shall adhere to the proposal as assessed by the Environmental Protection Authority in December 1993 and shall fulfil the commitments made on the 28 March 1990 (copy of commitments attached) and shall adhere to the assumptions made in the risk assessment" (see Recommended Environmental Condition 1c in Section 4).

The EPA recognises that each of the major hazardous industries on the Kwinana strip have an effective emergency management system in place which should cope with accidents. This system includes a total hazard control plan (prepared to the satisfaction of the Department of Minerals and Energy and audited annually by an independent auditor). Industry also has an emergency assistance agreement to cover mutual aid and an emergency communications system, a comprehensive emergency procedures manual, inter-industry emergency training, and a defined emergency road escape network.

Notwithstanding the above, the EPA believes that the principle it espoused during its assessment of the DuPont sodium cyanide proposal (EPA Bulletin 425) still remains. That is that there is presently no adequately co-ordinated civil emergency response system in place which could manage the public in the case of a serious accident. **The establishment of such a system to deal with public emergency response rather than industrial emergency response is an issue for the Government to consider rather than individual industries.** If due consideration is not given to the establishment of such a system by Government, it could have serious implications to the establishment of new risk generating industries on the Kwinana strip.

Accordingly, the EPA, whilst espousing its principle on co-ordination of emergency response for risk to the public, believes that the issue is one for Government and not individual industries to address and hence recommends that Condition 5 be deleted.

Recommendation 2

The Environmental Protection Authority regards Condition 5 of the Ministerial Statement of 1 June 1990 as amended in 15 March 1991, which refers to the timing of the debottlenecking of the existing plant (stage 1) and the approved but as yet unbuilt duplicate sodium cyanide plant (stage 2), as now superseded. Accordingly, the Environmental Protection Authority recommends that Condition 5 could be deleted.

With respect to the administration of the environmental conditions set by the Minister for the Environment, the EPA suggests that the Minister's Statement include a number of now standard conditions not reflected in the existing conditions on the proposal.

These conditions would allow for non-substantial amendments to the environmental conditions be undertaken by the Minister for the Environment on advice of the EPA. Additionally, the

issue of ongoing environmental performance could be addressed through the inclusion of a condition and procedures which require the proponent to prepare periodic "Progress and Compliance Reports". These reports would provide the EPA with an up to date view of the project status and compliance with environmental conditions. Such reports would be publicly available and could be used to demonstrate the proponent's commitment to the environmental issues.

Recommendation 3

The Environmental Protection Authority recommends that the standard implementation and compliance auditing conditions be included in the conditions for this proposal (see section 4, Recommended Environmental Conditions 1B and 11).

The above recommendations could be given effect through an amendment to the Minister's Statement on this proposal issued on 1 June 1990 and as subsequently amended on 15 March 1991 (Appendix 1). The recommended amendments are reflected in Section 4.

4 Recommended amended environmental conditions

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

PROPOSAL: SODIUM CYANIDE PLANT DEBOTTLENECKING
(300/846)

CURRENT PROPONENT: AUSTRALIAN GOLD REAGENTS PTY LTD

CONDITIONS SET ON: 1 JUNE 1990 AND AMENDED 15 MARCH 1991

Condition 1 of the Minister for the Environment's Statement issued 1 June 1990 (as amended 115 March 1991) is replaced to read as follows:

1A Proponent Commitments

In implementing the proposal, the proponent shall fulfil its commitments (which are not inconsistent with the conditions or procedures contained in this statement) made during the assessment of this proposal in EPA Bulletin 427, and as subsequently amended in EPA Bulletin 450 and EPA Bulletin 727 (a copy of the proponent's commitments is attached to the Minister's Statement published 1 June 1990).

1B Implementation

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

1C Adherence to proposal and commitments

The proponent shall adhere to the proposal as assessed by the Environmental Protection Authority in December 1993 and shall fulfil the commitments made on the 1 June 1990 (copy of commitments attached) and shall adhere to the assumptions made in the risk assessment.

The following condition and procedure are inserted after Condition 10 of the Minister for the Environment's statement published 1 June 1990 as amended 15 March 1991):

11 Compliance Auditing

In order to ensure that environmental conditions and commitments are met, an audit system is required.

- 11-1 The proponent shall prepare periodic "Progress and Compliance Reports", to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

Procedure

- 1 The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.
- 2 If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

Appendix 1

Minister's statement of 1 June 1990 which include the proponent commitments



WESTERN AUSTRALIA
MINISTER FOR ENVIRONMENT

EPA's COPY

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

SODIUM CYANIDE (LIQUID) PLANT-EXPANSION TO 40 000 tpa (DEBOTTLENECKING),
KWINANA

This proposal may be implemented subject to the following conditions:

1. The proponent shall adhere to the proposal as assessed by the Environmental Protection Authority and shall fulfil the commitments made on 28 March 1990 (copy of commitments attached) and shall adhere to the assumptions made in the risk assessments.
2. The proponent shall prepare and subsequently implement a comprehensive hazard identification and risk management programme in stages, to the satisfaction of the Minister for the Environment on advice from the Environmental Protection Authority and the Department of Mines.

This programme shall include the following:

- (1) hazard and operability studies (HAZOP) of the process units, to be completed and submitted before mechanical construction commences;
 - (2) safety engineering design, during the design process;
 - (3) quantified risk assessment, prior to commissioning;
 - (4) implementation systems, prior to commissioning; and
 - (5) safety reviews during the life of the plant at intervals to be determined by the Environmental Protection Authority.
3. The proponent shall:
 - (1) maintain the process equipment, instrumentation and alarm systems consistent with the safety and reliability assessments of the plant; and

Published on

- 1 JUN 1990

- (2) install very high integrity instrumentation for the control of the plant and for the detection of and response to any unplanned releases;

to the satisfaction of the Minister for the Environment, following advice from the Environmental Protection Authority and the Department of Mines.

4. Prior to construction of the expansion, the proponent shall revise the present site emergency plan to the satisfaction of the Environmental Protection Authority to cover the proposed expansion. The plan shall also meet the requirements of the Kwinana Integrated Emergency Management System (KIEMS).
5. No approval or licence to commence the expanded operations which will increase production from 30 000 to 40 000 tpa shall be issued by any statutory authority (nor shall the proponent commence these expanded operations beyond 30 000 tpa) until the key emergency response provisions of the Kwinana Integrated Emergency Management System are in place to the satisfaction of the Minister for the Environment on advice from the Environmental Protection Authority.
6. The proponent shall revise the previous construction and operational stage management plans to cover the proposed expansion. Each revised plan shall be submitted to, and shall be to the satisfaction of the Environmental Protection Authority following advice of the Department of Mines, before that stage of the development commences. The plans shall include the following:
 - (1) management of stormwater run-off;
 - (2) emergency response for site workers in the case of plant failure;
 - (3) storage and bunding requirements of additional sodium cyanide storage; and
 - (4) storage requirements for additional ammonia.

The proponent shall implement the approved plans to the satisfaction of the Environmental Protection Authority.

7. Prior to commissioning the expanded plant, the proponent shall revise, to the satisfaction of the Environmental Protection Authority, the present wastewater and solid waste management plan to take into account the additional effluent resulting from expansion of the plant.
8. The proponent shall install in the ammonia pipeline, remotely operated, fast action safety valves which can isolate the plants from each other and from the pipeline, to the satisfaction of the Environmental Protection Authority.
9. The proponent shall be responsible for decommissioning and removal of the plant and installations and rehabilitating the site and its environs to the satisfaction of the Environmental Protection Authority. At least six months prior to decommissioning, the proponent shall prepare and subsequently implement a decommissioning and rehabilitation plan to the satisfaction of the Environmental Protection Authority.

EPA's COPY

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

SGD. R.J. PEARCE, M.L.A.

Bob Pearce, MLA
MINISTER FOR THE ENVIRONMENT

1 JUN 1990

SODIUM CYANIDE PLANT - EXPANSION TO 40 000 tpa (DEBOTTLENECKING)

SUMMARY OF MANAGEMENT COMMITMENTS

The commitments which the proponent has made to environmental management during the design, construction and operation of the expanded facilities are as follows:

1. Prior to implementing any modifications to the design of the existing plant, the following safety checks will be undertaken:
 - (1) referral of the proposed modification to the process licensor, Roehm GmbH;
 - (2) liaison with the risk consultant on the proposed changes if they are likely to affect the risk analysis; and
 - (3) HAZOP analysis of the proposed modifications to the plant design.
2. Construction of the proposed expansion will be undertaken in accordance with a Construction Stage Management Report similar to that prepared for the existing plant, but recognising the potential hazards of the existing plant, together with relevant conditions imposed by the Environmental Protection Authority.
3. All construction materials and practices will be in accordance with the relevant Australian codes and international standards where appropriate.
4. The plant design will ensure that emissions of nitrogen oxides during normal operating conditions will be within the National Health and Medical Research Council (NH&MRC) recommended guidelines and will also comply with guidelines adopted by the Victorian Environment Protection Authority.
5. Safety features incorporated in the existing plant will be incorporated in the expanded facilities.
6. Wastewater from the plant will be managed according to the wastewater management strategy approved by the Environmental Protection Authority for the existing plant.
7. The process and storage areas will be sealed and bunded so that any washings, contaminated stormwater run-off or spills will be collected and directed to the wastewater treatment plant sump, and analysed and treated prior to disposal. Any discharge of treated wastewater into Cockburn Sound will comply with the criteria specified in Bulletin No. 103 or the terms of the Environmental Protection Authority licence.
8. Approval for any additional storage of sodium cyanide will be sought from the Chief Inspector, Explosives and Dangerous Goods, Department of Mines.
9. A fire protection system will be incorporated in the expanded facilities in accordance with the requirements of the plant design and the Western Australian Fire Brigades Board. CSBP works personnel will be trained in the appropriate fire-fighting techniques. In addition to the fire-fighting capability of CSBP's Kwinana works, the fire-fighting co-operative established by the industrial operators in the Kwinana district will be available for emergency assistance.

(Cont'd)

10. All employees will be trained in the safe work practices and emergency procedures appropriate to the operation of the plant and handling of all associated materials. The management structure for the expanded facilities will incorporate at least two tiers of personnel technically qualified to manage hazardous chemical operations.
11. On-site emergency facilities at CSBP's Kwinana works will continue to include a dedicated emergency response vehicle, fire tender and an ambulance at all times, and an occupational health sister will be in attendance during normal working hours.
12. A detailed operating manual has been prepared for the existing plant from information supplied by the licensor, covering all process work, including start-up, shut-down, plant testing, inspection and emergency action. The procedures manual will be amended as necessary to include the expanded facilities.
13. The proponent will arrange for observers from the licensor to be at the plant during commissioning of the expanded facilities if it is deemed necessary by the licensor and the proponent.
14. The expanded facilities and any interconnections to the existing plant will be subject to a full HAZOP study and follow-up prior to commissioning.
15. Stocks of neutralizing agent (ferrous sulphate) are located along the transport routes at agreed locations. They will be inspected regularly to ensure that they are kept in good order.
16. Emergency response practice sessions will take place on a basis agreed with the relevant authorities.
17. The plant operator will maintain a dedicated emergency response vehicle at the Kwinana works and this will be available to service any off-site incident involving the transport of sodium cyanide.
18. Upon commissioning, monitoring of the existing plant will be undertaken in accordance with a comprehensive Environmental Monitoring and Management Programme, and the proposed expansion will be incorporated into this Environmental Monitoring and Management Programme to the satisfaction of the Environmental Protection Authority.
19. Liaison with local Shires, the Environmental Protection Authority, the Department of Mines, Westrail and counter-disaster groups will occur as appropriate in regards to proposed changes to the agreed transport routes or the addition of new market areas.
20. The proponent will prepare a Total Hazard Control Plan to the satisfaction of the Chief Inspector, Explosives and Dangerous Goods, Department of Mines, for the sodium cyanide plant and the expanded facilities at Kwinana.

Appendix 2

Minister's statement of 15 March 1991



120/84/2

WESTERN AUSTRALIA
MINISTER FOR THE ENVIRONMENT

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

PROPOSAL : SODIUM CYANIDE (LIQUID) PLANT-EXPANSION TO
40 000 tpa (DEBOTTLENECKING), KWINANA

CONDITIONS SET ON : 1 June 1990

Condition 5 has been amended to read as follows:

5. No approval or licence to commence the expanded operations which will increase production from 30 000 to 40 000 tonnes per annum shall be issued by any statutory authority (nor shall the proponent commence these expanded operations beyond 30 000 tonnes per annum) until the key emergency response provisions of the Kwinana Integrated Emergency Management System are in place to the satisfaction of the Minister for the Environment on advice from the Environmental Protection Authority.

The 'debottlenecking' of the stage 1 of Australian Gold Reagent's Sodium Cyanide Plant at Kwinana from 15 000 tonnes per annum to 20 000 tonnes per annum sodium cyanide is not constrained by this condition.

Bob Pearce, MLA
MINISTER FOR THE ENVIRONMENT

7 MAR 1991

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