Boddington Gold Mine Project

Worsley Alumina Pty Ltd

Modification to processing and disposal of supergene and copper-rich basement ores

Report and Recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
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Proposal to modify Condition 1 of Ministerial statement - Boddington Gold Mine Project - mining and processing of supergene/basement ores

Pursuant to Section 46(1) of the Environmental Protection Act, the Minister for the Environment has requested the Environmental Protection Authority to inquire and report on the modifications to the proposal for the mining and processing of supergene/basement ores.

Worsley Alumina Pty Ltd submitted a Notice of Intent for the mining and processing of supergene and basement ores at the Boddington Gold Mine in July 1989. Following assessment of the Notice of Intent by the Environmental Protection Authority, the Minister for the Environment issued a statement "that the proposal may be implemented" on 22 November 1989 (Appendix 1).

Further metallurgical testwork carried out by the proponent on the processing of the ores has resulted in modifications to the Notice of Intent and hence has changed the proposal as covered by Condition 1 of the Ministerial approval.

The original proposal described using a floatation circuit to process the copper-rich supergene and basement ores rather than the existing carbon in leach process, as the copper could interfere with the carbon in leach circuit used to process the oxide ore. Disposal of the ores treated in the floatation circuit were to be directly disposed of in a separate segment of the existing residue disposal area to prevent contamination of the carbon in leach process water by the floatation reagents.

The modifications to the Notice of Intent are as follows:

1. Metallurgical testwork has shown that cyanide leaching of the tailings from the supergene floatation circuit is necessary to maximise gold recovery. It is therefore proposed to expand the pre-leach circuit to include a carbon absorption circuit which will provide additional processing of the supergene and copper-rich basement ores.
2. The inclusion of a separate carbon absorption circuit for the supergene floatation tailings, that will scavenge the floatation reagents, means that the separate residue disposal area is not required. Therefore, the supergene and basement residues will be disposed of in the existing residue disposal area.

In terms of environmental impact the modifications are seen as non - substantive and will have a positive result by utilising only the existing residue storage area rather than requiring a new separate area as originally proposed.

The Environmental Protection Authority has assessed the modifications to the original proposal and regards them as being environmentally acceptable.

Recommendation 1

The Environmental Protection Authority regards the changes to the methods of processing and disposal for the supergene/basement proposal as being environmentally acceptable and recommends that Condition 1 should be amended to read "In implementing the proposal (including the documented modifications of 1 March 1990) the proponent shall fulfil the commitments ..."

In proposals such as the Boddington Gold Mine, it is apparent that minor changes to the project are required as various aspects of the project are developed, for example as more detailed geological information is available from the mining process itself.

Where changes are substantial from the environmental viewpoint, then the changes will need to be assessed and if acceptable, the environmental conditions under which the proposal has been authorised to proceed will need to be changed according to the procedures under the Environmental Protection Act 1986.

However, where modifications to a proposal are minor and have insignificant environmental impact such as, where in the course of the detailed implementation of a project, the proponent seeks to change designs, specifications, plans or other technical material in a non-substantial way, such changes should be allowed outside the procedures under the Act, provided that the Minister for the Environment, on the advice of the Environmental Protection Authority, has first determined that the proposed change is non-substantial.

Accordingly, the Environmental Protection Authority makes the following recommendation.

Recommendation 2

The Environmental Protection Authority recommends that subject to the conditions in the Minister for the Environment's statement of 22 November 1989, as modified by Recommendation 1, detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material as submitted by the proponent with the proposal to the Environmental Protection Authority. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any non-substantial way, such changes may be effected provided the Minister for the Environment, upon the advice of the Environmental Protection Authority, has first determined that the proposed change is non-substantial.

Appendix 1

WESTERN AUSTRALIA

MINISTER FOR ENVIRONMENT

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

BODDINGTON GOLD MINE, MINING AND PROCESSING OF SUPERGENE/BASEMENT ORES

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 in the Notice of Intent of July 1989 (as amended) and shall carry out the mining and processing of the Supergene/Basement Ores in accordance with the relevant commitments documented in the Environmental Management Programmme for the Boddington Gold Mine of April 1987. (A copy of commitments summarized and consolidated on 30 October 1989 is attached).

2. To ensure that any acidic drainage waters are utilised within the Floatation Processing Plant Circuit, the proponent shall, prior to mining of potentially acidic ores, prepare and implement plans for the management and monitoring of the drainage from the waste and ore stockpiles, to the satisfaction of the Environmental Protection Authority.

3. The proponent shall extract any additional water from the Hotham River for the expanded operations in accordance with the conditions in the Statement for the Boddington Gold Mine Enhancement of Facilities issued by the Minister for Environment on 15 February 1988. (Copy attached).

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4. To maintain the water quality of Thirty-Four Mile Brook so that the Water Supply Reservoirs will be a viable long-term source of public water supply and to leave the site in an environmentally stable condition, the proponent shall undertake rehabilitation of the site and its environs in consultation with the Water Authority of Western Australia, the Department of Mines and, where appropriate, the land owner, to the satisfaction of the Environmental Protection Authority upon advice from the Water Authority of Western Australia and the Department of Mines.

   The proponent shall be responsible for decommissioning, and at least six months prior to decommissioning, shall prepare a decommissioning and final rehabilitation plan to the satisfaction of the Environmental Protection Authority.

5. 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 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.

Bob Pearce, MLA
MINISTER FOR ENVIRONMENT

22 NOV 1989

WORSLEY ALUMINA PTY LTD

BODDINGTON GOLD MINE

Consolidated and Updated Environmental Commitments – October 1989

1. Clearing for project activities will be kept to a minimum, consistent with safe operating practices.

2. Topsoil from areas cleared for project activities will be salvaged for use in decommissioning and other rehabilitation programmes.

3. Environmentally-sensitive construction and operational practices, including stringent forest hygiene measures, will be employed throughout the project area (see April 1987 Environmental Management Programme – Exhibit H, Appendix A; Environmental Checklist, Appendix E).

4. The operation will be licensed in accordance with the requirements of the **Environmental Protection Act, 1986** (includes air, water and noise pollution control).

5. The State will continue to be compensated for clearing of State Forest under terms of the **Alumina Refinery (Worsley) Agreement Act, 1973.**

6. Alternative access from private land around the downstream Water Supply Reservoir to State Forest to the west of the project area will be maintained for local bush fire brigades and CALM.

7. Biological monitoring programmes, based on information provided to the State in the draft report on baseline biological investigations, will be developed in consultation with the State. Results of these monitoring programmes will be reported to the State and changes to management and procedures developed as necessary with the State.

8. A quantified assessment of likely impacts of project clearing on streamflow and quality of Thirty-Four Mile Brook has been carried out with the Water Authority of Western Australia (see Appendix B of the April 1987 Environmental Management Programme). In consultation with the EPA and the Water Authority, surface and groundwater monitoring programmes will be developed and implemented to facilitate progressive planning and management of project activities, particularly mining and residue storage, to minimize adverse hydrological and hydrogeological effects.

9. Rehabilitation of project areas will be carried out in consultation with the State and, where appropriate, the land owner, with the aim of maintaining the water quality of Thirty-Four Mile Brook so that the downstream Water Supply Reservoir could be a viable long-term source of public water supply. If, at the time of decommissioning, the State requires the Water Supply Reservoir as a potable water source, the water quality in the reservoir will be reassessed and, should it prove to be unsuitable, the Joint Venturers will drain the dam, allowing it to refill naturally.

10. If unacceptable quality is detected in groundwater monitoring bores around the Residue Disposal Area, the remedial actions described in Section 8.3.3 of the April 1987 Environmental Management Programme will be evaluated as part of the development of a response to such a situation.

11. Material from residue and reclaim pipeline leaks/breakages will be contained at low points along the residue pipeline route and transported to the Residue Disposal Area. If spills are not fully contained, WAPL will carry out clean-up and rehabilitation of affected areas in consultation with the State.

12. In the unlikely event of a dam failure, including the overtopping of the Process Water Pond, the Joint Venturers will assume responsibility for clean-up and rehabilitation to the satisfaction of the State.

13. All waste and spilt materials in the Metallurgical Treatment Plant area will be contained within the process operation for reuse, or disposed of as appropriate.

14. Caustic soda used in the Metallurgical Treatment Plant will have a mean mercury content of less than 100 µg/L, with a maximum value of 1,000 µg/L.

15. Stormwater runoff from the cleared area of the Plant Site will flow into the Process Water Pond, which has been lined with clay and plastic to minimize leakage. The pond will have sufficient capacity to accommodate rainfall runoff from a one in one hundred year storm event.

16. Blasting operations will be managed in accordance with the relevant conditions of the Environmental Protection Act Licence for the Project and with any requirements of the Department of Mines.

17. Drainage (other than acidic mine drainage) will be installed in the mine pits, with runoff either used for dust suppression, or drained via silt traps to natural watercourses.

18. Perimeter drains will be installed around mine pits and stockpiles; water (other than acid mine drainage water) from these and from haul roads will drain through silt traps into natural watercourses.

19. The objective of the management of runoff from the mining operations will be to minimize the potential spread of forest disease and to reduce the long-term salinity and turbidity impact on Thirty-Four Mile Brook.

20. Mine waste not used in road construction will be returned as backfill to mine pits during the life of the project.

21. If it is decided not to process marginal ore, this material will be returned to mined-out pits.

22. Shallow mine pits will be contoured to slopes generally consistent with natural landforms.

23. Deeper pits will be rehabilitated if, at the time of completion of mining the weathered profile, no decision to mine bedrock has been made. Should a decision to mine bedrock to be made, detailed plans will be submitted to the State for approval.

24. Final rehabilitation will ensure that runoff will drain to natural watercourses or into the deeper pits.

25. Life-of-project land use plans will be prepared and submitted to the State on an annual basis.

26. The State will be provided with brief annual and comprehensive triennial environmental management reports as part of existing arrangements for the Worsley Alumina Project.

27. Water will be extracted from the Hotham River in accordance with licence conditions set by the Water Authority of Western Australia under the terms of the Rights in Water and Irrigation Act 1914.

28. Agreements will be negotiated and operated to the satisfaction of the Minister for Water Resources, with any other major users of water from the Hotham River to ensure that pumping does not reduce instantaneous flow below the minimum rate set by the Water Authority of Western Australia.

29. After two winter flows (i.e. after the winter of 1989), a report will be submitted to the Water Authority of Western Australia and to the Environmental Protection Authority on biological studies in, and details of pumping from, the Hotham River, enabling advice to be given to the Environmental Protection Authority as to the adequacy of the minimum flow rate set by the Water Authority in protecting the ecological integrity of the Hotham River.

30. Water and residue management structures will be constructed, modified and maintained to the satisfaction of the Water Authority of Western Australia under the terms of the Rights in Water and Irrigation Act.

31. Any acidic mine drainage from mine pits or stockpiles will be reclaimed for use in the Flotation Processing Plant, and the treatment of sources of such acid drainage will include evaluation of techniques such as encapsulation of acid-forming materials with inert material.