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Barnard River water supply project : environmental impact
statement : report on examination of submissions



THE ELECTRICITY COMMISSION OF NEW SOUTH WALES

**BARNARD RIVER
WATER SUPPLY PROJECT
ENVIRONMENTAL IMPACT STATEMENT**

**REPORT ON
EXAMINATION OF SUBMISSIONS**

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OCTOBER 1981

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CONTENTS

	<u>Page No.</u>
1. INTRODUCTION	1.
2. PUBLIC EXHIBITION	1.
3. COMMON MATTERS RAISED IN SUBMISSIONS	3.
3.1 Riparian Flows in Barnard River	3.
3.2 Effects of Increased Flows in Hunter River	4.
3.3 Access to Increased Hunter River Flow for Irrigation Purposes	6.
3.4 Development of Further Stages of Scheme	7.
4. INDIVIDUAL SUBMISSIONS - SUMMARY AND COMMENTS	8.
4.1 Department of Agriculture	8.
4.2 Hunter Conservation Trust	9.
4.3 Department of Main Roads	10.
4.4 Ian M. MacCallum, Bell's Brook	12.
4.5 H.W. Dick, University of Newcastle	12.
4.6 E.W. Caslick, Riverview	16.
4.7 Energy Authority of New South Wales	16.
4.8 Nundle Shire Council	16.
4.9 N.S. Mitchell, Trelawney	16.
4.10 Muswellbrook Shire Council	17.
4.11 Livestock and Grain Producers' Association of N.S.W. - Moonan Flat Branch	18.
4.12 Soil Conservation Service	18.
4.13 J.D. Bell, Belford Park	19.
4.14 D. Salkeld, Oratora	20.
4.15 Wingham Branch of the Dairy Farmers Association	21.
4.16 State Pollution Control Commission	21.
4.17 D.G. Day, Australian National University	22.
4.18 Forestry Commission of N.S.W.	24.
4.19 Upper Hunter Pastures Protection Board	24.
4.20 National Parks Association - Mid North Coast Branch	25.
4.21 Manning River Canoe Club	28.
4.22 R.T. & B.J. Mailer, Highlands	29.
4.23 Department of Public Works	30.
4.24 Tamworth City Council	30.



4.25	National Parks Association of N.S.W. - Tamworth Branch	31.
4.26	Gloucester Shire Council	34.
4.27	National Parks Association of N.S.W. - State Council	35.
4.28	Australian Democrats, Hunter Branch	38.
4.29	Great Lakes Shire Council	41.
4.30	Tuncurry Progress Association	45.
4.31	Taree and District Advancement Corporation	47.
4.32	State Rail Authority	48.
4.33	J.T. Fallding, 69 Cobran Road, Cheltenham	48.
4.34	Manning Valley Water Users' Association	48.
4.35	National Parks and Wildlife Service	52.
4.36	Water Resources Commission	58.
4.37	Department of Mineral Resources	60.
4.38	J.R. Carmichael and Sons, GIRO	60.
5.	CONCLUSIONS	60.

1. INTRODUCTION

An Environmental Impact Statement was prepared by the Electricity Commission for the proposed Barnard River Water Supply Project. The project is to be constructed to ensure reliability of water supply for power generation at Liddell and Bayswater Power Stations in the Hunter Valley and it involves the construction of an interbasin water supply scheme to divert water from the Barnard River to the Hunter Valley.

The purpose of this report is to summarise the submissions received following the public display of the Environmental Impact Statement and to comment on the various matters raised in the submissions.

The report will be available to Scone Shire Council, together with copies of the submissions, to assist in determination of the Development Application submitted by the Commission in connection with the project. Copies will also be sent to the Department of Environment and Planning and the Water Resources Commission.

2. PUBLIC EXHIBITION

The Environmental Impact Statement was placed on public display by the Electricity Commission of New South Wales over the period 20th July, 1981 to 28th August, 1981 at the following locations:

Scone Shire Council Library
214-216 Kelly Street
SCONE

Greater Taree City Council Library
Wynter Street
WINGHAM

Greater Taree City Council Library
2 Pulteney Street
TAREE

Gloucester Shire Council
Queen Street
GLOUCESTER

N.S.W. Government Information Centre
55 Hunter Street
SYDNEY

N.S.W. Environment Centre
399 Pitt Street
SYDNEY

Dept of Environment and Planning
Publications Desk, Ground Floor
Remington Centre, 175 Liverpool Street
SYDNEY

Dept of Environment and Planning
Newcastle Regional Office
Cnr King and Auckland Streets
NEWCASTLE

Electricity Commission of N.S.W.
T & G Tower
Cnr Park and Elizabeth Streets
SYDNEY

Notice of the display and details relating to the submission of comments were advertised in the following newspapers:

<u>Newspaper</u>	<u>Dates of Advertisements</u>
"Sydney Morning Herald"	20th & 29th July, 4th & 22nd August
"Newcastle Herald"	20th & 29th July, 4th & 22nd August
"Manning River Times"	19th & 26th July, 2nd & 16th August
"Gloucester Advocate"	21st & 28th July, 4th & 21st August
"Scone Advocate"	22nd & 29th July, 5th & 19th August
"Wingham Chronicle and Manning River Observer"	23rd & 30th July, 6th & 20th August

The closing date for receipt of submissions was 31st August, 1981.

The Electricity Commission also arranged for the public display of a model of the Scheme, with officers attending to answer questions at the following locations:

<u>Location</u>	<u>Date</u>	<u>Times</u>
Greater Taree City Library	27.7.81	11.00 a.m. to 8.00 p.m.
Wingham Library	28.7.81	11.00 a.m. to 7.00 p.m.
Gloucester Shire Council Chambers	29.7.81	11.00 a.m. to 7.00 p.m.
Scone Shire Council Library	30.7.81	1.00 p.m. to 8.00 p.m.

A total of 34 submissions were received by the closing date along with four received after 31st August, 1981.

3. COMMON MATTERS RAISED IN SUBMISSIONS

A number of matters were raised in several submissions and these are presented and discussed hereunder:

3.1 Riparian Flows in the Barnard River

Eleven submissions considered the riparian flow of 5 ML per day downstream of the pumping station to be too low. Details of suggested minimum licenced flows are as follows:

<u>Submission</u>	<u>Release (ML/day)</u>
4.25 National Parks Assoc. of N.S.W. - Tamworth Branch	12
4.27 National Parks Assoc. of N.S.W. - State Council	12
Appendix G Platypus Report (Dr T.R. Grant)	12
4.31 G.S. Allen	15
4.15 Wingham Branch of Dairy Farmers Assoc.	20
4.29 Great Lakes Shire Council	20
4.31 Manning Valley Water Users Assoc.	20
4.30 Tuncurry Progress Assoc.	22
4.20 National Parks Assoc. - Mid North Coast Branch	100

	<u>Submission</u>	<u>Release (ML/day)</u>
4.21	Manning River Canoe Club	150
4.1	Dept. of Agriculture	Not specified
4.25	Gloucester Shire Council	Not specified
4.38	J.K. Carmichael and Sons, Giro	Not specified
Appendix F	Fish and Aquatic Invertebrate's Report - New South Wales State Fisheries	Not specified

The values of 6.65 ML/day during summer and 3.8 ML/day during winter used in the Commission's study were determined on estimates of water requirements and transmission losses. This was considered to be an adequate basis for the purposes of the study.

However, the final assessment of riparian flows will be determined by the Water Resources Commission and stipulated as a condition of the Water Licence issued for the project under the provisions of the Water Act - 1912. It can be assumed that the licence conditions will protect the interests of all existing and future water users located downstream of the diversion works.

3.2 Effects of Increased Flows in Hunter River

Nine submissions dealt wholly or in part with the effects of increased flows in Oaky Creek and the Hunter River when the Scheme is operating.

As indicated in the E.I.S. it is planned to carry out river improvement works to control erosion and maintain existing river crossings. The Water Resources Commission was asked to recommend on works required and its report is included in the E.I.S. as Appendix I. Works will be carried out generally in accordance with the report's recommendations.

Matters raised in the submissions and not covered in the W.R.C. Report are as follows:

(a) Constructing Authority and Design Approval for Hunter River Works

It is proposed to have the river improvement works and crossings designed and constructed by the Water Resources Commission. Details of the works will be discussed with property owners when the detailed designs have been prepared.

(b) Responsibility for Maintenance and Replacement of Crossings

The maximum rate at which water will be diverted to the Hunter River is 260 ML/day, and the diversion will occur only during periods of low and medium flows in the river.

This will bring about raised water levels varying from about 0.1 to 0.4 metres at various locations along the river. There will be no effect on the incidence of high or flood flows which cause damage to crossings.

However, as a result of early representations by affected landowners, the Commission agreed to examine each case and accordingly arranged for a study by the W.R.C. In order to ensure that each landowner is not disadvantaged, the Commission undertakes to construct crossings to standards and designs recommended by the W.R.C. and the D.M.R. where the crossings are located on public roads. As previously stated the final design will be discussed with property owners prior to construction.

It is not normal practice for constructing authorities in N.S.W. to provide or improve river crossings downstream of water supply works and accordingly the Commission's undertaking to construct the crossings is considered to meet its obligations.

In respect to channel stability, which is the responsibility of the Hunter Conservation Trust, the Commission recognises that the diverted flows could accentuate to a minor degree, stability problems. Accordingly it has undertaken to arrange for improvements as recommended by the W.R.C., the constructing authority for Hunter Conservation Trust.

The major damaging factors on river channel stability are flood discharges and, as the operation of the Scheme will not affect these flows, it is considered that Commission's obligations are satisfied.

(c) Crossings Omitted or Improved Standard Sought

Claims in respect of omitted crossings and requests that the standard of crossings be upgraded will be referred to the W.R.C. for reassessment and will be the subject of discussions between the Electricity Commission and the landholder.

3.3 Access to Increased Hunter River Flow for Irrigation Purposes

Two submissions questioned the availability of diverted Barnard River water for irrigation. The Commission has no proposals to widen the scope of Stage 1 of the Scheme to provide supply for any purpose other than power generation supply. However the W.R.C. as part of its reappraisal of the Hunter Water Plan is examining the wider use of Barnard River water.

The operation of the Scheme will in no way reduce availability of water to users along the Hunter River.

Irrigation water use from Oaky Creek to Glenbawn Reservoir as determined from returns to the W.R.C. is as follows:

Number of licensed pumps - 28

Range of pump sizes - 3.0 to 42.0 L/sec.

Total capacity of all pumps - 404 L/sec.

Quantities of water pumped -

1976/77 97 ML

1977/78 123 ML

1978/79 112 ML

1979/80 155 ML

1980/81 460 ML

The quantities of water now being taken from the river are small in relation to the proposed diversion rate. If it is found that the quantities of diverted water which is taken for irrigation becomes excessive and detrimentally affects the objectives of the Scheme, the Commission will be compelled to oppose the granting of further licences and/or to seek the imposition of water allocations.

3.4 Development of Further Stages of Scheme

Eight submissions commented on the possible future development involving Stage 2, the construction of a major dam below the Stage 1 works. Three submissions commented on Stage 3, the pumped storage hydro-electric project.

It is reiterated that the Commission's present proposals are confined to the Stage 1 development. The potential of the Scheme for implementation of Stages 2 and 3 was included in the Environmental Impact Statement in the interest of completeness. As indicated in the Statement, any such future developments would be the subject of separate Environmental Impact Statements to be prepared if a decision is to be taken to proceed.

4. INDIVIDUAL SUBMISSIONS - SUMMARY AND COMMENTS

4.1 Department of Agriculture

Summary

The Department comments that Stage 1 of the project will not have a significant effect upon agricultural production. The Department supports the scheme but stresses that any later stages should be the subject of additional Impact Statements and should stand on their individual merits.

The submission also offers the following comments:

- (i) It recommends that rehabilitation of borrow pits located out of the reservoir areas should be carried out in conjunction with Department of Agriculture, Soil Conservation Service and Forestry Commission. All disturbed country should be carefully managed with regard to weed control, pests and soil erosion.
- (ii) The small improvement in water quality of the Hunter River above Glenbawn Dam attributable to the better water quality in the Barnard River at the diversion point is seen as a benefit of the project.
- (iii) It is assumed that satisfactory solutions will be negotiated with respect to river crossings in the Hunter River between Oaky Creek and Glenbawn Dam.
- (iv) Concern is expressed that the project would represent the start of a proliferation of such projects to supply water to the Hunter Valley.
- (v) It mentions that local landowners will likely oppose granting of a licence to the project unless an adequate minimum riparian release is guaranteed.

Comments

- (i) The works will be carried out in accordance with the recommendations of the Department of Agriculture.
- (ii) No comment required.
- (iii) The matter of crossings is covered in Section 3.
- (iv) The Stage 1 development of the Barnard River is planned to supply water to Bayswater and Liddell Power Stations only. The Commission has identified the potential for the possible future development of Stage 2 but there are no firm plans for such development to supply further water to the Hunter Valley region.
- (v) The question of riparian releases is dealt with in Section 3.

4.2 Hunter Conservation TrustSummary

The Trust states in its submission that it agrees generally with the project but requires further information on:

- (i) The method by which the water in Glenbawn Dam for use by the Electricity Commission is to be identified and accounted for so as not to prejudice the rights of irrigators.
- (ii) The responsibility to maintain stability of the channels of Oaky Creek and the Hunter River against the effects of the water transferred from the Barnard project.
- (iii) The reason that a rock-lined open channel has been chosen by the Commission to transfer the water along Oaky Creek Valley when the Water Resources Commission preferred a buried pipeline.

Comments

Comments on the matters raised by the Trust in its submission are:

- (i) The method of water accounting will be determined in consultation with the Water Resources Commission.
- (ii) This matter is the dealt with in Section 3.
- (iii) The report of the Water Resources Commission identified a number of alternatives for the work along Oaky Creek. The Electricity Commission has selected, on the basis of cost, the Water Resources Commission's alternative No. 5 (page 12, Appendix I). The proposed works, comprising a rock lined channel, drop structures and the provision of pipes where necessary, is considered to be an acceptable arrangement. The Electricity Commission will be responsible for the maintenance of these works.

4.3 Department of Main Roads

Summary

The Department submitted the following comments:

- (i) The Department has no objection to the project in principle subject to the necessary works on Main Road 105 being carried out at no cost to the Department and in accordance with plans acceptable to Scone Shire Council and approved by the Department.
- (ii) In the transporting of 30 tonne transformers formal assurance is required that loads in excess of Ordinance Loading (Ordinance 30 c) will not use the timber truss bridges on MR105.

- (iii) In respect of the recommendation of the Water Resources Commission (Alternative 4) involving construction of buried pipeline to take all Barnard River flows down to the Hunter River and leaving Oaky Creek in its natural state, the typical cross sections shown in Figure 11 of E.I.S. Volume 1 do not provide sufficient cover for road pavement and road service.
- (iv) It is essential that the transmission line easements and the pipeline corridor do not include Main Road 105 reserve.
- (v) As the rock to be used in the rock lining and bedding of section of Oaky Creek is proposed to be obtained from excavation work required to widen Main Road 105, the excavation should be charged, at least in part, against the Barnard River Water Supply Project. Work required on Main Road 105 resulting from the project should be at no cost to the Department.
- (vi) It is assumed that locations and standard of intersections to the Barnard River site and construction camps will be negotiated with Scone Council's Engineer.

Comments

- (i) The necessary works on MR105 will be carried out at no cost to the Department and in accordance with the plans of the Scone Shire Council and approved by the Department.
- (ii) Loads in excess of Ordinance Loading (Ordinance 30(c)) will not use the timber truss bridges on MR105. Temporary bypasses will be constructed if required for special heavy loads.
- (iii) The Departments requirements for minimum cover to buried pipes in road reserves and for road pavements will be adhered to.

- (iv) The transmission line easements and the pipeline corridor will not encroach upon MR105 reserve.
- (v) The necessary works on MR105 will be carried out at no cost to the Department.
- (vi) The details and locations of all intersections on MR105 will be subject to negotiations with Scone Shire and prescribed standards.

4.4 Ian M. MacCallum, "Bell's Brook", Moonan Flat via Scone

Summary

The submission states that there is no mention in the Environmental Impact Statement of improving present direct vehicular access across Hunter River to Mr. MacCallum's pump site and property. He asked that the matter be looked into.

Comments

This matter is dealt with in Section 3.

4.5 Dr. H.W. Dick, Department of Economics, University of Newcastle

Summary

Dr. Dick in his submission questioned a number of aspects of the E.I.S. and also made a number of comments as follows:

- (i) Why is the Barnard Scheme planned for operation in 1984, when Bayswater Power Station commences operation in 1985/86?
- (ii) Glennies Creek Dam should have been accelerated in 1979/80.
- (iii) Other dams proposed by the Water Resources Commission in the Hunter Water Plan should have been accelerated in lieu of the Barnard Scheme.

- (iv) Commissioning of Bayswater Power Station will be delayed for industrial and other reasons so there will be no need to have the augmented water supply in 1985/86.
- (v) The growth in the demand for electricity should be slowed down by cancelling the third smelter and discouraging the use of electricity. In this way, it would not be necessary to accelerate the construction of Bayswater Power Station and to construct the Barnard Water Supply Scheme.
- (vi) The E.I.S. does not give the cost of the Barnard project.
- (vii) The economics of constructing the Barnard Scheme has not been compared with the economics of the Water Resources Commission's proposals.
- (viii) It may be preferable to proceed immediately with the construction of Stage 2 Barnard Scheme rather than constructing the Stage 1 river works which will be abandoned for the later stages.
- (ix) The Commission bolsters its case for the Stage 1 project by raising Stages 2 and 3.
- (x) The Electricity Commission has been remiss by failing to ensure sufficient water for its power station construction programme.
- (xi) Claims that the Electricity Commission has failed to co-ordinate and liaise effectively with the Water Resources Commission.
- (xii) Questions the objectivity of having comments on the E.I.S. submitted to the Electricity Commission rather than the Dept. of Environment and Planning.

Comments

- (i) The need for the Barnard Water Supply Scheme is clearly set out in the E.I.S. In particular Table 1, Volume 1, of the E.I.S. sets out the projected water requirements year by year. It must be emphasised that the reliability of a new water supply scheme is low during initial years of operation and the Barnard project will provide the degree of reliability required for the Commission's purposes.

- (ii) The construction of Glennies Creek Dam was accelerated during 1980 in an attempt to match the Electricity Commission's accelerated programme. It is not practicable to complete the construction of this dam at a date earlier than that now planned.

- (iii) Progress on investigations and designs for other Water Resources Commission projects was such that it was not possible to accelerate the development of one or other of these schemes to meet the Electricity Commission's programme.

- (iv) There is no justification at this time to assume that the construction of Bayswater Power Station will be delayed and there is certainly no justification for making a decision which would place the effective operation of the station at risk.

- (v) Undertakings have been given for the supply of electricity to the proposed aluminium smelters and the Commission is obligated to meet its contractual commitments. The question of restriction of supply to general State consumers is not one for the Electricity Commission which is obligated to meet demands in accordance with the Electricity Commission Act, 1950.

- (vi) In the absence of an alternative viable scheme, the cost of the project is not a consideration in scheme selection. As indicated in the E.I.S., the economic penalties incurred by failing to maintain electricity supply would greatly exceed the cost of the project.
- (vii) See (vi) above.
- (viii) It is not practical to construct Stage 2 in the time required.
- (ix) The details of the second and third stages were included in the Impact Statement for the sake of completeness and to give early notice of the Scheme's potential for expansion. If the Commission had not presented details of the latter stages, it could be accused of piecemeal development.
- (x) The Barnard Project has been developed in order to meet the water requirements of the accelerated power station construction programme and accordingly the Commission has acted in a responsible and proper manner to ensure that operation of the new power station will not be restricted because of inadequate water supply.
- (xi) Planning of the water supplies to Bayswater Power Station has been the subject of continuing liaison and negotiation between the Electricity Commission and the Water Resources Commission since the initiation of investigations for a second power station in the Upper Hunter.
- (xii) The Consent Authority for the Barnard project is the Scone Shire Council and copies of the submission received along with the Commission's review will be given to Council to assist it in making its determination. It is considered to be proper and correct for the comments received to be examined by the technical organisation responsible for developing the project.

Copies of the submissions and the review will also be given to the Department of Environment and Planning. The procedures being followed were approved by the Department prior to the issue of the Environmental Impact Statement.

4.6 E.W. Caslick, "Riverview", Moonan Flat via Scone

Summary

Mr. Caslick seeks upgrading of his proposed river crossing to a culvert structure.

Comments

This matter is dealt with in Section 3.

4.7 Energy Authority of New South Wales

Summary

The Authority's submission advises that it has no comments on the Environmental Impact Statement.

4.8 Nundle Shire Council

Summary

Council advises that it has decided that no submission would be furnished.

4.9 N.S. Mitchell, "Trelawney", Moonan Flat via Scone

Summary

The submission states that Mr. Mitchell was led to believe that the crossing adjacent to his property would be kept in negotiable order and seeks confirmation in this regard.

Comments

This matter is dealt with in Section 3.

4.10 Muswellbrook Shire CouncilSummary

Council advises that it will offer no objection to the proposal subject to the following points which had been previously raised in regard to the transmission line.

- (i) A satisfactory report from the Soil Conservation Service of N.S.W. regarding the soil erosion along the proposed route.
- (ii) Small land holdings to be avoided along the proposed route wherever possible.
- (iii) Adequate reasons to be provided as to why timber poles should be used instead of concrete transmission poles or steel poles as required by Council policy.

Comments

- (i) & (ii) The two requirements of the Council in respect of the transmission line will be met by the Electricity Commission complying with the requirements of the Soil Conservation Service and by so locating the route of the line to avoid small landholdings wherever practicable.
- (iii) For a transmission line of the size proposed for the Barnard River Water Supply Project the use of concrete poles is not practicable. Concrete poles of the size required are at present being field and service tested but no clear long term results have been obtained. Further, the country generally traversed by the proposed line is not conducive to their use because of transport difficulties - the concrete poles being heavier and more susceptible to damage than wood poles. Under these circumstances it is not proposed that concrete poles be used in this transmission line although, depending on field trials, they may be used in future lines.

4.11 The Livestock and Grain Producers' Association of New South Wales - Moonan Flat Branch

Summary

The submission presents the resolutions passed at a recent meeting, specifically in regard to the increased flows in the Hunter River.

It stated that the landowners were generally pleased with the recommendations for the crossings except for Caslick's Crossing A.RL.377.2 km 25234 which the meeting felt should be upgraded to the same standard as C. Swamps 25382 Hunter River A.RL.371.5 km.

The following matters were also raised:

- (i) Who would be the constructing authority for the crossings, both public and private?
- (ii) Who would pay for the maintenance and upkeep of these crossings?
- (iii) Who would bear the cost of replacement of crossings if completely destroyed by a major flood?
- (iv) Clarification of the position of irrigators from Hunters Vale to Belltrees with regard to the respective allocations.

Comments

The matters are covered in Section 3.

4.12 Soil Conservation Service

Summary

The submission from the Service advised of the necessity for construction work required for the project to be undertaken in such a manner that erosion and sedimentation is minimised in the following areas:

- . Catchment works
- . Road easements
- . Transmission line easements
- . Construction areas and borrow sites

The Commission should consult with the Soil Conservation Service prior to the finalisation of construction plans to enable the specification of appropriate erosion and sediment control measures.

Comments

The Electricity Commission will consult with the Soil Conservation Service before and during construction.

4.13 J.D. Bell, Belford Park, Scone

Summary

The submission indicates there are no real objections to the proposal with the exception of the following reservations:

- (i) Right of property owners to review detailed plans for crossings.
- (ii) Maintenance of crossings which is considered to be a Commission responsibility.
- (iii) The need for a meeting between interested parties to provide a clear understanding in regard to irrigation from the Hunter River.
- (iv) The need for an agreement to cover rights of the landowner when the works are being carried out.

Comments

- (i) to (iii) The matters are covered in Section 3.

- (iv) Agreement in respect of works on private property will be negotiated with landowners prior to commencement of construction.

4.14 David Salkeld, "Oratora", Scone

Summary

Commends the Statement generally but comments upon the following points.

- (1) Water users along the Hunter River between Oaky Creek and Glenbawn Dam in respect of:
- (a) Commission policy on pumping for irrigation purposes in periods of low natural flows when it could be argued that without the addition of water from the Barnard project, irrigation would not be possible.
 - (b) Would the maximum pumping capacity of current irrigation licence holders have a significant effect on the 260 ML/day to be pumped from the Barnard River?
 - (c) What increase in volume pumped by landowners would be acceptable to the Electricity Commission?
 - (d) Will the Electricity Commission oppose the granting of new irrigation licences?
 - (e) Would the Electricity Commission sell water to irrigators wishing to increase their pumping capacity from the river during period when water from the Barnard River is not required for power station reservoirs?
- (2) Private and public crossings on the Hunter River in respect of:
- (a) Clarification of the standard of construction of concrete crossings with all crossings built to the highest Department of Main Roads standards and designed to resist scouring of the river beds and banks as much as possible.

- (b) Clarification of the responsibility for maintenance of the crossings in which it is submitted that the Electricity Commission should undertake to recompense landowners for cost involved in repairing structural damage caused by river flows.

Comments

The matters raised in this submission are covered in Section 3.

4.15 Wingham Branch of the Dairy Farmers Association

Summary

The submission states that the Association does not oppose the project. The Branch is concerned about the Commission's proposal that riparian rights should be set in the licence as 5 ML/day. This figure is totally unacceptable to the Association who indicate they will oppose the application for a licence unless the riparian rights are lifted to 20 ML/day. A number of tables and graphs are enclosed in support of the submission.

Comments

The matters raised are carried in Section 3.

4.16 State Pollution Control Commission

Summary

The State Pollution Control Commission raises a number of matters including future development, hydrology, siltation disposal of cleared vegetation and noise. It concludes:

"The State Pollution Control Commission is satisfied, having regard to the conditions it can impose on the proponent pursuant to the legislation it administers, that the emission of air pollutant, the discharge of pollutant to waters and the emission of noise will not be such as to warrant a decision not to proceed with Stage 1 of the proposed Barnard River Water Supply Scheme".

4.17 Dr. D.G. Day, Research Fellow, The Australian National University Canberra

Summary

Dr. Day in her submission questions a number of aspects of the E.I.S. as follows:

- (i) The Barnard Project is a hastily devised scheme and it would be preferable to raise Glenbawn Dam to provide the additional quantities of water.
- (ii) There is a paucity of stream flow and water quality data for the Barnard River, Orham Creek and Oaky Creek, which means that there will be no basis for comparison of future conditions.
- (iii) There is a lack of data on suspended solids and sediment yields which is required to reach conclusions on water quality changes.
- (iv) Broad studies of the hydrologic and geomorphologic environments have not been undertaken and these are required to estimate erosion patterns in tributaries.
- (v) The diversions will cause changes in the Barnard River channel geometry, possibly reducing the channel size.
- (vi) Reduced discharges in the Barnard River will change the water quality in the river.
- (vii) The sediment regime in the Barnard will be changed downstream of the works.
- (viii) The diversions will modify Oaky Creek by:
 - (a) Accelerating erosion.
 - (b) Creating instabilities at the upstream and downstream ends of improvement works.

- (c) Enlarging the channel.
 - (d) Causing bank instability.
 - (e) Changing the characteristics of bed materials.
 - (f) Increasing the turbidity of the water.
 - (g) Changing bank vegetation.
 - (h) Causing sedimentation of the Oaky Creek regulating storage.
 - (i) Changing the sedimentation regimes at tributary junctions.
- (ix) The channel morphology downstream of the regulating dam will be modified but to a lesser degree.

Comment

- (i) The Barnard project has been devised to meet the revised electricity needs of the State. As stated in the E.I.S., it is not practicable to provide the secure water supply in the time required by raising Glenbawn Dam.
- (ii) The stream flow and water quality data available for designing the project is of a similar standard to that which is commonly available for planning water supply projects. The lack of measurements for comparison of future conditions is of little significance. If required, the data can still be obtained during periods of no pumping.
- (iii) The diversion rates and the storages proposed are small in relation to stream flows in the Barnard and no significant changes are expected. The sedimentation basin provided by the reservoir in Orham Creek will prevent the transfer of all but the finest sediment to the Hunter River system.
- (iv) The E.I.S. presents the results of a complete and thorough hydrologic study. The works will be designed and constructed in a way to minimise erosion and geomorphologic change and accordingly, a detailed study of this specialist area is not considered warranted.

- (v) Channel sizes are largely determined by flood discharges and as these will not be affected by the proposed diversions, it is expected that there will be negligible changes to the channel geometry of the Barnard downstream the works.
- (vi) The project will cause negligible changes to water quality. This is demonstrated by the minimal variations of water qualities at location in the Manning River system with change in flow rates. Refer Figures H2 to H6 of Appendix H of the E.I.S.
- (vii) During low flow period, it has been observed that there is negligible bed or suspended sediment movement in the Barnard River. During flood periods it is expected that the sediment in the river will either pass over the weir or through the sluice which will be incorporated in the weir for this purpose.
- (viii) In accordance with standard engineering practices, the channel improvement works in Oaky Creek will be designed to minimise the potential effects raised by Dr. Day.
- (ix) Refer (viii) above.

4.18 Forestry Commission of N.S.W.

Summary

The Forestry Commission states it does not wish to make a submission on the project as it does not affect any State forest or timbered leasehold.

4.19 Upper Hunter Pastures Protection Board

Summary

The submission of the Board is confined to the lodging of a protest in principle to the proposal until detailed information

is available to the Board concerning relocation of roads in relation to access to Hunters Vale Reserve (TS & CR 12348, Parish Wandewoi) for the passage of travelling stock.

Comments

The proposed works will not affect access to the Reserve.

4.20 National Parks Association, Mid North Coast Branch

Summary

The submission outlines the following specific objections to the project:

- (i) The Environmental Impact Statement fails to state the true importance of the Barnard River to the Manning River Basin.
- (ii) It fails to indicate alternative schemes for reduction to power station water requirements.
- (iii) One of the alternative schemes presented in the Environmental Impact Statement may be preferable to the Barnard Scheme.
- (iv) The project will have a critical effect on the flow of the Barnard River below the weir during very dry periods.
- (v) A large number of platypii and tortoises may be killed and fish, amphibians, reptiles and birds will also be affected.

The submission also contains the following recommendations:

- (a) Abandonment of the project and investigation of the area with a view to forming a large National Park.

- (b) If it is decided to proceed, the project should be postponed until a revised Environmental Impact Statement has been prepared to include a number of specified items which are included in the submission summary.
- (c) If it is decided to proceed with the project as soon as possible, it should be subject to a number of conditions including a minimum riparian flow of 100 ML/day.

Comments

Objections

- (i) The Environmental Impact Statement presents graphs of monthly to daily flows at various locations and clearly identifies the contribution of the Barnard River to stream flows in the Manning River System. These clearly demonstrate the relationship between the Barnard and Manning Rivers.
- (ii) There are no economic methods of reducing power station water requirements.
- (iii) Of the eight alternatives discussed in the Environmental Impact Statement the Barnard River Water Supply Scheme is the only one capable of meeting requirements.
- (iv) & (v) Riparian flow requirements fixed by the Water Licence will ensure that there are no changes to the extreme flow regime in the river downstream of the pumping station and will be adequate for the aquatic life. The National Parks and Wildlife Service raised no objection to the project on nature conservation grounds.

Recommendations

- (a) The suggestion of a National Park is not a recommendation of the National Parks and Wildlife Service and would clearly be a matter of negotiations between landowners and National Park proponents.

(b) This is covered in comments on items raised in the list of objections.

(c) The question of riparian flows is covered in Section 3.

4.21 The Manning River Canoe ClubSummary

The submission expresses concern about the following features of the project:

- (i) The installation of a pipeline and pumping station with far greater capacity than that required by the present Scheme tends to pre-empt construction of the later stages.
- (ii) The reduction in number of canoeing days available in Lower Barnard River.
- (iii) It nominates a daily riparian release of 150 ML/day instead of the 5 ML/day suggested in the Environmental Impact Statement to minimise the effect upon flora and fauna downstream of the weir.
- (iv) The Environmental Impact Statement has not accepted some recommendations of the Platypus Report (Appendix G) and riparian flow suggested in the Fish & Invertebrate Report (Appendix F) should be considered before the project decision is made.
- (v) A separate report on the unnamed species of tortoise should be produced.
- (vi) It is believed the effect of the weir will be significant to at least the junction of the Nowendoc River and appraisal by the Commission of the extent of the effect would be welcomed.

Comments

The following comments are made in respect of the submission by the Canoe Club.

- (i) The adopted pumping station size is necessary to divert the required quantities of water with the proposed "run-of-river" scheme.
- (ii) The reduction in canoeing days on the Barnard is acknowledged as one of the consequences of the scheme. It has been accepted having regard for the availability of other streams suitable for canoeing in the near vicinity.
- (iii) & (iv) This matter is covered in Section 3.
- (v) The study undertaken by Professor R.C. Jones (Appendix C) states that the Stage 1 development should not significantly affect the survival of this species of tortoise. However, in accordance with his recommendation, further studies will be undertaken if it is decided to proceed with Stage 2 of the project.
- (vi) As detailed in the Impact Statement, the studies undertaken by the Commission indicate that the proposed diversions will have only a minor effect on the flows below the junction of the Barnard and Little Manning Rivers.

4.22 R.T. & B.J. Mailer, "Highlands", Moonan Flat

Summary

The submissions presents an objection to the proposed recommendation in the report by the Water Resources Commission (Appendix I) for the crossing of the Hunter River at Colonel Swamps - A.RL.371.5 km. It is submitted:

- (i) That the structure envisaged in the Environmental Impact Statement will be destroyed in times of flooding.
- (ii) That the construction of a low level bridge at this stage would prove more economical in the long term.

- (iii) That the responsibility for repair and replacement should be borne by the Electricity Commission.

Comments

The question of crossings is covered in Section 3.

4.23 Department of Public Works

Summary

The comments in this submission are confined to the landscaping component of the Environmental Impact Statement and suggest that landscaping will be undertaken only as a cosmetic measure and where necessary. It further suggests the landscaping input could have been expanded.

Comments

It is considered that the landscaping component of the Scheme is appropriate to the rural nature of the area and in keeping with the existing environment. All areas affected by the works will be restored in accordance with the recommendations of the Soil Conservation Service.

4.24 Tamworth City Council

Summary

The submission from Council advises that it can make no adverse comment on the proposal in respect of Stage 1 as this would leave provision for other water from the Barnard to be diverted westerly to feed into Chaffey Dam which was the basis of Council's investigations into a water augmentation scheme for the City of Tamworth. Council however, strongly emphasises its concern at the possibility of Stage 2 of the project proceeding and its effect upon the possible availability of water for Council use.

Comments

The submission from Council offered no adverse comment in respect of Stage 1 of the proposal. Council's concern regarding Stage 2 is covered in Section 3.

4.25 National Parks Association of N.S.W., Tamworth BranchSummary

The submission expresses concern at apparent lack of complete planning of project and stated that until July, 1981 information in the press suggested that the main dam would be built within three years and it was not until the release of the Environmental Impact Statement that the Association heard of the smaller scheme. The Association has no objection to the Stage 1 of the Scheme except for a moral dilemma concerning the taking of water from one catchment to another. Concern is also expressed in regard to the following:

- (i) No diagrams for construction roads and no locations of the borrow areas shown.
- (ii) Stream flow statistics at the weir have only been collected for one year and no figures exist for Orham Creek.
- (iii) Diagrams are difficult to understand.
- (iv) Incomplete information was given to environmental consultants and the length of time spent in the field by the consultants appears to be inadequate.
- (v) Lack of details of operation of the Scheme, WRC conditions on pumping, and discharge to be maintained from the Barnard weir.

Submission also makes the following recommendation:

- (a) Implementation of environmental safeguards on the contractor during construction - pits and construction roads to be located away from sensitive areas - flora and fauna to be protected from hunting, illegal fishing and plant collecting.
- (b) Further research to be undertaken to study the effect of Stage 1 on the flora and fauna of the area.
- (c) Maintenance of a 12 ML/day discharge from the Barnard weir.
- (d) Investigation to be undertaken to assess the effect of the upper storage (Stage 3) at Bralga Tops on the serpentine vegetation of the western escarpment.

Comments

In regard to the matters raised in the submission of the Association, the following comments are made:

- (i) The locations of construction roads and borrow areas are yet to be determined. This will be done during the design stage for developing the project. As stated in the Environmental Impact Statement, borrow areas will be located, wherever possible, within the storage areas and below flood levels.
- (ii) Very few water supply projects are developed from long term recorded stream flows at the diversion or dam site. The stream gauge station on the Barnard River immediately below the works was installed in late November, 1979. The only other records available for the Barnard River are at Barry, upstream of the works, since 1949 and at Mackay, immediately above the junction of the Manning, since 1962. The simulation of stream flow records for the project has included all available data.

(iii) In the presentation of the flow duration curves (Figures 15-21), the scale was selected to give an overall appreciation of the flows in the river from the project area down to Killawarra. The range of flows required the adoption of a small scale for the curves in the lower part of the river system to be meaningful. However, to assist in the dissemination of this information, Table 8 was included giving appropriate flow values for various durations.

(iv) The consultants were given the most accurate information available at the time of their engagement but as so often happens, changes were made during the development of a project as the investigations progressed. The time spent by the consultants in the field was appropriate to the study and they were afforded every opportunity to visit the site.

(v) The Impact Statement details the basis under which the Scheme would be operated to transfer water from the Manning to the Hunter River (see E.I.S. page 33). The conditions to be imposed by the Water Resources Commission through the Water Licence, including riparian release requirements, have yet to be determined.

The following comments are made relating to the submission recommendations.

- (a) Care will be taken in the planning and construction of the works to safeguard sensitive areas and due regard given to the various consultants recommendations.
- (b) As indicated in the Impact Statement, further surveys recommended by the N.S.W. State Fisheries and Dr. T.R. Grant, are to be undertaken.
- (c) The recommendation relating to riparian flows are covered in Section 3.

- (d) These studies would be undertaken if it is decided to proceed with the proposed Stage 3 development.

4.26 Gloucester Shire Council

Summary

The following comments are made by Council in its submission:

- (i) Riparian flow - the suggested flow to be maintained downstream of the weir should be considerably higher than the suggested 5 ML/day. Advice will be sought on this for submission to the licencing hearings when they are held.
- (ii) Pumping discharge rate - no discussion is made on the effects of increasing the pumping rate at the weir site. Council considers that it would be advantageous to increase the pumping rate of 260 ML/day. This would reduce the number of days that minimum flow would be experienced in the Barnard.
- (iii) Growth of flora at low water level - with the extended periods of low flow in the Barnard River, tree and shrub growth will be promoted in the centre of the existing stream. This will reduce the waterway area and will affect the behaviour of the stream during floods. It could result in erosion of the banks during floods.

The Council comments that it will not object to the proposal apart from seeking an increased riparian flow.

Comments

In respect of Council's submission, the following comments are made.

- (i) The question of the level of riparian releases is covered in Section 3.

- (ii) The selected pumping rate of 260 ML/day was adopted for engineering and economic reasons after consideration of a range of values. Increased pumping rates would incur significant cost increases particularly for the pipeline. Increased costs cannot be justified by the small reduction in the number of days of pumping. Increased pumping rates would bring about greater flows in the Hunter thereby increasing the likelihood of erosion and making river crossings more difficult.
- (iii) The increase in periods of low flow in the Barnard River will have little effect on the state of the river downstream of the works. Growth of vegetation in river channels is largely controlled by flood flows and these will not be affected by the proposed works.

4.27 National Parks Association of N.S.W., State Council

Summary

In the general comments contained in the submission, the Association advises the practice of diverting water from one river catchment to another as is proposed, is not supported by the Association. However, if it can be established that the proposed transfer as described for Stage 1 is both necessary and environmentally acceptable, the Association would accept the proposal on the basis that the need for the proposed Kerrabee Dam on the Goulburn River might thereby be obviated.

Specific comments contained in the submission are:

- (i) In respect of the mammal fauna, the Association urges that steps be taken to prevent any hunting activity during the construction stage and that the main faunal habitat be left undisturbed as far as possible.
- (ii) The Association supports the stated intention in the Environmental Impact Statement to protect a low woodland of rare and unclassified mallee species present in the area.

- (iii) The Association comments on the lack of sufficient detail in the low flow area of the flow-duration curves (Figures 15-23) and the failure of the text to correct this inadequacy.
- (iv) The Environmental Impact Statement does not make a direct comparison over time of flows and water storage availability in the Hunter River as compared to the Barnard River.
- (v) The Association urges that a flow of 12 ML/day below the proposed dam be required as a condition of approval for the development.
- (vi) The Association raises the possibility of implied approval for the eventual construction of Stages 2 and 3. In this event, the Environmental Impact Statement must be expanded to cover more fully the effects of such construction.

Comments

In respect of the general comment regarding interbasin transfer, it is considered that the Environmental Impact Statement justifies the need for the diversion and that the project works and operation of the Scheme can be achieved without significant detrimental effects to the environment. There would appear to be no other grounds for objection.

With regard to the specific comments raised by the Association, the following comments are made.

- (i) As stated in the Impact Statement, the works area will be closed to the public and the works will be carried out in such a manner as to minimise the effect on the existing habitat.
- (ii) No comment required.

- (iii) In the presentation of the flow duration curves (Figures 15-21), the scale was selected to give an overall appreciation of the flows in the river from the project area down to Killawarra. The range in flows required the adoption of a small scale for the curves in the lower part of the river system to be meaningful. It was recognised that this presentation lost detail of the low flows and accordingly Table 8 was included in the main section of the report giving the appropriate flow and duration figures so that interested persons could replot the data to whatever scale required. The text draws attention to the changed low flow regime.
- (iv) As stated in the E.I.S., for the purposes of assessing the maximum possible effects of the proposed Scheme, it was assumed that the maximum quantity of 20 000 ML/year is diverted to the Hunter River in each year of the simulation. The contribution from the Hunter has been neglected. The assumption therefore demonstrates the worst possible effects of the first stage development on river flows in the Manning Valley and this is considered to be the appropriate assumption for environmental impact assessment.
- (v) The question of riparian flows is covered in Section 3.
- (vi) As indicated in the Impact Statement, the document covers the Stage 1 development only. Any future development i.e., Stages 2 and 3, will be the subject of separate Impact Statements. While Stage 1 works has been engineered with due regard for the possible future development, its approval in no way pre-empts such future development.

4.28 Hunter Branch, Australian DemocratsSummary

- (i) The submission suggests that sufficient water could be supplied by the raising of Glenbawn Dam or the construction of Kerrabee, Rouchel Brook and Brushy Creek Dams if the current growth demand for power in the State was reduced. It then suggests that the growth demand could be reduced by cancelling or postponing the Lochinvar Smelter development or slowing down the industrial growth of the Hunter Valley.
- (ii) The submission notes that the purpose of both stages of the Scheme is entirely devoted to supply of water for power generation purposes and there is no mention of provision of any water for farmers along the river for irrigation purposes.
- (iii) The submission claims that Stage 1 is wholly dependent on water from the Barnard River being available in times of lengthy drought and, as these are frequent to this region, this Stage would be totally useless. With the future development of Stage 2 any storage of water would be taken from the farmers in time of drought when their need for water from the Barnard River would be increased. The opinion is expressed that this Scheme would totally disadvantage the farmers of the region and unless a sharing arrangement was implemented the project should be opposed. Even with such an agreement, the farmers would be disadvantaged.
- (iv) The submission notes that in Table 5 on page 48, the recorded yield for the Barnard River has been based largely on synthesised data and includes only one year of actual records without the year being stated. There are no actual records shown for the drought year 1980-81 for the Barnard area.

Specific comments contained in the submission are:

- (a) The E.I.S. in many areas is only a theoretical assumption of the project and through the lack of factual data, i.e. rainfall etc., its success in practical terms is difficult to assess.
- (b) Photograph reproductions in Volume 2 are of poor quality and assessment of the areas photographed is impossible.
- (c) The Environmental Impact Statement lacks costing information or any evidence of a cost benefit analysis and there is no indication of the availability and source of funding for the project.
- (d) It expresses concern that the growth in demand is for multi-national capital-intensive industry of little benefit to the region and would be a burden to the electricity consumer.
- (e) It expresses concern that there is no mention of flood control use or irrigation assistance to the farmers which could be incorporated to benefit the region.
- (f) It states that, in view of the future construction of Glennies Creek Dam to supply Bayswater Power Station, this project can only be viewed as a stop gap to enable power to be supplied in time for the industrialisation of the Hunter region.

The submission rejects the proposal until a more detailed assessment has been produced providing additional information as indicated and incorporating protection for the farmers.

Comments

- (i) The Electricity Commission of New South Wales has a statutory function to supply the State's electricity requirements. The reliable operation of both Liddell and Bayswater Power Stations must be assured if this function is to be carried out.

As stated and demonstrated in the Environmental Impact Statement, the Barnard River water supply scheme is required to ensure a reliable water supply for power generation.

- (ii) The Water Resources Commission in revising the Hunter Water Plan will be giving consideration to the use of the Barnard River as a multi-purpose scheme.
- (iii) The simulation studies contained in the Environmental Impact Statement demonstrate that the proposed Stage 1 development is capable of providing a minimum of 15 000 ML/year in the driest years and in excess of 20 000 ML/year in all other years studied without detriment to farmers of the region.
- (iv) Refer to comment (ii) on submission from National Parks Association of N.S.W. Tamworth Branch. (Submission No. 4.25)

The following comments relate to the specific items referred to in the summary to the submission:

- (a) The procedures adopted for developing the project, including the use of synthesised records is the accepted standard procedure used for the hydrologic design of water supply schemes. The use of rainfall data in lieu of stream flow data for water supply assessment would be a retrograde step.
- (b) It is considered that the quality of the reproductions in Volume 2 of the E.I.S. did not detract from competent assessment or understanding of the project areas. Notwithstanding, the original of the reports are available for personal perusal.
- (c) The Statement indicates that cost penalty to the community resulting from interruption to power availability could far outweigh the cost of the project and as there are no alternatives which could meet requirements, there is no point in preparing detailed cost/benefit studies to assist in scheme selection.

Funding will be provided through the normal sources available to the Commission for financing its development programme.

- (d) The need for the Scheme has been brought about by increases in the rate of growth in demand for electricity from State-wide consumers as well as the new industries.
- (e) The works provided for under Stage 1 of the development is essentially a run-of-river water supply and has no storages which could provide flood mitigation or for regulation for irrigation purposes.
- (f) The purposes of the Scheme are clearly stated in the Environmental Impact Statement.

4.29 Great Lakes Shire Council

Summary

Council in its submission states that it understands the need for additional water and does not object to the project in principle. It draws attention however, to sets of figures in the report which it considers to be incorrect and raises doubts about figures used in arriving at other conclusions. Matters raised are:

- (i) Area suitable for irrigation between tidal limit and Gloucester River junction is much too small which therefore underestimates water requirement.
- (ii) Estimates of population and water demand growth for Manning River Water Supply Scheme are too low.
- (iii) Concern that any reduction in river flows caused by diversion of the upper reaches will result in increased salinity at the pump intake for the Manning District Water Supply Scheme.

The following recommendations are incorporated in the submission:

- (a) Construction of a salinity barrage on the Manning River at Wingham.
- (b) A firm commitment to the construction of Stage 2 of the project prior to the commencement of Stage 1.
- (c) A guarantee of the perpetual flow below the weir of at least 20 ML/day as opposed to 5 ML/day proposed in the Statement.
- (d) Recognition of the fact that first priority for available water resources during stress period is to existing users and undertaking to adhere to appropriate pumping restrictions similar to those imposed in relation to pumping from the Hunter River at Liddell.
- (e) The natural environment of the upper reaches of the Manning River catchment area receive greater protection than it has in the past in regard to the need for restricting clearing and swamp draining activities coupled with stocking rates along its tributaries.

Comments

The following comments are submitted in regard to the items raised by Council in its submission.

- (i) The potential irrigation areas shown in Table 7 were determined by the Water Conservation and Irrigation Commission (now the Water Resources Commission) with the assistance of aerial photographs and are believed to be correct. It should also be noted that, in assessing the annual water requirement, the application of 0.6 m of water per year over the total potential area was adopted. This overestimates the requirement in that available records based on irrigation returns indicate that only approximately 60% of licenced areas are irrigated.

- (ii) As stated in the Impact Statement the estimates of projected population and water consumption were determined by studies undertaken by the Department of Public Works for the Oxley County Council and these estimates are considered to be reasonable.
- (iii) Past instances of salinity intrusions to the Bootawa pumping station have occurred at times of extreme low flow in the Manning River associated with periods of extreme drought throughout the Valley, when the flow in the Barnard has also been extremely low and would preclude diversion to the Hunter. Council is however concerned that the proposed diversion from the Barnard during higher flow periods will subsequently contribute to the extension of the period of salinity intrusion.

The available data for the 1980-1981 drought period includes measurement of periods of increased salinity at Abbott's Falls.

Readings of salinity were taken by the Electricity Commission of New South Wales during high tide between Abbott's Falls and Wingham on 7th November, 3rd and 19th December, 1980 and 5th February, 1981. The Public Works Department also measured salinities on 22nd October, 1980. The Oxley County Council have recorded the salinity of the pumps intakes above Abbott's Falls since June, 1980.

A review of this data shows a relationship between salinity and the flow over a number of preceding days and indicates that there is a threshold value around 100 ML/day at Killawarra below which saline intrusion has occurred at Abbott's Falls.

The table below show the percentage of time that a range of flows below 500 ML/day at Killawarra are equalled or exceeded both pre and post diversion for the years 1965, 1980 and for the period 1963 to 1980.

% of Time Flow Equalled or Exceeded at Killawarra						
Flow (ML/day)	1965		1980		1963-1980	
	Pre	Post	Pre	Post	Pre	Post
500	33.4	32.3	35.8	33.6	87.1	85.1
400	38.9	37.5	42.9	40.7	90.2	88.5
300	49.9	47.1	49.7	46.7	93.9	92.5
200	69.0	61.1	57.9	56.6	97.0	96.3
100	84.1	82.7	76.8	76.0	98.7	98.5
70	91.2	87.4	84.2	82.5	99.4	99.1
50	92.2	91.0	85.2	84.7	99.5	99.4
30	98.6	98.4	91.8	90.4	99.9	99.9
20	99.2	99.2	97.0	96.4	100.0	110.0
15	100.0	100.0	97.8	97.3	100.0	100.0
10	100.0	100.0	98.9	98.6	100.0	100.0
0	100.0	100.0	100.0	100.0	100.0	100.0

These figures clearly show that the proposed diversion will not significantly affect the incidence of low flows at Killawarra.

With regard to Council's recommendations, comments are as follows:

- (a) The Oxley County Council and the Public Works Department are investigating alternative means of preventing ingress of salt water to the Abbots Falls pumping station including the construction of barriers. Studies have indicated that relocation of the pump intakes upstream will avoid all problems.
- (b) Expenditure of funds for the construction of Stage 2 before it is required cannot be justified.
- (c) The question of riparian flows is covered in Section 3.

- (d) The Commission will operate the Scheme strictly in accordance with the conditions set down in the Water Licence to be issued by the Water Resources Commission under the Water Act, 1912.
- (e) Further consideration will be given to arrangements for catchment protection in association with the Soil Conservation Service, the Department of Agriculture, the Pasture Protection Board and Scone and Nundle Shire Councils.

4.30 Tuncurry Progress Association

Summary

The submission of the Tuncurry Progress Association objects to the damming of the Barnard River stating that it seems that the project is the result of inadequate planning and implementation of proposals that were investigated many years ago, but now, because of the development time required, cannot solve the short fall in water required for the Hunter Region. Because of this, the Barnard River offers a comparatively cheap solution that can be hastily implemented.

Concern is expressed that local authorities have been subjected to unnecessary pressure leading to a "fait accompli" situation because there is insufficient time for amalgamation of ideas and to employ suitably qualified consultants to investigate the proposal. The project seems to solve one problem while creating others and offering absolutely no benefit to the Manning area.

Specific comments include:

- (i) The use of average flow figures for the study are most misleading.
- (ii) In the past fifteen years the Barrington River has stopped flowing twice, affecting the Gloucester water supply. With proposed development of coal reserves in this area, diversion of water away from the area should be investigated and considered, as it may be required to supplement the Gloucester and Barrington Rivers.

- (iii) The projected population figures appear to be inaccurate.
- (iv) Low flows at Killawarra in the recent drought caused hardship and damage because of saline intrusion. It would be expected that the proposed Scheme will make this more severe.
- (v) Suggested solution of adding an extra pump to the Manning Water Supply is most unsatisfactory because as demand increases the quality of the water decreases due to turbidity.
- (vi) Further demands on the Barnard River for future power stations in the Hunter Valley which could eventually lead to total loss of the river as a reliable source of water for the Manning Valley.
- (vii) The riparian flow of 5 ML/day is totally unacceptable and a flow of at least 22 ML/day should be guaranteed.

Comments

From the very early stage in the development of the Scheme at the beginning of 1980, the Commission has held discussions with local councils and other organisations concerned with water usage in the Manning Valley and has disseminated widely, details of the scheme as it was being developed. As stated in the Environmental Impact Statement the Scheme will not create problems in the Manning area, but on the other hand, the availability of the water to the power stations will improve the reliability of electricity supply throughout the State, including the Manning area.

Comments on specific matters raised in the submission are:

- (i) The Environmental Impact Statement presents monthly stream flows from 1963 to 1979 and daily flows for 1980. The calculations of water quantities which could be pumped in each year were determined from daily stream flow values.

- (ii) The development of the Barnard River will not affect the supply of water to the Gloucester area.
- (iii) The projected population figures were determined by studies undertaken by the Public Works Department for Oxley County Council and are considered to be reasonable.
- (iv) & (v) See comments (iii) and (a) for Great Lakes Shire Council (Submission No. 4.29).
- (vi) This matter is covered in Section 3.
- (vii) The question of riparian flows is covered in Section 3.

4.31 Taree and District Advancement Corporation

Summary

The Corporation supports the submission by the Manning River Water Users Association and the views expressed in the submission by the Tuncurry Progress Association.

It submits that the growth rate in the area is exceeding all expectations causing the planning of larger industrial and commercial areas which will significantly increase demand for water. It further submits that the water supply for the Manning area should be investigated and the Barnard proposal await the outcome of these investigations.

Comments

As indicated in the Statement, the quantity of water it is proposed to divert is small compared with the surface water resources of the Manning Valley and the availability of water to existing and future users will not be in jeopardy.

4.32 State Rail Authority of N.S.W.Summary

The submission by the Authority states that it is not clear whether the movement of the 30 tonne transformers will be by road or a combination of rail/road transport.

Comments

As indicated in the Statement, the method of transport of all materials and equipment will be determined by the contractors selected to supply them. A condition of the contracts will be that transportation of materials and equipment is to be undertaken in accordance with the regulations of the appropriate Authorities.

4.33 J.T. Fallding, 69 Cobran Road, CheltenhamSummary

The submission expresses objection to the proposal which is seen as a short term solution to water supply problems in the Hunter Valley being used as a first stage in a larger development which is of questionable justification and of far greater environmental impact.

Comments

The matter is covered in Section 3.

4.34 The Manning Valley Water Users' Association

The submission received from the Association comprised a letter setting out six resolutions passed at public meeting held to discuss the E.I.S. for the Barnard River Scheme together with an attached copy of a report prepared by Mr G.S. Allen, Chartered Engineer, which was presented at the meeting.

While it might be expected that Mr Allen's report could form the basis of some of the resolution passed at the meeting it contains a number of specific comments and conclusions. For the purpose of this review, therefore, the submission by the Association as set down in its letter and the report by Mr Allen have been treated separately.

(A) Submission from Manning Valley Water Users Association

Summary

The submission stated that while the E.I.S. clearly showed the need to divert the water, it does not justify the construction of a low cost ponding system that cannot safeguard the water users of the Manning Valley, particularly in times of stress.

The resolutions which were passed at the meeting are presented below.

- (i) That Mr G.S. Allen be complimented for the report he presented and that the report be forwarded in support of this committee's submissions
- (ii) From the information presented it is obvious that large volumes of water are going to waste and for this reason the proposed diversion of water in principle should not be opposed.
- (iii) The the Electricity Commission implement a system of management of "Stage 1" to allow the diversions to be effected during times of high to medium flow rates in the Barnard River and that the perpetual flow be 20 ML or the flow of the river.
- (iv) That as part of "Stage 1" a weir or salinity barrage be constructed on the Manning River near Wingham to protect the town water supply source from saltwater intrusion.

- (v) That the Electricity Commission immediately commission studies and an E.I.S. for the full site development storage dam (extended "Stage 2"). Should the report prove favourable "Stage 2" must be immediately committed. Should the report prove unfavourable, the Electricity Commission must undertake to construct a storage sufficient to offset any adverse effects of diverting 20 000 ML per annum through the "Stage 1" system.
- (vi) That the Minister for Energy confer with the Minister for Planning and Environment to ensure that the upper catchment areas of the streams forming the Manning Valley Catchment be protected to maximise the quantity, quality and persistence of the Manning Valley Water Supply.

Comments on the Manning Valley Water Users' Association Submission

(i) & (ii) No comments.

(iii) The question of riparian flows is covered in Section 3.

The proposed operation of the Scheme as set out in the E.I.S. will not be detrimental to the interest of water users of the Manning Valley.

(iv) The question of a barrier to exclude salt water from the upper reaches of the estuary is covered in comment (a) of Great Lakes Shire Council's submission (Submission No. 4.29).

(v) The question of advancing the Stage 2 works is covered in comment (b) made in respect of Submission No. 4.29.

(vi) Noted.

Summary of Mr G.S. Allen's Report

Mr Allen's report comprises eight pages of text, five schedules and three graphs which re-examines Water Resources Commission stream flow data and information provided in the Environmental Impact Statement. His conclusions are:

- (a) To meet the commitments entered into for Bayswater Power Station, the Barnard River Scheme, Stage 1, completed by 1983/84, is the only apparent solution.
- (b) Release rates before storage for diversion of only 5 ML per day are probably inadequate in low flow, dry season and summer season conditions.
- (c) A more exhaustive study of the conditions identified in this evaluation is necessary before licence conditions can be finalised.
- (d) A study of the pondage conditions for the Bootawa Storage scheme is necessary.
- (e) Even on a subjective basis, with the background of this evaluation, a minimum riparian release of 15 ML (plus evaporation in summer) is necessary for satisfactory conditions down the lower Barnard (this incidentally meets the fish and platypus environmental conditions desirable).
- (f) There appears to be a strong basis for a much more sophisticated management plan of operation for sharing diversion and riparian flows. In particular it is not apparent from the drawing of the "Main Works Area" (Fig. 10) just how the riparian release is provided. Low level release is possible on the Orham Creek Dam (the scour outlet) but no similar facility is apparent on the Barnard River Weir.

It is noticed that the weir site will be unattended when in operation under current proposals. For more sophisticated management, remotely controlled valves may be needed in the Barnard River Weir (to drain to MOL RL 339). In all the circumstance, with power and communications available to the site, such provision appears not unreasonable.

- (g) A plan for the management arrangements for the protection of the catchment of the Barnard River is necessary.

Comments on Mr. Allen's conclusions are:

- (a) No comments required.
- (b), (c) & (e) The question of riparian flows is covered in Section 3.
- (d) The Manning River Water Supply Scheme is the subject of a study now being carried out by the Public Works Department and the Oxley County Council.
- (vi) Both the Barnard Weir and Orham Creek dam will be equipped with low level release pipes and valves.
- (vii) Refer to comment (e) on recommendations of the Great Lakes Shire Council (Submission No. 4.29).

4.35 National Parks and Wildlife Service

Summary

The submission from the Service comprises a covering letter summarising its comments on the proposed Scheme with an attached "Barnard River Water Supply Project - Stage 1 - Review of Environmental Impact Statement".

In its covering letter the Service states that it raises no objection on nature conservation grounds to Stage 1 of the proposed Scheme but is concerned that the approval and implementation of Stage 1 pre-empts the Stage 2 construction of a larger dam on the Barnard River. In view of this the Service considers that the Environmental Impact Statement for Stage 2 should be prepared before a decision on Stage 1 is made.

The Service considers that the case for the Barnard River development must be examined in the context of the impacts of alternatives to Stage 2 and lists these as Rouchel, Brushy, Glenbawn (augmentations) and Kerrabee. No such evaluation is presented for Stage 2 and accordingly the Service is not prepared to give even a qualified endorsement for Stage 2.

The submission states that under the circumstances outlined it would seem appropriate for this Commission to consult with the Water Resources Commission in the preparation of an integrated and comprehensive evaluation of alternatives available for water supply to the Hunter Valley including Stage 2 of the Barnard River Scheme. The Service concludes that the possibility that it may be prepared to endorse Stage 2 should not be ruled out if it is shown to have the least impact of the alternatives examined.

In the review of the Environmental Impact Statement which was attached to the submission for Stage 1 the following matters are raised:

Flora and Fauna

The review states that the reports on flora and fauna are very comprehensive providing adequate information to ascertain the wildlife conservation value of the area.

Stage 1

It states that Stage 1 of the project affects very little naturally vegetated area. Backup from the weirs on the Barnard River and Orham Creek will inundate only small areas of the respective water courses and there will be very little effect on flora or terrestrial fauna.

Variation of water flow resulting from the weirs may effect the aquatic fauna including a newly described species of tortoise (*Elseya* sp) about which little is known and further information on its distribution should be obtained.

Care should be taken to ensure the survival of the platypus in the area which, although not endangered, is protected in New South Wales. Maintenance of river flows except in drought conditions will help maintain the ecological balance and the habitat value for these fauna.

The transmission line and water supply pipeline traverse predominantly cleared grazing lands and, as such, will have little effect on the natural vegetation. The preferred transmission line is the least damaging of the three routes described.

Stage 2

The review indicates that it has no objections on nature conservation grounds to Stage 1 providing the above recommendations are considered. It expresses concern however that Stage 1 would be considered as infrastructure for Stage 2 and may foreclose options.

In view of the size and potential impact of Stage 2 and the pre-emptive nature of Stage 1 the Service feels that an Environmental Impact Statement for Stage 2 should be prepared before a decision on Stage 1 is made.

Aboriginal and Historic Sites

The review states that the archaeological relics report is not set out in a manner which allows easy checking of what was surveyed as to what is being proposed. It appeared from verbal description that the Barnard Dam, the Bralga Tops Dam and some sections of the pipeline were surveyed on foot. It would appear that the proposed transmission line, sections of the pipeline and the Oaky Creek regulating storage have not been surveyed.

The review states that the survey method appears to have been relatively sound but lists the following further work as being required for an assessment of the sites involved.

- (a) A more detailed map, showing areas to be affected by development and areas which have been surveyed (on foot and/or by other means).
- (b) A full survey of all areas to be affected (with the possible exception of some sections of the pipeline; this will depend on (a)).
- (c) A more detailed description of the rock shelters involved, specifically a description of any deposit they may contain. Some idea of their overall shape and dimension would have been useful, as would a couple of photographs.
- (d) The five "minor campsites" require further archaeological investigation and description, to allow an assessment on their real size and importance. This may involve some small test excavations.
- (e) Contradictory statements about "implements" and "simple" flakes need to be clarified.
- (f) A clear acknowledgement that all sites are protected under the National Parks and Wildlife Act, 1974, and that the Director's written consent is necessary before any destruction can take place, should be made.
- (g) Local Aboriginal people must be consulted, to discover whether they have any information about the area, or any interest in the recorded sites.
- (h) A survey should be undertaken along the proposed transmission line according to the usual agreement between the Service and the Commission's Transmission Lines Branch.

Comments

The Service indicates in its submission that it raises no objection to the development of Stage 1 of the Scheme on nature conservation grounds. Its concern appears to be that the construction of Stage 1 pre-empts the future construction of Stage 2 and on this basis it calls for the preparation of an Environmental Impact Statement for Stage 2 before a decision is made on Stage 1. The criticisms raised in the submission are devoted mainly to aspects associated with the Stage 2 development.

The matter of the development of Stage 2 of the Scheme is covered in Section 3 which states the Commission's proposals are confined to the Stage 1 development.

In respect to the attached review of the E.I.S. the Commission has indicated that it will carry out the further studies recommended in the various reports on aquatic fauna.

The review also made reference to the adequacy of the report on archaeological relics, listing a number of areas considered to be deficient. In reply the comments from Professor Dyall who carried out the relic survey, are reproduced below.

"Aboriginal Relics in the Barnard River Area:
Reply to N.P.W.S. Assessment of Report

- (a) A more detailed map is attached. It has been traced from the 1:25000 maps of the area (Barry, Glenrock, Curricabark).
- (b) The comment presumably refers to the Oaky Creek Regulation Storage Area, which was not part of my original brief. My limited survey there was undertaken with respect to a very simple discharge scheme, and I quite agree that further survey work is needed.

I will argue that a complete survey of this pipeline route is pointless. It crosses grassed-over ridgelines so that one could not hope to see any Aboriginal relics on the ground. The section from Bralga Tops to the Barnard River is a very steep scarp on which Aboriginal occupation is intrinsically improbable.

I have been on 35% of the length of the pipeline route without seeing a single Aboriginal relic. The rest of the route I have scanned from low-level helicopter flight without seeing any feature which suggested closer examination.

- (c) The only "rock shelters" are some incipient overhangs 100 m upstream from Bralga Gully on the west bank of Barnard River (grid ref. 573,976 Glenrock 1:25000 map). These "shelters" were from 30 to 100 metres up the scarp, and their floors sloped at the angle of strike of the rock strata (about 20° angles across the width of the very shallow openings). There were about ten such "shelters", the exact count depending on how one defines a shelter. All had solid rock floors with no deposit of any kind. None of them had a floor sufficiently level enough to sleep on.

I enquired about rock shelters of both the Electricity Commission field geologist (John Braybrook) and an itinerant kangaroo shooter who was camped in the river gorge near Orham Creek. Mr. Braybrook referred me to the Bralga Gully location as the only overhangs he had seen, and the shooter stated that there were no shelters anywhere in the neighbourhood.

- (d) The N.P.W.S. assessor really ought to be able to discover what she needs to know by combining my report with the site cards I have submitted, and a 1:25000 scale map.

The suggestion of "small trial trenches" does not belong in the real world. The assessor should realise that such a trench would probably fail to recover anything at all at the sites I have described.

- (e) The assessor has got herself very muddled up. A "used flake" is surely a "definite implement of the simple flake type". On that basis, I can find no inconsistencies either within my Appendix 1, or between that Appendix and the results.

With respect to the two cobbles at 586,973; they were lying on the hillslope about 30 m apart.

- (f) The Commission is hereby advised that the five "minor campsites" are Aboriginal relics and are protected under the National Parks and Wildlife Act of 1974. The Director's written permission is necessary before these sites can be destroyed.

In addition, the Commission should discuss with the National Parks and Wildlife Service whether or not any of the other locations at which I found Aboriginal material is to be defined as a site and to require such a permit for destruction.

- (g) The need to consult local Aboriginal people is of course acknowledged. However, in this case there are no Aboriginal people in the locality, and I could not even discover any living memory of them. This situation is recorded in my Report and I see no way of improving upon this situation.
- (h) With respect to the proposed transmission line, I have seen a call for tenders for this survey, dated August, 1981 and cannot therefore understand why the necessity for a survey is raised again at the present time".

4.36 Water Resources Commission

Summary

The submission from the Water Resources Commission states that it has no objection to the proposal. It raises the following matters:

- (i) The W.R.C. should be consulted on the quantity and method of removal of concrete aggregates from the bed of the Barnard River so that possible river sediment can be monitored and banks are protected.
- (ii) Detailed design of the upgraded river crossings should be referred to the W.R.C. in regard to adequacy and possible effects on river management. It understands that the Electricity Commission will be discussing maintenance aspects with landowners and relevant authorities.
- (iii) It requests that it be consulted when final design is prepared for the rock lined channelling works proposed in Oaky Creek instead of the buried pipeline suggested by the Commission.
- (iv) It confirms that the Barnard River proposal is to be reviewed by the Water Utilisation Council and the results of the review will be advised in due course.

Comments

- (i) The W.R.C. will be consulted in regard to the quantity and method of removal of concrete aggregates from the bed of the Barnard River.
- (ii) The Water Resources Commission has been asked and has agreed in principle to prepare the designs for the river crossings. Subject to satisfactory arrangements being made, the Water Resources Commission will also construct the crossings. The responsibility for maintenance aspects and replacement of crossings is covered in Section 3.
- (iii) The Water Resources Commission will be consulted on final design of the rock lined channelling works in Oaky Creek.

4.37 Department of Mineral ResourcesSummary

The submission from the Department advises that there are no matters of significance about which it wishes to comment. Additionally, none of the works involved in the project are affected by titles or applications for title administered by the Department.

4.38 J.R. Carmichael and Sons, "GIRO", GloucesterSummary

The submission from Mr. Carmichael raises objection to the Scheme on the basis that the intention of the Commission to release a minimum of 5 ML/day from the weir will severely affect future potential for irrigation on his property above the junction of the Myall River.

Comments

The question of riparian flows is covered in Section 3.

5. CONCLUSIONS

The matters raised in the submissions relate mainly to detail features of the Scheme which will be determined as part of the design of the works (e.g., crossings and erosion works along the Hunter River) or by prescribed procedures (e.g., flow maintenance requirements in the Barnard River). Other matters are dealt with in the Commission's comments upon the individual submissions.

It is considered that the Commission's review of the submissions indicate that the conclusions reached in the Environmental Impact Statement are valid and that there are no further considerations which would warrant delay or abandonment of the project.

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Barnard River water supply report on
examination of submissions

