



MINISTER FOR ENVIRONMENT

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

PROPOSED SODIUM CYANIDE PLANT AT KWINANA AND
TRANSPORT OF SODIUM CYANIDE BY RAIL

AUSTRALIAN GOLD REAGENTS PTY LTD

This proposal may be implemented subject to the following conditions:

1. The proponent fulfilling the commitments given in the Public Environmental Report and Notice of Intent for the proposal, and in subsequent correspondence with the Environmental Protection Authority (copy of relevant commitments attached).
2. The proponent shall:
 - . establish detailed specifications for loading, transfer and unloading areas for iso-tainers at the plant site, rail terminals and mine sites;
 - . outline specific safeguards for iso-tainers;
 - . detail mine site storage and handling requirements;
 - . identify responsibility for the various aspects of transport and transfer operations; and
 - . prepare contingency plans for dealing with spillages, should they occur, at all stages of the transport operation;

to the satisfaction of the Environmental Protection Authority and of relevant Government agencies and obtain all necessary approvals prior to the commencement of transport operations.

3. If the plant is located at the proponent's preferred site at Kwinana, then the proponent shall:
 - . prior to construction, ensure that the site layout is evaluated in a Hazard and Operability Study for the plant in order to prevent any possibility of contact between any acid storage and the sodium cyanide process or storage; and
 - . prior to commissioning, install appropriate safeguards for the ammonia pipe;to the satisfaction of the Environmental Protection Authority.
4. Prior to construction commencing, the proponent shall prepare, to the satisfaction of the Environmental Protection Authority, a construction stage management report, which in addition to other relevant matters should detail:
 - . the management of stormwater runoff from the site; and
 - . the management of dust and noise from the site.
5. The proponent shall, at the detail design stage, prepare a comprehensive and integrated hazard and risk management strategy, to the satisfaction of the Environmental Protection Authority and other relevant Government agencies.
6. The proponent shall, prior to commissioning the plant, prepare a waste water management report detailing methods of management and disposal. This management report must be to the satisfaction of the Environmental Protection Authority.

BARRY HODGE, MLA
MINISTER FOR ENVIRONMENT

15 October 1987

PROPOSED SODIUM CYANIDE PLANT

Major commitments made by the Proponent in the PER (Volumes 1 and 2); in the Proponent's response to issues raised in submissions and to issues raised by the EPA, and in the Notice of Intent on the Use of Rail Transport (May 1987).

1. INTRODUCTION

1.1 An extensive set of management commitments has been outlined, encompassing control methods, safety features, operational philosophies and monitoring procedures. The project partners are committed to the establishment of a safe, efficient plant, designed in accordance with statutory requirements and with the continuing cooperation of local authorities.

2. CONSTRUCTION (PER Vol 1, S 7.6.1)

2.1 During the construction phase of the project, the project partners will take those measures necessary to ensure that noise and dust caused by construction activities are minimised. Activity will be restricted to standard construction working hours and dust suppression watering practices will be adopted.

3. DESIGN (PER Vol 1, S 7.1)

3.1 Design will be aimed at making the facility as modern and as technologically advanced as possible, incorporating every available safeguard and the experience of existing producers.

3.2 The process components (gas mixer, reactor, absorption tower and incinerator) are designed to incorporate state of the art instrumentation and computer process control to ensure stable operating conditions.

3.3 Critical safety interlocks will detect any deviation or imbalance in flow, temperature, pressure, vacuum or level, and will initiate automatic plant shut-down in any abnormal situation. These interlocks will be duplicated, and all safety systems will be wired in such a way that the plant will shut down in a fail-safe condition.

3.4 All construction materials and practices will be in accordance with the relevant Australian codes.

3.5 *The design of the plant will be such that any potential for in-plant spillages of sodium cyanide will be minimised by:

(a) use of appropriate design standards, minimal pipe runs, high integrity pipework and quality control of the pipework installation;

(b) careful consideration of layout and design of pipe racks and by use of paving in process areas which will drain to waste water collection sump(s) for subsequent use and/or neutralisation.

3.6 *Should a sodium cyanide spillage occur, it is intended to contain and collect it, thus preventing any discharge which could lead to groundwater contamination. Additional to measures in 3.5, this will be done by providing spray box protection on pipe flanges where flanged pipe is used, although it is expected that fully welded steel pipe will be used for most of the product sodium cyanide piping.

- 3.7 *It is intended that sodium cyanide solution pipework leading to the storage area will be protected so that any spillage can be contained.
- 3.8 Installed standby equipment will increase operational reliability in all key process stages (eg vacuum blower, boiler feedwater pumps, critical temperature and pressure detection instruments).
- 3.9 Duplication of all critical equipment and a high level of automation will ensure operational stability.
- 3.10 Storage of sodium cyanide will be in accordance with the Explosives and Dangerous Goods Act, 1961, and approved by the Chief Inspector of Explosives and Dangerous Goods, Mines Department.
- 3.11 *The likely storage system for liquid sodium cyanide at the mines will consist of a combination of horizontal steel tanks to suit the mines' requirements, bundled according to the regulations of the Department of Mines. These tanks will be fitted with the normal design features, including a receival point, level indication, overflow line, venting and discharge line. CSBP will recommend safety hoses and showers at each receival facility.
- 3.12 *The proponent will undertake to notify the process licensers of any proposed design changes and to subject such changes to a hazard and operability (HAZOP) procedure using internal expertise.

4. COMMISSIONING (PER Vol 1, S 7.2)

- 4.1 During commissioning, a process observer from the licenser of the technology, Roehm GmbH, will be in attendance. This observer will be at the plant during the early stages of its operation, both before official hand-over and for a short time afterwards.

5. OPERATION (PER Vol 1, S 7.6.2)

5.1 AESTHETICS/GASEOUS EMISSIONS/ODOUR

- 5.1.1 The plant will be a clean industrial facility and will not generate any industrial wastes or any gaseous emissions that cannot be safely discharged to the atmosphere. It will not produce any odours during normal operation, but odours may result from fugitive emissions of process raw materials, natural gas and ammonia, which will be strictly managed in view of their potentially hazardous nature.
- 5.1.2 The plant design will ensure that normal emissions of nitrogen oxides will be well within the National Health and Medical Research Council (NH & MRC) recommended guidelines and/or with the EPA licence conditions.
- 5.1.3 The incinerator stack will be constructed to a height of 20 metres to facilitate dispersal of combustion products.
- 5.1.4 The plant site will be attractively landscaped and buildings will be aesthetically designed and clad in neutral colours so as to be compatible with the surrounding industrial setting.

5.2 WASTEWATER

- 5.2.1 The plant will normally produce no liquid wastes.
- 5.2.2 The process and storage areas will be banded so that any washings, stormwater runoff or spills will be collected in a dedicated sump. Subject to analysis, the sump contents will either be metered to the storage tanks or chemically neutralized to achieve the NH & MRC and World Health Organisation standards for cyanide content for drinking water. These small quantities of treated water will either be used as process water at CSBP's Kwinana works or disposed of in accordance with the relevant authorities' requirements.

5.3 GENERAL

- 5.3.1 *It is proposed that for management purposes the plant will be incorporated into CSBP's Chemicals Division (as operators for the proponents) with its established management structure: The day-to-day plant management will be by a Plant Superintendent with assistance from a Plant Chemist and a Plant Engineer. The Plant Superintendent will report to the Operations Manager - Chemicals who will in turn report to the Manager - Chemicals Division. Safety and environmental management would be the primary responsibility of the Plant Superintendent, Plant Chemist and Plant Engineer. Monitoring of the plant performance would be carried out by the Environmental and Loss Control Section of the Operations Department at Kwinana. The Environmental Superintendent will maintain liaison with the relevant authorities for compliance with any conditions of environmental or statutory approvals.
- 5.3.2 As part of the commitment to environmental management during plant operation, the project partners have implemented a public information programme which will continue throughout the project.

6. SAFETY

6.1 RISK ANALYSIS/HAZOP

- 6.1.1 Quantitative risk analysis has demonstrated that the proposed safety features and the inherently safe process design will restrict the imposed risk to levels well within currently accepted criteria.

*All aspects of the plant were examined for potentially hazardous events, including pipelines for feeding materials to the plant and transport of the finished product. The potential hazards identified will be reviewed and appropriate contingency measures incorporated into existing on-site and off-site emergency procedures for the Kwinana works. These potential hazards will also be taken into consideration in the detail design of the plant and the hazard and operability (HAZOP) review.

- 6.1.2 Prior to commissioning the plant, a full hazard and operability (HAZOP) study will be undertaken in conjunction with the plant designers and constructors.

6.2 CONTINGENCY PLANNING/EMERGENCY PROCEDURES (PER Vol 1, S 7.3)

- 6.2.1 A detailed procedures manual will be prepared from information supplied by the licensor, Roehm GmbH, covering all process work, including start-up, shut-down, plant testing, inspection and emergency action. The procedures manual will be available prior to commissioning for review by the relevant authorities.
- 6.2.2 A fire protection system will be incorporated in the plant in accordance with the requirements of the plant design and the Western Australian Fire Brigades Board. Plant 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 cooperative established by the industrial operators in the Kwinana district will be available for emergency assistance.
- 6.2.3 On-site emergency facilities at CSBP's Kwinana works will continue to include a fire tender and an ambulance at all times, and an occupational health sister during normal working hours.
- 6.2.4 Emergency procedures for the plant will be well documented and a number of outside agencies will be informed of these and available for assistance, if necessary.
- 6.2.5 All areas (in the sodium cyanide plant) where hazardous chemicals are stored will be bunded to contain any accidental spillages, and a drainage collection and detoxification system will form an integral part of the containment areas.
- 6.2.6 Adequate supplies of neutralizing chemicals will be maintained at the plant and at the main delivery areas for use in emergencies.

*The neutralizing agents used to treat any spilled sodium cyanide solution will be either sodium hypochlorite solution or hydrogen peroxide with copper catalyst (which can be obtained as a proprietary formulation). Hydrogen peroxide is the preferred agent for use within the plant. This technology is guaranteed by the process licensor as safe and effective. For offsite incidents, sodium hypochlorite solution is the preferred neutralizing agent.

6.2.7 *See also 8.6 and 8.7.

6.3 TRAINING

- 6.3.1 All employees will be trained in the safe work practices, including use of personal protective equipment, and emergency procedures appropriate to the operation of the plant and handling of all associated materials. Management training with regard to technology transfer and emergency procedures has already commenced.
- 6.3.2 *The programme for training of personnel and commissioning will involve the training of key operating personnel by the process licensor prior to start up. These personnel will then train the balance of the operating and maintenance team and will be supervised by the licensor. A process simulation package may also be used to assist with training.

See also 8.7.

6.4 SECURITY

6.4.1 Security around the plant will be ensured by chain-link boundary fences and controlled access to the site.

7. MONITORING, AUDITING AND REPORTING (PER Vol 1, S 7.4 and 7.5)

7.1 The environmental aspects of the sodium cyanide plant will be incorporated in the existing Environmental Management and Monitoring Programme, which is administered by CSBP's industrial chemists. This will require the continuous testing of the main stack for oxygen to ensure that optimum combustion occurs in the incinerator, and monthly testing for hydrogen cyanide, oxides of nitrogen and carbon monoxide.

7.2 The results of these monitoring programmes will be reported as required to the relevant regulatory authorities.

7.3 The sodium cyanide plant will be included in the CSBP's ongoing International Safety Rating System (ISRS) programme developed by the International Loss Control Institute. A Loss Control Superintendent has been appointed to coordinate the development of health and safety manuals. Internal audits will be used to check on progress, with periodic external audits. The programme will be assessed by external audit against the ISRS 'gold star' rating system, and CSBP has set a target to achieve a 'five star' rating (the highest) within three years.

8. TRANSPORT (Supporting Document)

The commercial details for rail/road transport are still being evaluated by the proponents in conjunction with Westrail. Regardless of the commercial arrangements, it will be necessary for the proponents, their agents or Westrail to satisfy international and Australian standards, codes of practice and regulations to assure the safety of all transport and associated operations.

8.1 Sodium cyanide solution will be loaded by a delivery hose and coupling into tank containers secured onto railway wagons at a new siding at the plant site at Kwinana.

8.2 The tank containers will be manufactured to meet Australian and international codes, and will comprise a tank mounted in a steel frame of standard dimensions (referred to as an iso-tainer).

8.3 Safety features of the tanks will include use of top loading/discharge, a pressure relief device, an integral sturdy steel frame enclosure and additional strengthening around the loading/discharge point to provide rollover protection. The tops of the nozzles would be below the top of the iso-tainer frame providing additional rollover protection.

8.4 The tanks will be marked clearly with emergency information panels.

8.5 During rail transport the iso-tainers will be secured by twistlocks onto a flat-top rail wagon. Each wagon will accommodate two iso-tainers. The twistlocks will be designed to ensure that in event of a derailment the container will remain secured to the wagon.

8.6 It is proposed that suitable emergency procedures be developed with the emergency services authorities for transport of liquid sodium cyanide. The proponents are willing to participate in the development of any such procedures, and in the implementation of any training programmes.

8.7 The emergency planning proposed for the transport of sodium cyanide includes:

- . training of transport operators including Westrail staff;
- . provision of protective equipment to appropriate staff;
- . strategic stocks of sodium hypochlorite or other cyanide-neutralizing chemicals in event of emergency;
- . handling and transport procedures for spilled liquid sodium cyanide and the neutralized effluent; and
- . communications.

8.8 In order to proceed with the use of rail transport, Westrail will provide a controlled siding from the existing railway line to the plant site at Kwinana with facilities for marshalling and shipping of wagons and iso-tainers. As part of these facilities a contained non-porous area and associated sump and pump system will be provided.

*Indicates commitments made in the response by the Proponent to the EPA (19 March 1987).