

Transport of Solid Sodium Cyanide, Change to Environmental Conditions

Australian Gold Reagents Pty Ltd

**Section 46 Report and Recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin1047
April 2002**

ISBN. 0 7307 6678 0
ISSN. 1030-0120
Assessment No. 1422

Contents

Page

- 1. Introduction and background..... 1**
- 2. The proposal 4**
- 3. Consultation..... 6**
- 4. Relevant environmental factors 7**
 - 4.1 Public and Environmental Risk..... 7
- 5. Conditions and commitments..... 16**
 - 5.1 Recommended commitments 16
 - 5.2 Recommended conditions 16
- 6. Conclusions 16**
- 7. Recommendations 17**

Figures

- 1. Location..... 3
- 2. Transport route 5
- 3. Rail route 11
- 4. Jandakot mound..... 13

Appendices

- 1. List of Submitters
- 2. References
- 3. Statement of Environmental Conditions of Approval (12 May 1995)
- 4. Recommended Environmental Conditions and Proponent’s Consolidated Commitments
- 5. Transport Management Plan - Key Commitments

1. Introduction and background

The Minister for the Environment and Heritage has requested the Environmental Protection Authority (EPA) to consider and provide advice under Section 46(3) of the Environmental Protection Act 1986 on Australian Gold Reagents Pty Ltd (AGR) proposal to transport solid sodium cyanide from its operations at Kwinana to the Fremantle Port North Wharf, for export.

AGR is a joint venture between Wesfarmers CSBP Limited and Coogee Chemicals Pty Ltd which was formed to manufacture and market sodium cyanide. The AGR facility is located at Wesfarmers CSBP's fertiliser and chemicals complex in Kwinana (Figure 1). It currently operates two liquid sodium cyanide plants which have a combined production capacity of 50,000 tonnes per annum (tpa) of pure (100%) sodium cyanide, with the potential to expand to 70,000 tpa. These plants produce sodium cyanide as a 30% (by weight) solution. AGR is constructing a downstream processing plant that is capable of producing 25,000 tpa of solid sodium cyanide briquettes from liquid sodium cyanide.

AGR was granted approval for the solid sodium cyanide plant on 6 December 2001 through a Section 46 review of the Ministerial Conditions (Ministerial Statement No. 579). Approval did not include the transport of sodium cyanide briquettes to, or export from, the Port of Fremantle.

There are currently seven Ministerial Statements for AGR's operations, two of which relate to the transport of sodium cyanide (as a liquid). In October 1987, the Minister for the Environment approved a proposal by AGR to construct a 15,000 tpa sodium cyanide plant at Kwinana and transport the sodium cyanide by rail out of Kwinana to specified rail heads and then by road to mine sites for gold extraction (Ministerial Statement No. 6). The transport requirements for liquid sodium cyanide were amended in May 1995, replacing the rail only option with a combined road/rail option (Ministerial Statement No. 384).

The EPA noted in its report (EPA, 2001) that a Section 46 review would be required for the transport and export of solid sodium cyanide via Fremantle Port. The EPA's intention was that this Section 46 review would include a review of the existing Ministerial Statements for the manufacture and transport of sodium cyanide plant in order to simplify and amalgamate the statements into one statement. However, the process to amalgamate existing Ministerial Statements has been more time consuming than AGR originally anticipated. As AGR is keen to avoid potential delays in obtaining approval for the transport of solid sodium cyanide, it has requested a Section 46 review of the transport component only and at a later date will request another Section 46 review of the existing Ministerial Statements. The Minister for the Environment and Heritage requested that the EPA inquire into and report on the proposed changes for the transport of solid sodium cyanide.

The EPA advertised the change to environmental conditions to include the "Transport of Solid Sodium Cyanide" on 25 February 2002. The Section 46 review included a 4-week public review period, since public concern about the transport of solid sodium cyanide was expressed during the assessment of the solid sodium cyanide plant.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses the consultation undertaken by the proponent. Section 4 discusses the environmental factor relevant to the proposal. The conditions and procedures to which the proposal should be

subject, if the Minister determines that it may be implemented, are set out in Section 5. Section 6 presents the EPA's conclusions and Section 7, the EPA's Recommendations.

A list of people and organisations that made submissions is included in Appendix 1 and References are listed in Appendix 2. Environmental Condition Statement 384, published on 12 May 1995 is presented in Appendix 3. The recommended conditions and procedures and proponent's commitments are provided in Appendix 4. AGR's key commitments in the Transport Management Plan are listed in Appendix 5.

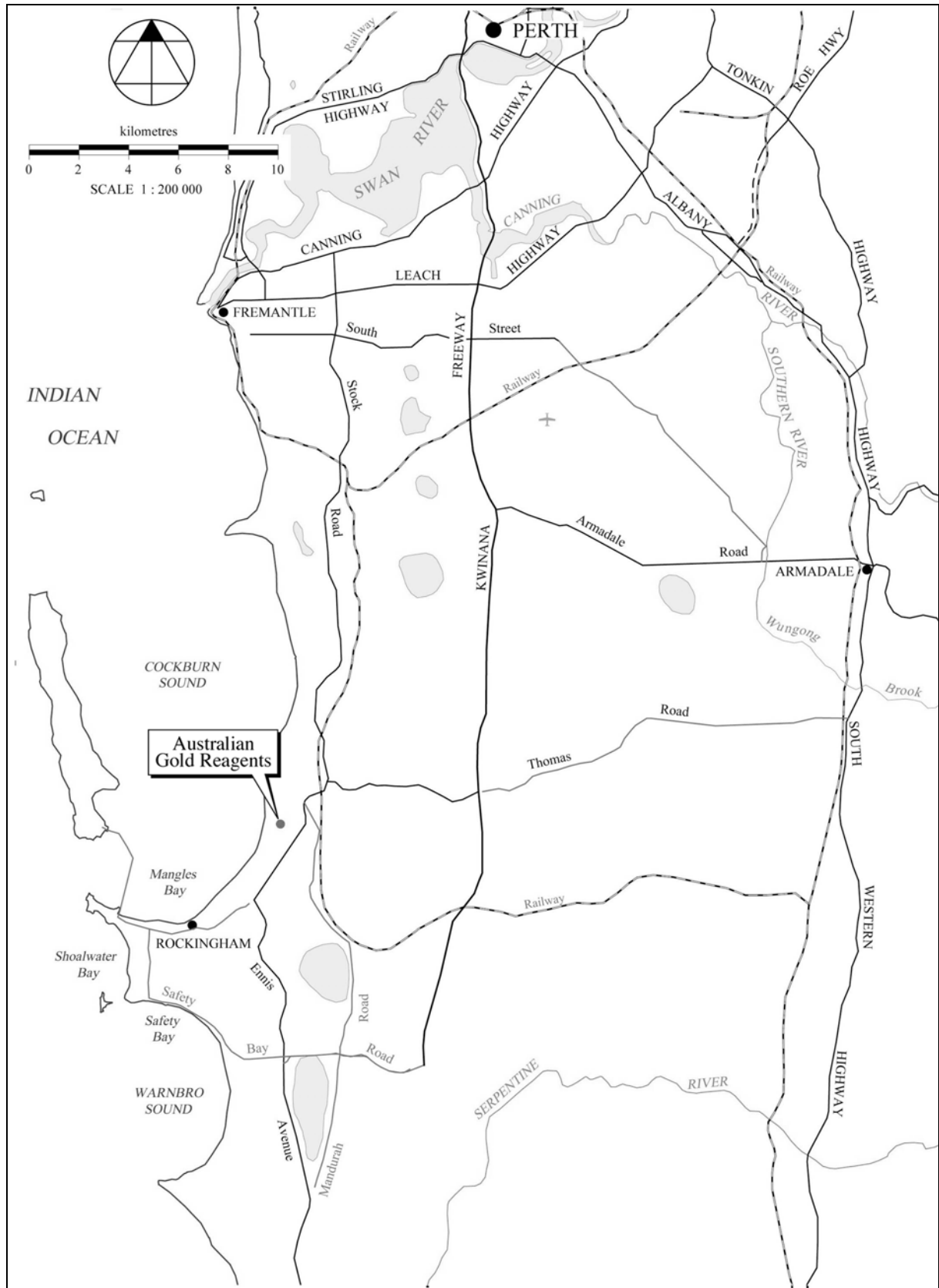


Figure 1: Regional Location (Source: ATA Environmental, 2001)

2. The proposal

AGR proposes to transport approximately 20,000 tpa of solid sodium cyanide briquettes by road from its solid sodium cyanide plant at Kwinana (currently under construction) to Fremantle Port North Wharf for export overseas, interstate or to remote sites within Western Australia. The proposed transport route extends for approximately 30 kilometres along Category 1 roads, through industrial and residential areas as shown in Figure 2. AGR proposes to export solid sodium cyanide through the Inner Harbour in quantities ranging from 100 to 1,000 tonnes per shipment. The proposal includes storage of solid sodium cyanide in a dedicated storage area at the North Wharf for up to 5 days.

The briquettes will be packaged into Intermediate Bulk Containers (IBCs) at AGR's packaging plant. Each IBC contains less than 1500 kg of briquettes that are sealed by 2 plastic layers (woven polypropylene bags with a heat sealed polyethylene liner) and stored in a plywood box for protection. The IBC's are then stored in standard 20 tonne sea containers (seatainers). Road transport capable of conveying two "20-foot" containers will be used to transport the briquettes directly to the North Wharf.

A detailed description of the proposal is provided in Sections 2, 5 and 7 of the Section 46 document (Australian Gold Reagents, 2002a).

AGR also proposes to transport solid sodium cyanide on existing approved transport routes for liquid sodium cyanide within Western Australia.

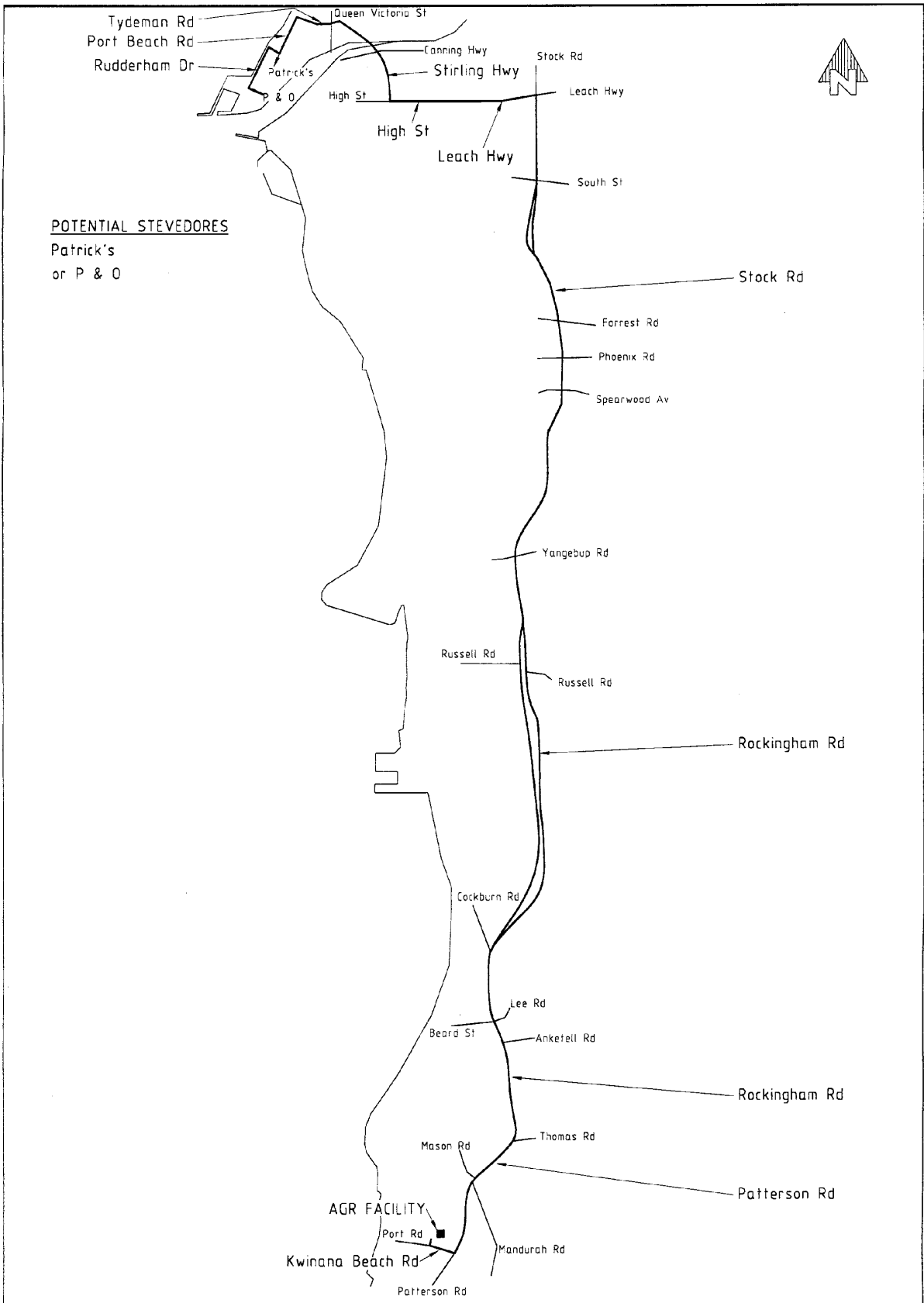


Figure 2: Transport Route (Source: Australian Gold Reagents, 2002a)

3. Consultation

AGR has made the following public presentations on the transport of solid sodium cyanide:

- Kwinana Community and Industries Forum (reported in community papers);
- Rockingham IP14 Consultative Community;
- Cockburn Sound Management Council Executive Committee;
- Fremantle Port Authority; and
- Town of Kwinana, and Cities of Rockingham, Cockburn and Fremantle (including representatives of the Transport Action Coalition).

AGR is an active member of the Kwinana Community and Industries Forum which provides a local forum for industry to inform the public on issues and address public concerns.

Consultation included both the (now approved) sodium cyanide solids plant and the transport of the product. AGR advised that some concern was raised within the community about the general use of the roads in the area for dangerous goods transport, and particularly about the transport of solid sodium cyanide. Concern was also expressed with respect to the transport component be assessed under Section 46 of the *Environmental Protection Act 1986*.

4. Relevant environmental factors

Section 46(3) of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage 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.

In the EPA's opinion the only environmental factor relevant to this proposal is public and environmental risk in regard to minimising the risk of spillage of solid sodium cyanide during transport and export operations.

4.1 Public and Environmental Risk

Description

Solid sodium cyanide is a white deliquescent crystalline solid and is classed as a Scheduled Poison (S7). Short term exposure to sodium cyanide by all pathways is considered to be highly toxic to humans. It is also toxic to aquatic life, birds and animals. Sodium cyanide will decompose on contact with acids, acid salts, water, moisture and carbon dioxide, producing highly toxic, flammable hydrogen cyanide gas. Most cyanides, including sodium cyanide are water soluble and spillage can potentially contaminate wetlands, rivers and groundwater. Cyanide however, oxidises and breaks down by a variety of mechanisms and is not persistent in the environment.

Sodium cyanide is a Class 6.1 Dangerous Good (one of 173 substances in this class) in the Australian Dangerous Goods code and therefore has to meet requirements with respect to storage and transport. The transport of dangerous goods is under the control of the Chief Inspector of Dangerous Goods of the Department of Mineral and Petroleum Resources (MPR) and is administered under the *Dangerous Goods (Transport) Act 1998* and the *Dangerous Goods (Transport) (Road and Rail) Regulations 1999*.

Solid sodium cyanide has already been imported by various companies via Fremantle Port and routinely transported by various carriers within the Perth Metropolitan Area (currently 100 to 200 tonnes per month). Approximately 8,500 tpa of solid sodium cyanide is currently imported into Western Australia by shipment and rail.

Transport of Solid Sodium Cyanide from Kwinana to the Fremantle Port

AGR commissioned Det Norske Veritas (DNV) to conduct a Qualitative Risk Assessment (QRA) for the transport of solid sodium cyanide from AGR's Kwinana site to the Fremantle Port (Det Norske Veritas, 2001a). The assessment considered the following:

- Loss of containment of solid sodium cyanide as a result of a collision (including vehicle roll over);
- Generation of hydrogen gas from solid sodium cyanide contacting acid, oxidisers or water; and
- Generation of hydrogen cyanide from a vehicle fire.

The assessment by DNV concluded that the total risk associated with the transport of solid sodium cyanide from Kwinana to Fremantle Port via the proposed road route to be low. It considered that the likelihood of loss of containment of solid sodium cyanide as a result of a vehicle accident to be low. It also considered that the likelihood of hydrogen cyanide gas being released due to spilled sodium cyanide coming into contact with rain water to be low due the low probability of loss of containment, the alkalinity of the briquettes and the “Cleanup and Containment” procedures that are in place.

The risk assessment made the following recommendations regarding road transport:

- AGR’s Transport Management Plan (Australian Gold Reagents, 2002b) is to be implemented and verified through regular auditing by both AGR and independent auditors;
- The proposed route should be modified and the Risk Assessment updated as traffic patterns change and as the recommended route for the Transport of Dangerous Goods in the Metropolitan Area map is updated by MPR and Main Roads WA to take into account change in the status of the roads;
- AGR should regularly review traffic data to identify if particular areas of the selected route become susceptible to a large number of incidents that would affect this Risk Assessment by increasing the likelihood of a hazardous event occurring; and
- If facilities adjoining the proposed route change (e.g. the construction of new sensitive developments), the impact of these changes upon the level of risk needs to be determined.

The Risk Assessment also made the two following recommendations:

- As the frequency of the road transport of solid sodium cyanide increases, rail transport could be considered by AGR as an alternative transport method; and
- AGR should be cognisant of other options for the transport of solid sodium cyanide, particularly if there are any infrastructure changes proposed for the Kwinana area; these options, if considered, may reduce the overall level of risk.

AGR has made commitments which incorporate the above recommendations (Appendix 4). It has also made a number of key commitments in its Transport Management Plan with respect to the transport of solid sodium cyanide, including an outline of contractor responsibilities. (Appendix 5). AGR, through CSBP’s Emergency Response Team provides offsite support in the event of an incident involving solid sodium cyanide. AGR has been manufacturing liquid sodium cyanide for more than 13 years. It has a good record with respect to the transport of liquid sodium cyanide to gold mining operations throughout Western Australia (no loss of containment during transport).

The Major Hazards Branch of MPR has reviewed the proponent’s proposal (Australian Gold Reagents, 2002a) and the QRA (Det Norske Veritas, 2001a) and has advised that it is satisfied with the proponent’s response to its questions relating to the proposal, given the preliminary nature of the project. The Water Corporation advised that the proposed transport route passes through the edge of only one Water Corporation main drainage catchment (Lake Coogee catchment). The Water Corporation requires a contingency plan for accidental spillage, with a

response and recovery plan that prevents significant sodium cyanide from reaching the lake system.

Sodium Cyanide Export at Port of Fremantle North Wharf

AGR commissioned DNV to conduct a QRA for the export of solid sodium cyanide from the Fremantle Port North Wharf (Det Norske Veritas, 2001b). The proposed packaging of the solid sodium cyanide meets the International Maritime Dangerous Goods (IMDG) Group 1 packaging standard and the Australian Dangerous Goods code. Normal shipping and stevedoring operations for a Packaging Group 1 dangerous goods provides for storage of the material for a maximum period of two hours at the North Wharf. A focus of the Risk Assessment was therefore on the five day duration proposed for onsite storage of the solid sodium cyanide. A Hazard Identification (HAZID) study identified eight potential hazards, including the following three risk issues associated with the storage of solid sodium cyanide seaintainers in the laydown area:

- A vehicle colliding with a solid sodium cyanide seaintainer;
- The mixing of solid sodium cyanide with incompatible substances; and
- Fire in the laydown area.

The Risk Assessment considered the level of risk to personnel and the environment for all eight hazardous events to be low and as such, are considered to be tolerable as per the “as low as reasonably practicable” (ALARP) principle.

AGR has not selected the shipping contractor and stevedore to manage the export operations. The Fremantle Port Authority (FPA) and the selected stevedore will be required to comply with the *Dangerous Goods (Transport) (Dangerous Goods in Ports) Regulations 2001* and develop a Safety Management System to MPR’s satisfaction for the safe storage and handling of solid sodium cyanide at the port. The two stevedores at the North Wharf (P & O Port and Patrick) use a computerised storage system to track and manage the stowage and segregation requirements according to the IMDG Code. AGR has advised that compliance with the Regulations will be included in the contractual agreement with the selected stevedore and that it will not commence export operations until the stevedore has the appropriate approvals in place. AGR has committed to audit the stevedores facilities and procedures for managing sodium cyanide before commencing the export operation and then every two years.

Inside the wharf the stevedore has the initial responsibility for emergency response should there be a spillage of solid sodium cyanide or a fire impacting on seacontainers of solid sodium cyanide. However, AGR will provide the same level of emergency response as exists outside the wharf. It has also committed to review the stevedores emergency response plans and train all stevedore, FPA and transport personnel involved in the export of solid sodium cyanide. The QRA (Det Norske Veritas, 2001b) assumed that solid sodium cyanide would be stored at the wharf in a secure dedicated laydown area with internal sumps that do not drain into waterways. AGR has committed to verifying that all the control measures and assumptions identified in the risk assessment are provided and/or implemented at the commencement of and during each shipment of solid sodium cyanide. A suitable stockpile of neutralising agent (ferrous sulphate monohydrate) will be stored at the Port in the event that a spillage of sodium cyanide cannot be fully recovered.

The Major Hazards Branch of MPR has reviewed the QRA (Det Norske Veritas, 2001b) and is satisfied with AGR's commitments, particularly with respect to auditing the stevedores facilities and procedures. It has also advised that a recent Quantitative Risk Assessment (Det Norske Veritas, 2000c), on the Fremantle Port Inner Harbour allowed for a considerable size expansion and the quantities and duration of sodium cyanide stored at the port is not likely to have a significant impact on the overall level of risk.

Rail Transport Option

Rail freight from Kwinana to Fremantle is currently railed from Kwinana to the Forrestfield marshalling yard and then the following day, railed from Forrestfield to a rail siding (adjacent to the stevedores) at North Fremantle (Figure 3). The seatainers are off loaded and transported by road for several hundred metres from the rail siding to the wharf since there is no direct rail access to the stevedores at the wharf.

Australia Western Railroad (AWR) has advised (per comm. Bob Wallis) that it would require a substantial increase in rail volume to open the direct rail link between Kwinana and the North Wharf.

AGR has selected the use of road transport over rail and considers that it has the following major advantages:

- The containers are only handled twice for the road transport option (on-load at the AGR site and off-load at the port), while at present at least four container transfers would be required for the rail option;
- All lifts of sea containers at the AGR site would be conducted by AGR personnel;
- The sea containers travel directly to the port using trained dedicated drivers along the designated transport route;
- The road transport option is more flexible, reducing the time that the product would be stored at the port;
- The road transport route is significantly shorter than the rail option;
- The rail option involves marshalling at Forrestfield and the wagons would remain in the yard overnight with minimal security; and
- Road transport is currently much more competitive than rail.

MPR is of the opinion that the current rail option is not an attractive option from a risk perspective. It referred to a comprehensive report on hazard analysis and consequences by the Health and Safety Commission of the United Kingdom (Health and Safety Commission, 1991) which compared rail and road transport options for various substances including motor spirit, LPG, ammonia and chlorine. This report concluded that:

“This comparison suggests that one cannot say that road is generally safer than rail or visa versa. Much depends on the particular circumstances of each route, and range of effect of the particular hazardous substances on the surrounding population”.

Rail access in the Perth Metropolitan area

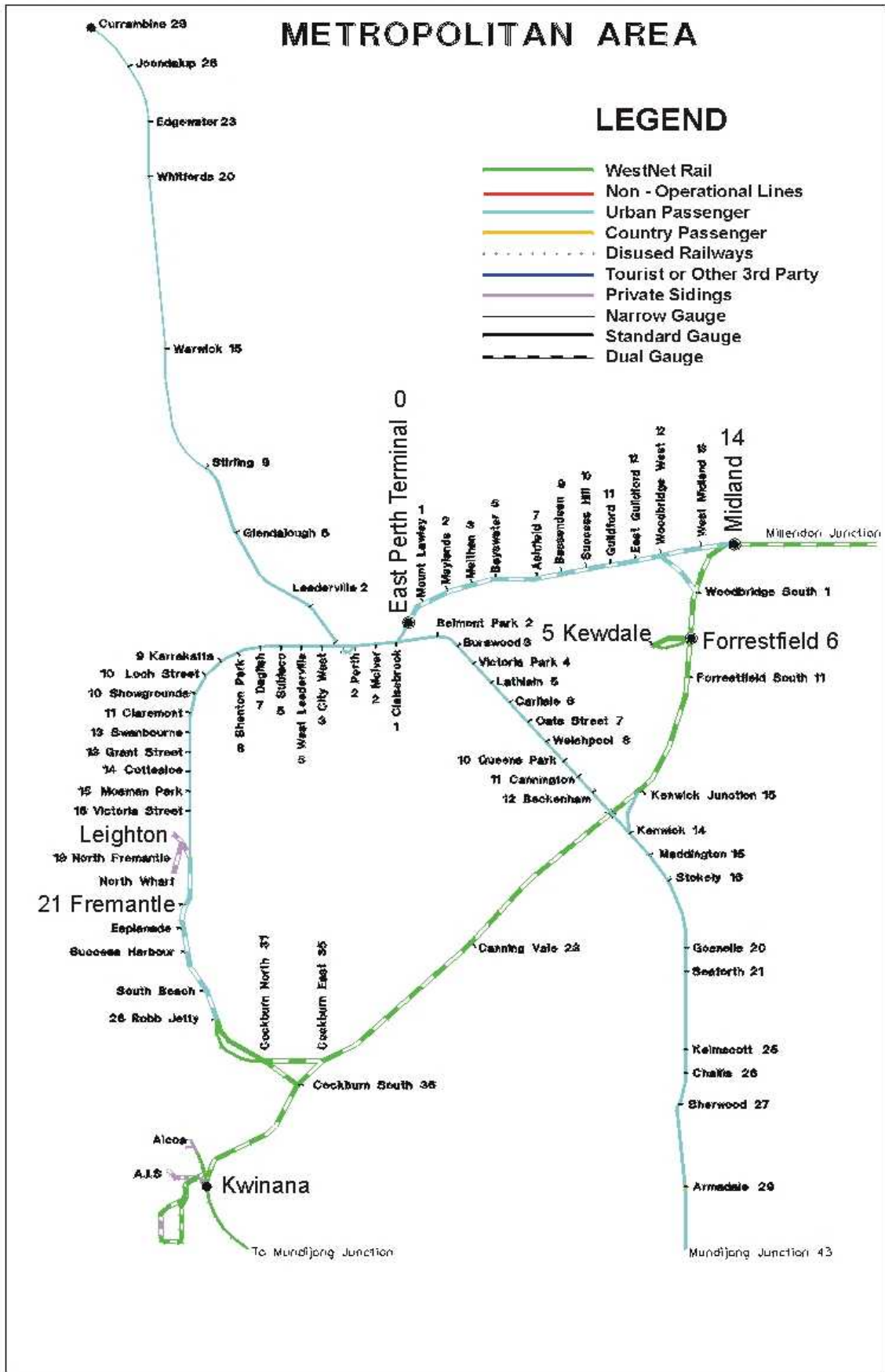


Figure 3: Rail Route (Source: Department for Planning and Infrastructure)

MPR recommended that the proponent provide a risk assessment between rail and road options, should a practicable option become available which facilitated direct rail transport from Kwinana to the Fremantle Port. The current rail route traverses the Jandakot Mound (Figure 4) and the Water and Rivers Commission advised that its preferred option is the proposed road route.

The proponent has committed to review the rail transport option within 3 years of commissioning of the solid sodium cyanide plant. The review would include a risk assessment of the rail option should there be a direct rail link to the port, such that marshalling at Forrestfield and the transfer of sea containers onto road vehicles at the AWR siding (adjacent to the stevedores) is no longer required. The Department of Planning and Infrastructure is conducting a Freight Network Review that includes a review of rail movements between Kwinana and Fremantle with a view to determining if a competitive direct rail link can be provided in the future.

Transport of Solid Sodium Cyanide on Routes Already Approved for Sodium Cyanide Solutions

AGR desires to have the flexibility to transport solid sodium cyanide on their existing transport routes for liquid sodium cyanide within Western Australia. AGR has advised that under the existing operation, small quantities of solid material are currently transported on these routes in sea containers to allow mining customers to keep an emergency store in the event of disruptions to the transport system. AGR has also advised that solid sodium cyanide is carried on most of these routes (road and rail) by competitors already, under the provisions of the Dangerous Goods Regulations. MPR has no objections to the transport of solid sodium cyanide on existing approved routes for liquid sodium cyanide. It has advised that it considers that the risk to the community would be no greater than that posed by the transport of liquid sodium cyanide.

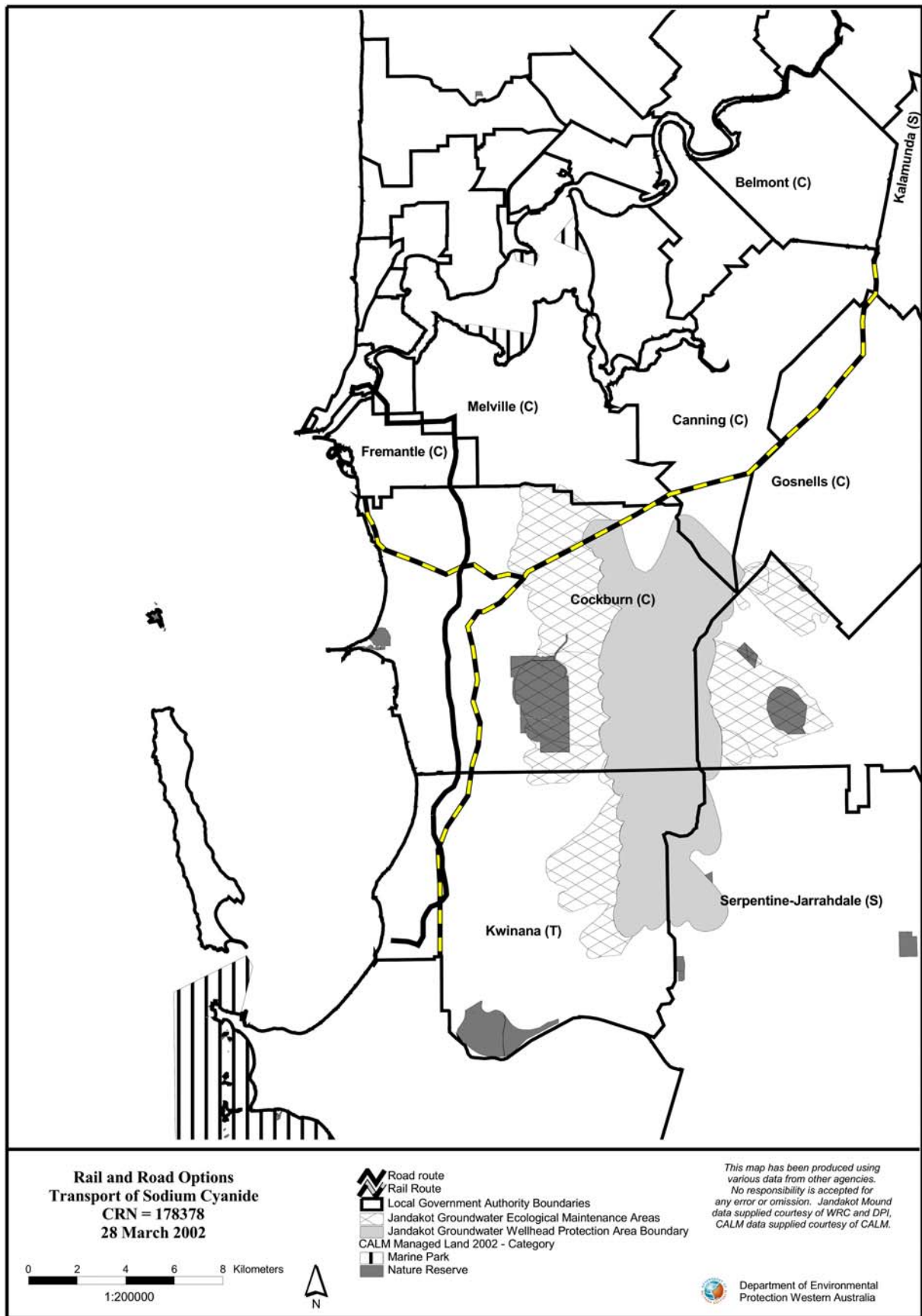


Figure 4: Jandakot Mound

Submissions

The City of Fremantle has requested that:

1. a risk assessment of rail transport be conducted; and
2. if the overall risks associated with rail transport are no higher than road transport, that solid sodium cyanide be transported from Kwinana to Fremantle Port by rail and not by road.

The Conservation Council of Western Australia expressed concern about the amount of heavy haulage traffic to and in the vicinity of Fremantle Port. It sought more information on incidents involving the road transport of solid sodium cyanide and details of the proponent's Transport Management Plan. It also advised that the State Government has initiated a Freight Network Review to address management of freight movements to and from Fremantle Port a key issue to be resolved. The Conservation Council considers that the proposed movement of solid sodium cyanide from Kwinana to North Quay by road to be in direct opposition to the efforts by the Minister for Planning and Infrastructure to get more freight to rail. It advised that the rail option should be re-examined and if not considered feasible at this time, then the mode of transport should be reconsidered in two or three years.

Assessment

The area considered for assessment of this factor is the proposed road transport route from Kwinana to the Fremantle Port North Wharf (Figure 2) and the storage site at the Fremantle Port North Wharf.

The EPA's environmental objective for this factor is to ensure that the transport and export of solid sodium cyanide is carried out in a manner such that public risk and environmental health and safety is managed to an acceptable level.

The EPA notes that solid sodium cyanide has already been imported by various companies via Fremantle Port and transported by various carriers within the Perth Metropolitan Area. It notes that approximately 8,500 tpa of solid sodium cyanide is currently imported into Western Australia by shipment and rail. The EPA notes that the Risk Assessments of the road transport of solid sodium cyanide from Kwinana to Fremantle Port (Det Norske Veritas, 2001a) and its storage at the wharf (Det Norske Veritas, 2001b) have determined the total risk to be low.

Since MPR is the regulatory authority for the management of the transport and storage of dangerous goods in WA, the EPA accepts its advice that it is satisfied with the commitments made by the proponent and responses to questions raised by MPR in its review of the risk assessments (Det Norske Veritas, 2001a and b). The EPA notes that the proponent is required to meet the *Dangerous Goods (Transport) Act 1998* and the *Dangerous Goods (Transport) (Road and Rail) Regulations 1999*. The EPA notes that the proposed route is consistent with MPR's Guidance Note: "Recommendations for Route Selection for the Transport of Dangerous Goods in the Perth Metropolitan Area" (Mineral and Petroleum Resources, 1999).

The EPA notes that the FPA and selected stevedore are required to comply with the *Dangerous Goods (Transport) (Dangerous Goods in Ports) Regulations 2001* and develop a Safety Management System to MPR's satisfaction for the safe storage and handling of solid sodium cyanide at the port.

The EPA notes that the proposed packaging will meet the IMDG Group 1 packaging standard. It also notes that prior to commencing export operations, AGR has committed to:

- Update its existing Transport Management Plan, including the emergency response procedures and training provisions;
- Review the Fremantle Port's Marine Safety and Environmental Management Plan with respect to the storage and handling of solid sodium cyanide;
- Audit the stevedores operations, safety management system and emergency procedures for storing and handling solid sodium cyanide, including verifying that the solid sodium cyanide will be stored in a secure dedicated laydown area with internal sumps that do not drain into waterways; and
- Verify that all the control measures and assumptions identified in the risk assessment (Det Norske Veritas, 2001b) are provided and/or implemented.

The EPA is satisfied that AGR is able to provide a coordinated emergency response should a spillage occur during transit or at the wharf. The EPA notes AGR's good record with respect to the transport of liquid sodium cyanide.

The EPA shares the concern expressed by the Conservation Council regarding the amount of heavy haulage traffic to and in the vicinity of Fremantle Port and agrees that the risk associated with a direct rail link transport option may be even lower than currently proposed. However, the EPA notes that this is not a viable option at this stage and acknowledges the concerns expressed by the proponent, MPR and the Water and Rivers Commission regarding the existing rail transport route between Kwinana and Fremantle. The EPA is satisfied that the proponent has committed to undertake a review of the options for the transport of solid sodium cyanide, including the road/rail transport options, within 3 years of commissioning of the sodium cyanide plant. The EPA supports the Freight Network Review being undertaken by the Department of Planning and Infrastructure to determine if a competitive direct rail link can be provided from Kwinana to the North Wharf.

The EPA considers that the transportation of solid sodium cyanide on routes approved for liquid sodium cyanide is acceptable, since MPR has no objections and has advised that it considers that the risk to the community would be no greater than would be posed by the transport of liquid sodium cyanide. It notes that the transport of solid sodium cyanide will be subject to the provisions of the Dangerous Goods Regulations.

Summary

Having particular regard to the:

- (a) advice provided by MPR; and
- (b) proponent's commitments;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for public and environmental risk.

5. Conditions and commitments

Section 46(3) of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment and Heritage 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.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment.

5.1 Recommended commitments

Australian Gold Reagents has made changes to commitments to reflect discussions with the DEP which have been part of the assessment process. The proponent's supplementary commitments as set out in the Section 46 document (Australian Gold Reagents, 2002a) and subsequently modified, as shown in Appendix 4, should be made enforceable conditions.

5.2 Recommended conditions

Having considered the proponent's supplementary commitments and the information provided in this report, the EPA recommends that the following conditions be imposed if the proposal by Australian Gold Reagents is approved for implementation:

- (a) The existing Ministerial Conditions applied to the project (Ministerial Statement No. 384 published on 12 May 1995), be subject to modifications necessary to:
 - Implement the supplementary consolidated environmental management commitments of 16 April 2002.

The amended conditions and supplementary Consolidated Commitments statement are presented in Appendix 4.

6. Conclusions

The EPA has considered the proposal by AGR to "Transport Solid Sodium Cyanide" and has concluded that it can be managed to meet the EPA's objectives for the relevant environmental factor.

The EPA concludes that the risk associated with the transport of solid sodium cyanide to and storage at the Fremantle Port North Wharf (Det Norske Veritas, 2001a and b) has been determined to be low. The EPA is satisfied that regulatory authority responsible for the transport and storage of dangerous goods in WA (MPR) has reviewed AGR's proposal and is satisfied with the commitments and responses to its questions, given the preliminary nature of the project. The EPA is satisfied that implementation of the proposal is subject to compliance with the *Dangerous Goods (Transport) Act 1998*, the *Dangerous Goods (Transport) (Road*

and Rail) Regulations 1999 and the Dangerous Goods (Transport) (Dangerous Goods in Ports) Regulations 2001.

The EPA considers that AGR's commitments to:

- Update its existing Transport Management Plan, including the emergency response procedures and training provisions;
- Review the Fremantle Port's Marine Safety and Environmental Management Plan with respect to the storage and handling of solid sodium cyanide;
- Audit the stevedores operations, safety management system and emergency procedures for storing and handling solid sodium cyanide, including verifying that the solid sodium cyanide will be stored in a secure dedicated laydown area with internal sumps that do not drain into waterways; and
- Verify that all the control measures and assumptions identified in the risk assessment (Det Norske Veritas, 2001b) are provided and/or implemented;

prior to commencing export operations, to be acceptable. It is satisfied that AGR is able to provide a coordinated emergency response should a spillage occur during transit or at the wharf and notes AGR's good record with respect to the transport of liquid sodium cyanide.

The EPA considers that the risk associated with the direct rail link transport option may be even lower than currently proposed and would help alleviate the amount of heavy haulage traffic to and in the vicinity of Fremantle Port. The EPA supports the current review of rail movements between Kwinana and Fremantle by the Department of Planning and Infrastructure to determine if a competitive direct rail link can be provided in the future. The EPA also supports AGR's commitment to review road/rail transport options within 3 years.

The EPA considers that the transportation of solid sodium cyanide on routes approved for liquid sodium cyanide is acceptable, since MPR has no objections and has advised that it considers that the risk to the community would be no greater than would be posed by the transport of liquid sodium cyanide.

In addition to the above, the EPA considers that conditions attaching to the environmental approval should be updated. It has therefore reported also on the updating of conditions.

7. Recommendations

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

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 transport solid sodium cyanide briquettes by road from its solid sodium cyanide plant at Kwinana (currently under

construction) to the Fremantle Port North Wharf for export overseas, interstate or to remote sites within Western Australia.

3. The EPA recommends that the Minister considers the report on the relevant environmental factors as set out in Section 4.
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 environment provided there is satisfactory implementation by the proponent of the amended conditions, including the proponent's supplementary commitments, as set out in Appendix 4.
5. The Minister imposes the amended conditions, commitments and procedures recommended in Appendix 4 of this report.

Appendix 1
List of Submitters

The City of Fremantle
The Conservation Council of Western Australia

Appendix 2
References

- Australian Gold Reagents (2002a), *Transport of Solid Sodium Cyanide from Kwinana to the Fremantle Port*, Australian Gold Reagents Pty Ltd, Western Australia.
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- Health and Safety Commission (1991), *Advisory Committee on Dangerous Substances. Major Hazard aspects of the Transport of Dangerous Substances*. HMSO. London.
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Appendix 3
Statement of Environmental Conditions of Approval
(12 May 1995)



Ass # 908

Bull # 772

State # 384

MINISTER FOR THE ENVIRONMENT WESTERN AUSTRALIA

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

PROPOSAL: SODIUM CYANIDE PLANT AT KWINANA AND
TRANSPORT OF SODIUM CYANIDE BY RAIL
(113 / 197 / 908)

COMPONENT: TRANSPORT OF SODIUM CYANIDE SOLUTION
FROM KWINANA (908)

CURRENT PROPONENT: AUSTRALIAN GOLD REAGENTS PTY LTD

CONDITIONS SET ON: 15 OCTOBER 1987
24 AUGUST 1989

The implementation of the transport component (road and rail) of these proposals is now subject to the following conditions which replace all previous conditions relating to transport:

1 Proponent Commitments

The proponent has made a number of management commitments in order to minimise risks to the public and the environment.

- 1-1 In implementing the proposals, including the transport of sodium cyanide by road reported on in Environmental Protection Authority Bulletin 772, the proponent shall fulfil the commitments made in the Public Environmental Reports (1986 and 1989), reported on in Environmental Protection Authority Bulletins 274 and 387; in the Notice of Intent (1987), reported on in Environmental Protection Authority Bulletin 284; in the document "Transport of Sodium Cyanide Solution from Kwinana, December 1994"; and in responses to issues raised during assessment and in subsequent correspondence with the Environmental Protection Authority; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A schedule of management commitments arising from the Public Environmental Reports (1986 and 1989), the Notice of Intent (1987) and the document "Transport of Sodium Cyanide Solution from Kwinana, December 1994" which will be audited by the Department of Environmental Protection is attached.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

Published on

12 MAY 1989

2-1 Subject to these conditions, the manner of detailed implementation of the proposals 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.

3 Transport and Emergency Management (See procedures 3 and 4)

3-1 The proponent shall establish detailed specifications for loading, transfer and unloading areas for iso-tainers at the plant site, rail terminals and mine sites.

3-2 The proponent shall outline specific safeguards for iso-tainers.

3-3 The proponent shall detail mine site storage and handling requirements.

3-4 The proponent shall identify responsibility for the various aspects of transport and transfer operations.

3-5 The proponent shall prepare contingency plans for dealing with spillages at all stages of the transport operation.

Note: The above conditions 3-1 to 3-5 are to be implemented to the requirements of the Department of Environmental Protection and other relevant public authorities.

3-6 Prior to the commencement of road transport on each route referred to in the document "Transport of Sodium Cyanide Solution from Kwinana, December 1994", the proponent shall consult with appropriate public authorities to ensure that all specific requirements are fulfilled in the transport and emergency response procedures, to the requirements of the Department of Environmental Protection and the Department of Minerals and Energy.

4 Proponent

These conditions legally apply to the nominated proponent.

4-1 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.

5 Time Limit on Approval

The environmental approval for the project is limited.

5-1 If the proponent has not substantially commenced the project, as modified to include road transport, within five years of the date of this statement then the approval to implement the modified project shall lapse and be void. The Minister for the Environment shall determine any question as to whether the modified project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposals can only occur following a new referral to the Environmental Protection Authority.)

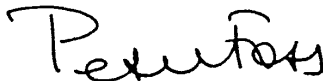
6. Compliance Auditing

To help determine environmental performance, periodic reports on progress in implementation of the proposals are required.

- 6-1 The proponent shall submit periodic Progress and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

- 1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.
- 2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.
- 3 The proponent's transport management systems, including transport procedures and operations, will be audited by the Department of Minerals and Energy, at least on an annual basis.
- 4 The Department of Minerals and Energy will report to the Department of Environmental Protection on incidents, cases of exceptions and non-compliance.



Hon. Peter Foss, MLC
MINISTER FOR THE ENVIRONMENT

**TRANSPORT OF SODIUM CYANIDE SOLUTION
FROM KWINANA (908)**

**SCHEDULE OF CONSOLIDATED MANAGEMENT
COMMITMENTS**

to be audited by the Department of Environmental Protection

AUSTRALIAN GOLD REAGENTS PTY LTD

Transport Management

- 1 The proponent will conform to all regulations and statutes relevant to the transport of dangerous goods as administered by the Explosive and Dangerous Goods Division, Department of Minerals and Energy (DOME).
- 2 The proponent will report any significant transport incidents to DOME.
- 3 The proponent is committed to the transport management systems contained in the document "Transport of Sodium Cyanide Solution from Kwinana, December 1994".
- 4 A procedure will be maintained for communications with the transport operations base as each vehicle travels along a transport route to a mine and until that vehicle logs off.
- 5 Each driver will maintain a log which includes time of departure from the Kwinana area, and a general goal will be to clear the metropolitan area before significant traffic build-ups occur.
- 6 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").
- 7 Safety features of the iso-tainers include use of top loading/discharge, a pressure relief device, an integral ruggedised steel frame enclosure and additional strengthening around the loading/discharge point to provide roll-over protection. The tops of the nozzles would be below the top of the iso-tainer frame providing additional roll-over protection.
- 8 The tanks will be marked clearly with emergency information panels.
- 9 Sodium cyanide solution will be loaded by a delivery hose and coupling into iso-tainers secured onto railway wagons or road vehicles at the siding at the plant site at Kwinana.
- 10 During rail transport the iso-tainers will be secured by twistlocks onto a flat-top rail wagon. Each standard gauge wagon will accommodate two iso-tainers and each narrow gauge will accommodate one. The twistlocks will be designed to ensure that in event of a derailment the container will remain secured to the wagon.
The same twistlocks are to be used for securing the iso-tainers to the road trailers.
- 11 For 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.

Emergency Response Management

- 12 The proponent will continue to liaise with Local Government Authorities, relevant government departments, State emergency authorities and the local emergency management advisory committees before transport commences along approved transport routes, to address local and specific issues, including setting up emergency plans and training programmes.
- 13 It is proposed that suitable emergency procedures be developed with the emergency services authorities for transport of sodium cyanide solution. The proponents are willing to continue to participate in the development of any such procedures, and in the implementation of any training programmes.
- 14 The emergency planning includes:
 - (1) training of transport operators including Westrail staff;
 - (2) provision of protective equipment to appropriate staff;
 - (3) strategic stocks of ferrous sulphate or other cyanide-neutralizing chemicals in event of emergency;
 - (4) handling and transport procedures for spilled sodium cyanide solution and the neutralized effluent; and
 - (5) communications.
- 15 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.
- 16 The proponent will change emergency response procedures for spillages during transport in accordance with any new data available to minimise ecological impacts.
- 17 Emergency response practice sessions will take place on a basis agreed with the relevant authorities.
- 18 The plant operator will continue to maintain a dedicated emergency response vehicle at the Kwinana Works and have appropriately trained response personnel available to service any off-site incident involving the transport of AGR's sodium cyanide solution.
- 19 Vehicles will continue to be equipped with means of communicating quickly, efficiently and reliably with an operational base, eg by means of 2-way radios, and shall be fitted with equipment and materials in accordance with the approved emergency plan.
- 20 The neutralizing agents used to treat any spilled sodium cyanide solution will be ferrous sulphate, sodium hypochlorite solution or hydrogen peroxide with copper catalyst or soda ash. Hydrogen peroxide is the preferred reagent for use within the plant. This technology is guaranteed by the process licensor as safe and effective. For offsite incidents, ferrous sulphate is the preferred neutralizing agent but in appropriate situations, other agents such as sodium hypochlorite may be used under strict AGR/CSBP direction.
- 21 Adequate stocks of neutralizing agent (preferably ferrous sulphate) will be maintained at the plant and along the main transport routes at agreed locations for use in emergencies. They will be inspected regularly to ensure that they are kept in good order.

Auditing

- 22 In addition to any required audits by a regulatory body, the proponent will continue to perform its own audits.
- 23 The proponent is committed to and will abide by the principles of Responsible Care which include in the Australian Chemical Industry Council's (ACIC), now the Plastics and Chemical Industries Association (PACIA) Code of Practice for the transport of chemicals.

Appendix 4
Recommended Environmental Conditions
and Proponent's Consolidated Commitments

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

SODIUM CYANIDE PLANT AT KWINANA AND
TRANSPORT OF SODIUM CYANIDE BY RAIL
SODIUM CYANIDE PLANT EXTENSION, KWINANA
(Includes Transport of Solids)

Proponent: Australian Gold Reagents Pty Ltd

Proponent Address: PO Box 345, Kwinana WA 6167

Assessment Number: 1422

Previous Assessment Numbers: 113, 197 and 908

Previous Statement Numbers: Statement No. 006 published on 15 October 1987,
Statement No. 073 published on 24 August 1989, and
Statement No. 384 published on 12 May 1995.

Report of the Environmental Protection Authority: Bulletin 1047

Previous Reports of the Environmental Protection Authority: Bulletins 274, 284, 387 and
772

The implementation of the *transport component* of the proposals to which the above reports of the Environmental Protection Authority relate is subject to the conditions and procedures contained in Ministerial Statement No. 384 (12 May 1995), as amended by the following:

Condition 1 (Proponent Commitments) of Statement No. 384 is deleted and the following condition is inserted:

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to minimise risks to the public and to protect the environment.

1-1 In implementing the proposals, including the modifications on the transport of sodium cyanide by road and the transport of solid sodium cyanide, as reported on in Environmental Protection Authority Bulletins 772 and 1047, respectively, the proponent shall fulfil the relevant commitments published on 12 May 1995 and those made on 16 April 2002. (Copies of both the commitments of 12 May 1995 and 16 April 2002 are attached).

**Proponent's Consolidated Environmental Management
Commitments**

12 May 1995

&

16 April 2002

**SODIUM CYANIDE PLANT AT KWINANA AND
TRANSPORT OF SODIUM CYANIDE BY RAIL
SODIUM CYANIDE PLANT EXTENSION,
KWINANA**

(Assessment No. 1422)

(Includes Transport of Solids)

AUSTRALIAN GOLD REAGENTS PTY LTD

Proponent's Consolidated Supplementary Commitments of 16 April 2002 – Transport of Solid Sodium Cyanide (Assessment No. 1422)

No.	TOPIC	ACTION	OBJECTIVE	TIMING	ADVICE
1	Transport Management Plan	1) Update the existing Transport Management Plan (TMP) to incorporate the transport of solid sodium cyanide. The TMP is to include: <ul style="list-style-type: none"> • The approved route (as outlined in submission); • Use of Intermediate Bulk Containers that meet IMDG Code; • Sea container inspections; and • Port disruption procedures; 2) Implement the TMP.	To ensure safe and effective management of transport operations.	Prior to transport of solid sodium cyanide, review bi-annually. Ongoing	MPR
2	Transport Route	Review the approved transport route and update the Risk Assessment (as required). (see Timing column).	To minimise risk.	As required based on: <ul style="list-style-type: none"> • Updates to the recommended Dangerous Goods Route; • Changes to facilities adjoining the route; and • A review of traffic data. Otherwise 3-yearly review.	MPR
3	Emergency Response & Training	Update the existing emergency response procedures and training provisions to include the transport, storage and handling of solid sodium cyanide.	To provide emergency response during product transport and assistance within the wharf area.	Prior to transport of solid sodium cyanide and update as required by the proponent's standard procedures.	MPR
4	Storage and Handling at Port	Audit the Stevedore's operations, Safety Management System and Emergency Response Plans for handling solid sodium cyanide.	To verify that control measures and assumptions identified in the QRA are provided and/or implemented.	Prior to transport of solid sodium cyanide and then bi-annually.	MPR, FPA

			<p>To verify that the Port Operations are compliant with Dangerous Goods in Ports Regulations with respect to solid sodium cyanide.</p> <p>To verify that drainage from the solid sodium cyanide laydown area is contained and emergency response is adequate.</p>		
5	Storage and Handling at Port	Review the Fremantle Port's Marine Safety and Environmental Management Plan with respect to solid sodium cyanide storage and handling.	<p>To verify compliance with the Dangerous Goods in Ports Regulations with respect to solid sodium cyanide.</p> <p>To verify that the emergency response procedures for a sodium cyanide spill are adequate.</p>	Prior to transport of solid sodium cyanide.	MPR
6	Transport Mode	Review other transport options, including road/rail viability and risk assessment.	To ensure the most effective transport mode is used, and public safety is protected.	Within 3 years of commencement of transporting solid sodium cyanide.	MPR

AGR = Australian Gold Reagents

DEP = Department of Environmental Protection

EPA = Environmental Protection Authority

FPA = Fremantle Port Authority

MPR = Mineral & Petroleum Resources, Department of

IMDG = International Maritime Dangerous Goods

QRA = Qualitative Risk Assessment

Appendix 5
Transport Management Plan – Key Commitments

AGR's Key Commitments for the Transport of Solid Sodium Cyanide

AGR's key commitments are listed below (adapted from Section 3 of the Sodium Cyanide Transport Management Plan – Ref. 10):

- Vehicles shall be equipped with the means of communicating quickly, efficiently and reliably with an operational base. A procedure will be maintained for communications with the transport operations base as each vehicle travels along the transport route and until that vehicle logs off.
- Road prime movers shall be maintained to manufacturers specifications and be subject to standards agreed during the carrier selection process.
- Road transport drivers shall have all the necessary licences including dangerous goods transport from the MPR Explosives and Dangerous Goods Division and AGR/CSBP certification for the transport of solid sodium cyanide.
- Drivers shall be trained and regularly retrained in the handling of solid sodium cyanide and in emergency procedures for initial (holding) response to a transport incident.
- AGR's operating agent CSBP shall provide a fully equipped emergency response vehicle and trained personnel on a 24-hour basis to respond to any transport incident involving AGR's solid sodium cyanide. AGR's Vehicle Operators Handbook details the requirements for vehicle operators (Ref. 11).
- AGR will only transport its product from Kwinana to the Fremantle Port along routes approved by the Chief Inspector of Dangerous Goods, MPR.
- Adequate stocks of the neutralising agent, ferrous sulphate, will be maintained at the plant and at the Fremantle Port Inner Harbour stevedore (yet to be nominated) for use in emergencies. These stocks will be inspected annually for stock level, chemical and physical state, access and general housekeeping. Ferrous sulphate is not toxic, and therefore is not considered to be a public risk.
- Inspection of all containers by AGR prior to the loading of solid sodium cyanide to verify that the container is fit for purpose.

Contractor Responsibilities for the Transport of Solid Sodium Cyanide

AGR's solid sodium cyanide transport carriers are required to uphold the following responsibilities.

- The transport operators must comply with all statutory requirements for the transport of dangerous goods.
- Only licensed drivers for the transport of dangerous goods, instructed in the properties of solid sodium cyanide, trained to deal with leaks and spillage, and

certified by CSBP shall be involved in the transportation and unloading of solid sodium cyanide.

- New drivers shall complete a theoretical and practical training course conducted by AGR prior to receiving accreditation to carry solid sodium cyanide. A minimum pass rate of 90% is required.
- All drivers shall complete a refresher course on an annual basis.
- All transport vehicles shall be equipped with effective communication equipment.
- The transport operators shall maintain effective communications with drivers during transport operations.
- Transport contractors are responsible for provision of adequate safety equipment for the protection of their personnel during operations.
- In the event of an incident the transport contractor shall make available resources as required by AGR/CSBP.

References

1. Australian Gold Reagents Pty Ltd, "*Sodium Cyanide Transport Management Plan – Draft*", Western Australia, December 2001.
2. Australian Gold Reagents Pty Ltd, "*Road Vehicle Operators Handbook 2000*", Western Australia, 2000.