

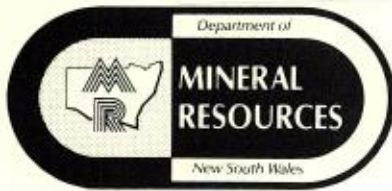


EIS 313

AA052367

Proposed mining and recovery of industrial topaz at Torrington :
environmental impact assessment

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DEPARTMENT OF MINERAL RESOURCES

**PROPOSED
MINING AND RECOVERY
OF INDUSTRIAL TOPAZ
AT TORRINGTON**

**ENVIRONMENTAL IMPACT
ASSESSMENT**

REPORT No. GS 1985 / 141

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**ENVIRONMENTAL IMPACT
ASSESSMENT**

NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES
SYDNEY NOVEMBER, 1985

EIS
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FOREWORD

Topalite Resources Pty Limited, formerly known as G. Whitburn Pty Limited, proposes to mine 1.5 million tonnes of industrial topaz ore by open cut methods from 24 individual deposits located near Torrington in northeastern New South Wales. Wolfram, bismuth and construction sand may be recovered as by-products. Topaz ore will be mined at a rate of up to 150,000 tonnes per annum and with the present known resource will have a life of approximately 15 years. A treatment plant will process the ore by gravitational and magnetic methods; - topaz concentrate being transported by truck to either Glen Innes or Newcastle where the Company proposes to construct a refining plant for the manufacture of refractory and fluorine products.

It is proposed to mine the topaz ore bodies from within Mining Lease Applications 609, 610, 612 and 617 (Inverell), and to erect an ore treatment plant on Mining Purposes Lease Application 597 (Inverell), for which Topalite Resources Pty Limited is now the registered applicant.

The majority of these lease application areas are located within the Shire of Tenterfield. There are no environmental planning instruments in force over lands affected by the proposal within the Shire of Tenterfield. The proposal therefore does not require development consent under Part IV of the Environmental Planning and Assessment Act, 1979 and its Regulation, 1980. However under Part V, the mining operation constitutes an "activity" for which the approval of a Minister or public authority is required in order to be carried out. The Minister for Mineral Resources and Energy is the approval body (the "determining authority") under Part V with respect to the proposal.

In accordance with Section 112(1) of the Environmental Planning and Assessment Act, 1979, the Minister for Mineral Resources and Energy, in a decision dated 18th October 1984, requested the applicant, then G. Whitburn Pty Limited, to prepare an environmental impact statement, as the proposed mining operation was likely to have a significant effect on the environment. The environmental impact statement was publicly advertised and exhibited by the Department of Mineral Resources from April 18 to May 17, 1985 and public comments were invited and received during the period of exhibition.

An adjoining and minor portion of the proposal, incorporating part of MLA's 609 and 610 plus the concentrate road haulage route, is located within the Shire of

Severn, where an environmental planning instrument is in force. This part of the proposal is therefore subject to Part IV of the Environmental Planning and Assessment Act, 1979 and is a designated development requiring the consent of the Severn Shire Council. The same environmental impact statement was placed on public display by Severn Shire Council for the same period April 18 to May 17, 1985. Severn Shire Council gave its consent to the development in June, 1985.

The Department has prepared and made public this Environmental Impact Assessment Report in accordance with Clause 64 of the Regulation. It examines the environmental implications of the proposal, and includes consideration of all public submissions, the views of Tenterfield and Severn Shire Councils, the Department of Environment and Planning and other Government authorities. This assessment report will be forwarded to the Company, to all Government agencies that provided advice to this Department, and to the authors of public submissions.

This report constitutes the Department's recommendations to the Minister for Mineral Resources and Energy for his consideration in making a final determination with respect to the grant of the subject leases. The Minister's decision in respect of this matter has been included in this document.

G. Rose
Secretary
Department of Mineral Resources

**PROPOSED MINING AND RECOVERY OF INDUSTRIAL TOPAZ AT TORRINGTON
ENVIRONMENTAL IMPACT ASSESSMENT**

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DECISION OF THE MINISTER FOR MINERAL RESOURCES AND ENERGY

Whereas -

1. Topalite Resources Pty Limited is the registered applicant for Mining Lease Application's 609, 610, 612, 617 (Inverell) and Mining Purposes Lease Application 597 (Inverell), lodged under the Mining Act, 1973.
2. the registered applicant wishes to mine by open cut methods approximately 1,500,000 tonnes of topaz ore over a period of 15 years, construct an ore treatment plant, and transport topaz concentrate to Glen Innes or Newcastle, (hereafter referred to as "the proposed operation").
3. the approval of the proposed operation by the Minister is an "activity" within the meaning of Part V of the EPA Act, the Minister is a determining authority within the meaning of that Part and the registered applicant is a proponent within the meaning of that Part.
4. the Minister in considering the proposed activity examined and took into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity and concluded that the activity was likely to significantly affect the environment.
5. no final decision was made to authorise the undertaking of the activity until -
 - (a) the Minister obtained examined and considered an environmental impact statement entitled "Environmental Impact Statement for the Mining and Recovery of Industrial Topaz at Torrington, N.S.W., for G. Whitburn Pty Limited" dated April 11, 1985 in respect to the activity, prepared in the prescribed form and manner by or on behalf of the proponent.
 - (b) a copy of the said statement had been referred to the Secretary, Department of Environment and Planning.
 - (c) notice as provided for in Section 113(1) of the EPA Act was given and the period specified in the notice had expired.
 - (d) the Minister had examined and considered the representations made in accordance with Section 113(2) of the EPA Act.
 - (e) the Minister had complied with Section 113(3) of the EPA Act by referring all representations received to the Secretary, Department of Environment and Planning.

9. no notices were served on the Minister by the Secretary, Department of Environment and Planning pursuant to Section 112(1) (d) and (e) of the EPA Act.
10. the Minister caused to have prepared by the Secretary, Department of Mineral Resources for the purpose of Regulation 64 of the Environmental Planning and Assessment Regulation, 1980 a document entitled "Proposed Mining and Recovery of Industrial Topaz at Torrington - Environmental Impact Assessment" (hereafter referred to as the report).
11. the report contains a recommendation that the activity be authorised and be subject to conditions.
12. Severn Shire Council has given its consent to that part of the development within Severn Shire.

Now therefore, I Peter Cox, Minister for Mineral Resources and Energy having complied with the provisions of Section 112 of the EPA Act and the regulations made thereunder and being satisfied that, with the safeguards proposed, the undertaking of the activity will not detrimentally affect the environment, have decided, pursuant to Section 53(2) of the Mining Act, 1973, to grant leases, in satisfaction of the Applications specified hereunder, to Topalite Resources Pty Limited subject to the conditions referred to in the following schedule:

SCHEDULE

<u>Lease Application</u>	<u>Lease to be Granted (Act 1973)</u>	<u>Term</u>	<u>Minerals</u>	<u>Conditions</u>
MLA 609, 610 (Inverell)	ML 1159	21 yrs	wolfram, quartz topaz, bismuth	Annexures A, B, C, D
MLA 612 (Inverell)	ML 1160	"	"	Annexures A, B, E
MLA 617 (Inverell)	ML 1161	"	"	Annexures A, B, C, F
MPLA 597 (Inverell)	MPL 242	"	-	Annexures A, G

Dated this third day of January, 1986.

Peter Cox
Minister for Mineral Resources and Energy

ANNEXURE A

This and the succeeding pages is the Annexure A referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of leases in satisfaction of Mining Lease Applications 609, 610, 612, 617 (Inverell) and Mining Purposes Lease Application 597 (Inverell).

1. (a) Within a period of three months from the date of this authority, or within such further time as the Minister may allow, the registered holder shall serve on each owner or occupier of the private land and on each occupier of the Crown land held under a pastoral lease, and on each mineral owner (other than the Crown) within the subject area, a notice in writing indicating that this authority has been granted, and whether the authority includes the surface. The notice shall be accompanied by an adequate plan and description of the subject area.

(b) If there are ten or more owners or occupiers affected, the registered holder may serve the notice by publication in a newspaper circulating in the region where the subject area is situated. The notice shall indicate that this authority has been granted, state whether the authority includes the surface, and shall contain an adequate plan and description of the subject area.
2. Upon the expiry or sooner determination of this authority or any renewal thereof the registered holder shall remove all machinery and buildings and the subject area shall be left in a clean and tidy condition to the satisfaction of the Minister.
3. The registered holder shall consult with the Department of Lands and the Soil Conservation Service in regard to the rehabilitation of any Crown Land affected by the operation other than that contained in the Torrington State Forest No. 320 and Extension No. 1.
4. Spoil dumps shall, upon conclusion of operations, be graded by the registered holder to form undulating or flat sloping areas, and shall be planted with grass, shrubs or indigenous trees, as directed by the Minister.

5. The registered holder shall not interfere with any Crown Improvements unless with the consent in writing of the Minister first had and obtained and subject to such conditions as he may stipulate.
6. The registered holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the consent in writing of the owner thereof or the Minister first had and obtained and subject to such conditions as the Minister may stipulate.
7. The registered holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent the contamination, pollution or siltation of any stream or watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or siltation of any stream watercourse or catchment area or any undue interference to fish or their environment.
8. The registered holder shall ensure that run off from any disturbed area including the overflow from any depression or ponded area is discharged in such a manner that it will not cause erosion.
9. The registered holder shall not interfere with the flow of water in any stream or watercourse, except for the purpose of obtaining water for the carrying on of the operations.
10. The registered holder shall not interfere with any well, water pump, dam or pipeline, without the consent of the owner and occupier first had and obtained.
11. The registered holder shall so conduct the operations hereby authorised as not to interfere with or impair the stability or efficiency of any telephone or power transmission line traversing the subject area.
12. The registered holder shall restrict the use of any road or track situated within the subject area during wet weather to minimise damage to such road or track.
13. In the event of operations being conducted on the surface of any track and/or road reserve traversing the subject area or causing any damage to or

interference with such track or road reserve the registered holder shall provide suitable alternate access at its own expense and shall allow full and free access along such track, road reserve, or any alternate access at all times and if so required by the Minister the registered holder shall restore the track to its original position and condition following the completion of operations.

14. The minimum number of roads or tracks shall be used for access from one site of operations to another and all roads or tracks, both temporary and permanent, shall be constructed to the specifications prescribed by the Soil Conservation Service, after consultation with the Forestry Commission and the Department of Lands in respect of lands controlled by those authorities, and the National Parks and Wildlife Service so as to minimise soil erosion. Adequate provision shall be made at regular intervals along each track for the drainage of runoff onto safe disposal areas. Where tracks cross natural watercourses, the watercourses shall be protected from erosion by provision of culverts or causeways.
15. The registered holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the registered holder shall observe and perform any instructions given or which may be given by the Minister or the Secretary with a view to minimising or preventing soil erosion.
16. The operations hereby authorised shall be carried out in such a manner as to interfere as little as possible with natural flora or fauna.
17. The registered holder shall make every effort to identify and avoid unnecessary disturbance to the wattle species **Acacia mcnutiana** and **Acacia betchii**. Where destruction of the former species is unavoidable the registered holder shall, as part of the rehabilitation process carry out replanting of this species using seed collected locally and to a density approved by the Minister.
18. The registered holder shall not fell trees, strip bark or cut timber on any private land, or Crown land held under a pastoral lease, within the subject area, except with the approval of the Warden and subject to payment to the owner of the trees, bark or timber of compensation assessed by the Warden under the Mining Act, 1973, and on any other land subject of this authority shall not cut, destroy, ringbark or remove any timber or other vegetative

cover except such as directly obstructs or prevents the carrying on of the operations hereby authorised.

19. The registered holder shall implement such dust control measures as approved by the State Pollution Control Commission to limit any dust deposition on the subject and nearby land, such that the operations do not interfere with the normal occupation of dwellings or any agricultural activities.
20. The registered holder shall, prior to the commencement of any construction or mining operations, arrange for the deployment of a water tanker to reduce dust levels. Stockpiling or dumping of any material is to be managed so as to minimise the emission of dust from the site. Haul roads and loading areas are to be provided with a compacted gravel surface and regularly watered.
21.
 - (a) The registered holder shall not knowingly destroy deface or damage any aboriginal relic or other item of archaeological significance within the subject area and shall take every precaution in drilling, excavating or disturbing the land against any such destruction, defacement or damage.
 - (b) The registered holder shall within twenty four (24) hours notify the Director of National Parks and Wildlife of the discovery of any such relic or other item.
 - (c) The registered holder shall not continue any operations likely to interfere with or disturb any such relic or other item without the concurrence of the Director of National Parks and Wildlife, provided that such concurrence must be given or refused within sixty (60) days of the notification referred to in (b) above.
22. The registered holder shall, at the end of every twelve (12) months of the term of this lease and any renewal thereof, provide a written report to the Regional Mining Engineer describing all works carried out on the area in that twelve (12) month period, and shall include diagrams of all excavations, topsoil and/or overburden dumps, access and/or haul roads, buildings, dams, stockpiles, made, used or constructed. A description of the tonnages of ore and tailings mined or treated, and the number of persons employed on the lease, shall also be provided.

23. (a) Where a Regional Mining Engineer is of the opinion that any condition of this authority relating to the working of the subject area, or any provision of the Mining Act, 1973 relating to the working of the subject area is not being complied with by the registered holder, he may in writing direct the registered holder:-
- (i) to cease working the subject area in contravention of that condition or Act; and
 - (ii) to carry out within a specified time works at the expense of the registered holder necessary to rectify or remedy the situation.
- (b) Where a Regional Mining Engineer issues any direction to the registered holder pursuant to paragraph (a) of this condition the registered holder shall comply with the direction.
24. The registered holder shall not keep nor permit to be kept on the subject area any dog unless chained up or kept under proper control.
25. Any gates within the subject area or any other gates used by the registered holder shall be closed or left open in accordance with the requirements of the owner or occupier.
26. The registered holder shall take all precautions against causing an outbreak of fire and shall comply with the provisions of and regulations under the Bush Fires Act, 1949, as amended and shall not burn off any grass, foliage or herbage unless with the consent of the owner or occupier and the local fire authority.
27. The registered holder shall not allow any firearms to be brought onto the subject area.
28. The transport of ore and concentrate shall be restricted to the hours 7 am to 6 pm Monday to Saturday and no transportation shall be undertaken on Sundays.

ANNEXURE B

This and the succeeding pages is the Annexure B referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of leases in satisfaction of Mining Lease Applications 609, 610, 612 and 617 (Inverell).

1. Mining operations shall be undertaken substantially in accordance with the environmental impact statement prepared by Boyd Pratt & Associates entitled "Environmental Impact Statement for the Mining and Recovery of Industrial Topaz at Torrington, N.S.W., for G. Whitburn Pty Limited" - dated 11th April, 1985, and no major variation shall be made therefrom without the approval of the Minister first had and obtained.
2. The registered holder shall restrict mining operations on the subject area to open cutting, and shall not adopt any other method of mining, unless with the approval of the Minister first had and obtained and subject to such conditions as he may stipulate.
3. The registered holder shall not open cut more than one hectare of the surface of the subject area at any one time, unless with the approval of the Minister first had and obtained and subject to such conditions as he may stipulate.
4. Operations shall be conducted in such a manner as not to cause any danger to persons and stock. The registered holder shall provide and maintain adequate protection, to the satisfaction of the Minister, around each excavation opened up or used by the registered holder.
5. (a) Any topsoil which may be disturbed shall be removed separately for replacement as far as may be practicable and as work progresses all other residues shall be returned to the excavations made and all worked ground shall be levelled off and the topsoil previously removed shall be replaced and levelled and sides of the cut shall be battered to a safe low angle and all depressions shall be effectually drained and such filling, levelling, battering and drainage shall be done to the satisfaction of the Minister.

- (b) If so directed by the Minister the registered holder shall plant or sow such grasses shrubs or trees in the replaced topsoil as may be considered necessary by the Minister to control erosion.
6. The registered holder shall on the completion of mining operations progressively rehabilitate each open cut area disturbed to the satisfaction of the Minister.
7. (a) The registered holder shall not excavate within 15 metres of the boundaries of any road shown on the said plan unless with the consent of the Minister first had and obtained and subject to such conditions as he may stipulate.
- (b) Notwithstanding that the registered holder shall have complied with this condition the registered holder shall pay to Tenterfield or Severn Shire Councils, or the Department of Lands the cost incurred by such Councils or Department of making good any damage to any road caused by operations carried on by or under the authority of the registered holder or any person claiming through or under the registered holder.
- (c) AND THE REGISTERED HOLDER HEREBY CONVENANTS with the said Councils or the Department of Lands that the registered holder will pay to the said Council or Department the cost incurred by the Councils or Department of making good any such damage caused as aforesaid.

AND IT IS HEREBY AGREED AND DECLARED that the amount to be paid by the registered holder under the provisions of this clause shall include in addition to the cost of all necessary labour and materials all costs and expenses reasonably incurred in and about the making of surveys the preparation of plans and specifications and estimates the supervision and inspection of the works and all administrative and overhead costs and expenses of the Council or the Department of Lands as the case may be related or attributable to the works undertaken to make good any damage caused to any road. A certificate under the hand of the Shire Clerks of the said Councils or the Secretary for Lands or the person for the time being acting as such Clerk or Secretary as to the amount of the cost of making good any damage to any road shall in all respects and for all purposes be conclusive evidence of the amount of such cost and of the due determination thereof.

8. At any point where a private haul road enters or crosses a public road a "Stop" sign shall be erected on the haul road and appropriately worded warning signs shall be erected on the public road by the registered holder.
9. The registered holder shall ensure that blasting is not carried out outside the hours of 7 a.m. to 6 p.m. and that the peak particle velocity generated by blasting within the subject areas does not exceed 5 mm/s at any dwelling or occupied premises.
10. The registered holder shall ensure that the blast overpressure noise does not exceed 115 dB (linear) at any dwelling or occupied premises and shall take all necessary precautions to prevent flyrock from blasting.
11. The registered holder shall monitor surface vibrations and noise levels from blasting in consultation with the District Inspector of Mines, the Regional Mining Engineer and the State Pollution Control Commission and, if necessary, shall adjust blasting procedures to eliminate any adverse impacts on nearby residents.
12. (a) Where the registered holder desires to commence prospecting operations in the subject area the registered holder shall notify the Secretary in writing and shall comply with such additional conditions as the Minister may impose, including any condition requiring the lodgement of an additional security for rehabilitation of the area affected by such operations.

(b) Where the registered holder notifies the Secretary pursuant to paragraph (a) the registered holder shall furnish with that notification details of the type of prospecting methods that would be adopted and the extent and location of the area that would be affected by them.
13. The mining operations shall be restricted to the hours 7 am to 6 pm Monday to Saturday and no work shall be undertaken on Sundays.

ANNEXURE C

This and the succeeding page is the Annexure C referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of leases in satisfaction of Mining Lease Applications 609, 610 and 617 (Inverell).

1. (a) This authority does not confer the power to cut or remove any timber within Torrington State Forest No. 320 and Extension No. 1 except such as directly obstructs or prevents the carrying on of the operations hereby authorised and the registered holder shall obtain authority under the provisions of the Forestry Act, 1916, as amended, or any Act amending the same and the Regulations thereunder before making use of the timber so cut for other than in connection with the operations hereby authorised. The sanction of the District Forester or his deputy shall be obtained before proceeding to cut any other timber within the said forest.
 - (b) The registered holder shall take all precautions against causing outbreak of fire on the said forest and shall not burn off any grass dry herbage or surface litter except with the consent of the District Forester first had and obtained and shall under the direction and control of the local Forest Officer stack and burn the heads of any trees destroyed during the course of the operations hereby authorised and the registered holder shall not permit any fire place to be constructed unless protected by stone wallings and fires lit therein shall not be left unattended.
 - (c) This authority is issued subject to any conditions and/or restrictions which may be prescribed in accordance with the provisions of the Forestry Act, 1916, as amended, or any Act amending the same and the Regulations thereunder and the Regulations under the Bush Fires Act, 1949.
2. In the event of operations encroaching on or within 3 metres of any constructed road or fire-break the registered holder shall provide a suitable deviation to the same standard as the previous road or fire-break and upon the completion of operations or the sooner determination of this authority the registered holder shall restore the road or fire-break to its original position and condition to the satisfaction of the Minister.

3. The registered holder shall not construct any new roads within the State Forest without the prior written consent of the District Forester or his Deputy.
4. The registered holder shall advise the District Forester or his Deputy of the proposed location of any new roads within the State Forest not less than 2 months prior to the intended construction and such roads shall be built to a standard approved by the District Forester or his Deputy.
5. Unless with the prior approval of the District Forester, the registered holder shall give not less than twelve (12) months written notice to the District Forester, or his Deputy of any proposed clearing of trees within the State Forest.
6. The registered holder shall be responsible for the maintenance, of any roads associated with the mining project within the State Forest and such maintenance shall be to the satisfaction of the District Forester or his Deputy.
7. The registered holder shall consult with the District Forester or his Deputy and the Soil Conservation Service in regard to the rehabilitation of any lands within the State Forest affected by the operation.

ANNEXURE D

This and the succeeding page is the Annexure D referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of a lease in satisfaction of Mining Lease Applications 609 and 610 (Inverell).

1. The registered holder shall:-

(a) ensure that at least eight (8) competent workmen are efficiently employed on the subject area on each week day, except Saturday or any week day that is a public holiday,

or

(b) expend on operations, carried out in the course of prospecting or mining the subject area, an amount of not less than One Hundred and Forty Thousand Dollars (\$140,000.00) during each year of the term of the authority.

Costs or expenses incurred which are not, in the opinion of the Minister, directly associated with the prospecting or mining operations, shall not be accounted expenditure for the purposes of this condition. The Minister may, at any time or times after a period of two years from the date on which this authority has effect or from the date on which the renewal of this authority has effect, as the case may be, by instrument in writing served on the holder of the authority, increase or decrease the amount of expenditure required under this condition, provided that not more than one variation in the amount of expenditure shall be made in any period of two years.

2. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve 96214.

3. (a) Security in the sum of Twenty thousand dollars (\$20,000.00) shall be lodged with the Minister by the registered holder for the purpose of ensuring the fulfilment by the registered holder of his obligations under this authority. If the registered holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the

Minister towards the cost of fulfilling such obligations. For the purpose of this clause the registered holder shall be deemed to have failed to fulfil the obligations of this authority if he fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The registered holder shall provide the security required by sub-clause (a) hereof in one of the following forms:-

- (i) cash,
- (ii) an interest-bearing deposit in the name of the Minister for Mineral Resources and Energy in such form and with such institution as may from time to time be approved by the Minister,
- (iii) a banker's certificate or bond in such form and given by such surety as may from time to time be approved by the Minister.

ANNEXURE E

This and the succeeding page is the Annexure E referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of a lease in satisfaction of Mining Lease Application 612 (Inverell).

1. The registered holder shall:-
 - (a) ensure that at least four (4) competent workmen are efficiently employed on the subject area on each week day, except Saturday or any week day that is a public holiday,
 - or
 - (b) expend on operations, carried out in the course of prospecting or mining the subject area, an amount of not less than Seventy Thousand Dollars (\$70,000.00) during each year of the term of the authority.

Costs or expenses incurred which are not, in the opinion of the Minister, directly associated with the prospecting or mining operations, shall not be accounted expenditure for the purposes of this condition. The Minister may, at any time or times after a period of two years from the date on which this authority has effect or from the date on which the renewal of this authority has effect, as the case may be, by instrument in writing served on the holder of the authority, increase or decrease the amount of expenditure required under this condition, provided that not more than one variation in the amount of expenditure shall be made in any period of two years.

2. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve 92761.
3. The registered holder shall not commence mining the two orebodies designated as N1 and N2 on Plan 6 of the environmental impact statement prepared by Boyd Pratt & Associates entitled "Environmental Impact

Statement for the Mining and Recovery of Industrial Topaz at Torrington, NSW, for G Whitburn Pty Limited", dated 11th April, 1985 without the written approval of the Minister first had and obtained. The registered holder shall make application in writing for the Minister's approval and such application shall specify the measures proposed to eliminate any adverse impacts on nearby residents or property resulting from noise, dust and vibration.

4. (a) Security in the sum of Ten thousand dollars (\$10,000.00) shall be lodged with the Minister by the registered holder for the purpose of ensuring the fulfilment by the registered holder of his obligations under this authority. If the registered holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the registered holder shall be deemed to have failed to fulfil the obligations of this authority if he fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.
- (b) The registered holder shall provide the security required by sub-clause (a) hereof in one of the following forms:-
 - (i) cash,
 - (ii) an interest-bearing deposit in the name of the Minister for Mineral Resources and Energy in such form and with such institution as may from time to time be approved by the Minister,
 - (iii) a banker's certificate or bond in such form and given by such surety as may from time to time be approved by the Minister.

ANNEXURE F

This and the succeeding page is the Annexure F referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of a lease in satisfaction of Mining Lease Application 617 (Inverell).

1. The registered holder shall:-
 - (a) ensure that at least four (4) competent workmen are efficiently employed on the subject area on each week day, except Saturday or any week day that is a public holiday,
 - or
 - (b) expend on operations, carried out in the course of prospecting or mining the subject area, an amount of not less than Seventy Thousand Dollars (\$70,000.00) during each year of the term of the authority.

Costs or expenses incurred which are not, in the opinion of the Minister, directly associated with the prospecting or mining operations, shall not be accounted expenditure for the purposes of this condition. The Minister may, at any time or times after a period of two years from the date on which this authority has effect or from the date on which the renewal of this authority has effect, as the case may be, by instrument in writing served on the holder of the authority, increase or decrease the amount of expenditure required under this condition, provided that not more than one variation in the amount of expenditure shall be made in any period of two years.

2. The registered holder shall as far as may be practicable so conduct operations as not to interfere in any way with the public use and enjoyment of Reserve 92769 and 96257.
3. The registered holder shall not conduct any operations within that part of the subject area that is affected by the existing open cut, known as "Carter's Cut", unless with the consent of the Minister first had and obtained and subject to such conditions as he may stipulate. In the event that the registered holder desires to conduct operations in such open cut it shall make application in writing to the Minister and such application shall specify the exact nature of the works proposed and shall include a management plan for rehabilitation of those areas of the open cut to be used.

4. (a) Security in the sum of Ten thousand dollars (\$10,000.00) shall be lodged with the Minister by the registered holder for the purpose of ensuring the fulfilment by the registered holder of his obligations under this authority. If the registered holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the registered holder shall be deemed to have failed to fulfil the obligations of this authority if he fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.
- (b) The registered holder shall provide the security required by sub-clause (a) hereof in one of the following forms:-
- (i) cash,
 - (ii) an interest-bearing deposit in the name of the Minister for Mineral Resources and Energy in such form and with such institution as may from time to time be approved by the Minister,
 - (iii) a banker's certificate or bond in such form and given by such surety as may from time to time be approved by the Minister.

ANNEXURE G

This and the succeeding page is the Annexure G referred to in the decision of the Minister for Mineral Resources and Energy dated 3rd January, 1986 in relation to the grant of a lease in satisfaction of Mining Purposes Lease Application 597 (Inverell).

1. The operations hereby authorised shall be constructed substantially in accordance with the environmental impact statement prepared by Boyd Pratt & Associates entitled "Environmental Impact Statement for the Mining and Recovery of Industrial Topaz at Torrington, NSW, for G Whitburn Pty Limited" - dated 11th April, 1985 and no major variation shall be made therefrom without the approval of the Minister first had and obtained.
2. In the event of the registered holder winning any minerals from the subject area, during the treatment of tailings, water or a mineral bearing substance, the registered holder shall pay to the Minister royalty:-
 - (a) at the same rate as is, at the time the minerals are won, prescribed for the purposes of Section 97(1) of the Mining Act, 1973, in respect of the same class of minerals won from an area subject of a mining lease and
 - (b) in accordance with the provisions of Section 103 of the Mining Act, 1973.
3. The registered holder shall promptly stabilise, topsoil and revegetate all non-working areas disturbed by the registered holder within the boundaries of the treatment plant site and shall carry out such landscaping measures necessary to improve the visual amenity of the site. Surface works and buildings shall be designed so as to present a neat, orderly appearance and to blend as far as possible with the surrounding countryside.
4. The registered holder shall erect stock-proof fencing around the perimeter of the treatment plant site.
5. The registered holder shall prior to the commencement of the operations hereby authorised submit to the State Pollution Control Commission for its approval, details of a proposed monitoring programme for surface water quality and noise levels in the vicinity of the treatment plant site and such a

programme shall be put into effect from the commencement of construction activities. A copy of the approved programme shall be submitted to the Secretary before commencement of the operations hereby authorised.

6. The operations hereby authorised shall be restricted to the hours 7 am to 10 pm Monday to Saturday and no work shall be undertaken on Sundays.
7. (a) Security in the sum of Ten thousand dollars (\$10 000.00) shall be lodged with the Minister by the registered holder for the purpose of ensuring the fulfilment by the registered holder of his obligations under this authority. If the registered holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the registered holder shall be deemed to have failed to fulfil the obligations of this authority if he fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.
- (b) The registered holder shall provide the security required by sub-clause (a) hereof in one of the following forms:-
 - (i) cash,
 - (ii) an interest-bearing deposit in the name of the Minister for Mineral Resources and Energy in such form and with such institution as may from time to time be approved by the Minister,
 - (iii) a banker's certificate or bond in such form and given by such surety as may from time to time be approved by the Minister.
- (c) The Minister may at any time or times hereafter vary either the amount or form or both the amount and form of the security required under sub-clauses (a) and (b). Where he has so varied the security he shall serve on the registered holder an instrument in writing requiring him, within a time specified in the instrument, to lodge a further security in such form as is specified in the instrument. After receipt of a further security the Minister shall release any security held in excess of that required.

1.0 INTRODUCTION

Topalite Resources Pty Limited, formerly G. Whitburn Pty Limited, (hereafter referred to as the Company), a wholly owned subsidiary of Kingsway Group Limited of Melbourne, seeks consent to mine and recover industrial topaz; with minor wolfram, bismuth and construction sand; from some 24 or more separate deposits located about 6 km north of the village of Torrington in northern New South Wales (Figure 1). The Company proposes to initially treat old battery sands. Topaz-bearing ore will be mined by open cut methods, transported by truck to a nearby treatment plant comprising a crusher, classifier, spirals and electrostatic and magnetic separators. Concentrates will be taken by road to a manufacturing plant to be constructed by the company at either Glen Innes or Newcastle. This plant will produce refractory and fluorine products for supply to domestic and export markets.

The Company has been prospecting in the Torrington area since the 1960's and currently holds Prospecting Licences 621 and 652 (Inverell). An additional Prospecting Licence Application (No. 347) is pending. The Company's prospecting programme has resulted in the identification of approximately 1,500,000 tonnes of quartz-topaz greisen ore, yielding 250,000 tonnes of recoverable topaz, with further prospecting expected to define an additional 500,000 tonnes of ore. Most of the known deposits have been covered by Mining Lease Applications 609, 610, 612 and 617 (Inverell) lodged for the mining of wolfram, bismuth, topaz and quartz, for which the Company is the registered applicant. Mining Purposes Lease Application 597 (Inverell) has also been lodged for the purposes of erecting a treatment plant, treatment and depositing of tailings, and establishing a nursery. The company has also entered into an agreement for the sale and transfer of Mining Lease 5611 (Act 1906) held by Mrs. B.J. Tobin.

The Minister for Mineral Resources and Energy is satisfied that a mineable resource exists and is prepared to consider the grant of the subject leases, once the requirements of the Environmental Planning and Assessment (EPA) Act, 1979 have been satisfied.

The majority of the proposed development is located within the Shire of Tenterfield (see Figure 1) where planning controls are not in force. Under Part V, Section 110, of the EPA Act the development is an "activity" requiring the final approval of the Minister for Mineral Resources as the "determining authority". The Department of Mineral Resources has been delegated the responsibility by the Minister for handling administrative arrangements in the processing of the proposal.

In light of the nature, magnitude, duration and location of the proposed operations, the Minister considered that if carried out, the Torrington industrial topaz project would be likely to significantly affect the environment. Consequently, pursuant to Section 112 of the EPA Act, the Minister directed the Company in a letter dated 23/10/84 to prepare an environmental impact statement (EIS).

In October 1984, pursuant to Clause 58 of the EPA Regulation, 1980, the Company consulted with the Director of the Department of Environment and Planning with regard to the form and content of the EIS. The Director's requirements for the EIS were notified to the Company (a copy of the letter is contained in Appendix 1).

As part of MLA's 609 and 610 lie within Severn Shire, where planning controls do apply (Severn Shire Council Interim Development Order No.1), that part of the proposal requires consent from Severn Shire Council. Under Part IV of the EPA Act the proposal is "designated development" and requires the submission of an environmental impact statement in support of the development application.

The Department of Environment and Planning, in a letter dated 9th November 1984 (Appendix 1), informed the Department that only one EIS covering the entire development would be necessary for submission under both parts IV and V of the EPA Act, and that simultaneous and coordinated public exhibition by the Department as determining authority, and by Severn Shire Council as consent authority, would be the most desirable course of action.

The draft EIS was examined by the Department in order to assess its suitability for public exhibition. The Department considered the draft to be lacking in some important detail, did not fully consider the Director's requirements, and did not fully meet the content requirements of Clause 57 of the Regulation. The Department, in a letter dated 3rd December 1984, therefore requested that a second draft be submitted by the Company.

The Minister gave his approval on 3rd April, 1985 for the amended document to be placed on public display. The Department arranged for exhibition of the EIS, entitled "Environmental Impact Statement for the Mining and Recovery of Industrial Topaz at Torrington, N.S.W., for G. Whitburn Pty Limited", for the period 18th April to 17th May, 1985 during which time public comments were invited through advertisement in local and state-wide newspapers. A copy of the advertisement is shown in Appendix 2. Copies of the EIS were sent to Tenterfield and Severn Shire Councils, and to selected State Government authorities for their comment.

Before and during the course of the exhibition period, technical officers of the Department undertook field inspections of the mining and ore treatment sites and the trucking route.

The Department forwarded copies of all submissions received by it, in response to the EIS display, to the Department of Environment and Planning, pursuant to Section 113(3) of the EPA Act, and also to the Company for its response to any matters of concern raised in those submissions. The Department also sought clarification from the Company during the course of preparation of this report. Correspondence between the Company and the Department is included in Appendix 3.

As a result of some public and Government submissions concerned at the lack of baseline data in certain areas, the Department requested the Company, in a letter dated 18th June, 1985 (Appendix 3), to carry out comprehensive surveys of flora, fauna and aboriginal sites over all areas to be disturbed or affected by the proposed operation.

A flora and fauna survey undertaken by Mount King Ecological Surveys was forwarded to the Department by the Company with a letter dated 26th July, 1985. The results of an aboriginal sites survey undertaken by the National Parks and Wildlife Service was forwarded to the Department with a letter dated 23rd August, 1985. Copies of both of these surveys were made available to the Department of Environment and Planning, the National Parks and Wildlife Service and the National Parks Association of NSW.

This Assessment Report summarises the components of the proposal, and contains an examination of the EIS, the supplementary documents and all submissions received. The conclusions and recommendations of the Department of Mineral Resources, based on its assessment of the proposal, are stated in Chapter 6 and these have comprised the Department's advice to the Minister for his final determination of the proposal.

The Company's intention to construct a processing plant at Glen Innes or Newcastle for the manufacture of refractories and fluorine compounds does not form part of this approval process. The erection of such a plant will probably require a separate EIS and development approval from the relevant consent authority under the normal development control provisions of Part IV of the EPA Act, 1979.

2.0 PROJECT DESCRIPTION AND PROPOSED SAFEGUARDS

Topalite Resources Pty Limited proposes to mine approximately 1.5 million tonnes of quartz-topaz ore, yielding some 250,000 tonnes of topaz, by open cut methods from a number of small separate deposits located near the village of Torrington in northern New South Wales. The Company has applied for four Mining Leases and one Mining Purposes Lease over the areas needed for mining and treatment of the ore. The landscape of the area comprises undulating native forest with some areas cleared for pastoral purposes. The area is a traditional mining locality, having been worked over for tin and wolfram since the turn of the century. The topaz concentrate will be the raw material for the Company's refractory and fluorine product industry (a separate project).

Sections 2.1 to 2.11 hereunder, briefly describe the project as given in the EIS.

2.1 Geology and Topaz Resource

The quartz-topaz (formerly known as "silexite") ore bodies occur within contact metamorphosed Permo-Carboniferous sediments of the Torrington Pendant, a roof remnant of country rock intruded by the Mole Granite. The granite has been a considerable source of base metal and other mineralization in the Torrington area.

The topaz deposits occur as sheets, sills, dykes and other irregularly shaped bodies at the intrusive contact between the Mole Granite and the sediments. The alteration of the country rock into a mixture of quartz, topaz and other minerals is called a "greisen". It is similar in appearance to quartzite. The Company's exploration programme has defined about 24 topaz deposits covering a total area of 16 ha. Further exploration is expected to yield some 30 deposits covering about 20 ha. The greisen contains about 20% topaz ($Al_2F_2SiO_4$) with minor amounts of wolfram and bismuth, which may also be recovered. Topaz from these deposits typically contains about 17% fluorine.

The topaz deposits frequently outcrop as small hills, more resistant to weathering than the surrounding sediments. The largest body is approximately 11m thick, about 3.3 ha in surface area and contains 464,000 tonnes of ore.

2.2 Uses and Markets for Topaz

The Torrington quartz-topaz deposits represent the largest known resource of industrial topaz in the world. Preliminary work by the Department of Mineral Resources (Ref 1) and the Company has shown that high quality "mullite" with superior refractory properties to synthetic mullite can be produced by the

calcination of topaz concentrates (Ref 2). Mullite ($\text{Al}_6\text{Si}_2\text{O}_{13}$) rarely occurs in nature. It is formed when aluminium silicates are heated, and is produced commercially in the electric furnace.

The Company's topaz-derived refractory grains will be used to manufacture refractory products resistant to high temperatures and chemical attack, such as kiln furniture and shelving, super duty bricks and high technology ceramic products. These products are widely used in the steel, glass, cement, aluminium, brick and chemical engineering industries. The fluorine in topaz can also be recovered and processed into saleable fluorine compounds such as cryolite (Na_3AlF_6), aluminium fluoride (AlF_3), fluorite (CaF_2), and fluosilicic acid. These products are consumed by the fluorochemical and aluminium smelting industries.

The Company intends to participate in all stages of the process from mining and production of topaz concentrates (the subject application), to manufacture of mullite and fluorine compounds (a plant to be constructed at Glen Innes or Newcastle), through to having entered into an agreement with a custom manufacturer of refractory and ceramic products.

The Company anticipates being able to replace most of the refractory raw materials (which are entirely imported) and fluorine compounds (mostly imported) used in Australia with its own products which are expected to be of superior quality. The Company expects to be able to sell 10,000-20,000 tonnes of medium-alumina mullite refractory grain per annum, requiring the mining of 75,000-150,000 tonnes per annum of greisen ore. The Company's secondary objective is to recover wolfram, and possibly bismuth concentrates as by-products, to be sold directly by the Company.

2.3 Mining Authorities

The Company has been prospecting the Torrington topaz deposits for many years and is the holder of Prospecting Licences 621 and 652 (Inverell), and Prospecting Licence Application 347 (Inverell). The Company proposes to mine most of the topaz deposits occurring within these authorities by virtue of Mining Lease Applications 609, 610, 612 and 617 (Inverell). The Company has also entered into an agreement for the sale and transfer of a small existing lease - Mining Lease 5611 (Act 1906) held by Mrs. B.J. Tobin. Other topaz deposits are expected to be defined within the prospecting licence areas by further prospecting and will be the subject of future mining lease applications.

The Company is also the applicant for Mining Purposes Lease Application 597 (Inverell) within which an ore treatment plant will be erected and old battery sands treated. The total area of the lease applications is about 710 ha within which 24 topaz deposits have a total surface area of about 16 ha.

The existing mining authorities are shown on Figure 1.

2.4 Open Cut Mining Methods

The 24 known topaz deposits are listed in Table 1 of the EIS. It is proposed to mine them sequentially (see Table 2 of the EIS) with several deposits undergoing preparation, mining or rehabilitation at the one time. The timing schedule will depend upon the amount of product the Company can market. It is anticipated that 75,000 increasing to 150,000 tonnes of ore per annum will be mined. At this rate the presently known resource should be exhausted in approximately 15 years.

As most of the deposits outcrop as small hills, mining will involve the excavation and removal of the tops of these hills by conventional open cut earth-moving/quarry-type methods. Each deposit will require preparation of an access road, and clear-felling of trees over the deposit and surrounding access apron. Timber will be salvaged where possible, otherwise burnt, or disposed of as required by the Crown Lands Office or the Forestry Commission on Crown Land, or by the landowner on private land. The deposit will be fenced to protect stock if required.

The little soil or overburden on the deposits will be separately stockpiled for later replacement. The ore will require blasting and ripping. Blasting will occur daily at a specified time between midday and 6.00 pm. Roads will be closed and a warning siren sounded. The Company will comply with all required Government safety procedures.

Mining will be done by contract earth movers with the plant expected to comprise:

- 1 air-track drill with compressor
- 1 bulldozer
- 1 excavator
- 1 front-end loader
- 3-4 on-highway dump trucks (10-15 t)
- several service and personal vehicles

The Company will operate a grader and water truck for road maintenance, dust control and fire fighting.

The largest deposit, designated Body M, will have a floor area of 3 ha and maximum depth of 14 m and will be developed by benching.

Mining will take place between the hours of 7 am and 6 pm Monday to Saturday.

2.5 Retreatment of Battery Sands

MPLA 597 (Inverell) contains sand-size tailings dumped as waste from stamp batteries used in previous wolfram recovery operations. These dumps contain approximately 80,000 tonnes of sand, grading about 15-20% topaz.

It is proposed for the first two years of the development, while the ore treatment plant is under construction, to install a small mobile plant to extract topaz and minor wolfram from the battery sands. Equipment required will be:

- 1 dumptruck
- 1 front-end loader
- screens, elevators, classifier, spirals, rotary drier, magnetic and electrostatic separators, bins, water pumps, sand pumps

Tailings sand from this operation will be stockpiled on the western side of Bald Rock Creek (see Figure 2).

2.6 Ore Treatment

The treatment plant for the topaz-bearing greisen ore will be constructed on MPLA 597 (Inverell) and will be commissioned within two years (see Figure 2). The plant will be located adjacent to Bald Rock Creek and the Torrington-Silent Grove Road, occupying about 32 hectares of cleared land owned by Mr. G.N. Ross.

The plant site will comprise a mill and concentrator, workshop, amenities building, office, ore and tailings stockpiles, tree nursery, tailings and water storage dams, car parking area and ore haulage roads. The plant will have a capacity of 50 tonnes of ore per hour and operate between 7 am and 10 pm Monday to Saturday. A septic tank and sullage trench will provide sewage disposal capacity for 30 employees.

Run-of-mine ore trucked to the plant will be stored in ore bins or stockpiled, then conveyed to primary and secondary crushers where it will be reduced to sand-size particles and the minerals separated by gravitational, magnetic and electrostatic methods. Several grades of topaz concentrate, and wolfram and bismuth concentrates, will be recovered. The water used in the milling and concentrating circuits will not require any chemical additives.

A long term ore or tailings stockpile, or an earthen bund, will be used as a noise barrier for the protection of residents close to the southern boundary of the site.

2.7 Tailings Disposal

Some 80% of the treated ore will require disposal as coarse and fine tailings. The sand-size (coarse) tailings will be dewatered and stockpiled, before being returned to the worked-out open cuts to assist rehabilitation. Some of the sand may be suitable for sale as construction sand along with the retreated battery sand tailings.

A smaller quantity of fine, clay-sized tailings will require settlement in an existing tailings dam which has a capacity of 50,000 tonnes. This dam will be cleaned out periodically and the fine tailings mixed with coarse tailings for disposal in the open cuts.

Water from the tailings dam will drain to the lower water storage dam for recirculation to the plant. The tailings dam wall is presently breached, but will be repaired and a 5 m wide by 1 m deep concrete spillway installed to accommodate a 1 hour, 50 year return period storm without over-topping the dam wall. Similar spillways will be provided for the upper and lower dams.

2.8 Water Supply

Potable and process water required for the operation will be supplied from the three earth-walled dams constructed on Bald Rock Creek about 75 years ago. The upper dam of 15 ML capacity will be piped to the plant site for potable and bathhouse use. The middle dam will be used to settle fine tailings, whilst the lower dam, of 10 ML capacity, will retain water for pumping back to the ore treatment circuit. Water losses, estimated to be 10%, will be made up from water pumped from the upper dam. The known water resource is adequate for 8 months operation and it is the Company's intention to efficiently use all water on-site.

2.9 Rehabilitation

Ore extraction will result in the removal of the tops of small hills leaving a small depression. These will be back-filled with waste and overburden, and with tailings sand from the treatment plant. It is intended that exhausted open cuts will be filled with overburden from nearby deposits due to the progressive development of the ore bodies. The fill will be partly compacted by dump trucks and bulldozer, and the surfaces contoured to be compatible with the surrounding landform. Any stockpiled topsoil will be replaced and revegetated with either grasses or trees,

accomplished with the advice and assistance of the Forestry Commission and Soil Conservation Service.

The Company intends to establish a tree nursery adjacent to the ore treatment plant as a depot for seedlings for the rehabilitation programme.

Excess tailings will also be used to partly rehabilitate an abandoned open cut known as "Carter's Cut" within MLA 617. Although the old workings are included within the Company's proposed lease it does not wish to become responsible for their complete rehabilitation. Hence the Company's future use of the area will be negotiated with the Department to their mutual benefit.

Once the topaz mining and treatment ceases, the plant and buildings will be dismantled and the site rehabilitated.

2.10 Transport

Haulage of ripped and blasted ore from each deposit will be transported by 10 to 15 tonne capacity on highway dump trucks to the ore treatment plant. At the nominal mining rate of 500 tonnes of ore per day, 40 truck loads or an average of 6 per hour will arrive at the plant. Trucks will return loaded with tailings as fill for the open cuts.

Ore trucks from the western deposits will use an existing unsealed public road, while those from the central deposits will use a pre-existing haul road and up-graded tracks, crossing the Torrington road where it adjoins the treatment plant site (Figure 2). Those from the eastern deposits will use ore haulage roads to be constructed.

Topaz concentrates from the plant will be transported in bulk by 25 tonne trucks under contract, with the loads covered by tarpaulins. Approximately 4 truck loads per day will be required to transport the concentrate via the public road through Torrington, to Deepwater on the New England Highway, and thence to Glen Innes or Newcastle. The tonnage of wolfram and bismuth concentrates to be transported will be insignificant.

The transport of ore and concentrates will take place between the hours of 7 am and 6 pm Monday to Saturday.

2.11 Employment

In full production, with two shift operations, the proposed development will directly employ at least 30 persons as follows:

. Mining and transport of ore	13
. Rehabilitation and road maintenance	3
. Ore treatment	10
. Administrative/technical	4

Where possible the workforce will be recruited locally from Torrington, Stannum, Emmaville and Deepwater. Indirect employment will be generated in the service, retail and transport industries. As most of the direct employees will reside in the Glen Innes and Tenterfield districts, employee accommodation, other than Company staff, will not need to be provided. Company staff and visitors will reside in the Company's accommodation units adjacent to the mine office, which is located next to the upper water supply dam. Construction workers are expected to stay in hotels and caravan parks in Torrington, Emmaville, Deepwater, Glen Innes or Tenterfield.

3.0 EXISTING ENVIRONMENT

This section summarizes the existing environment and has been compiled from information supplied in the subject EIS, from public and Government submissions, and from observations obtained during a visit to the area by officers of the Department of Mineral Resources.

3.1 Topography and Drainage

The physiography of the region is dominated by the Mole Granite batholith which forms a deeply dissected tableland at elevations in excess of 1000 m above sea level, and rising some 450 m above the surrounding country. Capping the granite is the sedimentary remnant of the Torrington pendant which is relatively flat to undulating. The topaz deposits frequently outcrop as small hills some 3 m to 5 m above the surrounding country which occurs at elevations of 1040 m to 1080 m asl, on the summit of the tableland.

The drainage system of the Mole Tableland is strongly controlled by jointing within the Mole Granite, exhibiting a strong rectangular pattern - the dominant directions being northeast-southwest with a more closely spaced association at right angles to it. However the Torrington pendant exhibits a more radial pattern with fewer streams but more swampy conditions.

The majority of the topaz deposits, and the processing plant site, occur within the Bald Rock and Cow Swamp creek catchments which flow northwards into the Mole River. A few deposits occur with the catchment of Flagstone Creek which flows southwest into the Beardy River. Both the Mole and Beardy rivers are tributaries of the Dumaresq River which forms part of the NSW/Queensland border.

3.2 Soils and Overburden

The outcropping hillocks of topaz greisen have very little topsoil cover or overburden. Some topaz deposits, which have little relief, exhibit a partial soil cover similar to the heavy clay soil that develops over the country rock sediments. Friable and hydrothermally altered granite usually occurs beneath the deposits.

3.3 Land Use and Visual Aspects

The area of the proposed development comprises gently undulating country with native forest and logging activity, areas cleared for grazing and other pastoral purposes, and old mining areas with open cuts, waste dumps, roads, dams and treatment plant sites.

Lands to be affected by the proposal include forested Crown land occupied for grazing purposes, forested Crown land occupied by the Forestry Commission for forestry purposes (Torrington State Forest), and cleared private land used for grazing. There is a small private cemetery at Tungsten.

The Company owns portion 7, parish of Rock Vale, on the Torrington/Silent Grove road which contains a house with self-contained accommodation units, office block, shearing shed and dam. This will be used as an office and accommodation facility for mine staff during the operation.

Portions 8 and 9 are partly cleared private lands owned by Mr G.N. Ross who has agreed to let the Company establish the treatment plant on part of his property.

The operation will be adjacent to the Torrington/Silent Grove road and will be clearly visible to passing traffic. There will also be a direct line of sight to the nearest residences - Mr Ross, and Mr and Mrs Stuttard, from the treatment plant as well as most of the nearest ore bodies.

3.4 Climate and Air Quality

Climate in the Torrington district largely reflects the elevation (in excess of 1000 m asl) of the Mole Tableland. Sub-zero temperatures are frequent in winter months, while summer temperatures rarely exceed 35°C. Rainfall recorded at Stannum (12 km east of the proposed development) from 1954 to 1960 showed a yearly mean of 989 mm falling on 86 days per year. Rainfall is therefore moderate with a distribution reflecting a summer maximum (173 mm February) and a winter minimum (38 mm August).

Dust levels in the area have not been measured but are expected to be low, with the only significant sources being road traffic on the unsealed Torrington/Silent Grove road, and the clearing of paddocks.

3.5 Water Quality

The Department of Mineral Resources collected and analysed water samples from four dams situated on Bald Rock Creek in order to determine the background water quality of the area (Ref 3). All substances, with the exception of fluoride, were present in very low concentrations. The tailings and lower dams (samples T3 and T4) exhibited fluoride concentrations of 2.30 and 3.25 mg/l which are in excess of the generally accepted levels for irrigation (1.0 mg/l), domestic (1.5 mg/l) and stock watering (2.0 mg/l) purposes.

The Department interpreted these higher than expected values as being due to the effect of the previous treatment of wolfram and tin ores on the treatment plant site where numerous heaps of tailings and waste remain. Wolfram ore contains topaz (high in fluorine) and tin ore contains fluorite, both of which could be responsible for releasing fluorine into the drainage system.

The Company has also sampled the upper dam on its own property and it has been proven to be suitable for domestic purposes.

3.6 Noise

Noise levels in the region are low reflecting the rural and forest nature of the area. A background noise level survey was conducted by noise consultants, Louis A. Challis and Associates Pty Limited. Measurements were made at three representative positions in the vicinity of the treatment plant site, on 1st February, 1985 between the hours of 1600 and 1800. The daytime background noise level, (L₉₀) under lowest wind conditions, was typically 35 dB(A), while at night time the sound level was 30 dB(A). Background noise levels of this locality are not affected by other mining operations nearby, logging in Torrington State Forest, vehicles on the Torrington/Silent Grove road, or agricultural activity by Messrs Stuttard or Ross.

3.7 Flora and Fauna

Identification of tree species growing on the deposits occurring in forested areas was carried out during a site inspection by the Forestry Commission. The dominant species found were:

<i>E. caliginosa</i>	(Broad Leaved Stringybark)
<i>E. melliodora</i>	(Yellow Box)
<i>E. deanii</i>	(Round leaved Gum)
<i>E. andrewsii</i>	(New England Blackbutt)
<i>E. moluccana</i>	(Grey Box)
<i>E. blakelyi</i>	(Blakelys Red Gum)
<i>E. rubida</i>	(Candlebark)
<i>E. viminalis</i>	(Manna Gum)

Wattles, Oaks and native grasses dominated the understorey.

The Forestry Commission classified the Torrington State Forest as a "New England Stringybark type" association and is common elsewhere in the Northern Tablelands. Mature stringybark, blackbutt and box are logged by a licensed sleeper cutter. The forested areas are occupied by birds, mammals - among the larger being feral pigs, wallabies and foxes, and reptiles. Tree regrowth, particularly wattles, has occurred on old mining and early cleared areas.

Other deposits have been affected by clearing for pastoral purposes, and are now occupied by sheep and cattle.

The Company stated in the EIS that it was not aware of any endangered species of flora or fauna in the area, although no systematic survey was carried out.

Following submissions from the National Parks and Wildlife Service and the National Parks Association, the Department requested the Company to undertake a flora and fauna survey of the areas that will be disturbed. The survey, by Mount King Ecological Surveys (Ref 6), was carried out in July, 1985 and a summary of its findings is as follows:-

The natural vegetation of the area is Tall Open Eucalypt Forest (20%), Open Eucalypt Forest (40%), Woodland (40%), all of which has been altered by logging, grazing or deliberate burning of the understory. Four classifications of the area's vegetative communities were recognised:

1. Open Forest (*E. deanii* - *E. caliginosa* - *E. andrewsii*)

This community exists over most of the remaining forested land. The overstory consists of tree species up to 40 m tall:

<i>E. deanii</i>	Round-leaved Gum
<i>E. caliginosa</i>	New England Stringybark
<i>E. andrewsii</i>	New England Blackbutt

An intermediate layer of tall shrubs, mainly wattles, may be present, and the ground cover is dominated by grasses.

2. Open Forest (*E. laevopinea* - *E. blakelyi* - *E. melliodora*)

This community exists in the western parts of the survey area mainly associated with the Mole Granite. Dominant tree species are between 15 m and 20 m tall:

<i>E. laevopinea</i>	Silvertop Stringybark
<i>E. blakelyi</i>	Forest Red Gum
<i>E. melliodora</i>	Yellow Box

An intermediate layer is dominated by wattles with a ground cover of shrubs, herbs and grasses.

3. Open Scrub (*Leptospermum flavescens* - *L. arachnoides*)

This community occupies small areas of impeded drainage, away from the proposed mining areas, and is dominated by tea trees:

<i>L. flavescens</i>	Tantoon
<i>L. arachnoides</i>	Stiff Tea Tree

4. Cleared land supporting grassland of introduced and native species.

Two species identified as being botanically significant in the National Parks Association submission, *Acacia betchii* (Red-Tip Wattle) and *Acacia mcnutiana* were found on orebodies A and B. These orebodies support Open Forest Community 2.

Orebodies C, D1-5 and E support Open Forest Community 1, with no species of botanic significance being found. The remaining orebodies also supported this community but were more disturbed by past mining operations, grazing and fire. The understory was particularly less diverse as a result of this disturbance.

Areas previously mined were also surveyed to determine the species present in areas affected by past mining. Acacias were common and *E. deanii* well represented. *E. caliginosa* and *E. andrewsii* were restricted to areas of remaining topsoil. The cover of ground plants was sparse.

A total of 14 mammal (8 native), 41 bird and 2 amphibians were located during the faunal survey of the mining leases. The number of species was low compared with that recorded in the region, which is indicative of the disturbance to the area. The small number of understory species, frequent burning, past mining, stock grazing, logging and land clearing have been responsible for discouraging the native fauna.

The range of native mammal species found in the area, including 4 macropod species, was considered typical of an open forest habitat. A significant number of Greater Gliders were found amongst the tall mature trees remaining in the mining leases.

3.8 Archaeology

No archaeological survey had been undertaken by the Company, however its local inquiries suggested that it was unlikely that there were any archaeological sites in the vicinity of the ore bodies or the treatment plant site. The area has been previously mined and any relics or occupation sites would have been destroyed.

Following submissions from the National Parks and Wildlife Service and the National Parks Association the Department requested the Company to survey the area for evidence of aboriginal occupation. The Company consulted the National Parks and Wildlife Service which provided an officer to inspect the areas proposed for mining. The Service also discussed the area with the Glen Innes Aboriginal Land Council. A letter from the Service to the Department (Appendix 4) states that no sites were found.

3.9 Local History

The first settlement in the area occurred in the 1840's, however it wasn't until the discovery of alluvial tin at Emmaville in 1872 that the population expanded. Torrington was founded by tin miners in 1881. Small settlements once existed at Tungsten and Cow Flat. Alluvial tin was mined in Bald Rock Creek. Wolfram, discovered in the 1880's, was mined from all of the topaz deposits, during the period 1903 - 1920. The largest workings, Carter's Cut, was still in operation up to 1972. The James Mine, at Cow Flat, is presently being worked for wolfram by open cut methods. Pacific Copper have also worked several large open cuts in Torrington State Forest for the recovery of wolfram, and there is a large treatment plant at Bismuth.

At the proposed ore treatment plant site, the remains of at least four previous wolfram treatment plants and two dams can be found. These operations were carried out during the periods 1903 - 1920, 1942 - 1945, 1953 - 1954, and 1971 - 1972. Numerous tracks, a major ore haulage road and several tramways were constructed. There are no visible remains of any machinery or buildings at these sites, only concrete foundations and embankments. The company proposes to protect all of these sites by providing fenced enclosures.

A small private cemetery at Tungsten, containing eight known graves, mostly of the Carter family, occurs within a small fenced area about 40m from the existing ore haulage road. The cemetery will not be affected by the proposed development.

3.10 Socioeconomics

The nearest centre of population is the village of Torrington (90 residents in 1981) about 6km south of the proposed development. The opportunities for traditional employment in tin and wolfram mining have declined since 1945 and many people are now engaged in the pastoral industry. Others commute daily to regional centres such as Tenterfield and Glen Innes.

3.11 Transport

Two roads used by the public traverse the area and will be used to transport ore to the treatment plant. The public road from Torrington to Silent Grove is a two-lane formed and unsealed road maintained by Tenterfield and Seven Shire Councils and averages several vehicles per hour. An unsurveyed road running west from the public road is a single lane graded track maintained by the Sherratt Mining Company as access to their James Mine, averaging 6 vehicles per day.

From the treatment plant, topaz concentrate will be transported the 33km from Torrington to Deepwater via a one to two lane unsealed public road with an average traffic frequency of 10 vehicles per hour.

4.0 REVIEW OF SUBMISSIONS

The Department of Mineral Resources placed the environmental impact statement on public display for the period 18th April to 17th May, 1985. Comments from any interested persons were invited during this period. The Department also sought advice from a number of relevant Government authorities. This chapter summarizes the issues raised in all submissions on the EIS.

4.1 Government Authorities

Tenterfield Shire Council

The Council advised that it had no objection to the proposal.

Forestry Commission of N.S.W.

Provided the operation was carried out in accordance with the mining schedule and disturbed areas rehabilitated as outlined in the EIS, the Commission had no comments on the proposed development.

Water Resources Commission

- The Commission pointed out that the EIS did not discuss alternative sources of water supply if the dam supply failed to meet the demands of the proposed operations. Any alternative supply work may require to be licensed under the Water Act.
- Bald Rock Creek does not become a "river" within the meaning of the Water Act until a point about 200 metres downstream of the north-west boundary of MPLA 597. Any water supply works below this point or on any other defined watercourse will require to be licensed under Part II of the Water Act.
- Water management works including the existing dams, and effluents to be discharged into any watercourses from the mines, ore, overburden and waste stockpile areas, treatment plant and amenities will require to be licensed under the Clean Waters Act which is administered by the State Pollution Control Commission.

Crown Lands Office, Sydney

- Consultation with the Crown Lands Office is required in respect of sand removal (if undertaken), rehabilitation and road construction over Crown Land.

- . The clearfelling and disposal of timber, if within proximity to creeks and watercourses, should be to the satisfaction of both the Water Resources Commission and the Soil Conservation Service.
- . Noise and dust generation, together with water quality (particularly in relation to runoff from mining and storage sites) should be to the satisfaction of the State Pollution Control Commission.
- . Consultation with the National Parks and Wildlife Service may be warranted in respect of the flora and fauna occurring on the uncleared or partially cleared outcrops of several deposits. Since the base rock of these areas differs from the surrounding areas this may result in specific ecotypes occurring in these areas.
- . The visual impact of the proposal (particularly the proposed plant site) would appear to be pronounced and adequate screening of the proposal appears to be warranted.

Lands Office, Armidale

The Lands Office at Armidale offered no objections to the granting of the Mining Leases subject to rehabilitation being carried out in accordance with the EIS and the standard conditions imposed by the Department of Mineral Resources. The Lands Office wished to be consulted in regard to rehabilitation of any Crown lands.

It was pointed out that excess run-off from the mine would drain into unoccupied Crown Land further down Bald Rock Creek, and such drainage should be strictly in accordance with the Clean Waters Act.

The Office wished to encourage mutual co-operation between the Company and the Department of Mineral Resources to rehabilitate previously abandoned mining areas left unrestored.

National Parks and Wildlife Service

- . The Service stated that the proposed mining and treatment operation lies partly within a much larger area of identified high nature conservation value.
- . There was no indication that a comprehensive survey of flora and fauna had been carried out.

- . A list of trees with virtually no reference to shrubs and herbs was not considered adequate. Although the topaz ore bodies have been partially disturbed by earlier mining, the EIS indicates that a number of bodies still support reasonably intact vegetation. Accordingly it was recommended that a comprehensive plant and animal survey be undertaken.

- . The Service was concerned by the potential for pollution of Bald Rock Creek which flows through the extensive natural area to the north. This concern emanates from the disposal of fine grained tailings. The EIS implied that they will remain in the settling dam after mining has ceased. If so, was there any threat of fines being washed from the dam or breakage of the dam wall, in the longer term?

- . It was noted that rehabilitation will be carried out with native species, at least on land coming under Crown control. In view of the nature conservation value of this area it is considered that rehabilitation should make use of species native to the Torrington area; either as seedlings grown from locally collected seed or by utilizing the natural seed bank within the topsoil itself. This will assist in maintaining the floristic integrity of this area, as well as providing species best able to cope with local conditions.

- . For a proposal of this nature it was quite standard for an Aboriginal sites survey to be undertaken by a qualified person. Such a survey had not been undertaken. It is considered to be necessary and the Service was prepared to suggest qualified people who could undertake the survey on behalf of the developer.

Department of Industrial Relations

- . The Mines Inspection Act, 1901, providing for health and safety, is to be observed and certain actions are required prior to the commencement of operations.

- . Dust control during drilling operations is not mentioned in the EIS. Water injection or a dust extraction method is considered necessary to eliminate dust for the health of employees, as silica is contained within the ore. It is noted that water sprays are mentioned during the milling process only.

- . At this planning stage, it is considered that the planned location of power lines is important for the safety of personnel. Power cables should be placed underground from a point so that no overhead power lines exist within 15 metres of the treatment plants, workshops and stockpiles and where possible do not go over haulage roads.
- . The possibility of the need to protect children (mainly) from collapsing sand stockpiles or quick-sand type ponds, is raised. This aspect is covered under General Rule (48B) of the Mines Inspection Act, but is highlighted at the design stage for consideration.
- . It was further considered that, while the noise produced by some of the plant, listed in Appendix 4 to the EIS, may be acceptable from an environmental stance, it may not be acceptable from an occupational health point of view. It will, for instance, be required that the truck driver be exposed to no greater than a 90 dB(A) daily noise dose.
- . Other subjects touched on, for example, the blasting at the mine, were not detailed, and it should not be construed that approval will be given for a particular practice, briefly mentioned in the EIS, on the basis that it meets environmental limitations.

Soil Conservation Service

- . All disturbed topsoil should be stockpiled for later rehabilitation.
- . The use of trees to vegetate disturbed areas will only offer long term protection. Until the trees are well established, the protection will be minimal. It is therefore imperative that a suitable ground cover be established in conjunction with the tree planting programmes.
- . If the Carters Cut is to be used for stockpiling of sand, acceptable rehabilitation conditions should apply with precautions taken to contain the material within the cut.
- . More details on the species of grasses proposed for establishment on the sand areas and the follow up maintenance programme should be given.
- . Every effort should be made to contain all the fine tailings within the middle settling dam. The spillways of the three dams should also be maintained in a stable non-eroding condition.

- It would be advisable to construct emergency earth spillways on each dam. These would cater for greater than fifty year return floods and would be located on the opposite sides of the earth wall to where the concrete spillways are constructed.
- The freeboard on all three dams should also be checked and adjusted if necessary.
- It is imperative that all available topsoil is stripped and stockpiled for the rehabilitation of the site. Attention should also be given to other areas of high organic matter build-up.
- No area should be left unrehabilitated for any period greater than six months.
- Although the mixture of wattle and gum seedlings that would grow on the cleared areas are not typical of the local tree type, this vegetation would assist in maintaining the stability of the site.
- More details on the grass species to be planted for grazing would be desirable.
- The peripheral drains around the stockpile sites should be flat channelled or parabolic in shape rather than 'V' shaped. They should be constructed so that maximum water velocities do not scour the channel.
- The roads should be constructed so as to minimise erosion.
- The use of native grass and legume species should be encouraged within the rehabilitation programme. Wattles are particularly useful due to their rapid growth and nitrogen fixing ability.

Department of Public Works

The Department had no comments to offer on the proposed development.

State Pollution Control Commission

The proposal as outlined in the EIS will require the Commission's approval under Section 16 of the Clean Air Act, Section 19 of the Clean Waters Act and Section 27 of the Noise Control Act. There appears to be no reason on environmental grounds why the proposal should not go ahead.

4.2 Public Submissions

National Parks Association of NSW

The National Parks Association objected to the granting of approval for the proposed operation because it considered that the environmental studies and assessment of impact were inadequate. The Association's submission was also based on the location of the proposed development being within a much larger area, the subject of a long-standing proposal for a "Beardy River National Park" (Figure 3), submitted to the NSW Government by the Association in 1976 (Ref 4). The area proposed for mining, although already disturbed by past mining, is also adjacent to the relatively undisturbed Binghi wilderness area as defined by Helman (Ref 5).

The proposed National Park encompassed the core wilderness area, with extensions particularly on the eastern side, for it was thought that the disturbed areas of former mining activity would act as a buffer zone, where walking and nature trails could be developed. Old mining relics could also be made available for industrial archaeological research or interpretation. The core wilderness area would have remained undisturbed and intact, though available for wilderness walking and compatible passive recreation such as photography.

The Association felt that the EIS did not adequately deal with the flora and fauna of the area, and that the authors had made minimal effort to find out whether there was any flora or fauna of special significance in the area. The Association submitted a list of rare or threatened plant species which occurred in the Torrington area, and stated that there were rare tree communities not recognized by the Forestry Commission that required conservation. It was likely that specially significant floral species would occur in contact areas near the edge of the granite.

The Association requested that before the application is determined a thorough botanical study be undertaken by an experienced botanist to identify all species growing near areas to be mined, roaded or used for overburden or waste disposal. Special attention should be given to rare ground plants, water plants, mosses, bulbs and orchids.

Regarding rehabilitation, the Association considered that the exotic grass species *Chloris gayana* should be avoided because of its ability to spread and invade adjacent vegetation in surrounding undisturbed areas. Rye grass and white clover would be suitable if fertiliser was used only once, with the initial seeding. The grass and clover without further fertilising would not persist, and seed-blown native species from the surrounding area would begin to take over.

The Company should seek advice from appropriate personnel in the Botany Department of the University of New England and the Glen Innes Agricultural Research Station of the NSW Department of Agriculture, whose special expertise in the uses of native pastures will be relevant.

The Company should be required to take special measures to use only local species for tree and shrub revegetation. This will require collection of local seed, not seed of the same species bought from elsewhere. The Company should refrain from using seedlings from bulk Forestry Commission supplies which do not name provenance; they should be required to avoid all exotic species. The Company should be required to appoint a seed collector for November, December and January of each year, trained in the identification of the local flora.

As a further precaution, those deposits which are nearest to the wilderness area should be left intact until experience has been gained in the revegetation process. Areas A, B and C appear to be very close to Helman's wilderness boundary line, and the first two are at the head of Flagstone Creek, and could adversely affect this creek by erosion and leaching of fluoride if extreme care is not taken with the revegetation programme. Other areas would appear to affect only one creek and its tributaries, i.e. Bald Rock Creek.

Despite a DEP requirement that the National Parks and Wildlife Service must be consulted about the possibility of Aboriginal relics or sites of significance being present, there is no evidence of this consultation having occurred, reliance having been placed on "local enquiries" to support the view that there are no prehistoric sites and that no relics are known to have been found.

The Association concluded that the above precautions, if implemented and policed, would assist in maintaining the integrity of the Binghi wilderness area and would not jeopardize the chance of an area of significant proportion being reserved some time in the future.

Mrs E.J. Kreis (Tenterfield)

Mrs Kreis was concerned that the area between Inverell, Glen Innes and Tenterfield, which was very popular with fossickers, was gradually being closed to the public. For the benefit of tourism in the district, she requested that an area of at least 3 acres in the proposed mining area be set aside as a "Public Fossicking Park".

Gem and Lapidary Council of New South Wales

The Council, on behalf of its affiliated Clubs, requested that an area of 10 hectares in the region be gazetted as a Fossicking Area.

South Coast Regional Council of Lapidary Clubs

The Council wished to point out that Lapidarists had been fossicking in the subject area for several years and wished to continue to do so. The Council considered that the amateur fossicker was being pushed off the field by mining leases and National Parks.

Western Suburbs Lapidary Club

The Club stated that the granting of the subject leases would exclude the many amateur fossickers who frequent the area throughout the year. It requested that consideration be given to the setting aside of at least 10 hectares of virgin topaz bearing land as a proclaimed Fossicking Area, so that the interests of the amateur fossicker can be preserved.

Queensland Lapidary and Allied Craft Clubs Assn. Inc.

The Association objected to the granting of the subject leases on the grounds that the mining of topaz in the area will prevent the amateur fossicker from entering the area to fossick for gemstones and will rob the area of tourist movement.

5.0 ASSESSMENT OF ENVIRONMENTAL IMPACT

Copies of public and Government submissions received as a result of the public exhibition of the EIS were forwarded to the Department of Environment and Planning and the Company. The Company was invited to respond to the submissions and to specific matters raised by this Department.

As a result of submissions by the National Parks and Wildlife Service and the National Parks Association of N.S.W., which considered the EIS to be lacking in adequate baseline data on the flora and fauna of the area, and failed to include an archaeological survey, the Department requested the Company to carry out comprehensive surveys by qualified persons for each of the above over all areas to be disturbed by the operation (see letter to Company in Appendix 3). Copies of the survey reports were subsequently made available to the National Parks and Wildlife Service, the National Parks Association of N.S.W., and the Department of Environment and Planning.

This chapter canvasses the various issues associated with the development, including the implications of the above surveys, and as such constitutes the Department's assessment of its environmental impact and the adequacy of proposed safeguards.

5.1 Mining Method

The Company has chosen conventional open cut/quarry methods (drilling, blasting, ripping) using normal earth moving equipment such as bulldozers and front-end loaders. This is the simplest and most effective method of extracting all of the outcropping greisen ore. Only the larger deposits will require the development of benches.

The deposits will be developed sequentially with several deposits undergoing clearing, mining or rehabilitation at the one time. The deposits are small and the amount of clearing will be kept to a minimum. Commercial timber on the deposits will be salvaged.

The use of explosives (discussed further in Section 5.4) may cause some significant impacts when mining is in the vicinity of the Ross and Stuttard residences. The Company will have to strictly comply with the Mines Inspection Act, 1901 and the Dangerous Goods Act, 1975 in terms of the safe use and handling/storage of

explosives, respectively. The Department of Mineral Resources will also impose restrictions on air blast velocity and vibration levels to ensure the "comfort" of residents is not disturbed, and to ensure that no property damage occurs.

The National Parks Association has suggested that the western-most deposits (A, B, C) within MLA 609 should not be mined until experience has been gained in the revegetation process, because these deposits lie within Helman's Binghi wilderness area. According to the Company's mining schedule in Table 2 of the EIS these deposits will be mined in years 6 to 8 of the operation. This will allow some time for the Department to assess the Company's performance in both mining and rehabilitation, as deposits N-R will have been mined and rehabilitated by the end of year 5. Nevertheless, the Department sees no reason why mining of deposits A, B and C could not be undertaken later in the programme, as they are the furthest from the treatment plant with the highest transport costs, and it is assumed that the Company would prefer to minimise its operating costs during the early years of the project.

5.2 Water Management

It is not expected that any "pit water" will be generated in the mining phase of the project due to the topographic nature of the deposits. It should only be necessary to prevent surface runoff from entering any of the open cuts, and although the EIS makes no mention of it, it would be advisable to provide perimeter drainage around each deposit while they are being worked.

At the treatment plant site, water conservation and management will be a very important component of the operation, as water will need to be conserved for use in ore processing, and therefore escape of water to Bald Rock Creek must be prevented. It is the Company's intention to operate a "closed system" by recirculating all process water, and the loss of any water to the creek system will be costly to the Company in terms of obtaining make-up water. As pointed out by the Water Resources Commission no alternative water supply has been indicated should the three existing dams fail to meet the demands of the operation.

Clean water runoff around the treatment plant and stockpile area will be collected in surface drains and fed into grit traps before entering the water storage dam. The Soil Conservation Service has suggested that flat channelled or parabolic shaped drains be used instead of the Company's proposed 'V' shaped drains, in order to avoid scouring of the channel. The Company should accept the Service's advice.

Although no chemicals will be added to the ore treatment process, because it is a wet process there is ample opportunity for process water to become contaminated from some minerals or elements within the ore. Water sampling by the Department has shown an excess of fluoride in the tailings and lower dams which was interpreted as being due to the influence of previous wolfram mining and the existence of battery sand tailings at the site. Therefore it is highly likely that elevated fluoride levels will occur in this operation as fluorine is a major element of the mineral topaz. It is unlikely that there will be any other trace metals or salts present in sufficient concentrations to be of concern.

Process water will be contained within the tailings and water storage dams. The lower dam does not normally overflow, and provided both dams are repaired and upgraded with engineer designed spillways, there should be no release of water to Bald Rock Creek except in times of extreme rainfall. The Soil Conservation Service has recommended the construction of emergency spillways, in addition to the proposed concrete spillways, to cater for greater than 50 year return floods. Again, the advice of the Service should be heeded by the Company.

The coarse sand stockpiles, which will be deposited wet, will require perimeter drainage, as they will be free draining. Contaminated runoff from the mill, workshop, car park area etc. will contain oil and grease and it is proposed to direct this water into grease traps.

Although the lower dam will trap any fines washed out from the tailings dam, the Department agrees with the Soil Conservation Service that every effort should be made to contain all of the tailings within the tailings dam. As this dam will need substantial repairs and upgrading the Company should ensure that such work is supervised by a qualified engineer and that the capacity of the dam is sufficient to contain all of the fine tailings likely to be generated over the life of the operation with sufficient free board to prevent over-topping.

The Department believes that the Company's proposals appear to be an acceptable approach to water management and generally adverse impacts are not envisaged. The State Pollution Control Commission will examine on-site water management in detail when considering the Company's application for a licence under the Clean Waters Act and certainly the SPCC has given no indication that it foresees any problems in that regard. The Company has given a commitment to carry out regular water sampling to monitor the effects of the operation.

5.3 Air Quality

Dust may be generated from a number of sources: vegetation and topsoil stripping, drilling, blasting, overburden removal, vehicle movements, ore stockpiles, milling, tailings disposal, and exposed areas. The SPCC will be responsible for the particular issues related to air quality when considering the Company's application for approval under the Clean Air Act. The SPCC in its submission saw no reason why the proposal should not go ahead on air quality grounds. The Department notes that no background dust levels were provided in the EIS.

The Company's mining method and the nature and size of the deposits mean that areas to be progressively stripped will be limited in size, and that only an access road, the deposit itself, and a small access apron around each deposit will need to be cleared. Any dust arising from this source can be easily controlled by use of a water tanker.

Drilling may be a significant dust source if not controlled. The EIS did not specify any dust control equipment for the drilling rig, and this point has been raised by the Department of Industrial Relations, particularly in relation to employees being exposed to silica dust. The Company will need to use a water injection or dust extraction method such as bag filters on the drilling rig, as required by the DIR or SPCC.

Dust will be produced by blasting operations, however the levels of dust may be reduced by proper selection of drill size and type, appropriate stemming material and restricting times to suitable climatic conditions.

Due to the nature of the deposits, very little overburden and topsoil will need to be removed or stockpiled. Therefore, these are not considered to be significant sources of dust generation.

The ore haulage roads, and vehicle movements along them, are potentially the major sources of dust emission. The Company intends to use a tanker truck for regular road watering and vehicular speeds will be limited. The haulage of concentrate will occur on public roads, however the number of loaded trucks will average only 4 per day, and therefore the dust emission will be no more significant than that generated by other road users. The loads will also be covered to prevent dust and spillage. Diesel exhaust emissions from earth-moving equipment and haulage trucks will be limited to the standards prescribed by the SPCC.

During the milling process, particularly crushing, ore will be sprayed with water and all parts of the plant will be enclosed. The DIR will ensure that levels of occupational exposure to silica dust within the mill will comply with prescribed standards.

The fine grained tailings will exit from the mill as a wet slurry and will be pumped to the tailings dam where they will be kept under water, so it is unlikely that any dust will be generated from that source. The clean, sand-sized tailings, including battery sand tailings, will be either stockpiled or returned as fill to the open cuts. Whilst it is unlikely that stockpiles of this material will cause any dust problems, the Department considers that facilities for water spraying of both the sand and ore stockpiles should be available in times of high winds.

Exposed areas such as those undergoing rehabilitation will also be a dust source and it is suggested that watering of these should be incorporated as a dust control measure until such time as vegetation growth covers these surfaces. Grass and trees should be planted around the treatment plant site also as a dust control measure.

The Department believes that acceptable air quality can be easily achieved with the protective measures outlined over most of the project area, with the exception of the two deposits nearest the Stuttard and Ross residences (N1 and N2). Special precautions and restrictions will need to be taken if these two ore bodies are to be mined. This is discussed further in the following section.

5.4 Noise

The Company engaged a recognized firm of noise consultants, Louis A. Challis and Associates Pty Ltd, to undertake a detailed acoustical investigation of the project. The major noise sources will be the treatment plant site, the blasting and mining of ore, and the transport of ore and concentrates. The only residents in the area affected by the project are Messrs Stuttard and Ross whose houses are approximately 750 m and 850 m in direct line from the treatment plant site, respectively.

The consultant's background noise survey indicated that for most of the time existing daytime acoustical levels were of the order of 35 dB(A) under low wind conditions, dropping to about 30 dB(A) during the night.

The primary and secondary crushers will be the most significant noise sources in the ore treatment area. To the southeast of the mill building a combined workshop and amenities building has been strategically placed as a sound barrier in the direction of the residents. The northeastern wall of this building will be 100 m long and constructed of a double layering of galvanised steel sheeting enclosing acoustical insulation. The wall will be 6 m high and will exceed the maximum height of the crushing plant. This will be supplemented by a 3 to 5 m bund wall along the southeastern boundary of the treatment plant site.

With these measures, the sound level at the nearest residence was estimated to reduce from 46 dB(A) to 34 dB(A) under normal conditions. Under temperature inversion conditions or a northerly breeze the sound level could reach 44 dB(A). If the front end loader is operating in the plant area the expected noise levels would rise to 37 dB(A) under normal conditions and 47 dB(A) under adverse conditions.

Therefore during normal daytime conditions the noise levels would only increase by 2 dB(A) above existing background levels, which is well within established criteria of 5 dB(A) above background, however up to 12 dB(A) above ambient levels could be experienced under adverse conditions.

The consultants analysed records of wind speed and direction in the region over the last 22 years and concluded that the chance of enhanced sound propagation from critical wind speeds in the direction of the residents was extremely unlikely and not a cause for concern. The chance of temperature inversions was also considered to be minimal as work will not commence on the site until 7 am.

It is the Company's intention to operate the treatment plant up until 10 pm Monday to Saturday. It is the Department's view that initial night time operations should be monitored by the Company at the nearest residence and the results submitted to the SPCC. The Department has some doubts about whether acceptable noise levels from the treatment plant can be achieved at night. The treatment plant will be licensed as "scheduled premises" under the Noise Control Act by the SPCC.

The Department considers that the hours of operation (7 am to 6 pm Monday to Saturday) for mining and the transport of ore and concentrates are acceptable.

Most of the major orebodies are located at greater distances from the residents than the treatment plant is. With the exception of the largest orebodies (L and M) most deposits will be mined and rehabilitated within a 12 month period and

therefore any impacts will be temporary. Noise sources will be from drilling, blasting and ore removal. All plant will be required to be fitted with approved engine exhaust silencing equipment.

The Company proposes to carry out blasting on a scheduled basis at a nominated time each day between midday and 6 pm. This time has been chosen as the most suitable for maximum sound attenuation. The Company also proposes to close access roads and sound a warning siren. All blasting practices affecting the safety of employees or the public will require approval of the Department of Industrial Relations.

The Company intends to conduct trial blasts to assess the most effective charge sizes, time delays and tamping procedures, and to monitor the blasting at the Ross residence. Charge sizes and delays will be selected such that the ground vibration velocity does not exceed 5 mm/sec. This standard is in accordance with the Department of Mineral Resources' requirements. The EIS also states that the blast overpressure will be limited to 120 dB (unweighted). The Department's established "comfort level" criteria for blast overpressure noise is 115 dB (linear) at the nearest dwelling or occupied premises and it will be this standard that will be applied as a condition of the leases.

Two small ore bodies (N1 and N2) are located at a very short distance from the Ross and Stuttard residences, 150m and 300m respectively. The Department agrees with the Consultant's analysis that the unrestricted mining of these deposits would present an unacceptable noise impact (up to 75 dB(A)) as well as the potential for vibration or fly rock damage to the residences.

It is therefore proposed that, at the time the Company wishes to mine either or both of these deposits, further application be made to the Minister setting out full details of the measures proposed by the Company to ameliorate any noise impact to the Ross or Stuttard families and to eliminate any potential for damage to improvements on these properties.

Given the fact that both of these deposits are very small and could probably be mined and rehabilitated within a month or two, it is considered that the most suitable strategy would be to make arrangements for both families to be absent from their properties during that period. The Department would also wish to ensure that a suitable compensation agreement for property damage was in place before any approval was given.

The consultant has suggested other strategies such as restricting daily operation times and providing acoustical treatment to the houses. These would be considered by the Department at the time of any application, however it is believed that the strategy of total absence is a more practical and effective approach.

Noise from ore haulage will be most significant for ore bodies N1 and N2, however trucks carrying ore from deposits P1, P2, Q and R will use the Torrington/Silent Grove Road to the treatment plant and will therefore pass quite close to the Stuttard residence. The consultant estimates that L_{10} 18-hour noise levels of 62 dB(A) will be experienced. The acceptability of this aspect will need to be carefully considered by the SPCC in the granting of any licences. Ore transport to the other deposits should present no adverse impacts as these deposits are remote from habitation.

Some additional, but intermittent noise impact will be experienced by people living along the concentrate haulage route, however this is not considered to be significant as the number of concentrate truck journeys per day is minimal. There will also be a general increase in road traffic noise through Torrington, Stannum and Emmaville at shift times due to employees' vehicles.

Noise is considered by the Department to be the most critical environmental issue of the development, however provided the safeguards discussed above are implemented, and periodic monitoring of noise levels are undertaken, it is believed that the operation can be conducted under conditions acceptable to the local community.

5.5 Visual Impact

Most of the topaz deposits occur within forested areas not visible from public roads. Some of the eastern deposits in the vicinity of the ore treatment plant will be visible from the Torrington/Silent Grove Road as extensive clearing for pastoral activities was carried out in 1983/84. As each deposit will be mined over a relatively short period of time, this visual impact will be only temporary.

The treatment plant site, adjacent to the public road, will be highly visible, not only to passing traffic, but to the Stuttard and Ross residences which have direct line of sight vision from 750 m and 850 m respectively.

In normal circumstances, it would be appropriate for an arboreal screen to be maintained along the boundary with the public road, however the Company's attempts to have the landowner leave a row of trees along the road while he was clearing his property were not successful. The Department does not believe it to be necessary to require the Company to plant an arboreal screen for the following reasons:-

1. The operation will be of only a short duration (15 years) which would be insufficient time for tree growth to become fully effective.
2. The site is remote and the amount of traffic using the public road is relatively minor.
3. It is a traditional mining area and the sight of another treatment plant would not be a visual intrusion to this area, and may be of interest to tourists.
4. The plant site has been previously used for ore treatment, since the 1900's, and visually is in a derelict state, which can only be improved.

The Company intends to clear up much of the site and provide landscaping to improve the visual amenity for its employees as well as the passing public. The appropriate colour selection will also help soften the visual impact of buildings and structures on the site. Grass and tree planting around the buildings will also assist in this regard.

As the Stuttard and Ross residences will have a permanent view of the treatment plant site, it is considered appropriate that some form of ameliorative measures be taken to preserve their rural outlook. The Company intends to construct a 100 m long, 3-5 m high, earthen bund wall or stockpile, principally as a noise shield, to protect these residences. Such a wall will also assist in screening much of the plant and buildings from view. The bund should be grassed and trees planted.

5.6 Flora and Fauna

The survey of the project area did not locate any species of plant or animal that will be endangered by the proposed development. Two species of wattle identified by the National Parks Association as botanically significant (*A. betchii*, *A. mcnutiana*), were found on two orebodies, however neither species are restricted to the Torrington region, and were not considered threatened.

The National Parks and Wildlife Service in a subsequent letter to the Department (Appendix 4) considered that *A. mcnutiana* was a rare wattle in NSW and disturbance should be avoided if possible, otherwise this species should be replanted from locally collected seed during rehabilitation. *A. betchii* was considered by the Service to be an uncommon species of wattle which should also be protected if possible.

The survey recommended that proposed access roads be sited so as to avoid the limited areas of Open Scrub within the leases. The National Parks and Wildlife Service supports this view. The Department recommends that the Company consult with the Forestry Commission, Crown Lands Office, and the National Parks and Wildlife Service over the detailed siting of its access roads.

The removal of the tree cover on the orebodies will not affect the conservation status of the tree species, but will reduce the habitat for the Greater Glider. Some loss of animals from the area is expected, however the Greater Glider was considered to be abundant throughout its range and there will be no significant effect upon the status of this species. No rare or endangered animal species were found in the area during the survey.

The Department supports the recommendation of the flora and fauna consultants that the clearing of trees from the area should be kept to a minimum. The Department notes that the surface area of each orebody is relatively small and that clearing and mining will be carried out progressively.

The EIS states that a total of 25 hectares of forest will be cleared, although the average area for each deposit is only 1.5 hectares. The mined areas will also be revegetated to native forest and ultimately fauna will be able to return. The impact on flora and fauna resulting from the mining operation, is considered to be minimal, particularly when compared to the unrestricted clear felling for pastoral purposes that has been recently carried out over an extensive area of the Ross property.

The flora and fauna survey also recommended that any belts of trees forming wildlife corridors between the leases and the Beardy River National Park Proposal area should be retained. If practical, this is also supported in order to allow relocation of any affected fauna. The Department considers that consultation between the Company and the National Parks and Wildlife Service could best achieve this goal.

5.7 Heritage and Archaeology

Much of the subject area was the scene of wolfram mining since the turn of the century. A few remaining relics, such as concrete foundations, tramway formations etc. exist on the site but there are no buildings or visible remains of any machinery of any kind. The area may have some potential for industrial archaeological study. It is the Company's intention not to interfere with any existing relics and it has stated in the EIS that such relics will be enclosed by fencing.

A small private cemetery exists at Tungsten and the Company has stated that this will not be affected. The Department will exclude the area of the cemetery from any title granted in satisfaction of MLA 617.

An aboriginal sites survey by the National Parks and Wildlife Service has found no aboriginal relics or sites of occupation. Any sites subsequently found during the course of mining will require notification to the Service as specified in Section 91 of the National Parks and Wildlife Act, 1974.

5.8 Transport

Ore trucks of 10 to 15 tonne capacity travelling between the topaz deposits and the treatment plant will use either existing unsealed access tracks on Crown lands or forestry roads through Torrington State Forest, both of which will be upgraded. These roads are only infrequently used by the public and other mining operators. It will be the Company's responsibility to maintain these roads to the satisfaction of the Forestry Commission or Crown Lands Office.

The Company will also construct a series of ore haulage roads on private property as access to the various deposits. These will be subject to private compensation agreements between the Company and landholders, and if necessary will need to be fenced to protect stock. All access tracks, both temporary and permanent, should be constructed so as to minimise soil erosion. The Department supports the view of the Soil Conservation Service that adequate provision should be made for roadside drainage and where necessary the installation of culverts or causeways.

Ore trucks will need to directly cross the Torrington-Silent Grove road as access to MLA 617. This intersection should be controlled by "Stop" signs on the haulage road and "Trucks Crossing" warning signs should be installed on the public road. Ore

trucks proceeding to and from MLA's 609 and 610 will need to traverse approximately 350 metres of this public road. The number of truck movements is expected to be about 12 per hour which should not interfere with the relatively small number of other road users.

Trucks of 25 tonne capacity will transport topaz concentrate from the treatment plant through Torrington, Stannum and Deepwater on public roads. About 8 truck movements and about 30 employee vehicle movements per day is not considered to be enough to adversely affect the capacity of these roads or jeopardise the safety of other road users. The Company will be expected to contribute towards the cost of maintenance of these roads with Tenterfield and Severn Shire Councils. In granting its development approval, Severn Shire Council has already imposed a condition to that effect.

The Company has indicated in its EIS that it will consider undertaking the following measures to minimise any impact from truck transport:

1. Selection of trucks that comply with Australian Design Regulations for noise emission.
2. Limiting truck speeds.
3. Ore and concentrate haulage to be restricted to 7 am to 6 pm Monday to Saturday.
4. Erection of warning signs and "Stop" signs where necessary.
5. Use of Torrington by-pass road to minimise impact on residents.
6. Restricting truck movements during school bus times.

The Department supports all of the the above measures and recommends that they be implemented.

5.9 Rehabilitation

The Company has described an acceptable rehabilitation philosophy in the EIS and has stated that either private land owners or occupiers, the Forestry Commission or the Crown Lands Office, will be fully consulted in regard to rehabilitation of

land they own or control. Overall supervision will be the responsibility of the Department of Mineral Resources through the Soil Conservation Service.

As most of the ore bodies occur as small hillocks there will not be any large holes remaining after mining. Any depression will be filled with overburden from adjacent deposits or tailings sand from the ore treatment plant. Most deposits have little overburden and no topsoil, which could present difficulties. It will be important for all available subsoil and topsoil to be salvaged at every opportunity and properly stored for subsequent use. As most of the deposits will be mined relatively quickly, the biological viability of the stored topsoil will most likely be retained.

Land that has been mined will be either returned to forest, grazing land, or other land use agreeable to the landowner. Nevertheless, as pointed out by the Soil Conservation Service, a ground cover of suitable native grasses will have to be initially sown to control erosion until trees become established. The National Parks Association has recommended that the Company seeks advice from the University of New England and the Department of Agriculture for the establishment of native pastures. Whilst the Company is free to consult with any experts it wishes, in matters related to rehabilitation, and the lease conditions pertaining thereto, ultimate approval will need to be obtained from the Department of Mineral Resources through the Soil Conservation Service.

In relation to tree and shrub revegetation, both the National Parks and Wildlife Service and the National Parks Association have recommended the use of local native species. The Department fully supports this philosophy in view of the nature conservation value of nearby areas. The Company has set aside an area near the treatment plant as a nursery site for seedlings and rehabilitation operations. It will also employ people with specific responsibilities for rehabilitation. Therefore the Department believes it to be quite feasible for the Company to collect its own native seed from the Torrington area and raise its own seedlings. The Department also suggests that the nursery site be used to establish a number of trial vegetation plots. Specifically, a number of trials may be needed to find a grass species suitable for growing on sand tailings.

The Company has indicated a desire to use part of the derelict Carter's Cut, which exists within MLA 617, to dispose of some 300,000 tonnes of sand tailings. The Company was not responsible for the open cut and, understandably, does not wish to be held responsible for its rehabilitation. The Department encourages co-

operative overburden and waste management by companies, such as the filling of abandoned open cuts, which serves the two-fold purpose of 1) rehabilitating a derelict area that would otherwise be a cost to the Government, and 2) preventing an additional waste disposal problem at another site.

The Department would expect the Company to be responsible for rehabilitating only that part of Carter's Cut that it wishes to use to dispose of its tailings. It is considered appropriate that before the Company is given permission to dispose of tailings in the cut that a rehabilitation plan be submitted to the Department.

The Lands Office has suggested that the Department of Mineral Resources contribute financially to an overall restoration programme for Carter's Cut. Whilst this would be considered, it must be appreciated that there are far too many derelict mine sites around the State for the funds available, and that other sites would probably have a higher priority. With co-operation from the Company at least part of the area can be rehabilitated to the mutual benefit of both parties.

Rehabilitation of the treatment plant site will involve the removal of all plant, buildings, hardstand areas etc. Any retreated tailings areas will also be required to be rehabilitated as well as the tailings dam after dewatering. It is most likely that the site will be converted to improved pasture, compatible with the surrounding paddocks owned by Mr Ross.

All rehabilitated areas will require follow-up maintenance for a number of years, and before any leases can be cancelled, the Department will need to be satisfied that all revegetated areas are self-sustaining and maintenance free.

5.10 Socioeconomic Impact

The EIS states that the proposed development will directly employ up to 30 people in mining, treatment and transporting the ore and concentrate. Additional employment opportunities will be available in local industries that will service the development. Mining has been a traditional industry in the area, but has declined in recent years due to depressed commodity prices and tin quotas. Small mine operators have been under increasing difficulties to remain viable. The Company considers that its operation may create a market for topaz concentrate which can be recovered as a by-product from wolfram mining, thus helping the viability of the small producers.

A new mining venture in this region will help stimulate the regional economy and maintain employment in the local mining industry. The Company intends that the majority of its workforce will be recruited locally, which is to be encouraged, and the accommodation of this workforce will therefore not produce any strain on housing or community facilities. The Company has its own accommodation facilities for senior staff on its property near the treatment plant. Existing hotel and caravan park accommodation in nearby towns should be adequate for the construction workforce.

The proposed development, if successful, will lead to significant benefits to Australia by way of royalties, foreign exchange and export income. A further 170 direct jobs will be created through the Company's proposed manufacturing plant which will be capable of producing high technology ceramic products of world significance.

The full development of this topaz resource from mining through specialised manufacture to domestic and export sales, can only create positive socioeconomic benefits to Australia, N.S.W and the local region.

5.11 Fossicking

A number of submissions from lapidary clubs throughout the State indicated that fossicking for gemstones was a common recreational pursuit in the area. These clubs were concerned that the granting of leases would exclude the many amateur fossickers and tourists who frequent the area.

Notwithstanding the fact that the Company has held a number of applications and authorities under the Mining Act, 1973 over the area for many years, and as such any fossicking within these areas is illegal, the Department feels that an informal working arrangement with the Company may be possible to accommodate the needs of the fossicker. Accordingly, the Department in its letter to the Company dated 18th June, 1985 (Appendix 3) requested the Company's consideration of this matter. The Company's reply (Appendix 3) indicated a willingness to assist fossickers, provided prior permission from the Mine Manager was obtained. The Company was however, mindful of its public liability responsibilities.

The Department recognizes the prior rights of the Company which has legitimate title to the area. The topaz resource within the existing and proposed title areas is of a fine grained industrial nature, and not of gem quality. For these reasons, the Department could not recommend to the Minister that a fossicking area be proclaimed as requested in submissions.

6.0 CONCLUSIONS AND RECOMMENDATIONS

In considering the proposed activity by Topalite Resources Pty Limited the Department has examined and taken into account to the fullest extent possible all matters likely to affect the environment, and in so doing has considered all representations received in relation to the environmental impact statement. Copies of all submissions have been referred to the Secretary, Department of Environment and Planning pursuant to Section 113(3) of the EPA Act.

The Department of Mineral Resources, based on the foregoing environmental assessment, is satisfied that the open cut mining and processing of quartz-topaz ore by Topalite Resources Pty Limited at Torrington can be undertaken in an environmentally acceptable manner within MLA's 609, 610, 612, 617 (Inverell) and MPLA 597 (Inverell), subject to the provision of adequate environmental safeguards and the incorporation of appropriate conditions.

The Department agrees in principle to the proposal being carried out in the manner described in the Company's environmental impact statement, except that unconditional approval to mine deposits N1 and N2 (shown on Plan 6 of the EIS) should not be given. These deposits are within 300m of two existing residences, and it is the Department's view that the mining of these deposits would cause unacceptable noise, dust and blasting impacts. It is proposed that the mining of these deposits should only take place with the prior approval of the Minister, and the residents concerned, after he has been satisfied that appropriate arrangements have been made by the Company to guarantee the safety, amenity and property of the residents and compensation agreements have been entered into. The Minister is also empowered to impose additional conditions in the mining lease at that time.

The Department believes that the project will have minimal effect on the Binghi wilderness area and would not necessarily jeopardize the integrity of the area as a possible National Park. The Department is satisfied that no rare or endangered species of plant or animal will be threatened, nor any aboriginal sites of significance disturbed. The Company has indicated a willingness to use only local native species in its rehabilitation programme. Although it is likely that process water from the treatment plant will contain fluoride concentrates in excess of

acceptable levels, it is the Company's intention to prevent the discharge of any contaminated water from the treatment plant site into Bald Rock Creek which drains into the wilderness area. This goal is considered to be realistic and technically achievable. The Department therefore considers that the objections by the National Parks Association of NSW and the concerns of the National Parks and Wildlife Service have been adequately catered for.

The Company has demonstrated a willingness to cooperate with groups wishing to fossick on its property, and therefore the objections and concerns of various lapidary clubs have also been satisfied.

The Company should ensure that the requirements of all public authorities having statutory responsibilities in respect of the proposed operations are met prior to commencing any development activities.

In respect of noise, air and water quality, the State Pollution Control Commission will undertake a detailed consideration of these aspects in determining approvals required under the Noise Control Act, the Clean Air Act and the Clean Waters Act. This report has raised certain matters in Chapter 5 which warrant particular attention by the SPCC in the granting of any licences.

The Company will also be required to comply with the provisions of the Mines Inspection Act, administered by the Department of Industrial Relations, in regard to occupational and public safety.

The Company has already obtained development consent for that small part of the project located within Severn Shire, but will be required to obtain all other necessary approvals, such as road construction, building permits etc, from both Severn and Tenterfield Shire Councils.

The Torrington topaz deposits are the largest known source of industrial topaz in the world which have the potential to produce high quality refractory raw materials and fluorine compounds which are presently imported to Australia. It is the Company's intention to develop a new high technology industry from mining through to manufacture and sale which will bring significant benefits to Australia through employment, export income and Government revenue. The Department believes that the first stage of this venture, the mining and processing of topaz concentrate, to be fully justified which will result in a net positive impact on the community.

6.1 Recommendations to the Minister for Mineral Resources and Energy

The Department of Mineral Resources recommends to the Minister for Mineral Resources and Energy that, pursuant to Section 53(2) of the Mining Act, 1973, leases be granted to Topalite Resources Pty Limited in satisfaction of Mining Lease Applications 609, 610, 612, 617 (Inverell) and Mining Purposes Lease Application 597 (Inverell) for a period of 21 years each, subject to the terms and conditions set out in Annexures A-G as specified in the schedule in the front of this report. It is recommended that one lease be issued in satisfaction of MLA's 609 and 610.

REFERENCES

1. Winward, K., 1976. Silexite Deposits of the Torrington Area, New England, and their Economic Potential. Rep. Geol. Surv. N.S.W., GS 1976/393 (unpubl.).
2. Department of Mineral Resources, 1984. Non-traditional Minerals of New South Wales. Trade Seminar: October, 1984. 54pp.
3. Brooks, K.A., Dunn, G.V. and Rhyder, G.J., 1985. Torrington Area: Analytical Results for Water Samples. Department of Mineral Resources Chemical Laboratory Rep. No. 85/17 (unpubl.).
4. National Parks Association of NSW, 1976. Beardy River National Park. A Proposal by the National Parks Association of New South Wales. Tomato Press. 36pp.
5. Helman, P.M., Jones, A.D., Pigram, J.J., and Smith, J.M.B., 1976. Wilderness in Australia, Eastern New South Wales and South Eastern Queensland. Department of Geography, University of New England. 147pp.
6. Mount King Ecological Surveys, 1985. Flora and Fauna Survey of Proposed Mining Project Land Near Torrington, N.S.W.

APPENDIX 1

CORRESPONDENCE BETWEEN DEPARTMENT OF MINERAL
RESOURCES AND DEPARTMENT OF ENVIRONMENT AND PLANNING

LETTER FROM DEPARTMENT OF ENVIRONMENT AND PLANNING TO
DEPARTMENT OF MINERAL RESOURCES DATED 9TH NOVEMBER, 1984.

The Secretary
Department of Mineral Resources
GPO Box 5288
SYDNEY. N.S.W. 2001

Our ref:84/1140

Dear Sir,

Proposed open cut excavation and treatment of quartz topaz greisen ore at MLA's
597, 609, 610, 612, and 617 Inverell, by G. Whitburn Pty. Ltd.

For your information Mr. Boyd Pratt of Boyd Pratt and Associates has consulted
with the Director concerning the preparation of an environmental impact
statement (EIS) for the above proposal.

2. Attached is a copy of advice forwarded to Mr. Pratt in which he was
advised that because the proposed development falls partly within
Tenterfield Shire where planning controls do not apply and partly in
Severn Shire where they do, consents would be required under both Part V
of the Environmental Planning and Assessment Act, 1979, with respect to
Tenterfield and Part IV with respect of Severn Shire. Under Part V the
Department of Mineral Resources is the determining authority and under
Part IV Severn Shire Council is the consent authority. Mr. Pratt was also
advised that given the nature of the development it would be appropriate
to seek the preparation of one EIS for submission under both Part IV and
V. A telephone conversation with an officer of your Department
suggested that no objection would be raised to this course of action.

3. When an adequate environmental impact statement has been prepared for the subject proposal, as determining authority, you should then proceed with the matter in accordance with sections 112 and 113 of the Act and place the document on public exhibition. The procedures for public display that are to be followed by the determining authority are as in clauses 60 and 64 of the Environmental Planning and Assessment Regulation, 1980.
4. At such time as the completed environmental impact statement is forwarded to the Secretary, it would be appreciated if two additional copies of the environmental impact statement could be forwarded to the Department, as well as details of the period of public exhibition and proposed public display locations. Should any submissions be made during the period of public exhibition, it is advised that such submissions should be forwarded to The Secretary and in the event of issues of interest to the Department being raised in any submissions received, we will advise you accordingly.
5. Because the proposal has both Part IV and Part V components liaison between your Department and Severn Shire Council would be desirable to ensure simultaneous and coordinated public exhibition and advertising etc. We ask that you confer with the Council regarding this matter.
6. Our advice to the applicant outlines the Director's requirements regarding the form and content of the EIS. It is considered that these matters should be taken into account in determining the proposal and it has been suggested that the applicant confer with you in this regard.

Yours faithfully,

E. WRIGHTER,
Assessments Branch
As Delegate for the Director

REQUIREMENTS OF THE DIRECTOR OF
DEPARTMENT OF ENVIRONMENT AND PLANNING

Mr. B. T. Pratt
Boyd Pratt and Associates
8 Jane Street
RANDWICK. N.S.W. 2031

Our ref: 84/1140

Dear Sir,

Proposed opencut excavation and treatment of quartz topaz greisen ore at MLAs 597, 609, 610, 612 and 617 Inverell by G. Whitburn Pty. Ltd.

Thank you for your letters of 1st and 12th October, 1984, which indicated that you are consulting with the Director with regard to the preparation of an environmental impact statement (EIS) for the above proposed development.

2. It is noted that the proposed development falls mainly within Tenterfield Shire but that a small area falls within Severn Shire. Because no planning controls currently operate in Tenterfield Shire, that part of the proposal falls under the jurisdiction of Part V of the Environmental Planning and Assessment Act, 1979. In Severn Shire planning controls do operate and for that part of the proposal a development consent is required under Part IV of the Act. In this regard Severn Shire Council is the consent authority.

3. The Department of Mineral Resources is the determining authority under Part V. That Department has recently indicated that pursuant to Section 112 of the Environmental Planning and Assessment Act, 1979, an EIS is required.

4. Under Part IV of the Act, pursuant to Schedule 3 of the Regulation, the proposal is designated development and accordingly an EIS is required to support the development application to Severn Shire Council.

5. Because of the nature of the development this Department is of the view that it would be appropriate to prepare one EIS relating to the entire development for submission to both the Department of Mineral Resources and Severn Shire Council. Both the Department of Mineral Resources and Severn Shire Council have verbally indicated that this would be an acceptable course of action.

6. The EIS is to be prepared in accordance with Clauses 34 and 57 of the Environmental Planning and Assessment Regulation, 1980, and it shall bear a certificate required by Clauses 26(1) (b) and 59 of the Regulation.

7. With regard to the form and content of the EIS, it is advised that the Director requires that you should take into account those matters specified in the attachment to this letter. These matters are to be adequately addressed in the statement, and should be taken into account in the determination of the proposal by Council and the Department of Mineral Resources with whom we suggest you confer. A copy of the Director's Requirements should be attached to the completed EIS to assist in comprehension of the document.

8. The National Parks and Wildlife Act contains legislative requirements for the preservation of relics and aboriginal places. The advice of the National Parks and Wildlife Service should be sought on the need for a professionally conducted aboriginal archaeological survey for inclusion in the EIS and on the appropriate manner for carrying out such a development.

9. Where matters are likely to come within the scope of legislation relative to air, water and noise control as administered by the State Pollution Control Commission, the views of the Commission should be sought and taken into account in preparing the EIS.

10. Should you require any further information regarding this matter, please do not hesitate to contact us again.

Yours faithfully,

E. Wrighter
Assessments Branch
As Delegate for the Director

NEW SOUTH WALES DEPARTMENT OF ENVIRONMENT AND PLANNING

ATTACHMENT

Proposed opencut excavation and treatment of quartz topaz greisen ore at MLAs 597, 609, 610, 612 and 617 Inverell by G. Whitburn Pty Ltd.

A comprehensive environmental impact statement EIS shall adequately cover all the matters specified in Clauses 34/57 of the Environmental Planning and Assessment Regulation, 1980.

These matters shall be clearly and succinctly outlined in the text and where appropriate supported by adequate maps, plans, diagrams or other descriptive details to enable all concerned to gain a clear understanding of the full scope of the development and its likely impact on the environment.

The following particular matters shall also be included in the EIS:

1. Background information.
 - . Location of works and indication of adjacent developments.
 - . Broad nature and extent of works proposed - a map showing proposed open cut areas, surface works, access and power routes etc should be included.
 - . Land tenure, boundaries, site details in relation to environmental planning instrument zonings and any other land use constraints.

2. Detailed description of the proposal.

This description shall not only describe the proposal at the site but also describe any associated operations such as winning and transport of materials, processes involved (highlighting any proposed crushing or blasting), disposal of wastes, rehabilitation, landscaping and use of the end product if likely to have environmental implications.

Particular matters to be covered include:

- . Characteristics and economic significance of the resource.
- . Possible availability of alternative sources.
- . Methods of extraction/plans of operations.
- . Type of machinery and equipment to be used.
- . Expected life of the operation.
- . Number of persons to be employed.

- . Hours of operation.
- . Times of any blasting or crushing envisaged.
- . Location and quantity of any necessary stockpiling.
- . Access arrangements - truck routes and number of truck movements.
- . Quantity of materials to be extracted
- . Noise levels.
- . Site drainage and erosion controls.
- . Proposals for rehabilitation and assurances of effective completion.
- . Description of the environment.

This description shall provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facets of the proposal. In this regard, physical, natural, social, heritage, archaeological and economic aspects of the environment should be described to the extent necessary for assessment of the environmental impact of the proposed development.

Attention should be given to the history of landuses in the area and description of the species of flora and fauna in the area.

4. Assessment of environmental impact and measures to be taken to reduce the impact especially with respect to:-
 - . The flow of any affected creeks and/or watercourses.
 - . Effect of extraction on sediment transport rate of any affected creeks.
 - . Any likely cumulative effects of the proposed operation when considered together with other operations in the vicinity.
 - . Possible effects of flooding on the operations.
 - . Effects on fauna and flora.
 - . Agricultural viability of the land holding.
 - . Likely noise disturbance caused by the operations, including transport operations, on nearby residences.
 - . Other impacts of trucking movements.
 - . Dust control and any nuisance likely to be caused.
 - . Water treatment and other pollution control measures.
 - . Disposal of waste material.
 - . Landscaping measures and effects on the visual environment.
 - . The proposed final use of the site and likely effectiveness of rehabilitation.

. Any likely affectation of sites of aboriginal archaeological or heritage value if located in the vicinity of the operations.


5. Authorities contacted.

The names of authorities contacted should be listed. Any comments relating to specific matters of interest raised by such authorities should be declared, including those in relation to possible cumulative environmental problems that may result.

The National Parks and Wildlife Service should be contacted in preparation of the EIS.

APPENDIX 2

COPY OF NEWSPAPER ADVERTISEMENT FOR PUBLIC DISPLAY OF EIS



**NEW SOUTH WALES
GOVERNMENT
DEPARTMENT
OF MINERAL
RESOURCES**

**ASSESSMENT OF
ENVIRONMENTAL IMPACT
OF A PROPOSED
INDUSTRIAL TOPAZ MINE
NEAR TORRINGTON**

PUBLIC EXHIBITION

The N.S.W. Department of Mineral Resources is undertaking an environmental impact assessment of a proposal by G. Whitburn Pty. Ltd. to carry out an industrial topaz mining operation in an area centred about six kilometres north of the Village of Torrington.

The company proposes to extract by open cut methods 1,500,000 tonnes of ore from 24 individual deposits over a 15 year period. Topaz and possibly wolfram and bismuth concentrates will be produced on site by the use of a crusher, classifier, spirals and electrostatic and magnetic separators. Initially the company will treat old battery sands.

An environmental impact statement has been prepared for the entire proposal and will be on public exhibition for the period 18th April to 17th May 1985 at the following locations during their respective normal opening hours.

- Department of Mineral Resources,
24th Floor, 8-18 Bent Street,
Sydney; and 214 Beardy Street, Armidale.
- Department of Environment and Planning,
175 Liverpool Street, Sydney.
- N.S.W. Environment Centre,
399 Pitt Street, Sydney.
- N.S.W. Government Information Centre,
55 Hunter Street, Sydney.
- Tenterfield Shire Council,
Council Chambers, Tenterfield.
- G. Whitburn Pty. Ltd.,
Suite 54,
1st Floor, 51 Spring Street, Bondi Junction.
- Severn Shire Council,
Council Chambers,
Church Street, Glen Innes.

Copies of the Statement are available for sale at a cost of \$20 from: Department of Mineral Resources, 24th Floor, 8-18 Bent Street, Sydney 2000. Persons or organisations wishing to comment on the environmental impact of the proposed mining operation are invited to make written submissions before 20th May, 1985 to: The Secretary, Department of Mineral Resources, 8-18 Bent Street, Sydney, 2000.

182457

APPENDIX 3

CORRESPONDENCE BETWEEN DEPARTMENT OF MINERAL RESOURCES AND
KINGSWAY GROUP LIMITEDLETTER FROM DEPARTMENT OF MINERAL RESOURCES TO KINGSWAY GROUP
LIMITED DATED 18TH JUNE, 1985

Mr Terrence Morris
Kingsway Group Limited
4th Floor
196-8 A'Beckett Street
MELBOURNE VIC. 3000.

Our Ref: M84/2693

Dear Mr Morris,

ENVIRONMENTAL IMPACT ASSESSMENT
TORRINGTON TOPAZ PROJECT

As a result of the public display of your environmental impact statement from 18th April to 17th May, 1985, the Department has received 15 submissions from Government authorities and the general public, copies of which are enclosed.

In view of the concerns expressed by the National Parks and Wildlife Service and the National Parks Association of N.S.W., it is requested that you carry out the following comprehensive surveys by qualified persons over all areas to be disturbed or affected by the proposed operation:

1. Aboriginal sites
2. Flora
3. Fauna

Reports of these surveys should be made available to the above organisations, and to this Department as soon as possible in order that the environmental assessment of the proposal can be completed.

The Department would also like the Company's response to the following specific matters raised in submissions, although the Company is invited to respond to any of the matters raised:-

Soil Conservation Service

- * Construction of emergency earth spillways on the tailings and lower dams.
- * Species of grass and trees proposed for rehabilitation.

Department of Industrial Relations

- * Dust control measures proposed during drilling operations.
- * Location of power lines within the treatment plant site.
- * Proposed safety measures in the vicinity of sand stockpiles.
- * Plant operator noise levels achievable.

Water Resources Commission

- * Alternative sources of emergency water supply.

Crown Lands Office

- * Visual impact of treatment plant site.

National Parks and Wildlife Service

- * Long term integrity of the tailings dam.
- * Feasibility of using local native seed or seedlings for revegetation.

National Parks Association of N.S.W.

- * Consultation with National Parks and Wildlife Service.
- * Local species for revegetation.
- * Location of deposits A, B, C within or adjacent to the Binghi wilderness area.

Various Public Submissions Concerned with Fossicking

- * The Company's view of the possibility of allowing fossicking on deposits not being worked, subject to prior approval of the Company and landowner.

Your early attention to these matters would be appreciated.

Yours faithfully,

A. Menton
Development Officer
18th June 1985

enc.

c.c. Mr Boyd Pratt

LETTER FROM KINGSWAY GROUP LIMITED TO DEPARTMENT OF
MINERAL RESOURCES DATED 4TH JULY, 1985

4th July, 1985

Mr A. Menton
Development Officer
Department of Mineral Resources
GPO Box 5288
SYDNEY NSW 2001

Dear Mr Menton

Thank you for your letter which was received on the 25th June, 1985.

Arrangements have been made for a professional ecological survey to be undertaken during early July. This survey will specifically address the question of;

- a. Aboriginal Sites
- b. Flora
- c. Fauna

A copy of the report will be sent to you as soon as possible.

So far as the remaining submissions we would reply as follows:-

I. SOIL CONSERVATION

Rehabilitation together with the construction of emergency earth spillways on the tailings and lower dams will be carried out with the advice and guidance of the Soil Conservation Service as well as the Department of Mineral Resources.

Similarly the species of grass and trees proposed will be under the advice of the Soil Conservation Service as well as the Forestry Commission.

Indeed as you will possibly know the Managing Director and our Geologists previously met with the Forestry Commission Officer in Glen Innes and these points were discussed well before our Environmental Impact Statement was initiated.

2. DEPARTMENT OF INDUSTRIAL RELATIONS

We would naturally only see that all recommended practices are effected. So bearing in mind we will have a high regard for safety aspects such as keeping power cables well and truly clear of thoroughfares, placing underground in sealed conduit, it will all be taken into account.

Plant operator noises will be contained, as far as possible, below the noise control codes. Stock piles, the site, will all be adequately fenced, security fenced and manned 24 hours a day. It will be the regular function of the Mine Manager to survey and remove potential danger areas such as unstable stock pile slopes.

3. WATER RESOURCES COMMISSION

There is no alternative supply so it will of course be in the Company's interest to treat all aspects of the operations involving the use of water with utmost caution, care and thrift. Not that the operations place demands upon the supply in any event.

4. CROWN LANDS OFFICE

So far as the visual impact of the treatment plant site the area is at present pretty desolate in appearance. Old tailings, waste dumps, windrows of cleared trees. During our operations, the whole site area will be cleaned and landscaped. Indeed we have already had the windrows burnt and are involved at the present time in levelling.

Similarly, see Item 1, discussions were held regarding trees, screening with the Forestry Commission as well as the land owner, Mr G.N. Ross.

5. NATIONAL PARKS & WILDLIFE SERVICE

The advice and guidance will be accepted which stems from the flora and fauna survey which is at present being carried out.

The tailings dam is not seen as a problem as it will be in the interest of the owners to maintain it in good condition. In any event it must not be overlooked that there are no toxic substances, as well as the fact that the tailings will be used.

6. NATIONAL PARKS ASSOCIATION OF NSW

We feel that it can be seen from our relationship with the existing private land owner that we have demonstrated our sense of responsibility to rehabilitation. We are only too happy to liase closely with the National Parks Association, Forestry Commission, to select the right vegetation for the right areas. The flora and fauna survey will obviously aid in this respect and will be referred to in the years to come.

7. FOSSICKING

We have of course discussed this aspect and you are aware of our views. The most preferable way of dealing with this request we believe is for us to view applications to enter on to our property, on a 'good neighbour' basis.

We do not wish to prevent fossicking, on the other hand we have to be mindful that we would not wish to place ourselves as a public company in a situation where we could be liable. For example, damage to cattle,

fences or the individual fossicker who sustains any accidental injury.

Therefore we feel that the question of prior authority to fossick should be sought from the Mine Manager so that he will be aware who is on the property and where. In that manner fossicking will still be carried on and we at least will be able to be forewarned.

I look forward to hearing from you. In the meantime, I would mention that the flora and fauna survey team is currently at Torrington, so I expect the Report in about three weeks.

Kind regards

Yours sincerely

KINGSWAY GROUP LIMITED

TERENCE E. MORRIS

APPENDIX 4

OTHER CORRESPONDENCE

LETTER FROM SEVERN SHIRE COUNCIL TO DEPARTMENT OF
MINERAL RESOURCES DATED 16TH JULY, 1985

16th July, 1985

Department of Mineral Resources
G.P.O. Box 5288
SYDNEY NSW 2001

Attention: Mr A. Menton

Re: Proposed Torrington Silexite Mine

Dear Sir

I wish to advise you that Council at its June meeting approved of the Development Application for the Proposed Torrington Silexite Mine owned by G. Whitburn Pty Ltd.

The Council advertised the Environment Impact Statement under Section 84 of the Act and invited the public to examine the Environment Impact Statement. No objections or submissions were received up to the 20th May, 1985.

Please find enclosed a copy of the letter sent to Boyd Pratt and Associates advising them of Councils Approval of the Development Application.

If you require further information, please do not hesitate to contact the Shire Engineer at the Council Chambers on 322555.

Yours faithfully

Shire Clerk

16th July, 1985

Boyd Pratt and Associates
Consulting Geologists
8 Jane Street
RANDWICK NSW 2031

Dear Sir

Re: Proposed Mining Proposal - G. Whitburn Pty Ltd

I refer to your Development Application and the required Environmental Impact Statement lodged with Council on the 12th April, 1985.

The Environment Impact Statement has been examined and assessed and from the correspondence entered into with the various State Government Bodies, it would appear that these instrumentalities are quite happy with the anticipated impact on the environment and the intended mining area.

The Environment Impact Statement was advertised in the press for the prescribed period and copies of the document were exhibited at offices of the Department of Environment and Planning in Sydney and also at the Shire Office in Church Street, Glen Innes. No objections to this proposal were received during the Exhibition period.

Following the exhibition period in accordance with Section 84 of the Act, Council considered this matter at the June Meeting and the Development Application was approved subject to the following condition:-

- i) That Council negotiate with the principal for a contribution towards the maintenance of the Shire roads which are to be used as haul roads, due to the increased generation of heavy loads along these roads.

Yours faithfully

Shire Clerk

LETTER FROM NATIONAL PARKS AND WILDLIFE SERVICE
TO DEPARTMENT OF MINERAL RESOURCES DATED 23RD AUGUST, 1985

Mr. A. Menton,
Development Officer,
Department of Mineral Resources,
G.P.O. Box 5280,
SYDNEY. N.S.W. 2001

23 August, 1985

Dear Mr. Menton,

RE: ENVIRONMENTAL IMPACT STATEMENT
INDUSTRIAL TOPAZ - TORRINGTON

I have reviewed the Ecological Survey report undertaken by "Mount King Ecological Surveys" and I consider it to adequately cover the matters raised by the Service in its review of the original EIS.

The report on the Ecological Survey contains several points on which I would like to comment.

Acacia mcnutiana (refer to page 13 of the report)

This is a rare wattle in N.S.W. and has only been collected from Boonoo Boonoo National Park and the Torrington area. Without evidence to show that it is an abundant species in the Torrington area, special provision needs to be made for its preservation. Accordingly it is recommended that a condition of the lease should be that this species be replanted as part of the rehabilitation process in areas where it has been removed by mining.

Acacia betchii (refer to page 13 of the report)

This is an uncommon species and the Company should be made aware of the need to avoid unnecessary disturbance of this species in areas surrounding the mining operation.

The recommendation in the report (page 13) that access roads etc. avoid areas of open scrub is supported by the Service. In addition, the advice concerning regeneration of mine sites by stock piling topsoil and using seedlings from locally obtained seed, is considered to be sound. This is certainly the approach favoured by the Service.

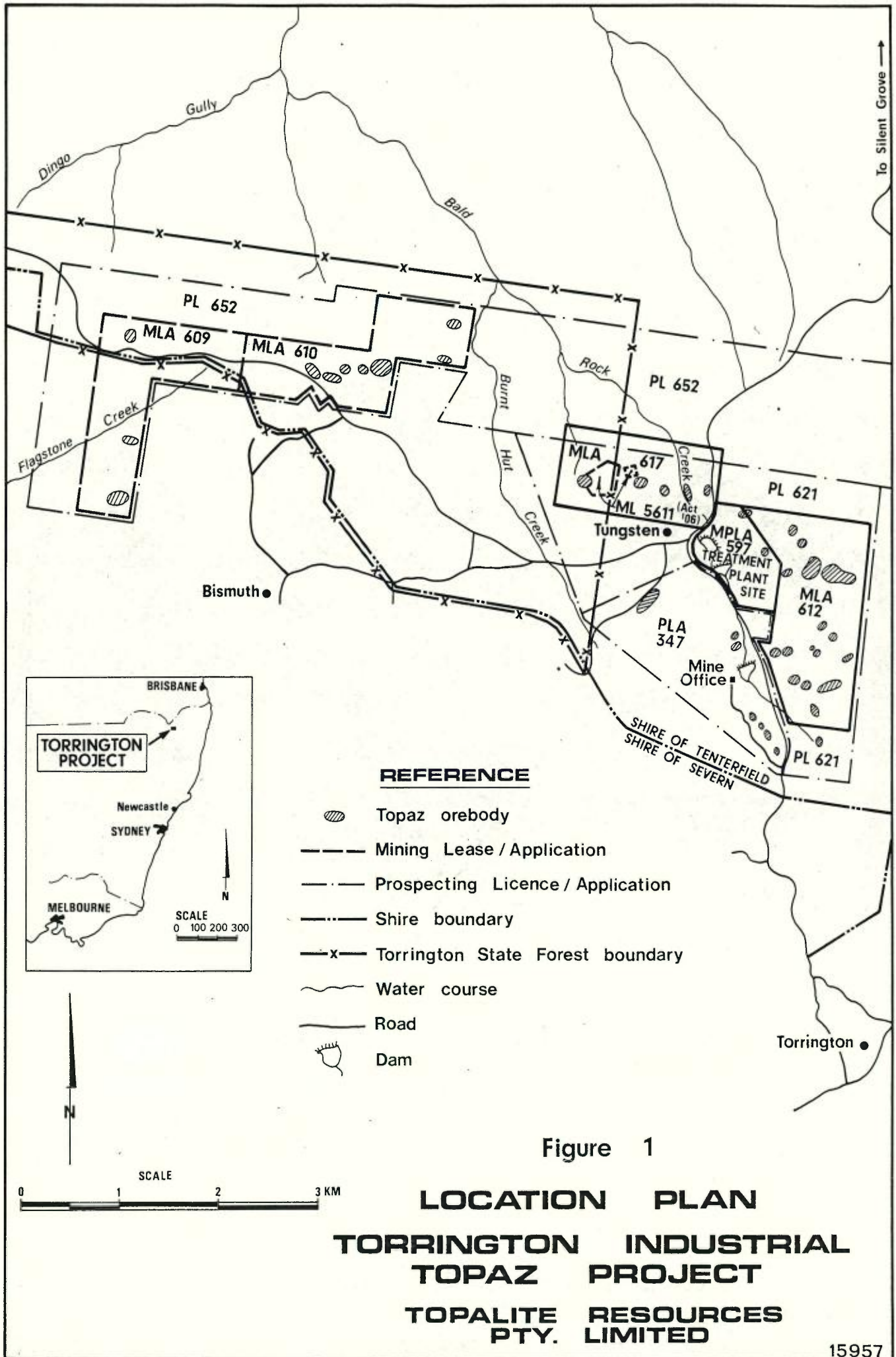
Another matter on which I can now comment is the Aboriginal Site Survey. The Service identified a need for such a survey in its review of the original EIS. The areas proposed for mining were inspected by a Service Officer and no sites were found. The Glen Innes Aboriginal Land Council, has also been consulted and their research concurs with our finding.

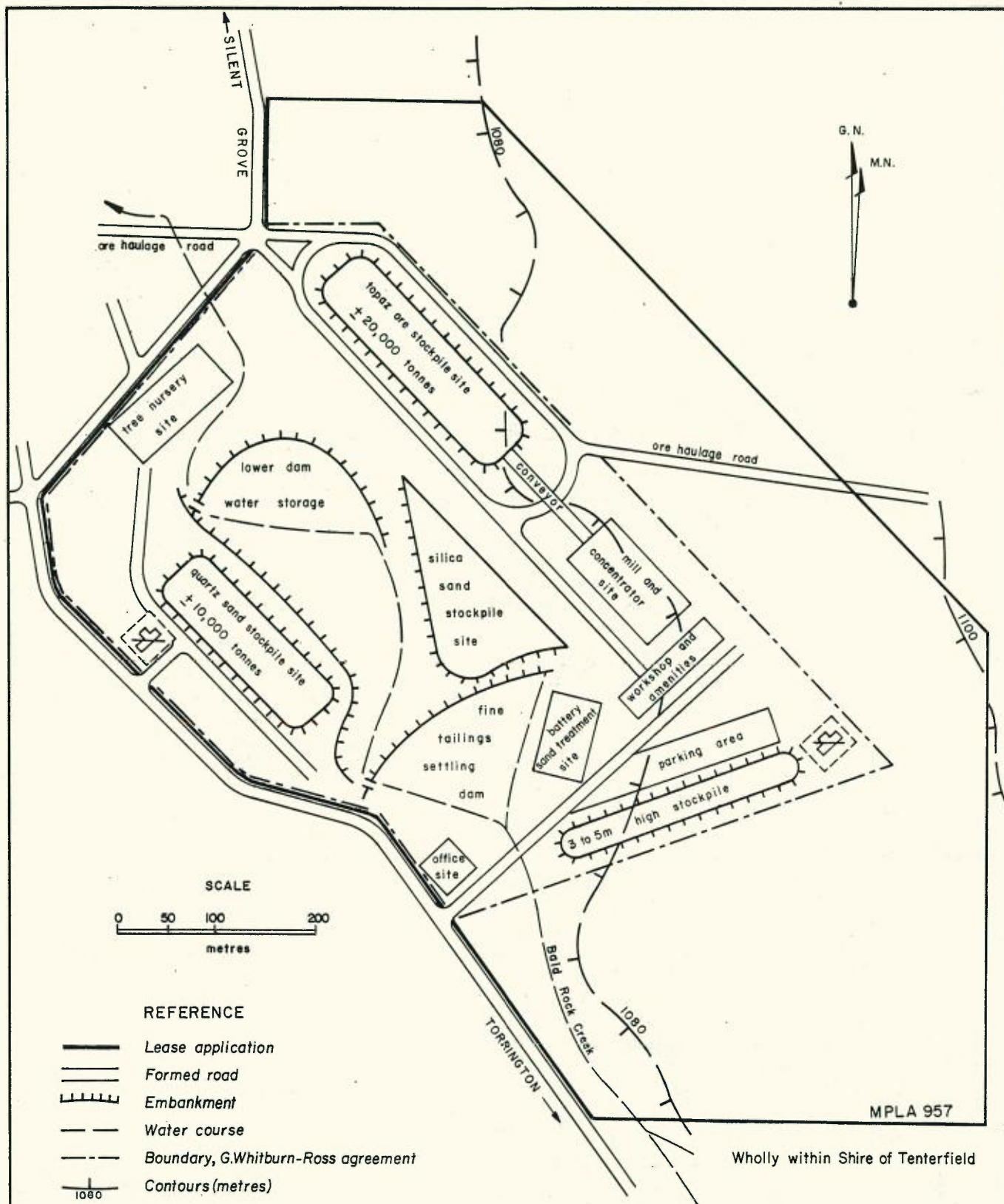
However, should any sites be discovered in the course of mining, then the Service must be contacted. It is illegal to destroy sites without the consent of the Director.

Subject to compliance with the matters discussed above, the Service raises no objections to the proposed mining operation. Thank you for supporting the Service in its request for more information. Should you have any further enquiries concerning the Service's input, please contact me.

Yours faithfully,

Greg Roberts,
Naturalist Armidale.





MPLA 957

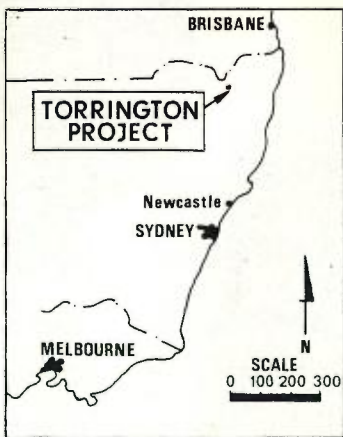
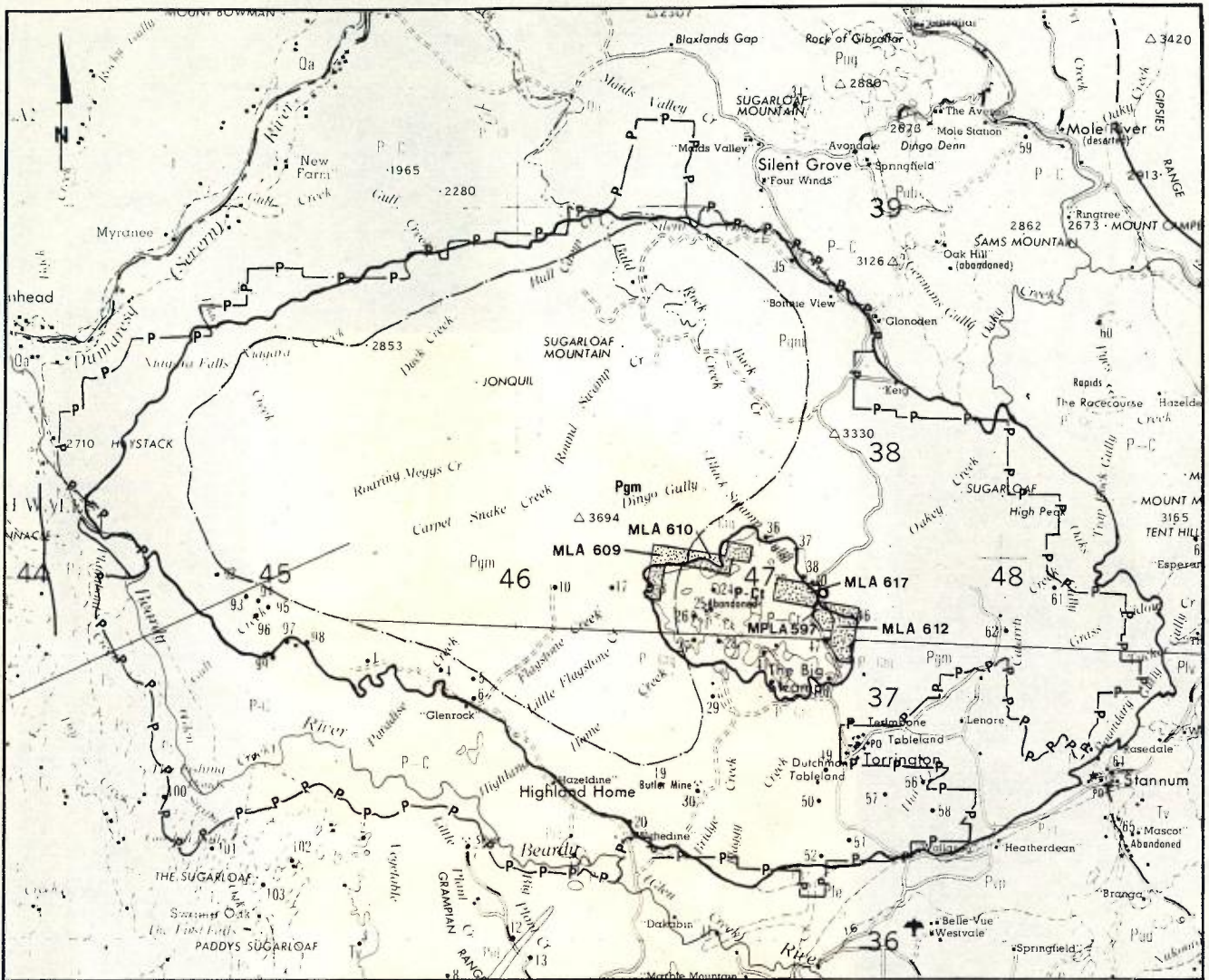
Wholly within Shire of Tenterfield

FIGURE 2






TREATMENT PLANT SITE

TORRINGTON INDUSTRIAL TOPAZ PROJECT

Topalite Resources Pty. Ltd.



REFERENCE

-  Mining Lease Application
-  Beardy River National Park Proposal (N.P.A.)
-  Binghi Wilderness Area (Helman)
-  Mole Granite
-  Torrington Pendant

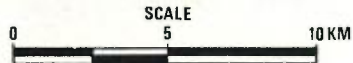


Figure 3

**RELATIONSHIP
TO
BEARDY RIVER NATIONAL PARK PROPOSAL
TORRINGTON INDUSTRIAL TOPAZ PROJECT
TOPALITE RESOURCES PTY. LTD.**

G WHITBURN PTY LTD

EIS

313

Mining and recovery of industrial
topaz at Torrington

