EIS 907

AB019505

P.F. Formation environmental impact statement extractive industry, concrete batching plant : Portion 198, Parish of Cornelia, Old Northern Road, Maroota

COLLIN C. DONGES & ASSOCIATES
PTY LIMITED

P.F. FORMATION
ENVIRONMENTAL IMPACT STATEMENT
EXTRACTIVE INDUSTRY, CONCRETE BATCHING PLANT
PORTION 198, PARISH OF CORNELIA
OLD NORTHERN ROAD, MAROOTA

Prepared for: P.F. Formation

B872

Prepared by:

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March 1992

ADDENDUM

Since completing this E.I.S. the writer has been advised that the two silos to be erected (see Figure 15 and text), will not have individual capacities of 75 tonne.

Readers are now advised that the two silos as now proposed will each be of 30 tonne capacity only, and that, rather than standing 13.5 metres off the floor of the compound they will now have a maximum height of only 12 metres.

Since, within this document, there was some minor concern that the top of the original silos may have been visible from various vantage points, that concern, though only of a minor nature before, is now somewhat even more diminished.

Please also note that any dirty waters which leave any part of the batching plant site will, after passing through a sediment pond system, flow into the 5 million litre wash plant intake dam (see Location No 3 at Figure 18). The capacity of this receptor dam was not referred to in this Statement.

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ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 (SECTION 77 (3) (D)).

ENVIRONMENTAL IMPACT STATEMENT

(i) This Statement has been prepared on behalf of P.F. Formation being the proponent on whose behalf the development application, as described below, is being made.

(ii) The Statement accompanies the development application made in respect of the development described as follows:

Operation of a concrete batching plant with a production capacity in excess of 20,000 tonnes per annum.

(iii) The development application relates to the land described as follows:

Street:	**Old Northern Road**
Locality:	**Maroota**
Real Property Description:	**Portion 198 Parish of Cornelia, County of Cumberland being the whole of the land in Certificate of Title Vol.14847 Folio 224.**

(iv) The contents of this Statement, as required by Clause 34 of the Environmental Planning and Assessment Regulation, 1980, are set forth in the accompanying pages.

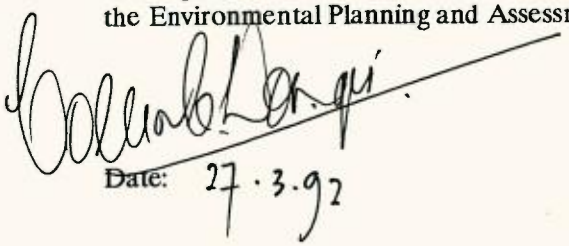
(v) Name, Qualifications and Address of person who prepared Environmental Impact Statement:

Collin C. Dongés MIS Aust., Dip. TCP., FRTPI, FRICS, FRAPI, Dip. Env. Stud., LGTCP, Dip. Leis. St., Reg'd Land Agent

939 Old Northern Road, Dural, NSW 2158

(vi) Certificate

I, Collin C. Dongés of Collin C. Donges and Associates Pty Limited, hereby certify that I have prepared the contents of this Statement in Accordance with Clauses 34 and 35 of the Environmental Planning and Assessment Regulation, 1980.



Date: 27.3.92

EXECUTIVE SUMMARY

Introduction

This Environmental Impact Statement has been prepared to accompany a Development Application to be lodged with Baulkham Hills Shire Council. The Statement addresses a proposal to construct a concrete batching plant upon Portion 198, Parish of Cornelia, off Wisemans Ferry Road at Maroota.

The proposal is designated development pursuant to Schedule 3(j) of the Environmental Planning and Assessment Regulation 1980 and, as such, an Environmental Impact Statement must accompany any such development application.

The Department of Planning anticipates that, with the release of residential, commercial and industrial land, the North-West Sector of Sydney, the primary target market area for the proposed batching plant, will expand rapidly. To enable the north-eastern parts of the North-West Sector, as well as the still growing outer areas of both the Hornsby and Baulkham Hills Shires to be developed with minimal inconvenience and impact in-so-far as concrete supply is concerned, there is a need and an opportunity to establish concrete batching plants in critical locations.

If not totally from a geographical viewpoint, certainly from a regional logistics viewpoint, the opening of a relatively small batching plant at Maroota has many advantages.

The Proposal

P.F. Formation proposes to construct a concrete batching plant at the site of its approved central sand processing plant at Maroota.

The choice of this site is governed by:-

- its close proximity to large moderately habitated rural sectors which are now far distant from any concrete batching facility;

- its reasonable proximity to parts of the north-eastern area of Sydney's North-West Sector development;

- the ready and immediate availability of on-site fine and fine to medium concrete aggregate, and

- the availability of emptied sand trucks to be used for the back cartage of coarse aggregate to the batching plant.

Although, theoretically, the plant to be installed would have capacity to produce about 36,000 tonnes of concrete per annum, from a practical point of view full production is better classified as being of the order of 30,000 tonnes per annum. This EIS therefore adopts this latter figure in its assessments of impact. However, despite a capacity to produce 30,000 tonnes per year, the proponents expect that it will be many years before annual output exceeds 40 tonnes per day or 11,000 tonnes per year.

Because the sand used in the concrete would be out-transported to another batching plant if there were no such plant at Maroota, the additional total heavy vehicle movements generated by the operation are thirteen per day (6.5 laden) at full production and eight per day (4 laden) at anticipated production.

Again, however, despite the fact that the proposed batching plant will create heavy vehicle movements which are additional to those generated by existing and future sand extraction operations, it is the proponent's intention to absorb these new batching plant related movements within the 200 laden movements already approved and to not apply for any additional movements by virtue of this application.

The Physical and Human Environment and Impact Potential

The part of the central processing plant area to be used for concrete batching is relatively flat with no natural vegetation or original topography now remaining.

The surface drainage of the site will be altered slightly to allow run-off to drain to the specially designed water recycling system which is part of the batching plant design.

The climate in the region is considered temperate with warm to hot summers and cold to mild winters.

Land use in the immediate vicinity of the site is primarily agricultural with scattered housing development to the east and west on the main road system. Apart from these few rural residences, the urban areas nearest to the site are the newly established subdivisions at McGraths Hill to the south-west and at Glenorie to the south.

Existing noise levels are considered commensurate with those of an active agricultural sector situated close to a main road system. Noise levels from the site are governed by the State Pollution Control Commission (SPCC) as outlined in its Environmental Noise Control Manual.

Potential noise pollution associated with the operation of a concrete batching plant will be mitigated through the use of noise reduction techniques. In addition, modern agitator mixer trucks equipped with hydraulically driven mixer barrels will mostly be used at the plant. These trucks are designed to eliminate motor noise previously associated with the wash down and wash out processes of a concrete batching plant.

The aforementioned mitigation measures will ensure that the predicted noise levels will comply with the acoustic criteria set by the SPCC.

Existing traffic on the main road system is relatively low but even so the small increases generated by this development will have minimal impact thereon.

All concrete batching plants produce contaminated water during the batching process. Safeguards outlined in this Statement will ensure that no contaminated water from the dirty yard area will enter the surrounding streams. A modern water recycling system will be installed to cleanse run-off water from the site prior to its being re-used in the batching process. In addition, the plant will be equipped with sediment traps to remove

any sediment from run-off from the clean yard area prior to release of this water to the clean water storage established for the same processing plant.

Potential air pollution associated with the operation of the proposed plant will be mitigated through the installation, on all machinery, of pollution prevention equipment. SPCC guidelines for the mitigation of air, noise and water pollution will be met and indeed exceeded in an attempt to promote a pollution-free development.

Land Use, Social and Economic Implications

The New South Wales Department of Planning together with Regional Councils has, in an attempt to relieve the pressure of the demand for housing and urban expansion in general, recognised the need for the rapid expansion of Sydney's North-West Sector. The proposed plant will serve part of the existing and anticipated demand in this part of the region.

The proposed plant will not be restricted for its market to the Windsor to Kellyville parts of the region but is expected to supply pre-mixed concrete to other areas to the north, south, west and east of the site.

The establishment of the proposed plant will add to the economy of the region both by providing quality concrete to the construction industry and by keeping part of the money generated through wages and expenses in the local area.

It is considered that at least part of the workforce associated with the operation of the proposed plant, and especially agitator truck drivers, will come from within the Maroota area further adding to the economic expansion of the locality.

PART 1 - INTRODUCTION

PART 1 INTRODUCTION

1.1 REQUIREMENT FOR THIS E.I.S.

This Environmental Impact Statement has been prepared to accompany a Development Application to be lodged with Baulkham Hills Shire Council. The Statement addresses a proposal to erect and operate a concrete batching plant on Portion 198, Parish of Cornelia, off Old Northern Road, Maroota.

Development consent is required for the proposal under the provisions of Baulkham Hills Local Environmental Plan 1991. The proposed use, which involves a plant with capacity to produce in excess of 20,000 tonnes of concrete per year, is listed as a Designated Development within Schedule 3 of the Environmental Planning and Assessment Regulation, 1980 and as such an Environmental Impact Statement must accompany the Development Application to Baulkham Hills Shire Council.

1.2 STATEMENT OF THE PROPOSAL

P.F Formation proposes to establish an extractive industrial operation, a concrete batching plant, on Portion 198, Parish of Cornelia. Portion 198 is already subject of a development consent allowing both the extraction of sand and the operation of a central extractive material processing plant.

This proposal aims to establish the new concrete plant within part of that area of Portion 198 which was earlier approved for sand extraction and processing. It is also intended that the new plant will depend for its operation on sand material won from Portion 198. However the plant will also use sand won from other nearby extraction sites including existing approved operations on Portion 167 and other sites not yet approved for development. The development of the concrete batching plant, which will also use ingredients brought to Maroota as backloading, is a component of P.F. Formation's Plan of Management for its total Maroota operation.

1.3 BACKGROUND TO THE PROPOSAL

P.F. Formation, a major producer of building sands in the Sydney area, supplies both bricklayers sand and coarse concreting sand used by the Sydney building market. A substantial part of the coarse sand won from its Maroota deposits is currently delivered to Emu Plains, where P.F. Formation operates its own concrete batching plant, or to Seven Hills, Mulgrave, Ingleburn and Wetherill Park, at which locations it operates conjointly with other concrete producers. At the stage when the company can commence extraction from its approved Portion 167 site on the south side of Wisemans Ferry Road the then access to yet coarser sands will mean that still further volumes of material will be diverted to concrete production.

This proposal seeks to obtain approval to establish a concrete batching plant to operate in association with the adjoining, approved centralised processing plant on Portion 198 and to partly rely for its raw material input on existing and anticipated future approved extraction sites. The surrounding sand pits, the central processing plant and the proposed concrete batching plant are to be linked to each other and to Wisemans Ferry Road by a purpose-built, approved haul road. The operation of this batching plant will allow for the more efficient road and vehicle use through the backloading of road haulage trucks which otherwise travel to Maroota without loads. It will also permit the servicing of demands for concrete arising from some of those northern parts of the metropolitan area not readily supplied from the other plants listed above.

This proposal will utilise part of Portion 198 as a concrete batching plant for the duration of extraction operations at Maroota.

The land upon which it is proposed to build the plant will have been fully extracted before construction is commenced. This being the case there is no concern that the operation itself will sterilise any of the valuable Maroota sand resource.

1.4 CONSULTATION WITH AUTHORITIES

Written consultations were made with the following authorities seeking their comments on the development proposal and their requirements for the content of the EIS.

- Department of Planning;
- Department of Water Resources;
- Soil Conservation Service;
- S.P.C.C.;
- Prospect Electricity;
- Roads and Traffic Authority;
- National Parks and Wildlife Service;
- Department of Mineral Resources;
- Department of Agriculture, and
- Baulkham Hills Shire Council.

Copies of all replies are contained in Appendix A. A summary of these replies and/or comments thereon follows:-

Department of Planning. The clause 35 response issued by the Department provided both the standard set of requirements for the preparation of an EIS and a set of advices relating to the application of those requirements to concrete batching plants. It also specifies that special attention should be given to addressing the following matters:-

- site access requirements including any road improvements;
- water management arrangements at the site;
- transport implications (local and regional) of the proposed plant, e.g. aggregate, flyash and cement deliveries, concrete deliveries;
- interaction of the concrete plant with sand extraction at the site and any adjoining or nearby sites owned by the proponent, and
- visual impact assessment.

Department of Agriculture and Fisheries. The Department provided a most comprehensive response which placed due emphasis on the need to address such items as:-

- the agricultural capability of the land within the site;
- impacts on surrounding agricultural uses and on groundwater resources;
- justification of the use, and
- rehabilitation.

Department of Mineral Resources. This response, while raising questions relating to a draft Plan of Management, which document could not be then made available for the purposes of this EIS, is generally supportive of the proposal provided the operation does not sterilise any resource deposits. [Note: the draft Plan of Management has now been sighted. This proposal is not seemingly in conflict therewith].

Prospect Electricity. This response advises that satisfactory arrangements have been made in the matter of access for the extension of supply. It also requests that the proponent provides advice as to the electrical load details of the proposed plant. This has been done.

Department of Water Resources. Although the Department has no special comment or advice to offer on the proposal it does refer to three of its publications which should be used as guidelines when preparing the EIS.

Roads and Traffic Authority. The Authority response raises various matters related to traffic impact upon the regional road network; the imposition of levies to pay for road maintenance and the possible need to upgrade intersection layouts in the local, Maroota, area.

Soil Conservation Service. The Service has brought to notice the need for the preparation of a program to minimise on-site erosion and off-site sedimentation.

Baulkham Hills Shire Council. Council's response raised a comprehensive set of questions which have generally been dealt with in the bulk of the other responses.

In addition to consultations with Government authorities, the design and layout of the proposal were formulated with the benefit of advice from specialist consultants with particular expertise in those areas in which the mitigation of specific impacts was considered to be important.

PART 2 - SITE INFORMATION

PART 2 SITE INFORMATION

2.1 SITE LOCATION AND ENVIRONMENT

The proposed extraction site lies within Baulkham Hills Shire, 1.0 km north-west of Maroota and approximately 50 kilometres north-west of Sydney's Central Business District. Glenorie, located 20 km to the south, is the nearest small scale commercial centre, while the more substantial centres of Castle Hill and Windsor lie 38 km to the south and 31 km south-west respectively (Refer Figures 1 and 2).

Nearby land holdings to the north and east of Portion 198 are predominantly used for agriculture although there are some nearby remnants of natural bushland. Maroota Public School is located about 850 m to the north-east of the proposed plant site. Land to the west and south is largely undisturbed bushland which slopes generally towards the Hawkesbury River which is approximately 5 km to the north-west.

Marramarra National Park is located about 4.5 km to the east of the site on the far side of the Maroota Ridge.

Existing vehicular access to Portion 198 is by way of a purpose-built haul road running from a four way intersection with Wisemans Ferry Road to the south. This route is the primary access for the existing extractive industry and raw material processing operations in the locality (Figure 5).

There is also an informal four wheel drive track between Lot 1, D.P. 588936 and Portion 35, leading into the eastern boundary of Portion 198 (Figure 5). However this access will not be used for extractive industry related purposes.

2.2 SITE DIMENSIONS

The location of the central processing plant area, which will incorporate the concrete batching plant as described in this statement, is shown in Figure 5. The site of the proposal, Portion 198, is approximately square in shape with a stepped eastern boundary. It covers an area of 33 hectares. Boundary lengths and other cadastral information are shown in Figure 3.

2.3 SITE ZONING

The site is zoned Rural 1(b) under the provisions of Baulkham Hills Local Environmental Plan 1991.

Under the provisions of that instrument an extractive industry which depends for its operations on the winning of extractive material from the land on which it is carried on, as will be the case in this instance, is permitted, with Council consent, within the Rural 1(b) zone. Moreover, the instrument also makes provision, within that zone, for the carrying out, again with the consent of Council, of industries directly associated with or dependent upon extractive industries.

Clause 34 of Baulkham Hills Local Environmental Plan 1991 also contains details of certain matters which Council should consider in its determination of any application for an extractive industrial development. These matters will be specifically addressed towards the end of this statement.

Portion 198 is also within lands covered by Sydney Regional Environmental Plan (SREP) No 9 - Extractive Industry (Figure 4). SREP No 9 effectively gives priority to extractive industry by discouraging development which may at a later date restrict the extraction of the underlying sand resource. In the case that any authority may take the view that this

proposal constitutes an "industry dependent upon extractive industry" as distinct from an "extractive industry" in its own right, either of which is permitted, with consent, in the 1(b) zone, clause 11 of SREP No. 9 provides that applications for such developments cannot be approved by Council without the concurrence of the Secretary of the Department of Mineral Resources. Although the earlier-noted Mineral Resources response to the initial consultation letter may not constitute a formal concurrence, it is being accepted by the proponent as an indication that the development, per se, will not be opposed by the Secretary.

PART 3 - EXISTING ENVIRONMENT

PART 3 EXISTING ENVIRONMENT

3.1 TOPOGRAPHY AND EXISTING EXTRACTION

Portion 198 is an area of undulating land on the western side of the Maroota Ridge. It drains towards the west with three principle drainage lines branching from the head of a gully located on the eastern boundary. Its highest point is at R.L. 187 m (A.H.D), located on a knoll on its southern boundary. The lowest point is at approximately R.L. 140 m in the above-mentioned gully. Rocky walls and outcrops are common, particularly along the ridges and the edges of the drainage gullies. Slopes on the site range from 5% to 15% with many steeper rock cliffs. The December 1989 topography of the site and surrounds is shown at Figure 6 while some of the more recent ground-form features of the central operating area are shown at Figures 7A and 7B. It should be noted that some of the features on Figure 6 have been altered as a result of development consents gained by the proponents since December 1989.

Earlier sand extraction has caused changes to the original topography of the northern third of Portion 198. An approximately triangular area of 4 hectares bounded by the northern site boundary and the northernmost drainage line has been extracted to a maximum permitted depth of 15 m below original ground level (to about R.L. 155 m A.H.D) to create what will eventually become an agricultural dam. Extraction of this area was completed in September 1991 and rehabilitation operations involving backfilling part of the excavation, topsoiling and revegetation are well progressed and are said to be under regular review by the Soil Conservation Service.

3.2 AGRICULTURAL SUITABILITY

The whole of the central operations area, except for retained, steep, vegetated acoustic and visual barriers, is totally cleared and extracted and is considered not suitable for agriculture.

Agricultural development of Portion 198 has been unsuccessful in the past. There are on the site the remains of two dwellings and an area cleared of bush and planted with exotic grasses.

The Sydney North-West Sector Regional Environmental Study, in its Agricultural Land Suitability Map, identified the land within the proposal area as being predominantly Class 4 with a small area of Class 3, and Class 5 land in the gullies. These classes are defined as follows:

Class 3 *Suitable for grazing. Well suited to pasture improvement and can be cultivated for an occasional cash crop or forage crop in conjunction with pasture management. Overall level of production is moderate as a result of high environmental costs which limit the frequency of ground disturbance. Has a moderate capability for agriculture. Pasture lands are capable of sustained high levels of production, although conservation measures may be required.*

Class 4 *Land suitable for grazing and not suitable for cultivation. Agriculture is based on native pastures relying on minimum tillage techniques. Overall level of production is low. Environmental constraints make arable agriculture uneconomic.*

Class 5 *Suited for only rough grazing or land not suited to agriculture. Agricultural production is very low to zero. Severe or absolute constraints to production imposed by environmental factors.*

Even were the proposed plant area not now cleared and extracted, the fact remains that without considerable (and probably otherwise uneconomic) improvement works, the land therein is of lower agricultural potential than surrounding land which has been properly rehabilitated and supplied with water following extraction.

3.3 SURROUNDING LAND USE

The adjacent properties to the east and north-east of Portion 198 (Lots 1 & 2 D.P. 588936, Portion 35, Lots 1 & 2 D.P. 2547255 and Portion 117) are used for agriculture including orcharding and market gardening. Extractive industry has in the past operated on and is further proposed on Portion 117. There is also existing extractive activity in the recently approved operation on Portion 198. As previously stated, the remaining land to the west and south of Portion 198 is predominantly undisturbed bushland.

The nearest dwellings, on lots 1 and 2, D.P.588436, are located over 800m from the proposed plant site. Maroota Public School is located some 850m to the north-east. The above buildings are located along the western side of Old Northern Road. These and other structural developments in the area are indicated on Figure 5.

3.4 SOILS

The yellow duplex soils of the development area correspond to Walker's (1960) Hammondville Series. They occur on the thinly laminated shales and sandstones of the Mittagong formation and characteristically have yellow podsolic soils. They typically consist of a thick (30 cm), well developed, sand loam A Horizon over a yellow B Horizon which becomes increasingly clayey with depth. These soils commonly contain a conspicuous, bleached A2 Horizon and an abundance of flat ferruginous stones. The profile is weakly structured throughout.

Numerous large rock outcrops across the site are bare of soil and vegetation, however soil profiles are generally deeper in the gully floors.

The sandy nature and weak structure of the topsoil facilitate rapid structural deterioration after cultivation. The subsoils are dispersible and highly erodible. However, if good vegetative cover is maintained, the erosion hazard of the topsoils is low.

Topsoil has been removed from the entire processing plant area which has in the recent past been disturbed by the existing extraction and overburden stockpiling operations on Portion 198. The stripped topsoil is stockpiled in semi-permanent and temporary bunds around the periphery of the central operations area. All soil disturbed by the past extraction operation has been retained on site for later use in rehabilitation operations. Rehabilitation trials have already been undertaken on nearby Portion 196 and are being used as a guide for the other works now underway in the total extraction area.

With one exception the valley protection areas within Portion 198 remain recently undisturbed apart from various rough tracks and other areas which were cleared of vegetation well prior to 1980 but which have now subsequently regrown. The one exception in this case lies in the fact that a 250 cm diameter steel pipe, required to gravitate water between the two major Portion 198 water bodies, has now been laid by hand across the central environmental protection zone. This pipe laying procedure did involve the levelling of a narrow strip of bushland but no surface soil was disturbed during the carrying out of the operation.

3.5 SURFACE HYDROLOGY

Drainage through the proposed site is towards the west from the crest of the Maroota Ridge towards the Hawkesbury River, approximately 5 km to the north-west. The limit of the catchment within which the plant will stand covers a total of approximately 56 ha and includes three agricultural dams and three major sedimentation ponds now in course of construction. Topography, catchment boundaries and drainage lines are shown in Figure 6.

The plant site, however, is on the outer rim of this large 56 ha catchment and, due to recent man-made topographic modifications and the location of bunding and catch drains around the periphery of the extracted central processing plant area, the only surface waters which will cross the plant area are those which flow from rainfall which falls directly onto that site (see Figure 8).

3.6 HYDROGEOLOGY

3.6.1 General

The geology of the Maroota area is shown in Figure 9 (after Etheridge, 1980). The Maroota Ridge is formed of Triassic age Hawkesbury Sandstone, in places overlain by Tertiary age sediments including the Maroota Sand.

The relationship between the various aquifer units is shown on Figure 10 which, though diagrammatic, is based on a section line from Portion 196 eastward towards Maroota (Figure 11). The section is compiled from the topographic map, registered borehole records and surface geology.

Portion 198 is located on the Triassic Hawkesbury Sandstone. Fresh rock occurs in scattered outcrops over the Portion and, in between, the sandstone is weathered to a deep soil profile to depths of up to 15 metres. The weathered rock is white to red-brown in colour, soft and friable allowing the excavation which will have been carried out under the batching plant area. Where this weathered zone is consistently above the water table, it is leached to give a loose white sand soil, which is referred to as eluvial sand.

Tertiary age sediments including the (geological) Maroota Sands occur elsewhere in Maroota but are not present on Portion 198. The Maroota Sand unit occurs, at its closest, 400 m to the east of Portion 198 along the crest of Maroota Ridge. Deep pockets of colluvium can be expected in the gully areas.

Where a deep weathering profile is developed in the sandstone the resulting eluvial sand is permeable. Dams or large wells constructed into this material can provide a source of farm water supply but the permeability is too low to yield significant supplies to boreholes. Figure 9 shows the inferred extent of deep sand including the eluvial sand.

3.6.2 Aquifers and Water Supply

Hawkesbury Sandstone is a quartz sandstone, generally massive with well developed cross bedding and intercalations of shale and siltstone beds. Bulk grain size is generally in the range of fine to medium sand but sorting is generally poor with some silt and pebble grains.

The fresh Hawkesbury Sandstone is generally an impermeable rock. However, discreet fracture horizons occasionally occur in association with shale bands or other lithology changes which give permeable zones parallel to the major horizontal bedding planes. These aquifers are confined by the adjacent impermeable sandstone and often form perched aquifer systems above the regional water table. An overall bulk permeability to the sandstone is given by vertical regional fracture zones which allow the slow vertical drainage between discreet aquifers. Deep boreholes into the Hawkesbury Sandstone, generally for domestic purposes (Table 3.6.2.1, Figure 11), generally have a low yield of less than 1 litre/second which indicates a relatively low permeability (Australian Groundwater Consultants, 1986).

TABLE 3.6.2.1: SUMMARY OF REGISTERED BORES

Bore	Distance from (m) Por 198	Total Depth (m)	Standing Water Level (m)	Water Elevation (mAHD)	Yield L/s	TDS mg/L	pH	Strata/ Comments
15051	2800	85.3	30.4	200	0.44	fresh		
16348	1000	73.1	30.4	187	0.13			
33197	3425	76.2	40.2	87	0.08			clay & sandstone
34628	750	91.4	5.4	207	.23			sandy
			41.1	171	.13			sandstone
35725	2800	155.4						abandoned
37737	4000	124.6	54.8	82	0.96	2000	6.3	
37738	3825	94.4	39.0	111	2.53		4.6	
38147	1625	121.9	64.9	135	0.68		2.6	soft sandstone
			17.0	185				soft sandstone
			29.5	170.5				soft sandstone
			31.7	168.3				soft sandstone
48741	950	30.0	23.2	200	0.08			sandy
53898	1600	31.0	6.0	177	0.5	56	5.1	
55962	1450	22.0	2.0	183	0.43	fresh		
57460	2450	76.0	24.8	116				sand
58504	3950	15.2	3.6	141	0.38	good		
59118	1600	6.0	5.0	184	0.5			
59742	900	23.2	7.6	179	1.52			
60147	2800	46.0				150	5.1	sandstone
60051	1425	172.2	31.2	180	1.386			

Note: where data is omitted it was unrecorded

The Maroota Sand, consists of sand, gravel, clayey sand and clay. These sediments are in a channel system of alluvial origin overlying the triassic bedrock. The Sand attains a maximum thickness of 39 m in the area south of Maroota; north of Maroota the maximum thickness is 5 m. The Maroota Sand is generally more porous than the Hawkesbury Sandstone and is capable of supplying sufficient quantities of water for irrigation purposes. The Maroota Sand unit does not occur on this site and will not be affected by any of the proposed operations. This material will, however, be extracted from Portion 167 and transported to the site for processing and use for concrete manufacture.

In general, the Maroota Sand and the eluvial sand (weathered Hawkesbury Sandstone) aquifers are perched on the fresh bedrock of Hawkesbury Sandstone. Where these aquifers are located high on the topographic ridge they discharge either by overflowing at their margins or by slow vertical infiltration into deeper aquifers. Where the deeper aquifers crop out or sub-crop on the slopes of the ridges they discharge to creeks and gullies or to the pockets of weathered rock.

Generally the groundwater quality throughout the area is of domestic standard. A water sample taken from the groundwater sump of the dam on Portion 196 has an electrical conductivity of 270 microsiemens/cm at 25°C. This is equivalent to a total salinity of about 170 mg/litre and suggests a very local recharge from rainfall.

Portion 198 is in a topographic low area and in the discharge zone of the regional groundwater flow through the Hawkesbury Sandstone aquifer as well as the flow in the perched aquifers formed by the deep weathering of this sandstone.

The rock aquifers have been shown to have a transmissivity range of 0.06 to 2.3 cu.m/day. The bulk permeability and specific yield of the in situ sand are estimated at 0.1 m/day and 1% respectively. A total thickness of sand aquifer of 15 metres will have a transmissivity of 1.5 cu.m/day which is within the ranges calculated for the rock aquifers (Australian Groundwater Consultants, 1986). During excavation of the now completed extraction area in the north of Portion 198 a number of groundwater seepage zones were observed. The flow rate was estimated at less than 0.05 l/s.

Groundwater levels have been measured using the open drill holes remaining from the exploration of the site. The depth to water varied across the site from 0.6 m near the creek in the lower part of the site to 18 metres on the ridge to the south. Generally the water levels were at a depth of about 2 to 4 metres and the groundwater level is following the surface water trends.

3.7 CLIMATE AND AIR QUALITY

Climatic data was obtained from the Bureau of Meteorology. The climate is described as generally temperate with warm to hot summers and cold to mild winters. The extremes in temperature are generally greater than those experienced in the Sydney area.

Average rainfall is about 839 mm/y. The distribution of rainfall and its comparison with that at Glenorie and Sydney to the south are shown in Table 3.7.1.

TABLE 3.7.1 CLIMATE DATA

ITEM	J	F	M	A	M	J	J	A	S	O	N	D	YEARLY AVERAGE
Temperature (°C)													
Average Maximum	26	26	25	22	21	18	17	19	21	23	24	26	
Average Minimum	18	17	16	14	11	8	7	8	10	12	16	17	
Rainfall (mm)													
MAROOTA	98	84	91	90	55	96	50	46	57	67	75	77	839
GLENORIE	107	101	100	79	79	104	57	66	52	72	77	79	973
SYDNEY	120	123	135	105	99	115	84	72	58	76	80	95	1,162

Wind data is available from a gauging station operated by the Bureau of Meteorology at Glenorie Post Office. As Glenorie is located 20 km to the south and because the batching plant will be located at the foot of a steep, high cutting in a ridge to the south of the site it is expected that there will be, at the micro level, some local divergence from conditions experienced at Glenorie.

Wind probability data for both 9 a.m. and 3 p.m. for the three periods, January to April, May to August and September to December are contained in Appendix B. Morning breezes throughout the year occur in a sector between north west and south west with by far the majority of movements rising from the north west. For evening breezes, although May to August movements occur generally from between the same north west to south west sectors, the predominant annual movement is from the north east to south east sector with the greatest percentage coming from the east.

3.8 ACOUSTIC ENVIRONMENT

The existing acoustic environment within the area adjacent to the proposed extraction and processing operations was investigated by measuring background noise levels adjacent to the nearest residential areas. A detailed acoustic study of the earlier proposal to establish the central processing plant is contained in Appendix C. In order to preclude any suggestion of the use of an already impacted acoustic environment as an indicator of existing background noise levels, it was considered that the pre-processing plant acoustic environment should continue to be accepted as the base background.

Background noise monitoring positions representing individual residences or noise sensitive areas are labelled BG1, BG2 and BG3 in Figure 12. Positions BG2 and BG3 are representative of residential properties on Wisemans Ferry Road in close proximity to the proposed extractive operation. Position BG1 is adjacent to the Maroota Public School on Old Northern Road and is considered to represent the existing noise climate at potentially noise sensitive locations along Old Northern Road.

Noise surveys to establish the existing noise environment in the vicinity of the proposed operations were carried out on 9 September, 1989. The ambient noise surveys were conducted in accordance with the Australian Standard 1055-1989 "Acoustics - Description and Measurement of Environmental Noise" and the State Pollution Control Commission (SPCC) Environmental Noise Control Manual. The weather on the occasion of testing was fine with a light north/north-easterly breeze.

The results of the ambient noise surveys are presented in Table 3.8.1, and are analysed in Appendix C.

TABLE 3.8.1 AMBIENT NOISE SURVEYS - RESULTS

Monitoring Location	Time	Noise Levels (dBA)				Noise Sources
		L1	L10	L90	Leq	
BG1	1145 - 1200	79	63	43	65	Road traffic, birds, trees rustling.
BG2	1210 - 1225	75	62	38	62	Traffic, birds, insects, trees rustling, distant machinery.
BG3	1230 - 1245	70	53	37	56	Road traffic, birds, insects, trees rustling.

3.9 EXISTING VEGETATION

The original vegetation has been completely removed from those parts of the central operations area upon which the approved processing plant and the adjoining, proposed concrete batching plant will be located. Where both possible and desirable, existing vegetation has been retained in nearby sectors where it will serve as visual screening from the east.

The remainder of the site within and adjoining the environmental protection zones along the watercourses through Portion 198 is naturally vegetated with considerable variation in structure and species composition between remnant growth on the higher, more exposed slopes, and the lower, more sheltered slopes along those drainage lines. The vegetation can be divided respectively into two major structural groups - Shrubby Low Open Woodland/Shrubby Woodland, and Grassy Open Forest, the extent of which is shown in Figure 6. Additionally, along the beds of the drainage gullies an unusual riparian association has developed. Appendix D contains the detailed assessment of the vegetation in the conservation area adjoining the proposed plant site.

3.10 NATURAL FAUNA

The area surrounding the site affected by this proposal is within the ridge-top plateau much of which, due to agricultural activities, has long been denuded of natural vegetation. It is most likely that the cleared areas are frequented only by mobile species with habitats established in the surrounding bushlands.

A specific fauna study was not undertaken of Portion 198, however studies conducted for nearby proposals on Maroota Ridge (Collin C. Donges and Associates Pty Limited, 1979, Appendix E) are assumed to be representative of the fauna that could be expected on the subject site.

It is significant to note that a number of bird species has often been observed in very close proximity to existing extraction sites in the area, including Portion 198, while extractive operations were under way. However, some more timid species may temporarily move away from bushland immediately adjacent to the proposed works area until construction is completed.

A complete list of bird species observed and species that may exist in the area is given in Appendix E.

Common reptile and mammal species typical of the area could also be expected to have habitats near the site. However, the plant site itself would not now contain any unusual habitat characteristics or rare and endangered species and all habitats are well represented in the surrounding bushland and in the National Park system.

3.11 ARCHAEOLOGICAL INVESTIGATIONS

During November 1989, the overall, Portion 198 development area was surveyed for Aboriginal Archaeological sites. Although much of the site had been disturbed by agricultural land clearing activities there are many areas that could still have traces of past Aboriginal activities, such as rock engravings, grinding grooves and stone artefacts.

No sites were found during the survey but, due mainly to poor ground surface visibility, some could remain undetected. Results from other surveys in the region predict that archaeological evidence in the present study area is likely to be sparse. As a result, no further archaeological work is thought to be necessary. No archaeological material was found during the initial extraction operations which preceded the final levelling of that part of the Portion 198 central operations area upon which the processing plant will be located and upon which the concrete batching plant is sought to be located..

3.12 VISUAL ASSESSMENT OF THE SITE

3.12.1 Visual Characteristics of Maroota

The Maroota area forms part of the Hornsby Plateau - an upland which has been deeply incised by tributaries of the Hawkesbury River. The ridge and valley terrain is complex and the pattern of land use closely reflects the pattern of topography and soils (Cameron McNamara, 1987).

Portion 198 is typical of the upper slopes of Maroota Ridge in that it is characterised by thickly vegetated incised gullies between more sparsely forested rocky ridgelines. Approximately 50% of Portion 198 has been stripped of vegetation by past agriculture, extractive industrial and processing plant area operations. One new dam has been created as a result of early extraction activities and another is being built as part of the water supply and sedimentation control system required by the processing plant and, if approved, the concrete batching plant.

3.12.2 Visual Sensitivity of the Site

Visual sensitivity is an indication of the degree to which the visual resources of an area may be affected by development such as extractive industry (Cameron McNamara, 1987).

The existing processing plant site is not visible from outside the Portion and, as a consequence, neither would the proposed batching plant. The only distant viewsheds to the site are from the west, which is uninhabited. There is a closer viewshed from several hundred metres of Old Northern Road to the east and at this stage it is possible to gain glimpses of the eastern side of a large earthen mound which, running in a south to north direction, has been pushed up as an acoustic/visual barrier to the east of the central processing plant area. It is intended to extend this mound to the north prior to its later revegetation.

Because of the generally enclosed location of the proposed development and the degree of visual disturbance resulting from the existing pit, the slight intrusive nature of the above mound can be considered to be of low visual sensitivity even in its present denuded form.

3.13 TRANSPORT

The major transport routes servicing the Maroota area are the classified Main Roads, Old Northern Road (MR 181) and Wisemans Ferry Road (MR 160). Old Northern Road in this locality had an Annual Average Daily Traffic Flow (AADT) of 2088 vehicles in 1987. In that year Wisemans Ferry Road had an AADT of 1663 vehicles. In 1989 the AADT counts for the same two locations had dropped to 1642 for Old Northern Road and 1481 for Wisemans Ferry Road. These and other major and minor servicing roads are shown in Figures 2, 5 and 13.

The Haul Road across the water reserve and running from Wisemans Ferry Road to Portion 198 (Figure 12) has been approved, is constructed, and should be in use by the

time of lodgement of this application. When completed, the Haul Road will provide the primary access to the extraction areas and to the processing and batching plant sites.

The primary routes used by trucks delivering pre-mixed concrete are shown in Figure 13. Although the proportion of trucks using Old Northern Road and Wisemans Ferry Road as delivery routes is not quite equal, the volume of material passing along each road is very similar. The predominant route for the delivery of cement, flyash and aggregate, the latter as backloading from the Emu Plains/Penrith area, will be Wisemans Ferry Road.

A limit of extractive industry traffic generation from the existing extraction operations was set in previous development consents for Portions 196, 117, 167 and 198. A maximum of 100 loaded vehicles per day was permitted from the sites serving the processing plant. Approval has also been granted for 50 loads of unprocessed sand to be transported from Portion 167 along the Haul Road, to Portion 198 for processing - at the time of writing this operation has not yet commenced although construction of the Haul Road from Wisemans Ferry Road to Portion 167 has been completed. It should be noted that, again at the time of writing, the proponents of this batching plant have applied to Baulkham Hills Council to have total outgoing laden truck movements increased to 200 per day. The vehicle movements generated by the proposed batching plant would be contained within the total of 200 laden outgoing movements as sought.

Trucks of 15-25 tonne capacity carrying an overall average of 18 tonnes per trip are used for sand haulage and will continue to be used to transport aggregates from Emu Plains/Penrith to Maroota. Cement and flyash, if the latter is used, will be delivered in 22 tonne pneumatic tankers, and pre-mixed concrete will be delivered to the market place in 6 cubic metre (14 tonne) mixer trucks. In 1989 P.F. Formation vehicles comprised approximately 29% of all truck traffic using Old Northern Road at Maroota, and less than 7% of heavy vehicle movements on Old Northern Road at Dural. It is thought that these percentages will not have changed significantly.

The impact of, and the implications for road maintenance of the use of Old Northern Road by P.F. Formation vehicles has been recently examined in great detail in the Land and Environment Court. The judgment of the Court was that a contribution of 50 cents

(indexed to inflation) per tonne of product material is to be paid to Baulkham Hills Shire Council to go towards the maintenance and upgrading of Old Northern Road and Wisemans Ferry Road. It is anticipated that this figure, most recently indexed to 55 cents per tonne, will now also apply to outgoing loads of concrete but not to material brought in as backloading. This anticipation stems from the fact that the levy which is already paid for use by laden vehicles travelling in one direction, has been arrived at by using cost estimates relating to the repair, upgrading and maintenance of the full width of the road system. In effect, the levy on the forward journey already covers the cost of works required on that side of the road used for the return journey. On the assumption that this levy adequately addresses the impact of existing extraction operations on the use of the main road network, no further examination of the subject will be made here. The matter is however further discussed in a response to the RTA letter as previously mentioned at point 1.4 above.

PART 4 - PROPOSED DEVELOPMENT

PART 4 PROPOSED DEVELOPMENT

4.1 Main Components of the Proposed Plant

A site plan of the proposed concrete batching plant is included as Figure 14.

Raw materials are to be combined in the required amounts with water and loaded into concrete mixer trucks to be delivered as pre-mixed concrete to construction sites.

The proposed plant consists of the following major equipment:

- Compressor;
- Silo base and 7m³ cement hopper, 2 x 56m³ capacity (75 tonne) cement and flyash storage silos;
- Cement weigh scale;
- 7m³ aggregate weigh hopper and 750mm wide loading conveyor to GOB hopper;
- Small additive container/dispensers;
- Reverse pulse (Fowlerex Pulsmatic) fully automatic dust filtering system with State Pollution Control Commission (SPCC) overfill kit;
- 4 x 40 tonne aggregate storage bins;
- Ramp for front end loader to load aggregate from the storage bins into the weigh hopper;
- Aggregate weigh scale;
- Waste-water and first-flush water collection and water-recycling systems, and
- A water supply tank (which may or may not be located inisde the batching plant enclosure).

4.2 Capacity of the Proposed Plant

The full potential capacity of the proposed plant is estimated to be approximately 36,000 tonnes per annum. However, due to fluctuations in demand for concrete and limitations with regard to hours of operation, it has been further estimated that, if the plant were ever fully operational,l actual production capacity would be in the vicinity of 30,000 tonnes per annum. This latter figure is used in calculations of eventual truck movements and raw material requirements. In those later calculations it is assumed that the standard concrete mix will comprise only aggregate, sand, cement and water. However, in practice, the operators will most likely add flyash as a special purpose component. The use of flyash, which is a cement substitute, enables the production of a concrete which uses less cement per cubic metre of product. Since flyash weighs less than cement the proposed second silo will, if used for flyash, have the potential to decrease incoming raw material delivery vehicle numbers.

4.3 Hours of Operation

The proponent seeks permission to operate the proposed concrete batching plant during the following hours:

6.00 am - 6.00 pm Monday to Saturday

There will be no operation of the plant or delivery of raw materials outside these hours.

Richard Heggie Associates, in their acoustic assessment report (Appendix C), recommends, due to strict SPCC noise control requirements between the hours 6.00 am and 7.00 am Monday to Saturday, that i) the unloading of aggregate trucks, ii) the unloading of cement and flyash tankers and iii) the wash out of agitator mixer trucks not occur within that 6 am to 7 am period.

Although the proponent seeks to commence operations at 6.00 am Monday to Saturday inclusive, it is proposed not to perform any of the above mentioned operations prior to

7.00 am. To enable the commencement of batching at 6.00 am, all delivery of raw materials will be completed prior to the closing of the plant in the previous afternoon. In addition, to overcome the need to use the front end loader prior to 7 am, aggregate will be loaded to the weigh hopper prior to ceasing operation in the evening.

Emergency breakdown maintenance may be required outside the above operating hours but such events would be infrequent.

4.4 Manpower

The proposed concrete batching plant, should it reach full productivity, will operate using the following manpower:

concrete agitator truck drivers	2 persons
batcher/allocator/plant manager	1 person
Total personnel	3 persons.

This figure may alter during periods of peak production according to the number of concrete agitator trucks that are required during large pours. Permanent on-site employment is restricted to the batcher/allocator/plant manager.

4.5 Raw Materials

The resources required for the manufacture of pre-mixed concrete are:

. cementitious materials;

. flyash;

. fine aggregate;

. coarse aggregate;

. water, and

. minor special additives.

In the production of standard concrete mixes, fine to medium grained sand is mixed with coarser sands, aggregate and cement in the following proportions:

Ingredients for 1 cubic metre	**Quantity tonnes**
Aggregates	1.1
Sand	
- coarser	0.6
- fine to medium	0.3
Cement	0.25/0.30

The presence of fine to medium grained sand helps to minimise the need for cement which accounts for a minimum of 50% of the total cost. All of the necessary grades of fine aggregate will be readily available on site.

Water

To make 100 cubic metres of pre-mixed concrete requires approximately:

. 220 tonnes of the above mentioned raw materials, and

. 10 tonnes of water.

The water to be used in all phases of the process, including concrete batching, vehicle and yard wash-down and aggregate spraying, will be drawn from the clean water dam

associated with the central processing plant. This water will be stored in a tank on or above the batch plant site and, as used, will be topped up with water drawn from the waste water recycling tank system.

4.6 Raw Material Delivery and Storage

Aggregate will be delivered to the plant using 22 tonne capacity articulated delivery trucks. This material will be carried as backloading in vehicles which have already delivered processed sand from Maroota and which are returning to Maroota via the Penrith/Emu Plains area.

These trucks will not normally require to enter the batching plant enclosure since they will turn off the major internal access route onto a service road along the south-east boundary of the compound. This road takes the trucks to a higher level from which they can load material into the ground bins within the plant site on the level below (Figure 14).

Cement and flyash will be delivered to the site by way of pneumatic tankers. These tankers will also enter the site via the western gate. Once on-site the tanker can either drive to or reverse to the unloading facility at the side of the batching plant (Figure 14).

Cement and flyash will be stored in overhead silos which are part of the batching plant. These silos will be fitted with SPCC approved loading devices enabling the cement and flyash to be loaded to the silos using air pressure. Air is forced into the tanker, the build-up of air pressure in the tanker forcing the cement/flyash from the tanker via hoses connecting the tanker to the silos thus eliminating the potential for dust pollution.

4.7 Raw Material Loading Operations

Aggregate from the inground storage bins will be loaded into the aggregate weigh bin by front end loader which in turn transfers it to the conveyor which then transports the aggregate to be mixed with cement from the cement weigh bin as both materials pass through the gob-hopper and into the agitator mixer barrel.

To prevent dust pollution and the carrying of excess raw materials from the site, trucks will be washed down prior to leaving the batching plant compound. The water discharged from the trucks during this process is collected by cut-off drains and flows to water recycling ponds to eventually be recycled in the concrete making process (Figures 16 and 17). This procedure prevents the flow of waters into non-sealed areas outside the plant compound.

4.8 Traffic Generation

Traffic generated by a concrete batching plant is directly related to the tonnage of concrete produced. The proposed plant will have an absolute maximum capacity to produce 60 cubic metres per day, this, over 50 five and a half day working weeks per year, is a maximum capacity of about 36,000 tonnes per year. In the first instance, however, the proponent expects to produce only about 40 tonnes per day or, over the above described year, 11,000 tonnes. Even at later maximum production rates, if ever achieved, it is not expected that the plant could achieve a production of 30,000 tonnes per year.

Traffic movements both to and from the site will be a combination of raw material delivery trucks, agitator trucks and employee and visitor vehicles.

Traffic generation is assessed on the basis that there are 275 operating days per annum which represents 50 weeks at 5.5 days per weeks. This, because of domestic demand for small amounts of concrete over holiday periods, is a longer working year than that allowed for in the extractive industrial sector of the site. The latter use aims at only 250 working days per year.

Waste Removal

This will not generate any vehicle movements since all wastes from the plant will be either recycled for further use or, once hardened, disposed of in fines settling ponds or as other clean backfilling.

Employees and Visitors

3 employees @ 1.5 return trips per day	4.5 return trips
1 visitor @ 1.5 return trips per day	1.5 return trips
Total return car trips per day	6

Six car trips per day is equivalent to 12 light vehicle movements.

Raw Material Delivery Trucks

A 30,000 tonne per annum concrete batching plant will use 28,670 tonnes of raw material and cement per annum. This figure allows for 4.4% water in the finished product.

Adopting the constituent components of the dry mixed finished product in the following proportions:-

Aggregate:sand:cement = 1.1:0.9:0.275

The 28,670 tonnes of dry raw materials in 30,000 tonnes of wet mixed concrete will contain:-

Aggregate	(48.3%)	=	13,847.6 tonnes
Sand	(39.6%)	=	11,353.3 tonnes
Cement	(12.1%)	=	3,469.1 tonnes
Total			28,670.0 tonnes

If this is converted to raw material delivery movements there is no need to take account of sand delivery, since this is available on site, and at maximum production rate the following deliveries, in 22 tonne vehicles, would be required:-

Aggregate	-	630 per year
Cement	-	158 per year

The aggregate, however, would arrive at the site as backloading in vehicles which would be returning to Maroota whether or not the concrete batching plant was operating, and the only new laden delivery movements would therefore be those made by cement tankers at the rate of three per week. This represents a total of six new road movements per week. Note, however, that these numbers will be further reduced when and if the second silo is used for flyash rather than cement.

Concrete Mixer Trucks

A 30,000 tonne per annum concrete batching plant will produce 12,766 cubic metres of concrete per annum. The proposed plant will mostly use 6 cubic metre agitator trucks for delivery of pre-mixed concrete.

To deliver 12,766 cubic metres of concrete would require 2,128 deliveries per year in six metre capacity three axle rigid type trucks. However, about 40% of the pre-mixed concrete is sand which would have been transported from the site in any case. This 40% of 30,000 tonnes represents 600 out-movements in 20 tonne capacity vehicles. The net increase in laden movements generated by the importation of raw cement and the delivery of concrete is therefore 1,528 per year or six per day over a 275 day concrete manufacturing year.

Therefore, disregarding small vehicle movements, the proposed plant, when operating at full capacity, would generate an additional 6.5 laden vehicles, or 13 movements per day. It should be realised, however, that it is the intention to commence operations with anticipated orders at the rate of only one third full capacity, that is, 11,000 tonnes per year. This represents about four additional total movements per day. At this stage the proponents believe that this number of additional movements can be accommodated within the total of 400 daily movements (laden plus empty) permitted from the existing approved central processing plant. Even should demand on the batching plant increase it is considered that the above 400 movement limit will be satisfactory and no additional movements are therefore sought as a consequence of this development proposal.

4.9 Transport Routes

Raw material delivery to the site will be from the Penrith area. The main road routes for delivery of concrete and aggregate are shown at Figure 13. These are Old Northern Road and Wisemans Ferry Road within Baulkham Hills Shire and, depending upon points of demand beyond Dural and McGraths Hill at Windsor, other roads within that Shire and adjoining shires.

With the exception of a scatteration of rural-residential dwellings and farm houses along the above two main roads, Glenorie on Old Northern Road and McGraths Hill on the extension of Wisemans Ferry Road are the closest residential areas. Raw material delivery trucks will pass through Glenorie and will not use residential streets in the McGraths Hill area. Concrete mixer trucks will not use any Baulkham Hills or Hornsby Shire residential roads unless delivering concrete therein.

Raw material delivery trucks from Penrith will access the site via Wisemans Ferry Road. There will be, on average, only one cement delivery every second day. All other raw material deliveries will be in trucks which are returning to Maroota in any case. Deliveries of pre-mixed concrete will, at full production, generate an additional six laden movements per day. It has been estimated that the demand for concrete will generally be divided between areas to the south, south-east and south-west of the site. There will, however, be some deliveries to the north. Consequently, it has been estimated that four laden concrete mixer trucks per day will use both Old Northern Road and Wisemans Ferry Road. These numbers, however, represent, at full production, an actual increase of four per day in the former road but only two per day on the latter road.

4.10 Energy

The proposed plant has been designed to operate using electric power. Prospect Electricity has already provided supply to the site.

Concrete mixer trucks will be a mixture of petrol and diesel powered vehicles.

Consumption of fuel will be directly related to the demand for concrete from the plant, the distance travelled to those markets, and the times at which loaded vehicles are permitted to leave Maroota.

4.11 Fuel Storage

The proposed concrete batching plant has no provision for the on-site storage of fuel.

4.12 Vehicle Storage

Under initial operating conditions the proposed concrete batching plant will be serviced by only two concrete mixer trucks. This may later increase to three or even four at times of high demand. These trucks will be parked on-site overnight. Adequate on-site parking facilities will be available within the concreted, fenced batching plant compound.

PART 5 - WATER POLLUTION CONTROL MEASURES

PART 5 WATER POLLUTION CONTROL MEASURES

5.1 Potential Sources of Contaminated Water Discharges

The operation of a concrete batching plant generates waste water that may be contaminated with sediment. The concrete industry together with the SPCC Clean Waters Branch has developed effective means of preventing the discharge of contaminated water that would otherwise occur during the operation of a concrete batching plant or during rainfall. During rainfall the first flush of stormwater from the specially graded and drained dirty areas of the yard is collected and held for recycling through the concrete batching plant.

As a concrete batching plant is a net user of water, the recycling of waste water serves to prevent contaminated waste water discharging to natural waterways and enables water usage costs to be reduced.

Potential sources of contaminated water discharges include:

5.1.1 Construction Phase

The potential exists for sediment run-off from the site during the construction of the yard area, the concrete batching plant, and the pits and drainage works.

5.1.2 Operation Phase

During operation there are two potential sources of contaminated water:

- process water generated during the operation of the concrete batching plant, and
- stormwater run-off from the yard area made dirty by the spillage of raw materials during the loading of mixer trucks. The yard is divided into dirty and clean areas. There are specific requirements for run-off water from dirty areas. A sediment trap is required for clean areas.

5.2 Measures to Control Contaminated Water Discharges

The following measures have proved effective in the control of water discharges from a concrete batching plant. They are considered to satisfy the requirements of the SPCC and Soil Conservation Service and are to be incorporated into the construction and operation phases of this proposal.

5.2.1 Construction Phase

The site will be virtually flat but, apart from special grading of the dirty yard area, will generally have a slight fall to the north-west corner.

By the time of the initial construction stage of the proposed plant, sediment traps and stormwater diversion bunds will have been erected along the downhill side of the overall central processing plant area (see Figure 18). These works will function to divert run-off and sediment from the site and into a long, shallow sedimentation pond prior to eventual discharge into the clean waters of the dam used for supply to the adjoining sand processing plant.

Construction operations can be expected to mobilise additional sediment if rainfall occurs. However, because the whole compound area will be paved prior to the erection of the major components of the plant and because all run-off from this paved area will be directed to above sediment trap constructed outside the compound, the potential for additional erosion and sedimentation will be largely eliminated. Even should high rainfall cause excessive run-off to flow from this sediment pond, any such discharge would have to pass through the major processing plant clean water dam before it could possibly discharge into the surrounding natural drainage system.

5.2.2 Operational Phase

Clean Yard Area

The clean yard area will drain to a large sediment pond before discharging into the clean water supply dam outside the compound. Any sediment which actually reaches the water supply dam will be suspended in waters which will be used in the sand washing process and will eventually mix with the fines from the sand washings and pass through a major series of large settling ponds before the thus cleaned waters eventually travel the full cycle and return to the clean water supply dam (Figure 18).

Dirty Yard Area

Run-off from the dirty yard area will drain into below ground level collection tanks for recycling.

All of this dirty yard run-off water, whether it is process water from i) the mixer truck loading operation, ii) washing-down of the plant and mixer trucks, iii) clean water out of mixer barrels or iv) rain water run-off, will be diverted to the settling tanks.

5.3 Water Recycling System

The following principle of operation is adapted from *The National Ready Mixed Concrete Association (NSW) Ltd Enviromanual.*

All contaminated water flows to the settlement pit for re-use. The volume of stormwater to be retained is equivalent to a specific depth over the catchment area.

A 10 mm depth of rain water should be able to be held in the water collection and recycling system. As is seen from Figures 14 and 16, the dirty yard area is approximately 210 m^2. A depth of 10 mm over this area approximates to 2,100 litres of rain water. This run-off would be equivalent to the first 5-10 minutes of heavy rain. The design, which provides capacity for a 13,500 litre storm surcharge prior to overflow, meets the current requirements of the SPCC.

Any contaminated rain water from the dirty yard area flows into the distribution drain between the second washout pit and the first settlement pit and is directed into that latter pit. The water level in the first and second settlement pits rises until the necessary first flush volume is contained. At this point the levels in the system are designed to redirect the water entering the distribution drain into stormwater overflow drains.

Water in the twin sediment tank flows over a central weir into a holding pit from which it is pumped to the daily use tank mounted on the plant. The settling sections of the pit system are periodically cleaned out.

The mixer truck wash-out facility is fitted with a drainage system which also flows into the settling pit system.

The north west corner of the site will, if considered necessary, be fitted with a simple sediment trap for removal of sediment from the clean yard area. The sediment trap is a safeguard measure designed so that it will not be used as a holding tank. Given the presence of a further downslope sediment pond and storage dam, however, this on-site sediment trap is thought to be superfluous. The proponent is open to further directions in this matter.

During the agitator truck loading operation it is inevitable that water is discharged into the loading area. The quantities of water spilled per load of concrete are small. As spillage of raw materials does occur in this area, this water will also drain into the water recycling system.

PART 6 - AIR POLLUTION CONTROL MEASURES

PART 6 AIR POLLUTION CONTROL MEASURES

6.1 Potential Sources of Air Emissions

It is recognised that all concrete batching plants have the potential to emit dust. Proper design and maintenance should mitigate these emissions.

Three potential sources of dust emission are recognised:

. the conveying of raw materials from storage areas to hoppers;

. the loading of these materials into agitator trucks, and

. emissions released from the yard and material storage areas.

The potential for dust release exists in the following areas of the proposed plant:

. yard and truck traffic areas;

. aggregate handling during delivery;

. transfer of raw materials by front end loader from the main aggregate bins to the weigh hopper;

. filling of cement and flyash silos from bulk tankers;

. the transfer of the cement and flyash from the silos into the weigh hoppers, and

. discharging of batched materials into the agitator barrels.

6.2 Measures to Control Emissions

Measures used to prevent the release of dust from the operation of the proposed concrete batching plant are described below:

- all yard and traffic areas are to be sealed with concrete pavement;
- the yard area is to be regularly washed and swept clean;
- aggregates are delivered in damp condition or damped down prior to tipping;
- if aggregate in the main bins dries out it will be spray damped prior to front end loader pick up and tipping into the weigh hopper;
- a bag-house filter system of approximately 7 sq.m. of filter cloth will be fitted to prevent cement dust emissions during the filling of cement silos;
- a high level indicator interlocked to a cut off valve will be fitted to the cement/flyash inlet (or filler) lines;
- air tight inspection hatches will be fitted to the silos, and
- the outlet from the bag filter is ducted to within the relatively wind-free environment a metre from the ground.

During the transfer of cement/flyash from the silos into the cement weigh hopper and to the gob hopper the following safeguards are employed:

- airtight connections on all equipment, and
- rotary gate valves which will be fitted to all silos and weigh hopper outlets.

During the transfer of materials from the gob hopper to the agitator truck barrel the following pollution reduction measures will be employed:

- the discharging point of the gob hopper will be fitted with a rubber sock to enable materials to flow, with no loss, into the chute on the mixer barrel, and

- a water spraying is fitted around the charging chute.

With the application of these controls the operation of the proposed plant will have negligible impact on the existing air quality of the surrounding area.

PART 7 - WASTE CONTROL

PART 7 WASTE CONTROL

7.1 Introduction

At the end of each days' production the mixer truck barrels are washed out. An above ground wash out tank capable of periodic cleaning will be installed as part of the proposed plant. No waste will be discharged on the site other than into the wash out tank or into moulds constructed for the purpose of making concrete blocks or concrete pavement out of otherwise surplus and wasted pre-batched return materials.

7.2 Solid Waste Disposal

Occasionally mixer trucks are forced to return to the batching site with some concrete remaining in the mixer barrel.

Should a market for this returned concrete not be found immediately, the concrete is washed out of the mixer barrel and allowed to harden as solid waste or poured into moulds in the production of concrete blocks.

The solid waste material is collected into two wash out pits as indicated in Section 7.1 above.

Solid Waste Disposal Options

There are several options available for the disposal of solid waste material:

- use in on-site concrete moulds;
- disposal as on-site fill, and
- re-use by blending with road base at a quarry.

The method of disposal of solid waste material from the site will be a combination of the above mentioned options depending on the circumstances of each case. Unless these materials are used or disposed of on-site, which is the most likely case, the disposal method employed will be carried out in accordance with the guidelines and requirements of the Metropolitan Waste Disposal Authority.

The methods employed to batch and deliver concrete are advanced to the stage where competitiveness ensures strict supervision and the efficient use of materials. As a result the quantity of solid waste that will be generated by the concrete batching plant will be insignificant.

PART 8 - NOISE EMISSION AND ACOUSTIC SAFEGUARDS

PART 8 NOISE EMISSION AND ACOUSTIC SAFEGUARDS

8.1 Introduction

A concrete batching plant has the potential to create acoustical impact on the environment.

Equipment and procedures with the potential to cause noise pollution at a concrete batching plant include:

- agitator mixer motors used in charging. During this operation the mixer barrel is rotated to mix the raw materials prior to leaving the plant;

- agitator mixer wash-down. During the wash-down procedure the mixer barrel is rotated at high speed, the main source of noise being the engine used to power the mixer;

- transportation of aggregate from aggregate storage bins and subsequent loading into the aggregate weigh hopper, and

- auxiliary engines used to unload cement and flyash from delivery tankers. The tankers use a compressor that is powered by an auxiliary engine or a power take-off from the engine of the prime mover.

8.2 SPCC Acoustic Criteria

The standard SPCC noise pollution control criteria outlined in the Commission's Environmental Noise Control Manual have been adopted to test the potential for noise pollution from the plant.

For residences in rural areas the SPCC recommends the following outdoor background noise level objectives as per Chapter 21 of its Environmental Noise Control Manual.

Time Period	Acceptable Limit	Extreme Limit
Day	45 dBA	50 dBA
Night	35 dBA	40 dBA

Day - 7.00 am to 10.00 pm Monday to Saturday
8.00 am to 10.00 pm Sunday

Night - 10.00 pm to 7.00 am Monday to Saturday
10.00 pm to 8.00 am Sunday

8.3 Existing Acoustic Environment

Statistical measurements of typical existing daytime background noise levels at selected monitoring locations at and surrounding the then proposed central processing plant were conducted by Richard Heggie Associates Pty Ltd on the morning of 9 September 1989. The selected monitoring points are indicated at Appendix C and at Figure 12. The consultant's report relating to the central works area within Portion 198 is an essential part of this EIS as it shows, even with operating hours commencing at 6.00 a.m., that the acoustic impacts arising from site and sediment pond extraction operations, plus wash plant activity, were considered to be acceptable at nearby residences.

The proposed concrete batching plant contains many components which are already incorporated within the central processing plant operation as analysed in the Heggie Report. These items are:-

- the air compressor;
- the front end loader;
- on-site truck movements, and
- truck movements upon the haul road

- so that, to some extent, much of the batching plant operation has already been assessed as having acceptable impact at nearby receptor area.

8.4 Noise Level of Equipment and Operations at Proposed Plant

The equipment and/or activities considered as potential noise sources in predicting the operation noise levels at this site are:-

- batching plant;
- compressor;
- front end loader;
- concrete trucks;
- wash out facilities;
- bulk cement deliveries, and
- trucking operations.

The above equipment/activities are described in more detail in the following sections.

8.4.1 Batching Plant

The batching plant will be free-standing steel framed structures supporting silo and batcher equipment. Although the brand of the particular plant to be used has not yet been decided, and may indeed be a pre-used, fabricated model, its basic components will include:-

- a drive through truck loading area;

- two 75 tonne silos standing, in all, some 18.5 metres above ground level. The plant will initially use only one silo for cement and will probably later use the second silo for flyash;

- charging bins and conveyor constructed at the head of a drive up ramp used by the front end loader to deposit aggregate carried from the raw material bins.

Even though the equipment has not yet been selected, total maximum noise emission from this type of plant would not exceed 85 dBA at one metre.

8.4.2 Service Compressor

A service air compressor is required to supply compressed air to the plant. The compressor will be selected with a noise specification of less than 75 dBA at one metre and located in a plant room. It is again brought to note that this is the same unit as that which will be in use at the adjoining central processing plant.

8.4.3 Front End Loader

A Case 580C front end loader, also already proposed for the wash plant operation, with which use it will be shared, will be required to handle raw material loading for the concrete batching plant. Typical noise levels generated by standard front end loaders (wheel type) are between 88-89 dBA at seven metres. With the fitting of a standard noise control kit an additional 8 dB noise reduction can be achieved.

8.4.4 Concrete Truck Loading at Batch Plant

In the process of loading the agitator trucks with concrete ingredients, each truck in turn will be located at the base of the batching plant. The truck will set its barrel into a rotating mode while the ingredients are being fed. Total noise emission from this source will not exceed 90 dBA at one metre.

Trucks in the loading bay will be shielded from all surrounding off site receptors by a combination of a purpose built, high embankment and the natural rock escarpment which together circle the processing plant and batching plant areas in an arc running from the south-west to the east.

8.4.5 Wash Out Facilities

As trucks return to the site they proceed to the wash out facility to clean out excess concrete. This operation consists of flushing out the barrel while it is in a rotating mode. Total noise emission from this source will not exceed 95 dBA at one metre.

Trucks at the wash out facility will also be shielded to surrounding receptor locations by man-made and natural mounds and walls.

8.4.6 Bulk Raw Material Deliveries

It has been estimated that a maximum of up to six deliveries of bulk cement and flyash could eventually be made each week. The deliveries would be made by bulk pressure tankers self equipped with power packs. Noise emissions from the power pack will be specified not to exceed 85 dBA at a distance of seven metres.

Aggregate carried as back loading will be tipped in the raw material bins at the rate of about 2.5 loads per day under full production input.

8.4.7 Trucking Operations

Trucks entering and leaving the plant compound could generate peak noise levels of between 86-90 dBA at seven metres distance while on site.

The transport route into and out of the site will be via an approved haul road.

The product transport fleet will initially consist of two six metre trucks only.

8.4.8 Vehicle Movements on Site

The site layout is such that agitator vehicles entering the batching plant compound will enter by the western gate and depart by the eastern gate.

Aggregate delivery trucks will be able to enter the compound from either end but, in the longer term, it is planned that they will travel along a high level service lane beside the southern sides of the compound and then tip into the raw material bins from an upper level platform.

All ground surfaces that will carry the transport vehicles will at all times be kept both damp and well graded.

8.5 Measures to Control Noise Emissions

The following noise attenuation measures will be employed at the proposed concrete batching plant:

- batching plant: total noise emission not to exceed 85 dBA at one metre, chutes, hoppers, etc. to be lined with rubber or similar sound deadening lining material where necessary;

- service compressor: the air compressor shall be selected to a noise specification of 75 dBA at one metre and enclosed in a plant room;

- trucking operations: the internal road system will be kept smoothly graded;

- front-end loaders used on site shall be selected (with a noise control kit if required) to a noise specification of 81 dBA at 7 metres;

- bulk cement deliveries: the unloading of bulk cement shall be restricted to the hours of 0700 to 1600 and power pack should be selected not to exceed 85 dBA at a distance of 7 metres;

- agitator wash outs: to be prohibited prior to 0700;

- bulk raw material deliveries: the unloading of aggregate trucks shall be restricted to the hours of 0700 to 1600;

- material storage: bulk materials will be stored in holding bays along the southern boundary of the site. To reduce noise propagation the rear and extreme end walls of the holding bays will be constructed to a height of 3 metres above plant ground level;

- the operating hours of the development will be restricted to between 6.00 a.m. and 6.00 p.m., Monday to Saturday;

- lining the side of the weigh hopper where falling aggregate strikes its sides;

- the use of agitator mixer trucks with hydraulically operated barrels. The use of hydraulically operated barrels eliminates the need for an external motor on the mixer. The barrel is rotated using hydraulic power supplied by the truck motor effectively eliminating motor noise during wash-down and wash out.

8.6 Plant Noise Emission Levels

The noise levels calculated in Tables 8.6.1 and 8.6.2 indicate the proposed plant noise contribution at Location R2 (see Figure 12 and Appendix C). It is considered that the dwelling at this site, which is 850 m distant from the proposed plant area, would be the most adversely affected by potential noise deriving from the operation.

At Location R2 (Old Northern Road) the predicted average maximum (L10) noise level contribution from fixed plant and operations should not exceed 28 dBA. For transit activities peak noise levels of up to 38 dBA have been calculated.

Table 8.6.1 Calculation of Plant Sound Pressure Level Contributions

Reference Location R2 - Old Northern Road - Continuous Noise Emission

Noise Sources	A-weighted Sound Power Level dBA	Distance m	Distance Attenuation dB	Earthen Embankment dB	Noise control (site shielding) dB	Resultant level dB
Batching plant	97	850	67	8	no allowance made	22
Concrete truck loading	88-98	850	67	8	"	23
Service compressor	83	850	67	8	"	8
Wash out facility	98-103	850	67	8	"	28

Total contribution average maximum (L10) noise at Location R2 should not exceed 28 dBA.

Table 8.6.2 Calculation of Plant Sound Pressure Level Contributions

Reference Location R2 - Transit Noise Emission

Noise Sources	A-weighted sound power level dBA	Distance m	Distance attenuation dB	Earthen Embankment dB	Noise controls (shielding) dB	Resultant levels dB
Trucks on site	111/115	850	67	10	no allowance made	38
Bulk cement deliveries	110	850	67	10	"	33
Front end loader	107	850	67	10	"	30

Peak contribution of transit noise at Location R2 should not exceed 38 dBA.

8.7 Assessment of Impact

With many of the batching plant activities being much further distant from surrounding dwellings than the closest point of operation of the same equipment within the Portion 198 extraction and central processing plant activity as analysed in the Heggie report at Appendix C, and with the proposed plant's operation being confined to daytime hours, it is considered that any delivery activity, transit, and any continuous noise emission from the plant will be well within SPCC acceptable limits criteria and that they will thus have no impact on any nearby residents.

PART 9 -ENVIRONMENTAL IMPACT OF THE PROPOSED DEVELOPMENT

PART 9 ENVIRONMENTAL IMPACT OF THE PROPOSED DEVELOPMENT

9.1 Introduction

Having established an appreciation of the existing environment and the operating procedure of the proposed concrete batching plant it is possible to identify potential impacts which the proposed plant may have within that existing environment.

Despite the rural setting of Maroota, the provisions of SREP No. 9 bestow upon this part of the locality a form of surrogate industrial zoning so that the intensity of any identified impacts is likely to be reduced as the extractive development of Maroota intensifies and the area reaches its potential as a prioritised extraction area.

The environmental safeguards outlined in previous sections, and hereafter, will ensure that the operation of the plant will have no unacceptable level of impact.

9.2 Planning Issues

The proposed development is permissible with the consent of Baulkham Hills Shire Council. The use is consistent with the objectives of the EPA Act and, provided all safeguards are implemented, the plant will comply with all planning codes.

9.3 Water Quality

The proposed concrete batching plant has no potential to cause contaminated water to enter the stormwater system. As mentioned in Part 5 of this Statement safeguards which will prevent water from the site reaching the natural drainage system without first having first passed through a series of cleansing procedures have been incorporated into the design of the proposed plant and already exist in the layout of the surrounding central processing area.

It is considered that these safeguards are sufficient to cater for waste water generated by the batching plant. The design of the water collection and recycling system meets the requirements of the SPCC.

9.4 Air Quality

Part 6 of this Statement outlines both the potential sources of air pollution associated with the operation of a concrete batching plant and the measures that will be employed to mitigate the emission of pollutants into the atmosphere.

With the implementation of the safeguards as outlined in Section 6.2 the plant will have negligible impact on the existing air quality of the surrounding area. No further control measures are warranted.

9.5 Noise Levels

Noise levels generated during the processes associated with the batching and delivery of concrete are indicated in Section 8 and at Appendix C of this Statement. An assessment of the impacts of this noise is provided at Section 8.7.

It should be understood, however, that the above assessment is made in light of an annual productivity of 30,000 tonnes of batched concrete whereas, at least in the early years of operation, actual production is not expected to exceed 11,000 tonnes.

9.6 Visual Impact

The silos, being the tallest sections of the plant, may have a minor visual impact on the surrounding environment. The proposed plant is located behind purpose-designed visual and acoustic barriers, but even so, part of the upper section of these structures, plus the filter mechanisms on top of them, may be visible through trees from the north-east quadrant. It is not expected that these glimpses of the plant, seen against a heavily timbered backdrop, will cause any local annoyance or disturbance.

The remainder of the plant will not be visible from any dwelling or road in any other direction (see Figure 15).

9.7 Traffic Impact

All trucks travelling both to and from the plant will travel along classified main roads. Advice obtained from the Regional Traffic Authority concerning the use of main roads for heavy vehicular traffic, (see Appendix F), indicates that, provided developments meet planning approval under the legislation, main roads may be used for traffic up to the applicable legal weight and dimension limits. All vehicles used in the operation of the proposed plant will be required to meet the above-mentioned criteria and thus no impact on the main roads system is anticipated from the use of these vehicles.

As indicated in the concluding paragraph of Section 4.8 the proposed operation, working to full capacity, would generate a total of only 6.5 additional laden heavy vehicle movements or 13 total heavy vehicle movements per day. This is not an excessive number and the surrounding road system is expected to adequately cope with it.

However, despite these additional movements, the total situation, when viewed in the regional context, and in light of the use of returning empty vehicles for backloading, actually decreases wear and tear on the wider regional road system. This is especially so when road distances between Maroota and points of demand for pre-mixed concrete are less than the distances between the proponent company's Emu Plains batching plant and those points of demand.

9.8 Socio-Economic Impact

Establishment of the proposed plant will create further employment opportunities in the Maroota area. The impact on the economy of the area because of the creation of employment will be beneficial. The proposed plant will inject both money and the multiplier effect thereof into the local community.

PART 10 - CONCLUSIONS

PART 10 CONCLUSIONS

Demand for pre-mixed concrete in the North-West Sector of Sydney has remained reasonably strong over recent recessionary times. With the advent of either or both an economic upturn and/or predicted increases in planned development in this part of the sub-region, this demand should increase dramatically in future years.

Improvements in the technology of concrete batching, changing building techniques and increases in the amounts of concrete required by the construction industry have placed enormous demands on the production capacity of existing concrete batching plants. In many instances, because of the long distances between existing plants and new areas of demand, development pressures are also generating otherwise unnecessary wear and tear on the public road system.

The proposed concrete batching plant at Maroota has potential capacity to cater for present and future demand in that sector of the region. Further, in cases where the distance between the proposed supply and the new demand is less than that between the existing supply and new demand, the development will reduce pressure on public road maintenance funds.

Although, as with any such development, this proposal has potential to cause negative environmental impacts, the safeguards which will be employed within, and indeed implemented into, the design stage of the operation would have the effect of offsetting any potential environmental impact of the proposal.

It has been demonstrated that the existing road system is capable of maintaining the minimal traffic increases directly attributable to the proposed plant. It has also been demonstrated that the carrying of raw material, aggregates, as back-loading from Penrith to Maroota will also contribute to reduced vehicle movements and wear and tear on roads.

The only feasible alternative is to not proceed with this proposal, however the proposed development is only a relatively minor adjunct to a large, centralised sand processing plant, which is considered to have minimal potential for adverse impact upon land use within the area of operations, and which will be economically advantageous to both the operator and the public at large.

This concrete batching operation will be carefully designed and constructed to incorporate the latest technology applicable to such a small plant and this, together with the necessary environmental safeguards, will ensure that the project has no significant adverse impact upon the environment.

PART 11 - STATUTORY REFERENCES

PART 11 STATUTORY REFERENCES

11.1 REFERENCE TO CLAUSE 35 CONSULTATION

The Director's Clause 35 consultation notice of 25 September 1991, as copied at Appendix "A", required that various matters be specifically addressed within this statement. Below, following an italicised restatement of each such matter, is a commentary in which reference is made to either the issue itself or to those sections of the EIS which address each such issue.

11.1.1 *"Site access requirements including any road improvements."*

This matter is not specifically addressed within the EIS because of the fact that the proposed batching plant is to be located within an area which is already approved as a central sand processing site and which, by virtue of that approval, has already had site access and road improvement works carried out.

As indicated in section 3.13 the plant area within Portion 198 is accessed by a purpose-built haul road running from an RTA approved, new, four-way intersection with Wisemans Ferry Road (see Figure 5).

This batching plant when fully operational will generate 6.5 additional laden heavy vehicle movements, or a total of 13 movements per day through the above purpose-built intersection. This number of movements is relatively insignificant in light of the fact that the current approvals held by the proponents authorises a maximum of 100 daily movements across Wisemans Ferry Road and 400 daily turning movements into and from that road. The movements generated by this operation will in fact be contained within the 400 turning movements as already approved.

11.1.2 *"Water management arrangements at the site."*

Figures 15 to 18 of the EIS provide an indication of the water management techniques to be employed in this proposal. These techniques are fully discussed in Part 5.

The batching plant will be located within a larger sand processing plant area which is fully bunded in order to prevent the escape, into surrounding bushlands or watercourses, of any water which has not passed through sedimentation and polishing ponds.

As will be seen from the above figures, the only water which can escape this processing plant drainage compound is that which, due to excessive wet weather, overflows the major clean water supply dam located as a sump at its lowest point.

All clean water used in the batching plant will be water which is either drawn from the processing plant clean water dam or from its own waste water recycling system.

All water falling on the dirty yard area within the batching plant will be returned to that plant's waste water recycling system. Any storm overflows from that recycling system and all run-off from the clean yard areas of the batching plant will discharge into open dish drains around the inner periphery of the central processing plant drainage compound.

These open drains will discharge into a sedimentation trap which will ensure that all fines are dropped prior to overflow into the processing plant clean water intake dam.

Even though dirty water from the batching plant reaches the processing plant clean water intake dam it would then be passed through the processing plant as wash water and carried with then dirty water to the series of settling ponds and silt dams which are arranged to clean such waters before they are returned to the major clean water collection dam in the north-west corner of Portion 198. From that collection dam the water is then returned by gravity flow to the original processing plant clean water intake dam.

As before indicated, the whole water system associated with this small plant and the major plant which surrounds it constitutes a fully enclosed cycle.

11.1.3 *"Transport implications (local and regional) of the proposed plant, e.g. aggregate, flyash and cement deliveries, concrete deliveries."*

As discussed in the body of the EIS, this plant is not expected to operate for many years, if ever, at full capacity. Its primary aim is to satisfy the demands of those of the proponent's concrete using clients whose projects are closer to Maroota than they are to their, the proponent's, Emu Plains batching plant.

The primary advantage of setting up a plant in this locality lies in two factors. The first is that this is the source of all of the fine aggregate sand used in all of the proponent's concrete and the second is that trucks returning empty to Maroota from the Penrith area can readily carry coarse aggregate back to Maroota as back loading.

Both of the above factors eliminate otherwise unnecessary heavy vehicle movements on the road system and the fact that the Maroota plant will service sites which are closer to Maroota than they are to Emu Plains means that wear and tear on the public road system is further reduced.

The only additional heavy vehicle trips generated by the presence of this plant at Maroota are those attributable to the haulage of bulk cement and flyash. Whereas these trips, generally from the south of the region, would normally have terminated at Emu Plains, they will now proceed to Maroota. However, at the rate of only three deliveries per week at full production, it is apparent that the reduction in kilometre/tonnes attributable to the carrying of coarse and fine aggregates and pre-mixed concrete will by far outweigh the additional kilometre/tonnes involved in the transportation of bulk cement and flyash.

11.1.4 *"Interaction of the concrete plant with sand extraction at the site and any adjoining or nearby sites owned by the proponent."*

As stated in section 1.2 of the EIS, this batching plant will be producing ready-mixed concrete containing fine aggregate sand won from the land, Portion 198, upon which it stands. At times, however, because of demands for concretes of different strength or characteristics, coarser aggregate sand won from other nearby extraction sites operated by the proponent will be blended with the thus finer aggregates won from Portion 198.

11.1.5 *"Visual impact assessment."*

The visual impact of the proposal is discussed in sections 3.12.2 and 9.6 of the EIS. At the time of writing the proponent had not made a final decision as to the brand of silos and air filters to be used on the site so that the degree of visual obtrusiveness (if any) of the filter boxes could not be assessed. However, if there are such views they will be from far distant points and the combination of environmentally compatible colours and the intention to screen plant to later prevent all such views or glimpses will virtually eliminate any thus potential visual impacts.

11.2 REFERENCE TO CLAUSE 34 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT

The following items referred to in Clause 34 of the Environmental Planning and Assessment Act can be found in the text in the following places:-

(a) a full description of the designated development proposed by the development application;

The establishment of a concrete batching plant to service a perceived growing market for concrete in the sub-region (Part 4).

(b) a statement of the objectives of the proposed designated development;

The development aims to capitalise on the use of trucks which presently return empty to Maroota and to load them with some of the raw materials necessary to supply pre-mixed concrete to both the existing market and to the market which is expected to develop with the release of residential, commercial and industrial land as part of the North-West Sector (sections 1.2 and 1.3).

(c) a full description of the existing environment likely to be affected by the proposed development, if carried out;

A detailed description of the existing environment is provided at Part 3. No aspect of the existing environment precludes the development as proposed.

(d) identification and analysis of the likely environmental interactions between the proposed designated development and the environment;

The most important potential environmental interactions will be from water, dust and noise pollution and the increase in traffic generated by the proposed plant. Water, dust and noise pollution are discussed in Parts 4, 5, 6 and 8 respectively with traffic generation discussed in Part 4.8.

(e) analysis of the likely environmental impacts or consequences of carrying out the proposed designated development (including implications for the use and conservation of energy);

The development will have minimal impact on the environment. This Maroota sector is prioritised for extractive industry within Sydney Regional Environmental Plan No. 9 (Extractive Industry) and the area of operations will be protected from the encroachment of further residential development until extraction of the natural resource materials is completed. The proposed plant is considered to be in keeping with the aims and objectives of REP No. 9 (Part 9).

(f) justification of the proposed designated development in terms of environmental, economic and social considerations;

The proposed development will have minimal environmental impact; will produce concrete for an expanding regional construction industry, and will provide employment and associated economic benefits to the region (Part 9).

(g) measures to be taken in conjunction with the proposed designated development to protect the environment and an assessment of the likely effectiveness of those measures;

Environmental protection measures have been included in the design of the proposed concrete batching plant. These measures will ensure that those requirements of the various authorities directed to the mitigation of potential environmental impacts will be met (Parts 5, 6, 7 and 8). The effectiveness of the proposed mitigation measures is summarised in Parts 9 and 10.

(g1) details of energy requirements of the proposed development and measures to be taken to conserve energy;

The proposed plant will consume electricity at a rate approximately equivalent to the average household.

(h) any feasible alternatives to the carrying out of the proposed designated development and reasons for choosing the latter;

The only alternative is to not proceed with the benefit so that, given the minimal potential for adverse impacts and the private, public and social benefits, admittedly minor, which will derive from its operation, the development of the plant is considered to be the better alternative (Parts 9 and 10).

(i) Consequences of not carrying out the proposed designated development.

Should the proposed development not be carried out, concrete required by those parts of the region's expanding construction industry which are readily accessed from Maroota, will of necessity be delivered from areas remote from points of demand. To not proceed with the development will also mean a loss of the opportunity to use raw materials as back-loading to Maroota (Part 1.3).

11.3 RESPONSE TO CLAUSE 34 OF BAULKHAM HILLS LOCAL ENVIRONMENTAL PLAN 1991

Subject Clause 34 states:-

"*Extractive industries*

34.(1) In respect of extractive industry development, the Council must aim:-

(a) to ensure that extractive industries are not carried out in areas of particular environmental sensitivity; and

(b) to ensure that extractive industries are undertaken in accordance with management and planning provisions as contained in any plan of management adopted by the Council; and

(c) to permit extractive industry development which is of regional significance without burdening the Council with costs for the provision of services and roads.

(2) Before granting consent to an application to carry out extractive industry development the Council must take into consideration whether the development is in accordance with:-

(a) the provisions of any management plan adopted by the Council; and

(b) any staging and rehabilitation plan adopted by the Council."

- and the manner in which this Statement responds to its requirements is discussed below, seriatim.

34(1)(a) The proposed development, which constitutes an extractive industry by virtue of its reliance upon the use of material won from the site, will be conducted in the midst of a site already approved for, and now being actively development, as, a central processing plant works area.

Although lands surrounding the central processing plant site are environmentally sensitive, the overall impact measures already in place, together with those still being put into effect, will ensure that the processing plant operation will not impact adversely upon these sensitive peripheral lands.

Because the proposed batching plant is to be contained within the central processing plant area, and especially because it is to link into the closed water cycle of the major plant, the proposed new operation will cause no threat to any environmentally sensitive area.

34(1)(b) At the time of writing Council had not adopted any Plan of Management for the Maroota area. It has however adopted a broad-based Plan addressing extraction operations throughout the total Shire and it is now calling for public comments upon a draft Plan relating specifically to the Maroota area.

In that this EIS acknowledges a need to pay Section 94 contributions towards road repair, maintenance and upgrading, the proposal is in accord with the basic tenet of the Shire-wide Plan.

In-so-far as the draft Maroota Plan advocates a reliance upon central processing plants, the proposal is also in accord with its provisions.

It can not be reasonably construed that the proposal as addressed within this statement is in direct conflict with any of the other proposals of either of these two Plans.

34(1)(c) Although not precisely stated within this EIS, the proponents of this operation anticipate that they will be paying a Section 94 levy which will more than reasonably cover the costs of any upgrading and repair of roads which may be necessitated by virtue of their activities.

The proponents also anticipate that they will be paying all other costs associated with the servicing of the site and, to this extent at least, it can not be envisaged that the operation will increase, to any degree, Council's costs for the provision of roads and services.

34(2)(a) and (b) Despite the fact that Council has not yet adopted the draft Maroota Plan of Management, this proposal, as aforesaid, is not in conflict with either:-

- any provisions of that draft Plan, or
- any staging or rehabilitation specifications within that Plan.

Likewise it is considered that the proposal is generally in overall accord with the parallel facets of the Shire-wide Plan of Management - Extractive Industry.

11.4 REFERENCE TO SECTION 90 OF THE EPA ACT

The following matters for consideration are referred to in Section 90 of the Environmental Planning and Assessment Act, 1979. A summary statement for each is given.

(a) the provisions of:-

(i) any environmental planning instrument;

Baulkham Hills Local Environmental Plan 1991
State Environmental Planning Policy No. 11
Sydney Regional Outline Plan No. 9 - Extractive Industry

(ii) any draft environmental planning instrument that is or has been placed on exhibition pursuant to 47(b) or 66(1)(b);

None of which the writer is aware.

(iii) any draft State Environmental Planning Policy which has been submitted to the Minister in accordance with Section 37 and details of which have been notified to the consent authority; and

None of which the writer is aware.

(iv) any development control plan in force under section 73, applying to the land to which the development application relates;

None of which the writer is aware.

(a1) the provisions of:-

(i) any conservation agreement entered into under the National Parks and Wildlife Act 1974 and applying to the whole or part of the land to which the development application relates; and

(ii) any plan of management adopted under that Act for the conservation area to which the agreement relates;

Not applicable.

(b) the impact of that development on the environment (whether or not the subject of an environmental impact statement) and, where harm to the environment is likely to be caused, any means that may be employed to protect the environment or mitigate that harm;

The proposed development will have minimal effect on the environment. Impacts will include a small increase in traffic, an acceptable emission of noise and possible minimal visual impact. Mitigation/safeguard measures to be incorporated into the operation of the plant are detailed in the body of the Statement.

(c) the effect of that development on the landscape or scenic quality of the locality;

The site is for extractive industrial purposes and is centrally located within the REP No. 9 Maroota sand deposit area. It is cleared of vegetation but, with stands of peripheral trees remaining, the surrounding area is almost fully protected from visual contact with the proposed development. It is proposed to infill gaps in these trees as part of the landscaping of the site. It is considered that the impact of the development on the landscape and scenic quality of the area will be negligible.

(c1) the effect of that development on any wilderness area (within the meaning of the Wilderness Act 1987) in the locality;

No wilderness areas have been identified within the locality of the site.

(d) the social effect and the economic effect of that development in the locality;

The North-West Sector has been identified as a major growth area within the Sydney region. Parts of Dural, Cherrybrook and Baulkham Hills are still undergoing steady growth. The establishment of industry and housing in this sub-region will create a strong demand for pre-mixed concrete. The development of a concrete batching plant in the locality will provide efficient and economical delivery of concrete to some construction sites. It is considered that, through the provision of employment at the plant and through general spending in the local community, the economy of the sub-region will be enhanced. These factors will contribute to the general social development of the region.

(e) the character, location, siting, bulk, scale, shape, size, height, density, design or external appearance of that development;

The size, shape, height, density and external appearance of the plant are in keeping with development that would be expected in the vicinity of a central sand processing plant within an extractive industrial area. It is considered that the character and siting of the proposed development will not adversely affect surrounding development.

(f) the size and shape of the land to which the development application relates, the siting of any building or works thereon and the area to be occupied by that development;

The size and shape of the land to which this development relates are considered ideal for the efficient site layout of a concrete batching plant. The ease of excavation of the land allows development with ideal drainage and with minimisation of visual and noise pollution.

(g) whether the land to which that development application relates is unsuitable for that development by reason of its being, or being likely to be, subject to flooding, tidal inundation, subsidence, slip or bush fire or to any other risk;

The land is not susceptible to tidal inundation, subsidence or slip. It is, however, subject to minor bushfires but it is considered that the wider development associated with sand extraction and processing will alleviate any danger of bushfire damage.

(h) the relationship of that development to development on adjoining land or on other land in the locality;

The site is surrounded by lands which are either being extracted or which will, subject to Council's approval, be later extracted in terms of the priorities within REP No. 9 Extractive Industry.

(i) whether the proposed means of entrance to or exit from that development and the land to which that development application relates are adequate and whether adequate provision has been made for the loading, unloading, manoeuvring and parking of vehicles within that development or on that land;

The proposed development will have two entrance/exit points. All vehicles entering the site will have adequate area for on-site manoeuvring either to unload raw material or to enter the batching plant. Adequate space for on-site vehicle turning is to be provided. The site has been designed to allow change of the entrance points to exit points and vice versa should the need arise.

(j) the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect of that traffic on the movement of traffic on that road system;

It has been estimated that at full production the proposed batching plant will generate approximately 13 total traffic movements per day. This figure includes agitator truck

movements and raw material truck movements. All roads used for the delivery of raw materials to the plant and for delivery of concrete to the market place are classified main roads designed to carry heavy vehicles. It is concluded that the level of traffic generated by the proposed plant will not reduce the level of service of intersections which will be used to access the site and the marketplace.

(k) whether public transport services are necessary and, if so, whether they are available and adequate for that development;

It is presumed that the workers employed at the proposed concrete batching plant will drive to and from work by car. The development will place no demands upon existing local bus services.

(l) whether utility services are available and adequate for that development;

Prospect Electricity has indicated that its aerial supply to the adjoining sand processing plant will satisfy demands made by the batching plant.

(m) whether adequate provision has been made for the landscaping of the land to which the development application relates and whether any trees or other vegetation on the land should be preserved;

The site is itself clear of all vegetation. Peripheral trees remain around the wider site. These will be retained as part of the overall landscaping program. Additional landscaping will be carried out as any need for visual screening become obvious. This, however, is extremely unlikely.

(m1) whether that development is likely to cause soil erosion;

As part of the initial stage of development of the site, the entire concrete yard area is to be paved and sloped to promote water flow to a sediment trap. To further prevent soil erosion during the construction stage Soil Conversation Service recommendations will be implemented.

(r) the public interest;

The proposed development, which will add to the social and economic development of the region through the creation of jobs and the supply of concrete from a modern efficient plant, is considered to be in the public interest.

(s) any other prescribed matter.

Not applicable in this case.

11.5 REFERENCE TO BAULKHAM HILLS SHIRE COUNCIL - LETTER OF 31 JANUARY 1992 (SEE APPENDIX A)

The Council of the Shire of Baulkham Hills has requested that the E.I.S: consider the provide information upon various matters. These matters are set-out below and each point is followed by discussion therein.

"(i) the effects of the proposed development on the extraction operations at Maroota in terms of Regional Environmental Plan No 9."

The proposed development will operate as a use ancillary to, and depending upon, the winning of extractive material from within the R.E.P. No 9 area. In the overall viewpoint it will be seen that the establishment of the proposed plant at Maroota will mean that pre-mix mixed concrete, a product of local fine and fine-course aggregates, will reach local users over much shorter routes than they would were the raw materials to be taken elsewhere for batching.

"(ii) the manner in which the proposed development would be co-ordinated with authorised extraction activities in the surrounding area."

The proposed plant will operate beside the existing approved sand processing plant. It will rely on local materials processed through that plant and will use clean waters from the supply source built for that plant. The batching plant will work in harmony with all Maroota extraction operations and will not disrupt any other such operations.

"(iii) the noise impact of the operations of the batching plant and effect on surrounding properties."

The acoustic impact of the proposal is discussed within the E.I.S. The noise generated by the plant and vehicles servicing it will generally be of the same order as that generated by the adjoining processing plant. Any batching plant activity which has potential to cause neighbour-disturbance will be confined to daylight hours only and the actual potential for disturbance is vastly minimised by both distance and barrier attenuation.

"(iv) **the impact of the batching plant operations on the surrounding land including private land holdings Crown Land Maroota State Forest."**

As discussed in the body of this Statement any impact caused by this batching plant upon surrounding land will be negligible to nil.

"(v) **the expected life span of the batching plant and daily volumes of material likely to be processed."**

The E.I.S. fully addresses anticipated daily output figures at the initial production rate of about 11,000 tonnes per year but it assesses potential impacts as though the plant was to operate to full practical capacity of 30,000 tonnes per year.

At this stage the rate of any expansion, if any, from 11,000 to 30,000 tonnes per year, can not be assessed, although, since the proponents expect the batching plant to be operating over the full life of the extraction of Maroota, perhaps up to 50 years, it is probably reasonable to say that the proposed plant, or later replacement models, will be operating well into the next century. Under this circumstance, and given the exponential growth of Sydney, there is no doubt that the plant will eventually operate to a full practical capacity.

"(vi) **the expected daily truck numbers likely to be generated by the operations of the batching plant."**

The plant will produce concrete from sand which was formerly taken to other batching plants. It will use course aggregate brought to Maroota as backloading on sand-delivery trucks. The only additional heavy vehicle movements to be generated by the proposed plant are a minor number of weekly, as distinct from daily, cement/flywash tanker deliveries.

"(vii) the proposed route of transportation of the material which is processed at the batching plant."

Pre-mixed concrete will be carried along the internal haul route to Wisemans Ferry Road and thence, depending upon the source of demand, will be carried north or south along Old Northern Road towards Wisemans Ferry or Glenorie, respectively, or west along Wisemans Ferry Road towards Windsor.

"(viii) the proposed rehabilitation of the affected land following removal or relocation of the batching plant."

Since the plant may well be in operation for near a half a century, the proponent has not yet considered, and the E.I.S. does not specifically address, rehabilitated end-use of the land.

While on all present indications it might be expected that this land, like all earlier, surrounding extracted land, will be rehabilitated to pasture, orchard or market gardening use, the passage of time may well ordain that the end-use, at the time of abandonment of the plant, may fall within a category which we can not today imagine.

"(ix) Council's Draft Plan of Management on Extractive Industries for the Maroota area."

The batching plant is not in any way in conflict with the aims, objectives or tenets of the Draft Plan of Management.

"(x) The justification of the batching plant in terms of the material to be processed and relation expected market demand."

The plant will cause no local environmental damage and will in teh sub-regional sense, decrease wear and tear on the public road system. The fact that it will create new local employment and economically satisfy local and nearby demand for pre-mixed concrete and are, in themselves, a manner of justification for its establishment.

FIGURES

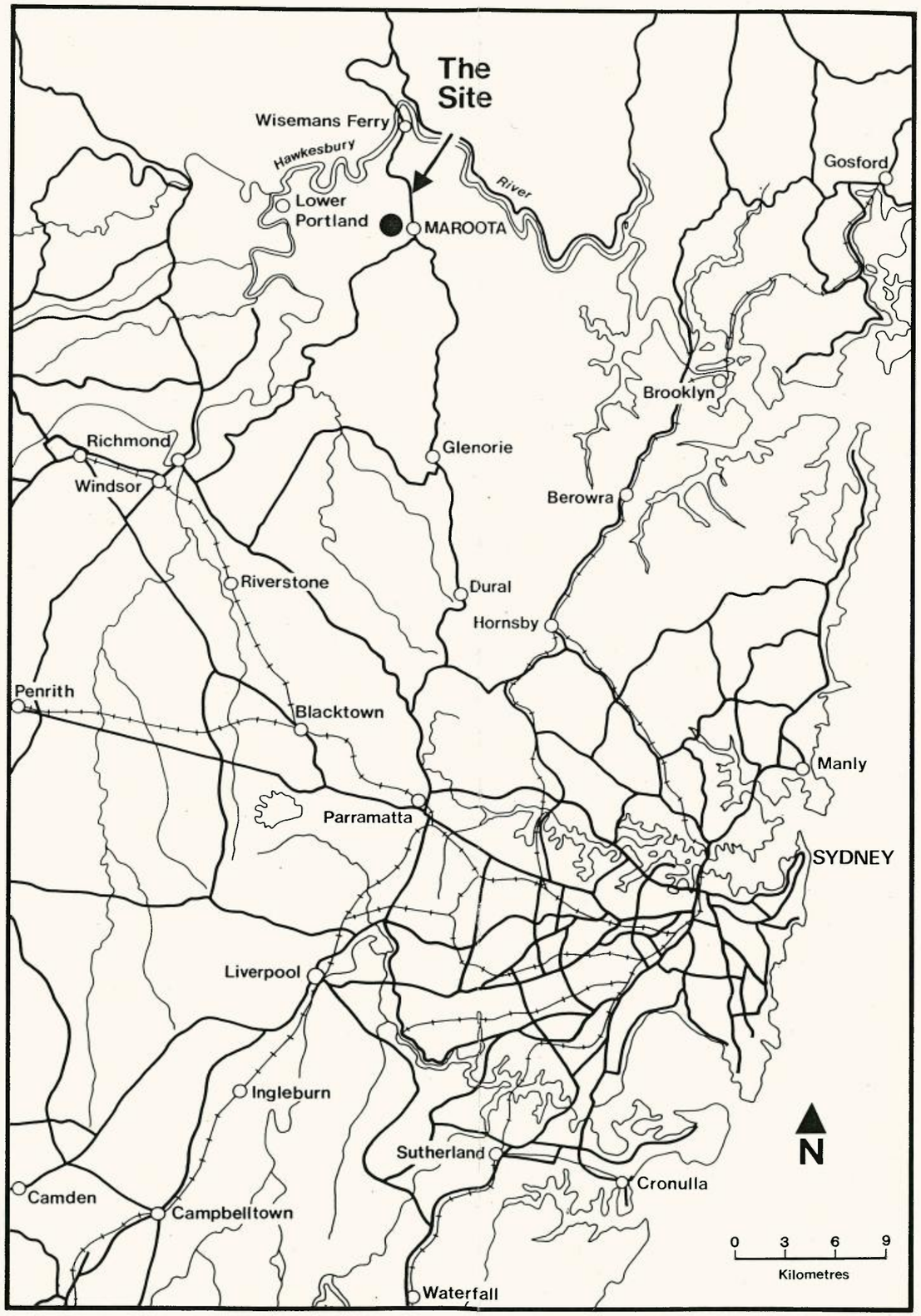


Figure 1: REGIONAL LOCATION

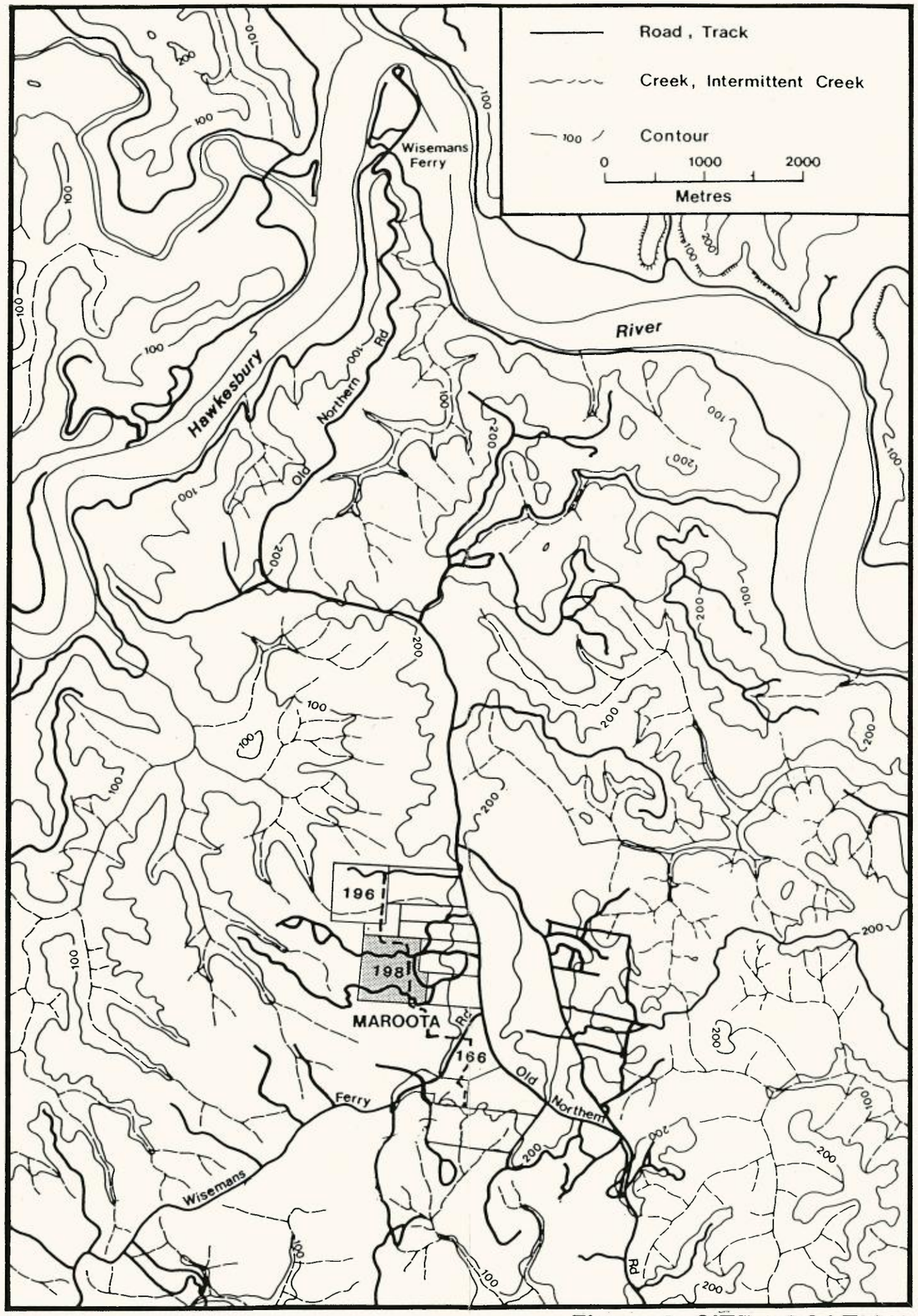


Figure 2: SITE LOCATION AT MAROOTA

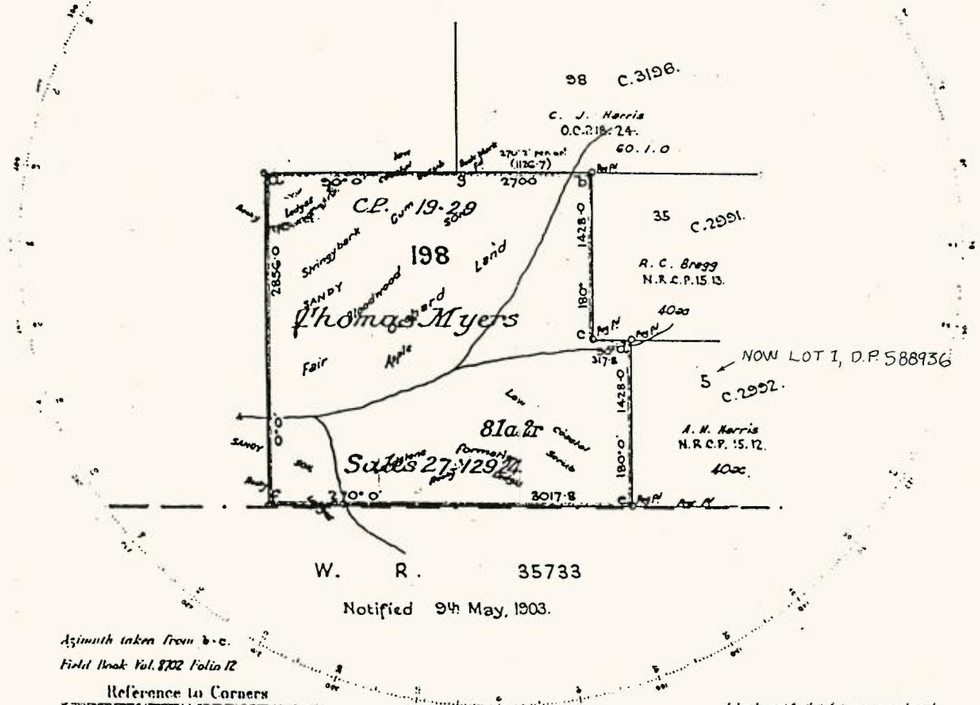
PLAN OF PORTION 198 — Baulkham Hills Shire —

County of Cumberland Parish of Cornelia

Land District Windsor Land Board District Sydney Eastern Division

Applied for under the 87th Section of the Crown Lands (Consolidation) Act of 1913 by (Miss) Frances Ivy Jeffries

O.C.P. 19.29 of 12th Sept.



Azimuth taken from b-c.

Field Book Vol. 8702 Folio 12

Reference to Corners

Corner	Bearing	From	Links	P. or Brs.
a	Rock mark at	Corner		198
b	246° 22'	Cum	61·2	35·198
c	300° 38'	Blackwood	24·6	35·198
d	230° 38'	Blackwood	18·5	5·198
e	227° 15'	Cum	66·1	5·198
f	163° 21'	Blackwood	63·7	198

Improvements Nil

Reference to Traverse

Line	Bearing	Distance

Scale 10 Chains to an Inch.

I hereby certify that I or persons under me on the 3rd December 1903 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands

W. A. Parke *Licensed Surveyor*

Transmitted to the District Surveyor with my letter of 6th December 1903 27

Voucher No. 19 Passed P.12.6.04

Calculation Book No. 285 Folio " " 3

Checked and Charted Authur Bonnell 8/12/04

Examined W. Reed

Plan approved C. Edwards

Draftsman in Charge

Cat. No. C.3344.2030.

Figure 3: CADASTRAL INFORMATION

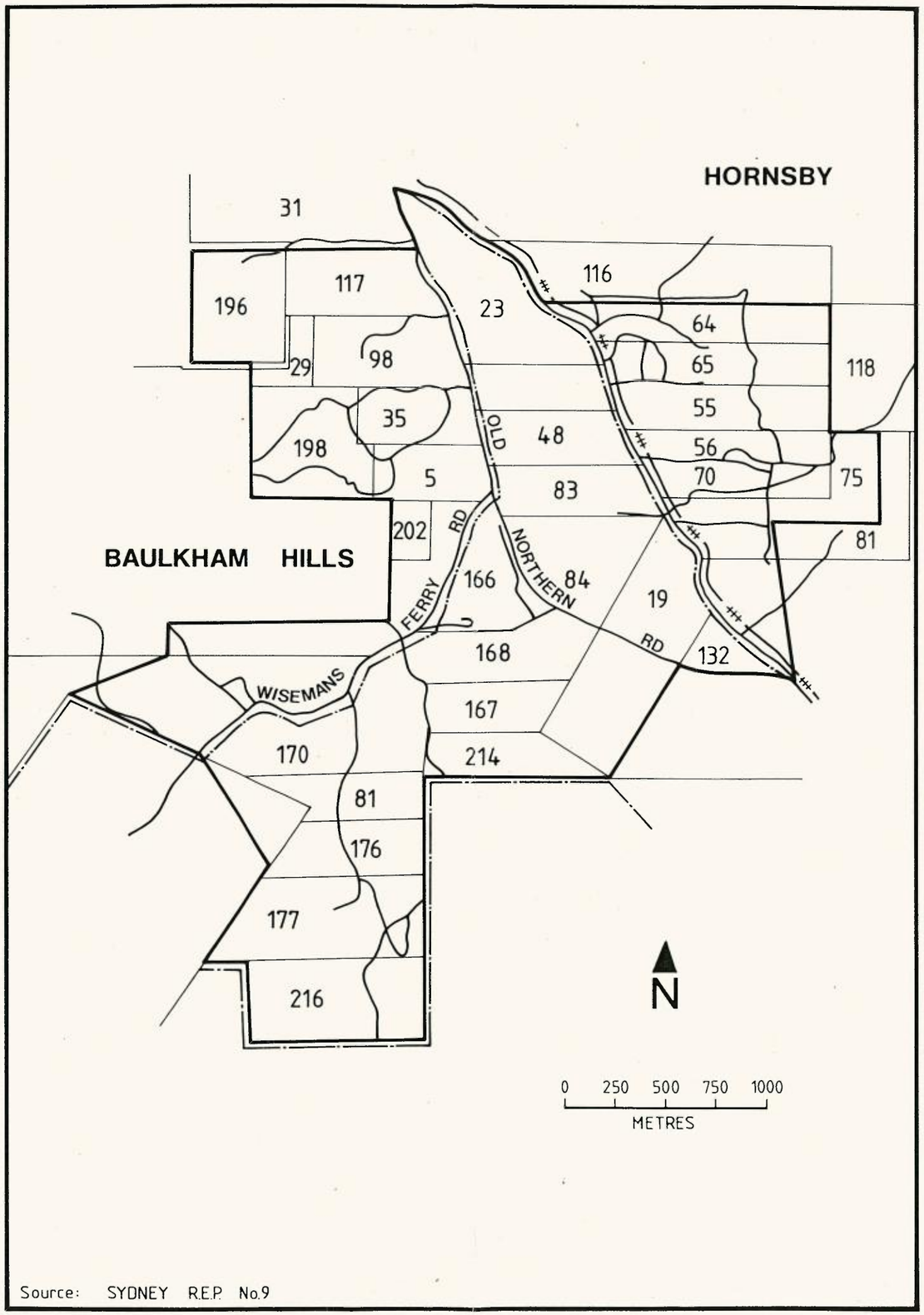


Figure 4 MAROOTA AREA SUBJECT TO REP No.9

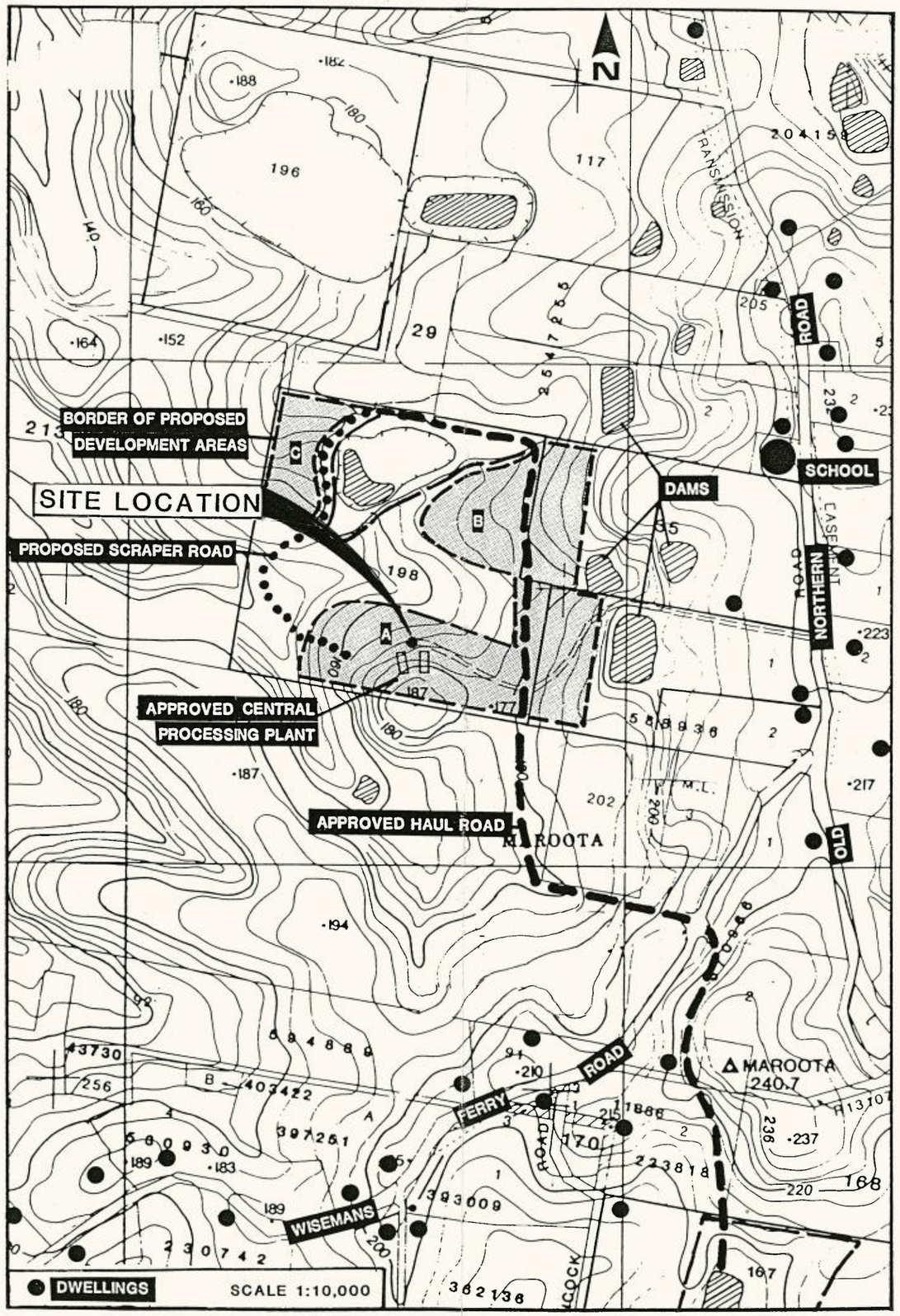


Figure 5: SITE LOCATION AND ACCESS

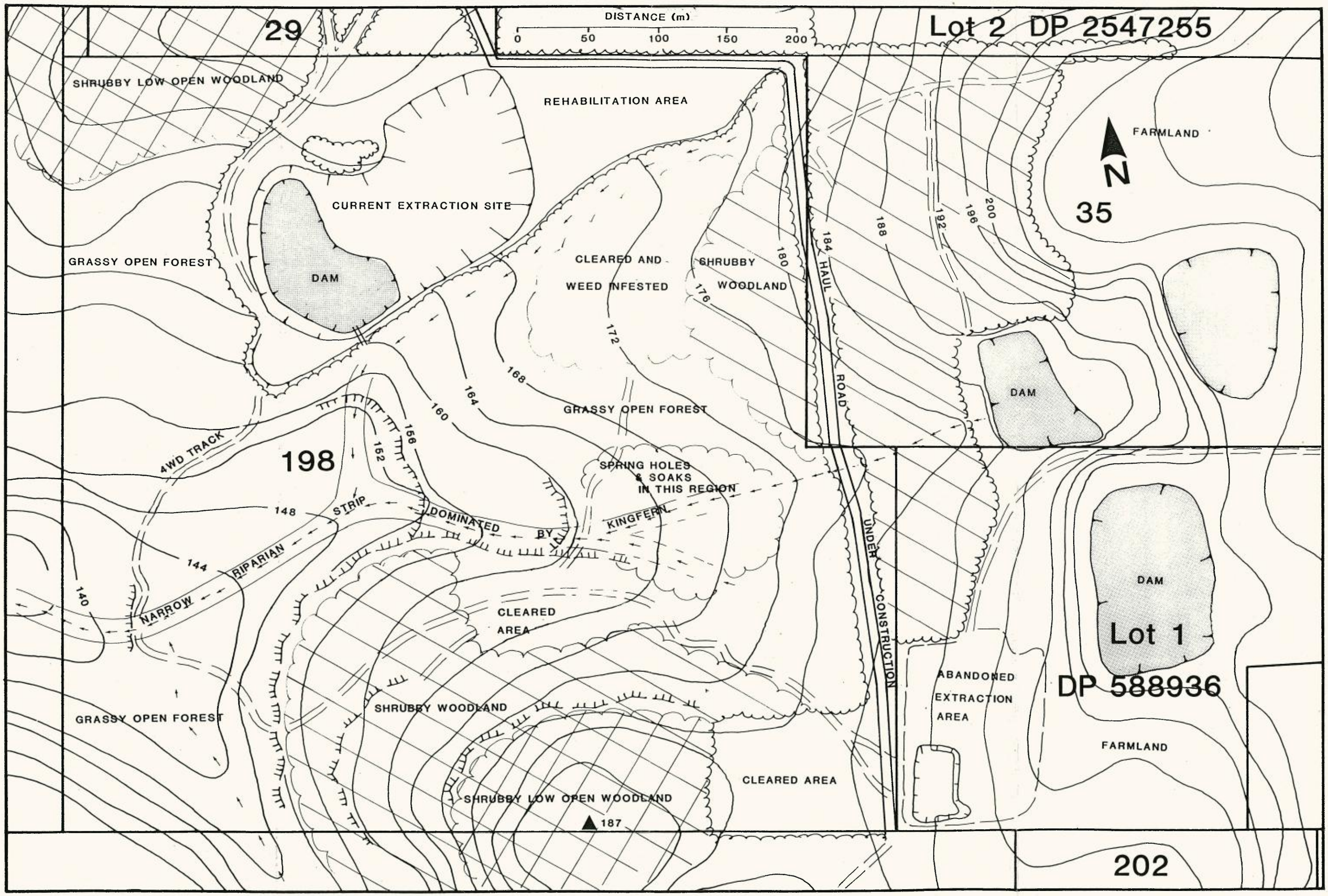


Figure 6: SITE TOPOGRAPHY
(DECEMBER 1989)

PORTION 29

LOT 2 DP 547255

ROAD

EDGE OF ROAD AND TREE LINE

543.15

287.27

MEDIUM TIMBER

TOP OF BANK

CLEAR AREA

TREE LINE

BOTTOM OF BANK

TOP OF BANK AND TREE LINE

MEDIUM TIMBER

LOT 2
DP 703821

TOP OF BANK AND TREE LINE

WATER LINE

DAM

PORTION 213

574.54

PORTION 198
32.982 ha

PROPOSED BATCHING PLANT SITE

63.93

BOTTOM OF BANK

TOP OF BANK

CLEAR AREA

DAM

LOT 1
DP 588936

MEDIUM TIMBER

CONCRETE PAD

BUILDING

ROAD

287.27

607.08

EDGE OF ROAD AND TREE LINE

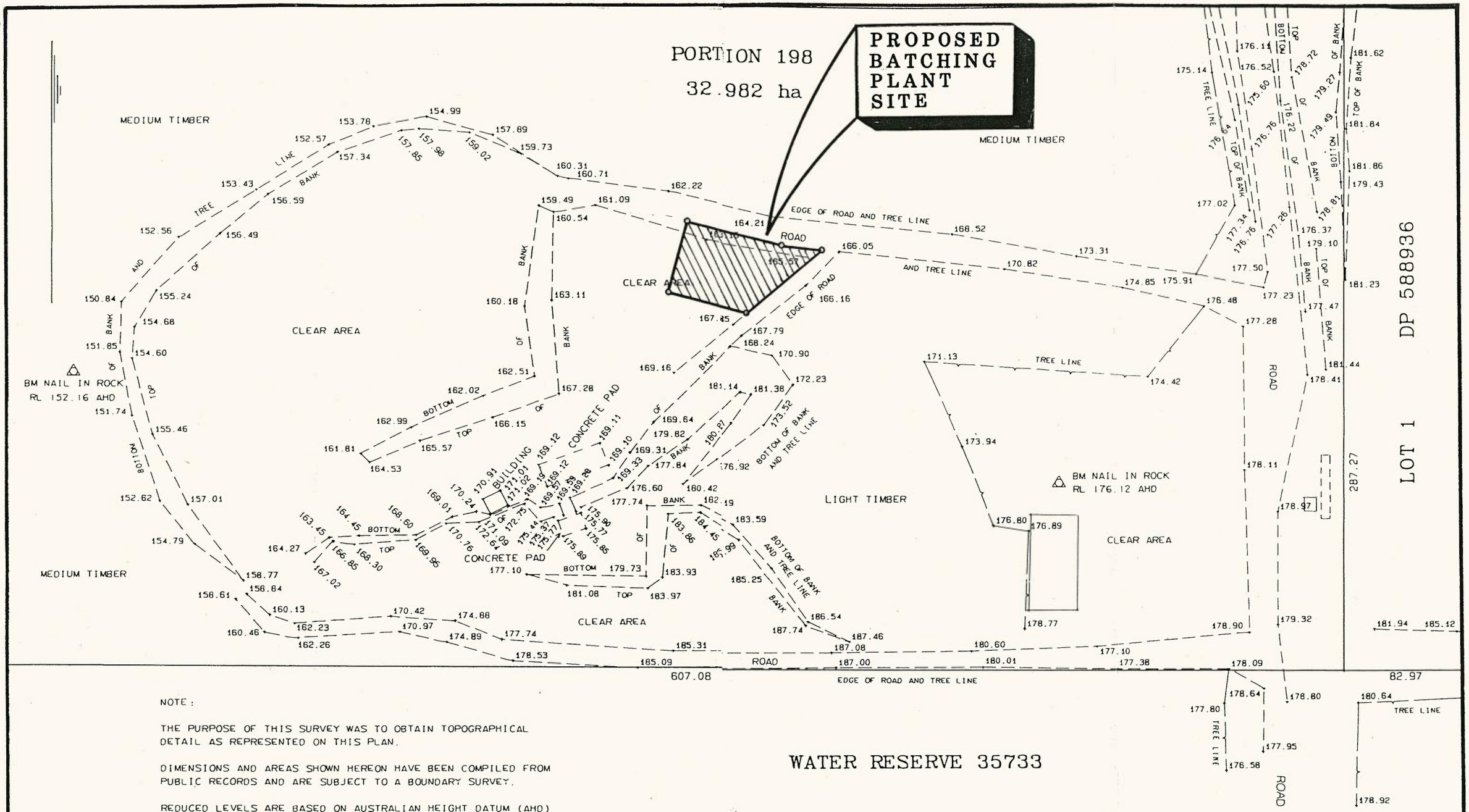
WATER RESERVE 35733

PORTION 202

PLAN OF PORTION 198 PARISH OF CORNELIA COUNTY OF CUMBERLAND AT MAROOTA RE: PF FORMATION	RATIO **abt. 1:3000**	SURVEYED SS	COLLIN C. DONGES & ASSOCIATES Pty. Limited CONSULTING SURVEYORS & TOWN PLANNERS 939 Old Northern Road, Dural 2158 Phone: 651 2784, 651 1469
	LEVEL DATUM	DRAWN SS	
	DATE SEPTEMBER 1991	DESIGN	
	SHEET 1 OF 1	REF. CH1545A/S847	

MAN-MADE FEATURES ON PORTION 198

FIGURE 7A



NOTE :

THE PURPOSE OF THIS SURVEY WAS TO OBTAIN TOPOGRAPHICAL DETAIL AS REPRESENTED ON THIS PLAN.

DIMENSIONS AND AREAS SHOWN HEREON HAVE BEEN COMPILED FROM PUBLIC RECORDS AND ARE SUBJECT TO A BOUNDARY SURVEY.

REDUCED LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) AND ARE SHOWN THUS +162.48

WATER RESERVE 35733

PLAN OF PART PORTION 198
PARISH OF CORNELIA
COUNTY OF CUMBERLAND
AT MAROOTA

RE: PF FORMATION

RATIO **abt. 1:1500**	SURVEYED SS
LEVEL DATUM AHD	DRAWN SS
DATE SEPTEMBER 1991	DESIGN
SHEET 1 OF 1	REF. CH1545B/S847

COLLIN C. DONGES & ASSOCIATES
Pty. Limited
CONSULTING SURVEYORS & TOWN PLANNERS
939 Old Northern Road
Dural 2158
Phone: 651 2784
651 1469

SPOT-LEVELS AROUND CENTRAL PROCESSING PLANT AREA

FIGURE 7B

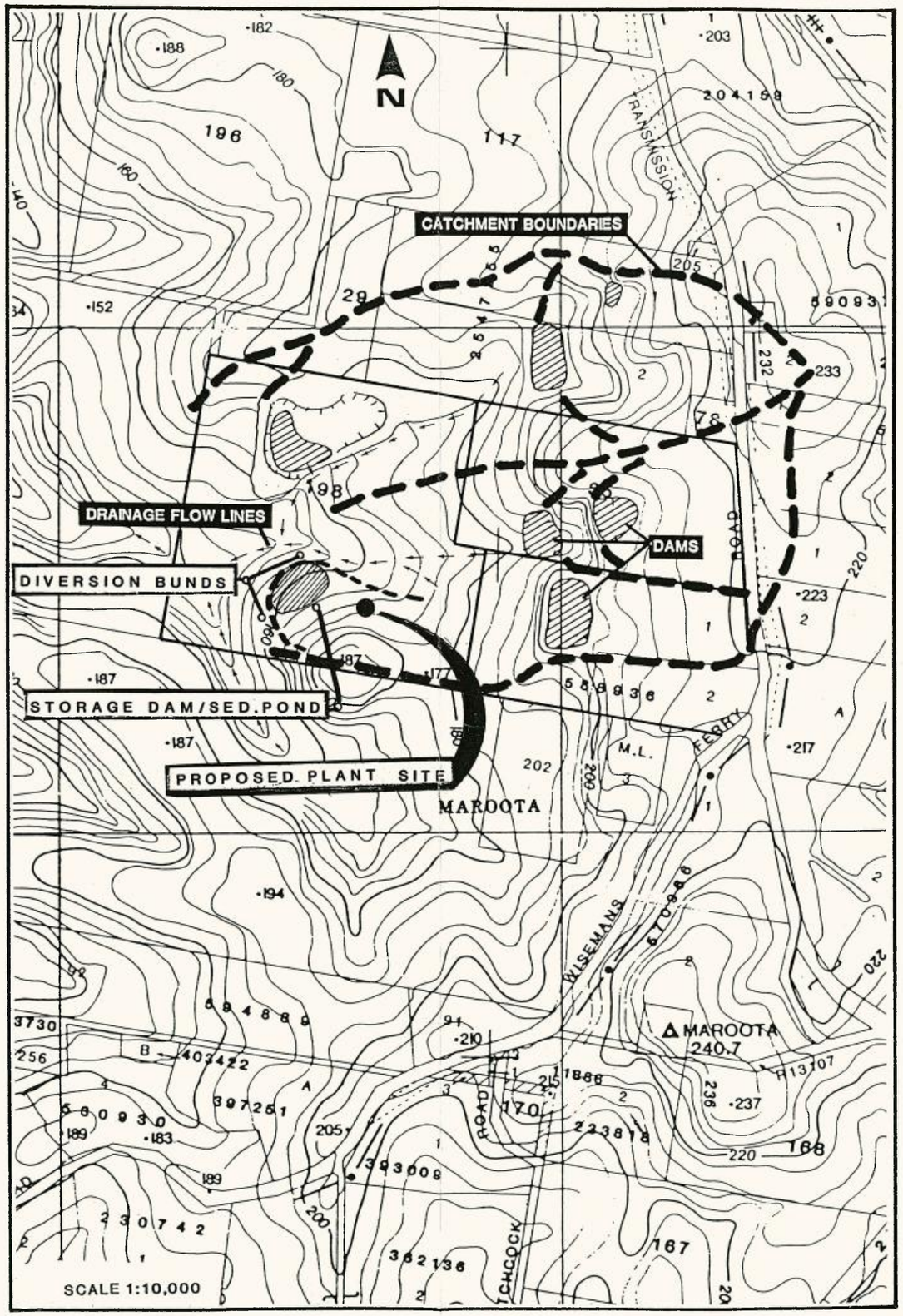


Figure 8 : DRAINAGE PATTERN

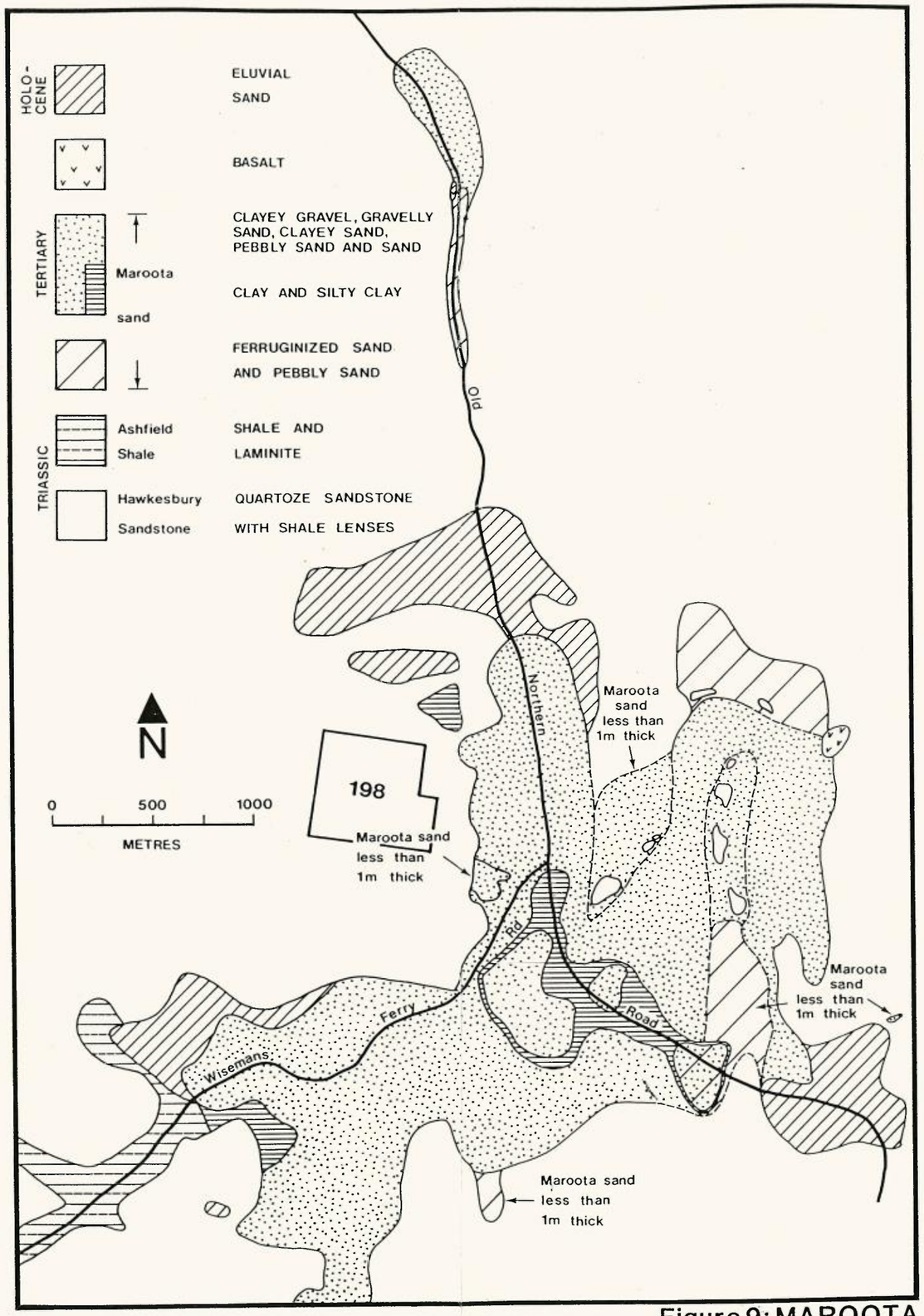


Figure 9: MAROOTA GEOLOGY

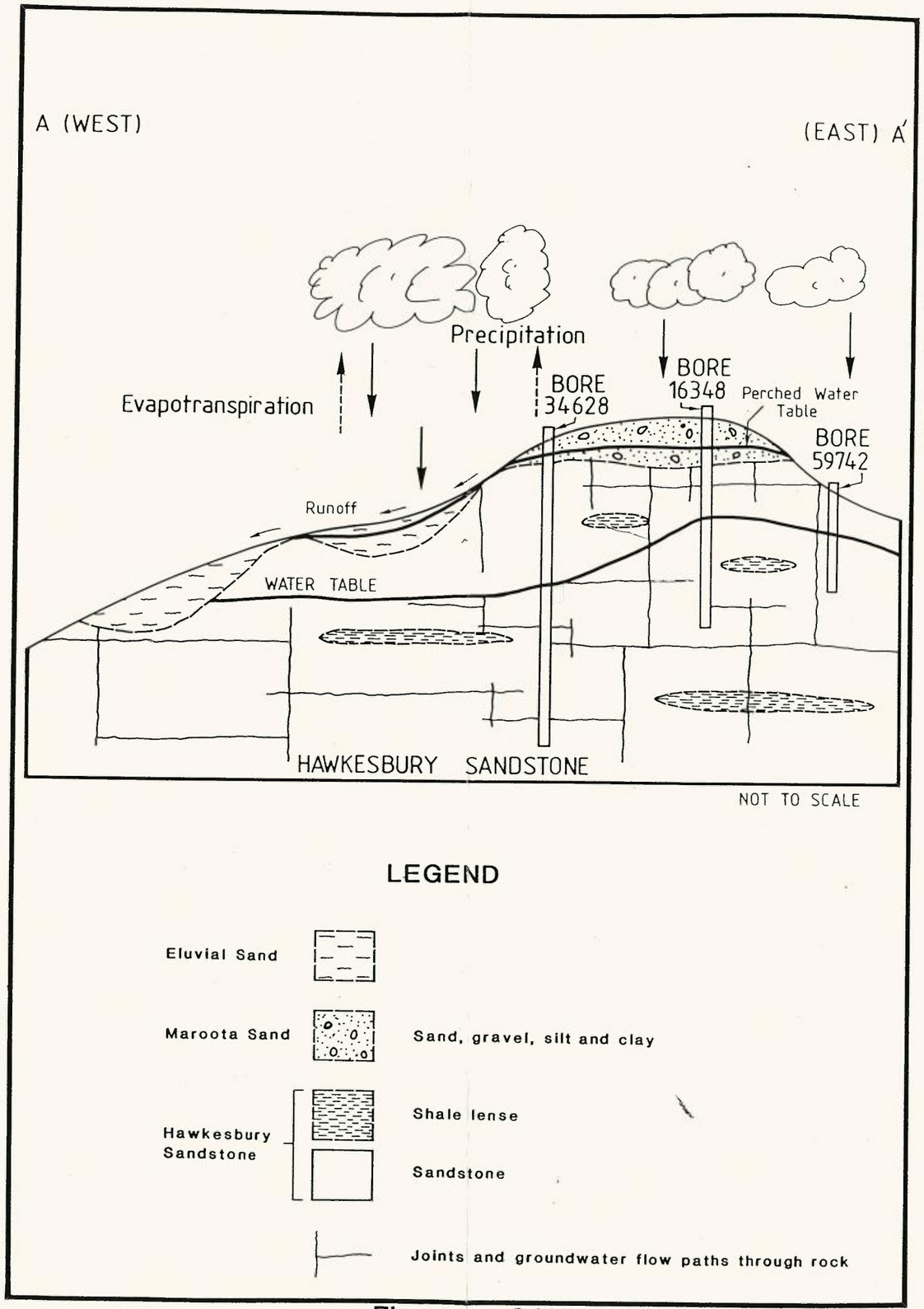


Figure 10: SCHEMATIC HYDROLOGICAL SECTION AT NORTH MAROOTA

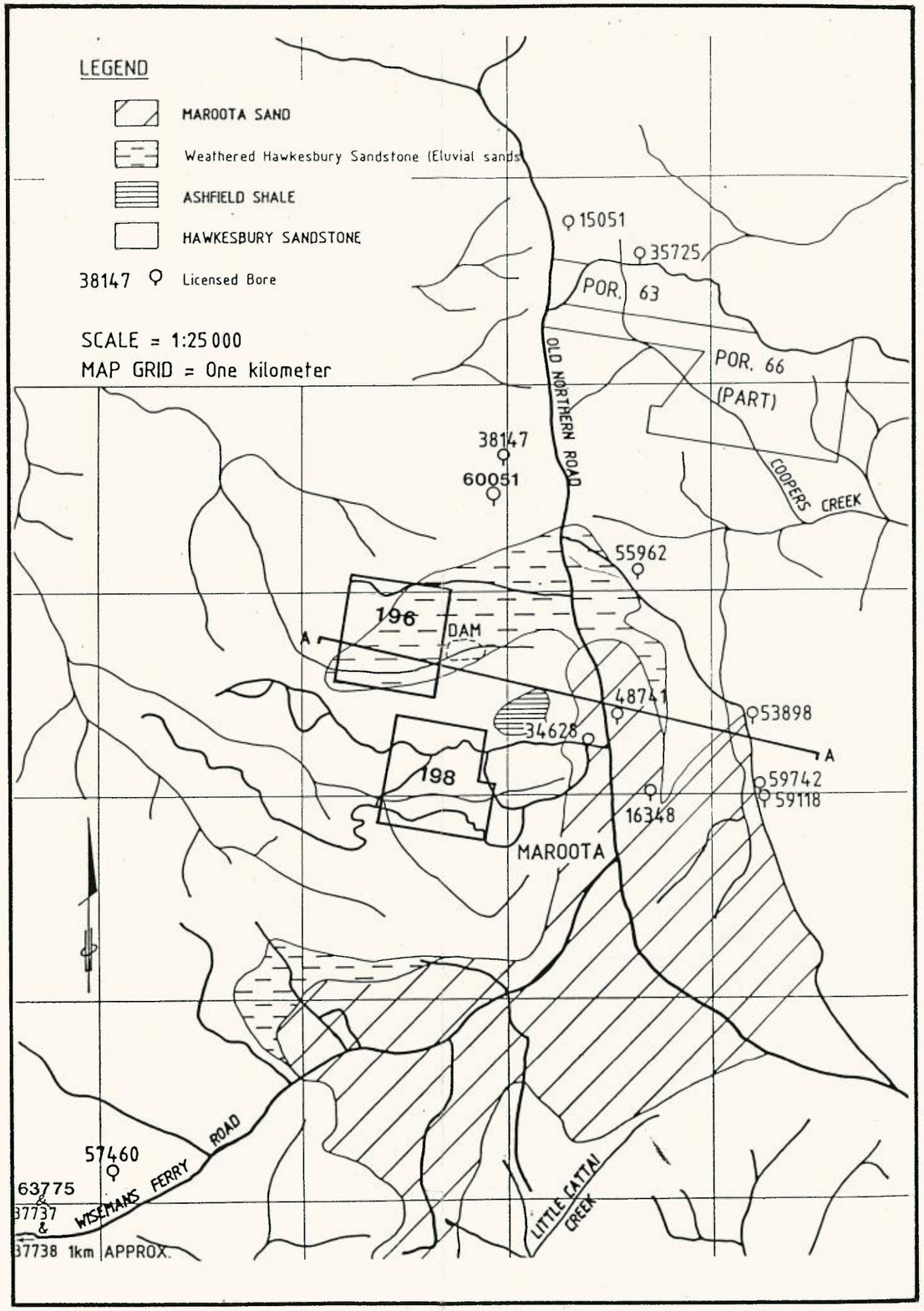


Figure 11: BOREHOLE LOCATIONS

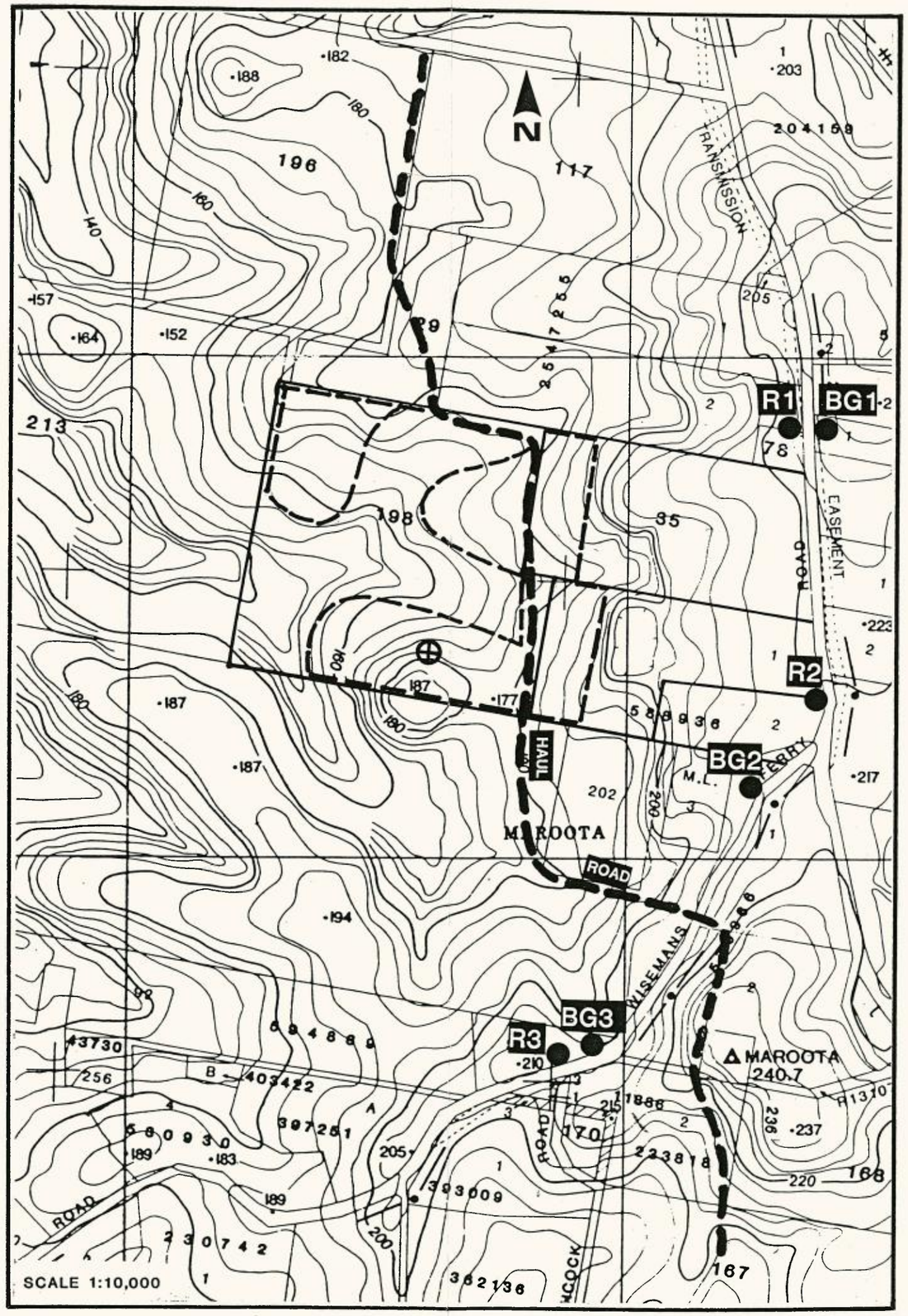


Figure 12: NOISE LEVEL MONITORING SITES

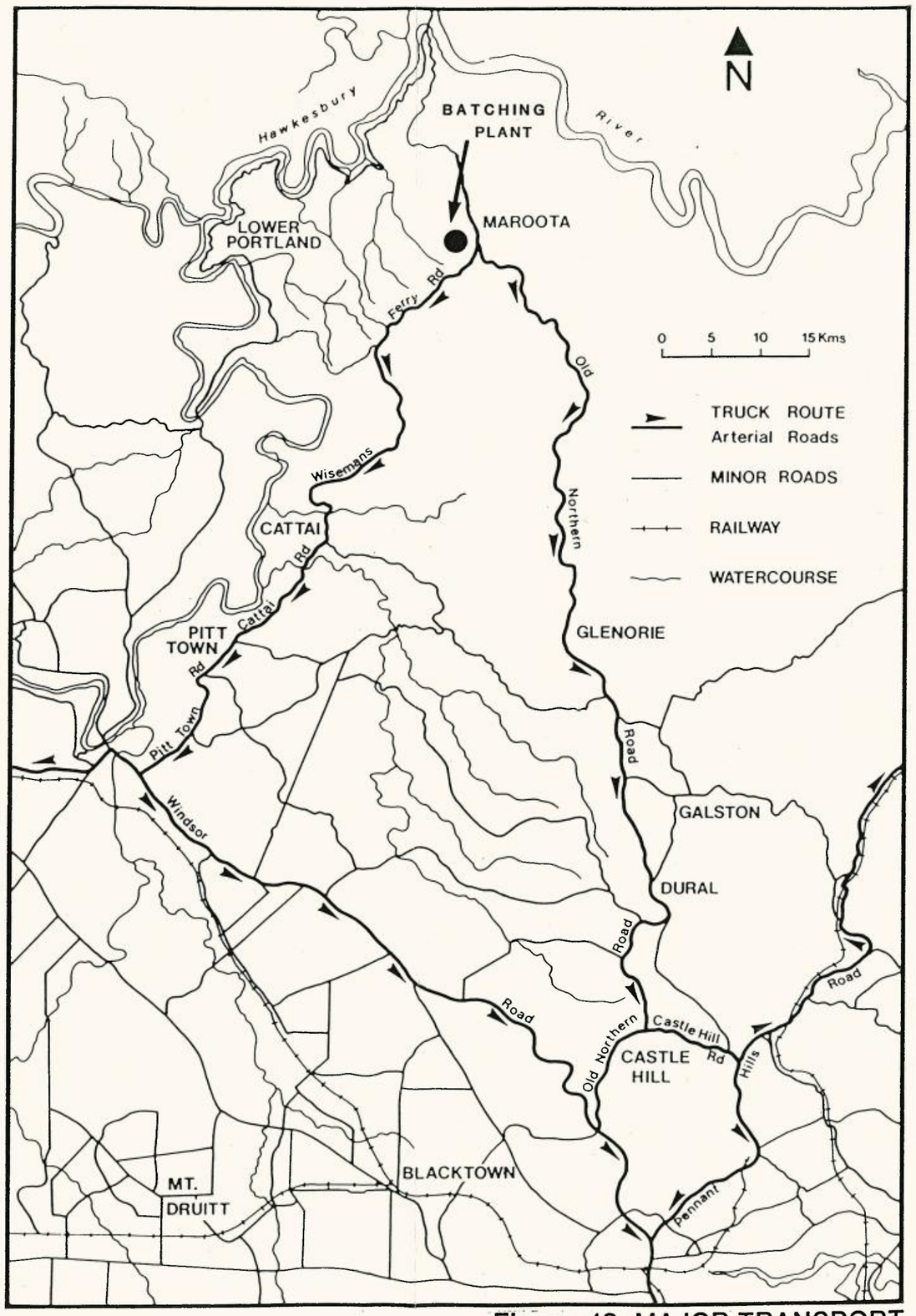


Figure 13: MAJOR TRANSPORT ROUTES

CONSERVATION ZONE

FROM LOWER HEAVY VEHICLE TURNING AREA

MAJOR INTERNAL ACCESS ROUTE

TO HAUL ROAD

AGITATOR ENTRY

GATE

BOUNDARY FENCING

AGITATOR EXIT

GATE

Loading pod/gob hopper/spray ring

Agitator truck

Additive No. 1

Additive No. 2

Dirty yard area

Concrete slab

Aggregate weigh hopper

Loading conveyor

Aggregate weigh scale

Concrete slab

Cement weigh scale

First flush facility - ground level

Ramp

Cement tanker

Cement Silo No. 1

Ceme. /lyash silo No. 2

Dirty yard area

Landscaping

Recycled water facility - ground level

Wash-out facilities - above ground

BOUNDARY FENCING

Landscaping

BOUNDARY FENCING

Initial edge of concrete yard area

Potential truck parking area

Coarse and fine aggregate ground storage

BOUNDARY FENCING

UPPER LEVEL

AGGREGATE BIN CHARGING PLATFORM

NORTH

VEGETATED ACOUSTIC/VISUAL MOUND/BARRIER

RATIO 1:200

UPPER HEAVY VEHICLE TURNING AREA

BATCHING PLANT SITE PLAN

FIGURE 14

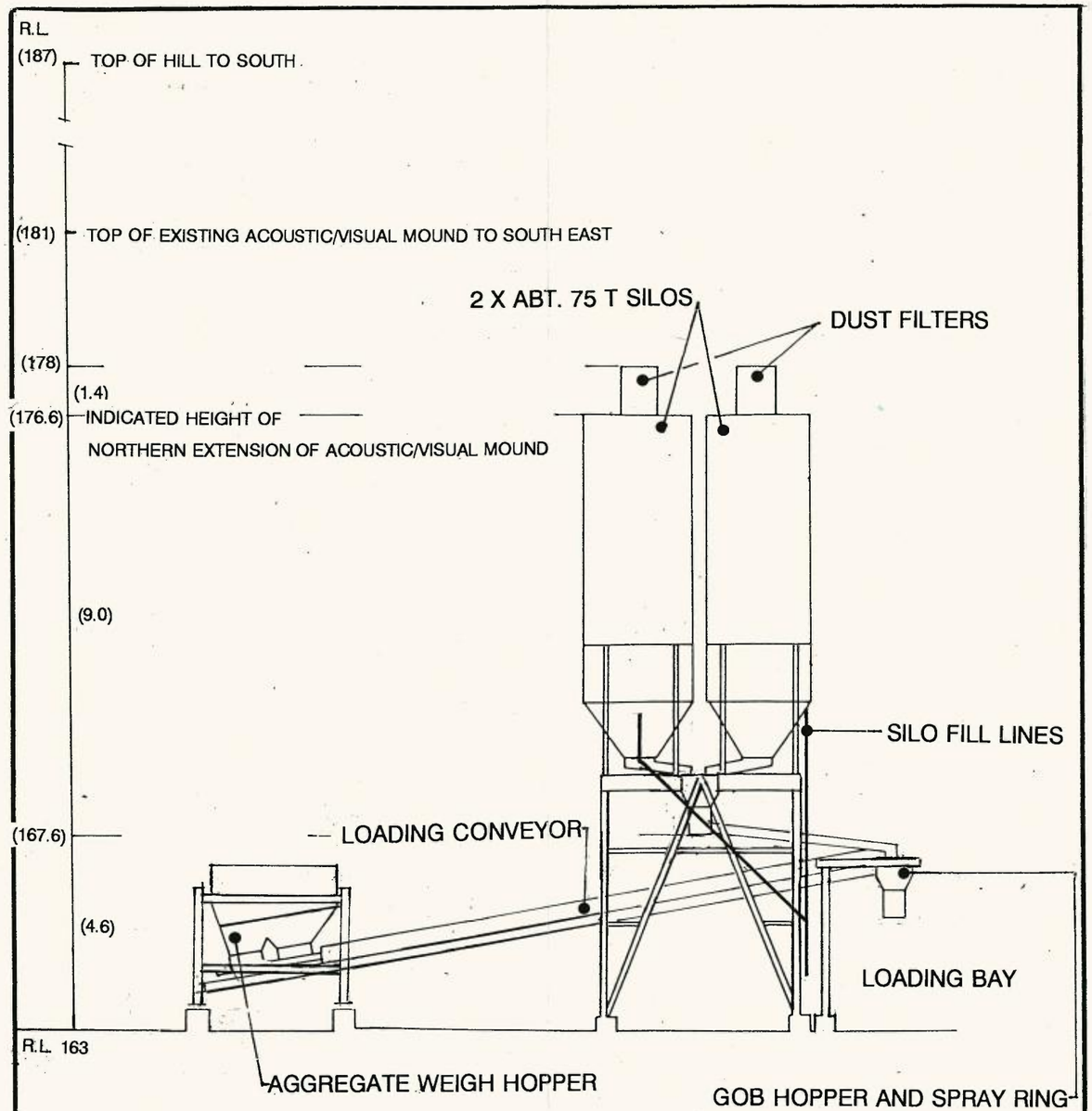

R.L.
(187)
TOP OF HILL TO SOUTH
(181)
TOP OF EXISTING ACOUSTIC/VISUAL MOUND TO SOUTH EAST
2 X ABT. 75 T SILOS
DUST FILTERS
(178)
(1.4)
(176.6)
INDICATED HEIGHT OF
NORTHERN EXTENSION OF ACOUSTIC/VISUAL MOUND
(9.0)
SILO FILL LINES
(167.6)
LOADING CONVEYOR
(4.6)
LOADING BAY
R.L. 163
AGGREGATE WEIGH HOPPER
GOB HOPPER AND SPRAY RING
ABT 1:125
ELEVATION OF PROPOSED PLANT

FIGURE 15.

CONSERVATION ZONE

BUND WALL

BUND WALL

ACCESS ROAD

TO HAUL ROAD

TO SED. PONDS

GUTTER FLOW

CONCRETE SLAB

CONCRETE

DIRTY

CONC. SLAB

DWARF WALL

YARD

DISH DRAIN

RETAINING WALL

AREA

DISH DRAIN

SLAB

WATER RECYCLING FACILITY

BELOW GROUND

WASHOUT FACILITY

ABOVE GROUND

AGGREGATE BINS

NORTH

VEGETATED ACOUSTIC/VISUAL MOUND/BARRIER

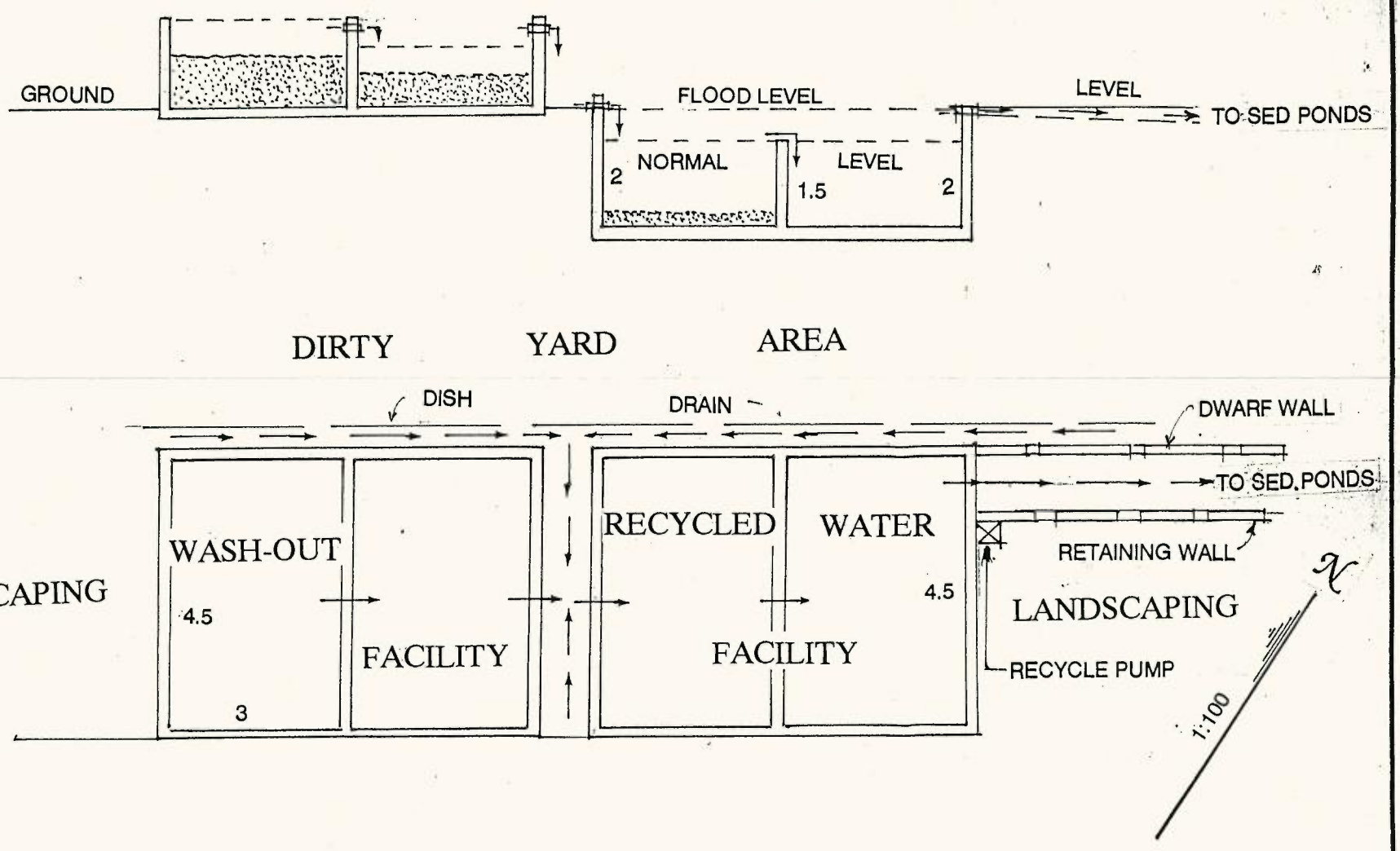
RATIO 1:200

ON SITE DRAINAGE

FIGURE 16

VOLUMES

TANK FLOOD LEVEL = 4.5 x 6 x 2.0 x 1000 = 54,000 LITRES
NORMAL LEVEL = 4.5 x 6 x 1.5 x 1000 = 40,500 LITRES
FIRST FLUSH CAPACITY = 13,500 LITRES

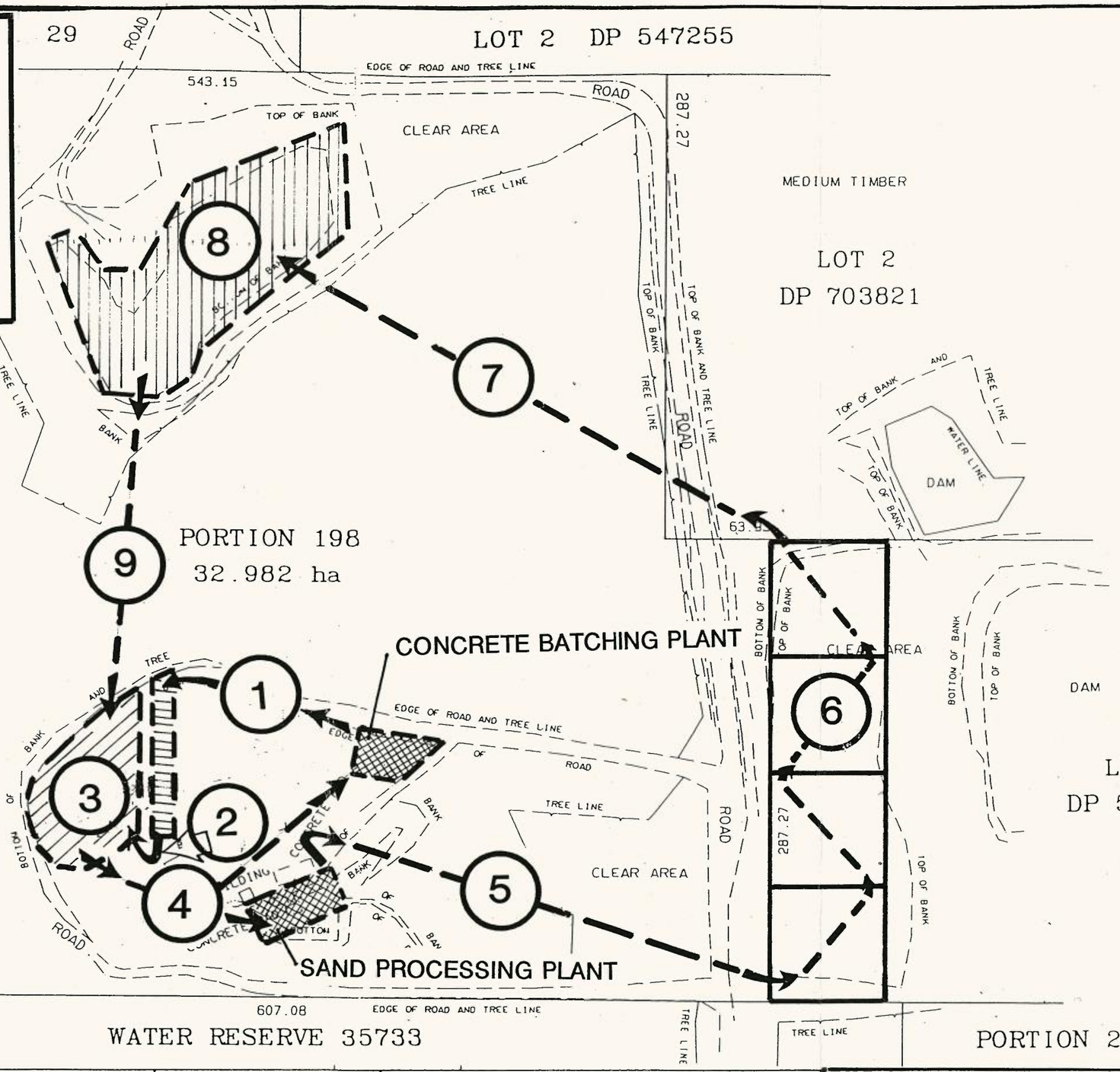


WATER RECYCLING SYSTEM

FIGURE 17

LEGEND

1. DIRTY WATER FROM BATCHING PLANT TO SEDIMENTATION POND
2. THROUGH SEDIMENTATION POND INTO CLEAN WATER SUPPLY DAM
3. THROUGH CLEAN WATER DAM
4. FROM CLEAN WATER DAM TO BOTH PLANTS
5. FROM PROCESSING PLANT TO SETTLEMENT PONDS
6. THROUGH SETTLEMENT PONDS
7. FROM SETTLEMENT PONDS TO CLEAN WATER PICK-UP DAM
8. THROUGH CLEAN WATER PICK-UP DAM
9. FROM CLEAN WATER PICK-UP DAM TO CLEAN WATER SUPPLY DAM



PLAN OF PORTION 198 PARISH OF CORNELIA COUNTY OF CUMBERLAND AT MAROOTA RE: PF FORMATION	RATIO	SURVEYED SS	COLLIN C. DONGES & ASSOCIATES Pty. Limited CONSULTING SURVEYORS & TOWN PLANNERS 939 Old Northern Road Phone: 651 2784 Dural 2158 651 1469
	LEVEL DATUM	DRAWN SS	
	DATE SEPTEMBER 1991	DESIGN	
	SHEET 1 OF 1	REF. CH1545A/S847	

INDUSTRIAL WATER CYCLE

FIGURE 18

APPENDICES

New South Wales Government

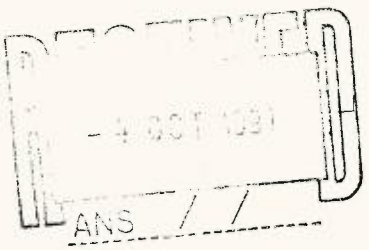
Department of Planning

Remington Centre
175 Liverpool Street, Sydney 2000
Box 3927 G.P.O. Sydney 2001
DX . 15 Sydney

Telephone : (02) 391 2000 Ext:
Fax No : (02) 391 2111

2077

Collin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158



26 SEP 1991

Contact :

Our reference : V. Thomson

Your reference : S90/05667/001

B 872

Dear Sirs,

PROPOSED CONCRETE BATCH PLANT,
PORTION 148, PARISH CORNELIA, MAROOTA

Thank you for your letter of 26 July 1991 indicating that you are consulting with the Director with regard to the preparation of an environmental impact statement (EIS) for the above development.

2. As development consent is required for the proposal and it is a designated development within the meaning of Schedule 3 of the Environmental Planning and Assessment Regulation, 1980, as amended, an EIS must accompany the development application to the Baulkham Hills Shire Council. The EIS shall be prepared in accordance with clause 34 of the Regulation and shall bear a certificate required by clause 26(1)(b) of the Regulation (see Attachment No. 1).

3. In addition, pursuant to clause 35 of the Regulation, the Director requires that the following matters be specifically addressed in the EIS:

- Site access requirements including any road improvements;
- Water management arrangements at the site;
- Transport implications (local and regional) of the proposed plant, e.g. aggregate, flyash and cement deliveries, concrete deliveries;
- Interaction of the concrete plant with sand extraction at the site and any adjoining or nearby sites owned by the proponent;
- visual impact assessment.

4. Attachment No. 2 is a guide to the type of information most likely to be relevant to the development you propose; not all of the matters raised therein may be appropriate for consideration in the EIS for your proposal; equally, the guide is not exhaustive.

5. In preparing your EIS you should approach the Baulkham Hills Shire Council and take into account any comments Council considers may apply to its determination of the proposal.

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

Yours faithfully,

Peter Hamilton
Manager
Assessments Branch
As Delegate for the Director

DEPARTMENT OF PLANNING
ATTACHMENT NO. 1

STATUTORY REQUIREMENTS FOR ENVIRONMENTAL IMPACT STATEMENTS

In accordance with Part IV of the Environmental Planning and Assessment Act, 1979, an environmental impact statement (EIS) must meet the following requirements.

Pursuant to clause 34 of the Environmental Planning and Assessment Regulation, 1980, as amended, the contents of an EIS shall include the following matters:

(a) full description of the designated development proposed by the development application;
(b) a statement of the objectives of the proposed designated development;
(c) a full description of the existing environment likely to be affected by the proposed designated development, if carried out;
(d) identification and analysis of the likely environmental interactions between the proposed designated development and the environment;
(e) analysis of the likely environmental impacts or consequences of carrying out the proposed designated development (including implications for use and conservation of energy);
(f) justification of the proposed designated development in terms of environmental, economic and social considerations;
(g) measures to be taken in conjunction with the proposed designated development to protect the environment and an assessment of the likely effectiveness of those measures;
(g1) details of energy requirements of the proposed development and measures to be taken to conserve energy;
(h) any feasible alternatives to the carrying out of the proposed designated development and reasons for choosing the latter; and
(i) consequences of not carrying out the proposed development.

The EIS must also take into account any matters required by the Director of Planning pursuant to clause 35 of the Regulation, which may be included in the attached letter.

The EIS must bear a certificate as required by clause 26(1)(b) of the Regulation.

DEPARTMENT OF PLANNING
ATTACHMENT NO. 2

ADVICE ON THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR A CONCRETE BATCHING WORKS

A definition of concrete batching works may be found in paragraph (j) to Schedule 3 of the Environmental Planning and Assessment Regulation, 1980, (as amended). These are defined as being works in which more than 20,000 tonnes per annum of concrete or concrete products are manufactured or are capable of being manufactured by the mixing of sand, rock (or gravel) aggregate, various additives, water and/or cement.

(N.B. When determining the capacity of the plant in this regard, it is considered reasonable to take into account the daily working hours, the working week and working year normal for the concrete batching industry and the maximum production rate of the plant to be installed).

Works of a temporary nature associated with a construction site and located on or adjacent to the construction site are specifically exempted.

Concrete batching works have prompted considerable public controversy in the past since, among other things, they affect visual amenity, generate heavy vehicle movements, require the handling and storage or raw materials which may raise dust and cause disturbance through noise. This is the prime reason for designation of concrete batching works industries under the Environmental Planning and Assessment Act, 1979.

The purpose of this paper is to outline various issues relevant to the preparation and consideration of an EIS for concrete batching works. It is intended to assist the preparation of the EIS. It is the applicant's responsibility to identify and address, as fully as possible, the matters relevant to the specific development proposal in complying with the statutory requirements for EIS preparation (see Attachment No. 1).

The matters nominated in this paper are not intended as a comprehensive identification of all issues which may arise in respect of a concrete batching works. Some of the issues nominated may not be relevant to a specific proposal. On the other hand, there may be other issues, not included, that are appropriate for consideration in the EIS.

Information provided should be clear, succinct and objective and where appropriate be supported by maps, plans, diagrams or other descriptive detail. The purpose of the EIS is to enable members of the public, the consent authority (usually the Council) and the Department of Planning to properly understand the environmental consequences of the proposed development.

1. Description of the proposal.

The description of the proposal should provide general background information on the location and extent of the works, existing and proposed, an indication of adjacent developments, and details of the site, land tenure, zonings and relevant forward planning proposals and any other land use constraints.

The extent to which the supply of raw materials and access to markets for the finished product has determined the location of the plant in preference to alternative sites should be stated and any regional strategy for determining the location of these developments should be indicated.

This section should provide specific information on the nature, intent and form of the development. It should, as far as possible, include such details as the processes involved, wastes created and landscaping. A description should also be provided of associated operations such as the transport of materials.

Particular details that may be relevant include:

- Characteristics and economic significance of the product.
- Plans of operation.
- Any proposals for future expansion, including staging and timing.
- Capacity of plant now and in the future.
- Sources and quantities of raw materials.
- Type of machinery and equipment to be used.
- Expected life of the operation of the plant.
- Number of persons to be employed.
- Hours of operation.
- Details of necessary stockpiling; means of storage.
- Access arrangements - truck routes, truck numbers, parking, etc.
- Site drainage and erosion controls.
- Water supply requirements.

2. Description of the Environment.

This should 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 facet of the proposal. In this regard, physical, natural, social archaeological and economic aspects of the environment should be described to the extent necessary for assessment of the environmental impact of the proposed development.

3. Analysis of Environmental Impacts.

Environmental impacts usually associated with concrete batching works are listed below. Where relevant to the specific proposal, these should be addressed in the EIS, taking into account the adequacy of safeguards proposed to minimise them.

- Likely noise disturbance caused by the operations, including transport operations, on nearby residences.
- Other impacts of trucking movements, including access across railways and on to highways.

- Potential for air pollution, particularly dust emissions.
- Water management: including water requirements and the effects on the existing water supply system; proposals for separating clean and contaminated runoff before discharge; water treatment; quality and quantity of effluent for disposal.
- Treatment and disposal of waste material.
- Effects on the visual environment.

In addition, any potential for hazard or risks to public safety and any proposals to monitor and reduce environmental impacts should be included.

4. Contact with relevant Government Authorities.

In preparing the EIS, it is suggested that authorities, such as those listed below, should be consulted and their comments taken into account in the EIS.

- The State Pollution Control Commission in regard to air, water and noise impacts and relevant pollution control legislation requirements;
- The National Parks and Wildlife Service if aboriginal places or relics are likely to be affected.
- The Department of Agriculture and Fisheries if prime agricultural land may be affected by the proposal; and;
- The Heritage Council of NSW if the proposal is likely to affect any place or building having heritage significance for the State.

It is the responsibility of the person preparing the EIS to determine those Departments relevant to the proposed development.

[JRI785L]

New South Wales Government

Water Resources

Collin C.Dongés & Associates Pty Limited
PO Box 244
DURAL NSW 2158

Telex: 121188
Facsimile: (02) 895 7281
Telephone: (02) 895 6211
Ext: 7441
Contact Name: John Ross
Our Reference: 0042246
Your Ref.: B872

Attention: Mr Collin C. Dongés

Dear Collin,

**Re: EIS - Proposed Concrete Batching Plant,
Por 198, PH Cornelia, Old Northern Rd, Maroota**

Thank you for letter of 26 July, 1991, seeking this Department's comments and requirements for the above EIS.

This Department has no special comment or advice on the subject proposal. However, in the conduct of the study it is recommended that you make full use of the three documents sent to you with the Department's letter of April 18, 1991 (copy attached). All appropriate matters discussed in these guideline documents should be addressed in the above EIS.

Again, the Department would appreciate being sent draft copies of the subject document for review and endorsement.

Yours sincerely,

John A.Ross
for Manager, Investigations
Technical Service Division
7 August, 1991

Attach.

[JAR371L]

New South Wales Government

Water Resources

Collin C Dongés & Associates Pty Limited
PO Box 244
DURAL NSW 2158

Telex: 121188
Facsimile: (02) 895 7281
Telephone: (02) 895 6211
Ext: 7441
Contact Name: J.A. Ross
Our Reference: 0036893
Your Ref.: B870

Dear ~~Sir~~ Collin,

**Re: E.I.S. - Proposed Extractive Industry,
Lot 1, D.P. 204159, Old Northern Rd, Maroota**

Thank you for your letter of 4th April, 1991, seeking this Department's comments and requirements for the above E.I.S.

Enclosed for your information and retention are the following Departmental documents:

a) "A Guide to Stream Channel Management";

b) "The 7 - Step Method of Controlling Bank Erosion and Sediment Build-Up"; and

c) A revised "General Requirements for Environmental Impact Statements". (This is essentially a checklist of water resources matters to be addressed in the assessment of environmental impacts).

The Department would appreciate being sent a draft copy of the subject E.I.S. for review. It would be worth noting that if multiple copies of the draft document can be made available (even on a loan basis) this helps significantly to expedite the review process.

I trust the above and enclosed information will prove useful.

Yours faithfully,

John A Ross
for Manager, Investigations
Technical Service Division
April 18, 1991

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
New South Wales Government

Incorporating the **Soil Conservation Service**

PO Box 1416
PARRAMATTA 2124.

Phone: 895 7503
Fax: 895 7501

Colin C Donges
Colin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158

Contact: Mr Matt Corbett

Our reference: M217; M10803

Your reference:

Dear Sir,

RE: PROPOSED EXTRACTIVE INDUSTRY FOR:-
1. lOTS 1 & 2 DP 570966 & LOT 2 DP 233818 WISEMANS FERRY ROAD, MAROOTA
2. PORTION 117, PARISH OF CORNELIA, OLD NORTHERN ROAD, MAROOTA
3. PORTION 198, PARISH OF CORNELIA, OLD NORTHERN ROAD, MAROOTA - (PROPOSED CONCRETE BATCHING PLANT)

I refer to your three letters of the 25th and 26th July, 1991, seeking comment on any special requirements which should be addressed in your Environmental Impact Statement.

As you are probably aware, erosion and sediment control are important environmental considerations prior to and during any development, including quarry operations. It is essential to minimise on-site erosion and off-site sedimentation of adjacent properties, streams, waterbodies and the like.

In this context, a progressive erosion and sediment control program should be implemented from the initial stages until operations have been completed and the sites fully stabilised and/or landscaped. This program should be outlined in the Environmental Impact Statement and should consider:-

(i) Progressive extraction and rehabilitation.

(ii) The stockpiling of available topsoil to aid later revegetation.

(iii) The control of surface drainage.

(iv) The construction of sediment trapping structures.

(v) Temporary or short term erosion control measures (eg. diversion banks, use of hay bales, silt fencing etc.).

(vi) Revegetation utilising appropriate grass species.

(vii) Maintenance of rehabilitated areas.

Additionally, I refer you to the Service's publication `Guidelines to Meet Requirements for Information on Soil and Land Stability In Proposals for Open-Cut Mining and Rehabilitation' that has been previously forwarded to your office. This document has been prepared to assist with soil conservation sections of Environmental Impact Statement studies.

In respect to the subject proposals, the Service would welcome the opportunity to discuss erosion and sediment control in more detail by way of a site inspection when a draft programme has been developed.

For further information or advice please contact me at the Service's Parramatta office on 895 7503.

Yours faithfully,

Matt Corbett

Matt Corbett
for B.J. Wright
District Soil Conservationist
METROPOLITAN.

16th August, 1991.

PROSPECT ELECTRICITY

10 Smith Street, Parramatta, NSW 2150
Postal address: *PO Box 389, Parramatta, NSW 2124*

DX 28443 Parramatta
Fax: (02) 635-2511

Telephone: (02) 635-0300
or number in local directory

In reply quote: 118/88 BW:LM
Your contact: Brian Waites
Telephone Ext: 83440

14 August 1991

Mr C Donges
Collin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158

Dear Mr Donges

PROPOSED CONCRETE BATCHING PLANT - PORTION 198, PARISH OF CORNELIA, OLD NORTHERN ROAD, MAROOTA

I refer to your letter dated 26 July 1991 and our recent telephone discussions regarding the proposed concrete batching plant within the above property and confirm as follows.

The concrete batching plant is to be constructed adjacent to the proposed sand plant for which your client is presently negotiating with Prospect for supply.

Supply arrangements to the sand plant involve an extension of supply over neighbouring Crown Land property, and it would appear that satisfactory arrangements have been made with the Crown for this extension of supply.

However, it is requested that your client submit a revised application for the sand plant to include electrical load details for the concrete batching plant.

Yours faithfully

B. Waites

Brian Waites
Senior Engineering Officer
WINDSOR DISTRICT

Our Reference: 31.5390 KM:armm
Mr Moon
831 0965

Roads and Traffic Authority
Sydney Western Region

RECEIVED
26 AUG 1991
ANS / /

RTA

Colin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158

83 Flushcombe Road
Blacktown
New South Wales 2148
Telephone (02)831 0911
Facsimile (02)621 5543
PO Box 558
Blacktown NSW 2148
DX 8120

PROPOSED CONCRETE BATCHING PLANT PART 198 - PARISH OF CORNELIA, OLD NORTHERN ROAD, MAROOTA

Dear Sir

I refer to your letter of 26 July 1991 and confirm that the Authority would generally like to see an Environmental Impact Statement give consideration to:

(i) Traffic demands and how that demand is to be accommodated on the existing Regional road network. Information on traffic movements per week, including tonnage, would assist in assessing the impact, if any, of the development on the major road network, and what steps in terms of traffic management measures are required;

(ii) Where traffic generation is high and involving heavy vehicles, consideration could be given to the issue of road maintenance. The Authority is pursuing the indexed levy rate of three cents per payload tonne kilometre applied to major heavy truck movements where appropriate; and

(iii) Where intersection layout in the vicinity of the site is poor, what improvements are required in terms of traffic and safety to accommodate turning movements, street signs, parking restrictions, street lighting, pavement condition, etc and the cumulative effect of the proposal with other developments in the area.

I trust the above information assists.

Yours faithfully

C. Ford

C Ford
Development & Road Safety Manager

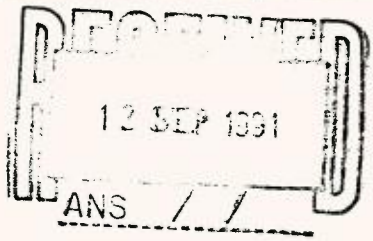
GS - 505

DEPARTMENT OF MINERAL RESOURCES

NEW SOUTH WALES GOVERNMENT

MINERALS AND ENERGY HOUSE
29-57 CHRISTIE STREET
CORRESPONDENCE PO BOX 536
ST LEONARDS NSW 2065
DX 3324 ST LEONARDS
TELEPHONE (02) 901 8888
FACSIMILE (02) 901 8777

The Secretary
Collin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158



Our Ref: L91/0370
Your ref: B872
3rd September 1991

Dear Mr Donges,

ENVIRONMENTAL IMPACT STATEMENT FOR CONCRETE BATCHING PLANT PORTION 198, PARISH OF CORNELIA, OLD NORTHERN ROAD, MAROOTA

I refer to your letter dated 26 July 1991 concerning the above proposal and seeking details of any special requirements which this Department would like addressed in the E.I.S. you will be preparing. The delay in responding to your request is regretted.

As you are aware, the proposal affects part of the Maroota area included in Schedule 2 and shown on Sheet 9 within the Sydney Regional Environmental Plan No. 9 (Extractive Industry). Also relevant to the area of the proposal is the Draft Plan of Management for extractive resources at Maroota, prepared for Baulkham Hill Shire Council by Resource Planning Pty Ltd (dated June 1991).

This Department supports your suggestion that the proposal should be considered in the context of the associated extractive industry. While the proposed plant is not an extractive industry *per se*, it is clearly a closely related activity as it intends to directly utilise and process local sand supplies. In such a case this Department would consider it appropriate to regard a concrete batching plant as part of the extractive industry which is already in existence in Portion 198. The Department of Mineral Resources also supports the proposal of back loading as a means of minimizing total heavy vehicle movements.

Except in the case of batching plant proposals within mine subsidence districts, where such heavy plant might require special construction considerations, this Department typically has few special requirements for developments of this type. Where mine subsidence does not pertain, as at Maroota, the Department's major concern is to ensure that an adequate resource base exists and is readily available to support the proposal, and also that the proposed development will not unnecessarily sterilize valuable resources. If the land over the envisaged resource base is fully or partially held by the appropriate extractive operator, or other resource security measures are in place, this might be mentioned.

The proposal site is close to the limiting line of the 'Total extent of extractive resources' mapped in Figure 3 of the Draft Plan of Management referred to above. Moreover, the geological map (Figure 5) in the Draft Plan indicates that the

proposal site should likely be free of any resource sterilization concerns with the possible exception of sand available from friable Hawkesbury Sandstone. This is relevant as the present and past extractive sites within Portion 198 are in Hawkesbury Sandstone.

The Department is also anxious to consider and assess any potential impacts on current or future access to identified resources. Desirably, all extractive industry plant should be transportable or located where it is not likely to hinder future extraction or sterilize quantities of profitably extractable materials. This could be briefly commented upon in the E.I.S.

This Department encourages the inclusion of all relevant drilling or other subsurface data available, and any other test results you may have in respect of the depth and quality of sand which is either affected by the proposal or is supportive of its viability.

This Department holds a copy of the Maroota draft plan of management referred to above, and also other references to the Maroota sand deposit, which you may wish to consult for possible relevance if you have not already done so.

Should you have any further enquiries on this matter please do not hesitate to contact Dr J. Byrnes, Geologist (02 901 8331) or Mr I. Paterson, Senior Geologist (02 901 8368).

Yours faithfully,

S. Lishmund
for Director-General

9/9/91

New South Wales Government

NSW Agriculture & Fisheries

Our reference: DAS 16/70 AK:DS
Your reference: DAS 16/9

Telephone: (063) 61 6100
Fax: (063) 62 9059
Extension:

Bloomfield Office
Forest Road
Orange South

Bloomfield Office
PMB 21
ORANGE SOUTH NSW 2800

Mr C.C. Donges
C. Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158

Dear Sir,

Proposed Concrete Batching Plant
Portion 198, Parish of Cornelia,
Old Northern Road, Maroota

I refer to your letter of 25 July 1991 requesting NSW Agriculture's advice on matters the Department wishes to see addressed in the Environmental Impact Statement (EIS) for the proposed concrete batching plant at the above location. The Department believes the EIS should address the following issues:

Land Resources

* A full description of the existing land uses on site and within the surrounding properties. An examination of the Department's Agricultural Land Class Maps indicate that the site in question has been assessed as Class 4 with some Class 3 agricultural land.

* The size of the proposed extractive development in relation to the property as a whole.

* The effects of the proposed development on the agricultural viability of the property and on the agricultural industries within the local district.

* Identification of potential impacts on adjoining landholders; for example, access, transport, dust, noise, water (surface and groundwater) and visual factors and a description of measures proposed to mitigate these effects.

N·S·W AGRICULTURE & FISHERIES CENTENARY 1890~1990

Water and Aquatic Resources (for detailed advice on these matters please consult with NSW Fisheries, PO Box 356, St Leonards NSW 2065)

* An assessment of the impact on surface and underground water. This should include a description of water quality and measures which would be taken to mitigate any potential impacts.

* Aquatic habitats should be identified along with measures proposed to prevent any adverse effects both on-site and downstream.

Rehabilitation

* Description of the proposed end use and justification for this land use.

* Measures proposed to maintain viability of the topsoil which may be needed for rehabilitation of the site.

* Outline of the rehabilitation plan showing design criteria for the rehabilitation program.

Cumulative Impact

The Environmental Impact Statement should also examine the cumulative impact of the development proposal in the context of regional land and aquatic resources.

Thank you for bringing this matter to the attention of the Department.

Yours faithfully,

ANDREW KENNEDY
for K.P. SHERIDAN
DIRECTOR GENERAL
18 September 1991

Baulkham Hills Shire Council

Administration Centre, 129 Showground Road,
Castle Hill, N.S.W., 2154
Telephone (02) 634 0111
DX 8455 Castle Hill
Fax (02) 899 1346
Office Hours 8.30am - 4.30pm

31 January 1992

Your Ref. B872

Our Ref
P 5321 10555

Collin C Donges & Associates Pty Ltd
PO Box 244
DURAL NSW 2158

RECEIVED
- 4 FEB 1992
ANS / /

Attention: Collin Donges

Dear Sir

Proposed Concrete Batching Plant, Portion 198, Parish of Cornelia, Old Northern Road, Maroota

---

In regard to the abovementioned and your letter dated 26th July 1991, Council advises that you should consider the following and provide information on these matters in conjunction with any formal development application.

(i) The effects of the proposed development on the extraction operations at Maroota in terms of Regional Environmental Plan No. 9.

(ii) The manner in which the proposed development would be co-ordinated with authorised extraction activities in the surrounding area.

(iii) The noise impact of the operations of the batching plant and the effect on surrounding properties.

(iv) The impact of the batching plant operations on the surrounding land including private land holdings Crown Land and Maroota State Forest.

(v) The expected life span of the batching plant and daily volumes of material likely to be processed.

(vi) The expected daily truck numbers likely to be generated by the operations of the batching plant.

(vii) The proposed route of transportation of the material which is processed at the batching plant.

(viii) The proposed rehabilitation of the affected land following removal or relocation of the batching plant.

(ix) Council's Draft Plan of Management on Extractive Industries for the Maroota area.

(x) The justification of the batching plant in terms of the material to be processed and in relation expected market demand.

Should you have any enquiries regarding the above, please contact the Extractive Industries Officer, Mr Andrew Steers of Council's Environmental Services Department on the telephone number indicated below.

Yours faithfully

R. Connolly

Richard Connolly A.M.
GENERAL MANAGER

Enquiries: Andrew Steers
Telephone: 634 0111 (Between 8.30am - 10.00am)

AS:DOC478/TOWN/TCORRO

APPENDIX B

MONTH	% CALM DAYS	AVE SPEED WINDS (KM/HR)	MAJOR WIND DIRECTION	HIGHEST WIND SPEED PER HR % OCCURRENCE	PREVAILING WIND DIRECTION
JAN	12	7.25	E	21-30 4%	SW-E
FEB	14	6.63	SW	21-30 8%	S-SW
MARCH	9	6.65	W	21-30 4%	S-NW
APRIL	10	6.65	NW	31-40 2%	SW-NW
MAY	7	9.22	NW	31-40 1%	W-NW
JUNE	8	8.83	NW	31-40 3%	SW-NW
JULY	7	7.29	NW	21-30 10%	W-NW
AUGUST	5	10.23	NW	31-40 6%	SW-NW
SEPT	7	10.17	NW	31-40 3%	SW-NW
OCT	7	12.22	NW	41-50 1%	S-NW
NOV	11	9.85	NW	31-40 3%	S-NW
DEC	11	10.22	E	41-50 1%	SW-E

9 a.m. Winds

MONTH	% CALM DAYS	AVE SPEED WINDS (KM/HR)	MAJOR WIND DIRECTION	HIGHEST WIND SPEED PER HR % OCCURRENCE	PREVAILING WIND DIRECTION
JAN	-	19.35	E	31-40 9%	NE-SE
FEB	2	14.10	E	31-40 8%	NE-S
MARCH	-	14.08	E	31.40 3%	E-SE
APRIL	2	10.52	E	31-40 3%	NE-SE &
MAY	-	11.96	NW	31-40 11%	SW-NW
JUNE	2	12.72	SW	41-50 3%	SW-NW
JULY	-	13.25	W-NW	41-50 1%	W-NW
AUGUST	2	17.54	W	51 2%	W
SEPT	2	17.34	E	41-50 4%	NE-E
OCT	3	16.66	E	41-50 1%	E
NOV	2	21.07	E	31-40 24%	E
DEC	-	23.73	E	41-50 3%	E

3 p.m. Winds.

APPENDIX C

REPORT C98-R1

PF FORMATION PTY LTD

SAND EXTRACTION OPERATION

NOISE IMPACT ASSESSMENT

RICHARD HEGGIE ASSOCIATES PTY LTD
CONSULTING ENGINEERS

Prepared for: Collin C. Dongés & Associates Pty Ltd
P.O. Box 244
DURAL NSW 2158

11 December, 1989

CONTENTS

CONTENTS

RICHARD HEGGIE ASSOCIATES PTY LTD
CONSULTING ENGINEERS

22 Giffnock Avenue (PO Box 148)
North Ryde NSW 2113
Australia

Telex AA72350
Fax (02) 805 0356
Telephone (02) 805 0144

REPORT C98-R1

PF FORMATION PTY LTD

SAND EXTRACTION OPERATION

NOISE IMPACT ASSESSMENT

COLLIN C. DONGES & ASSOCIATES PTY LTD

11 December, 1989

1. INTRODUCTION

PF Formation Pty Ltd proposes to extend its current sand extraction operations located on Old Northern Road, Maroota, to include an adjacent parcel of land known as Portion 198, Parish of Cornelia. The company requires this extension to their existing operations in order to ensure the continued availability of raw materials and to increase production output and product range. This proposal also includes relocating the existing wash plant at Portion 196 to the new work site. There are no immediate plans to relocate the dry screening plant, however, it will be installed on Portion 198 at a later date.

This report presents the results of acoustical investigations to determine the potential noise impact on nearby premises.

2. PROJECT DESCRIPTION

Extension of the existing operations will entail continuation of the current extraction method. Vegetation clearing, topsoil pre-stripping and mining is carried out using bulldozers whilst stockpiling and loading of overburden and raw material will be undertaken by front end loaders. The wash plant is supplied by rear dump trucks or elevating scraper. Processed products are transported to the Sydney market by a fleet of rear dump trucks.

The wash plant consists of a 20 cubic metre drive-over hopper which feeds onto a 10 metre long electrically-powered conveyor. Sand which passes through the screen is washed down into a constant density tank from where it is pumped out by an electric sand pump. This pump feeds two cyclones which in turn discharge into a second constant density tank. From the constant density tank, sand is then pumped up to the stockpile tower area where it is distributed by two cyclones. Slimes are removed through a sludge pump and water supply to the plant is via an electrically powered pressure pump.

3. SITE DETAILS

The project area falls within Portion 198 which is located to the north and east of Wisemans Ferry Road and Old Northern Road respectively. The surrounding area at Maroota is predominantly covered by small properties which mainly cultivate citrus, stone fruits and market gardens. A number of extractive operations exist nearby and the Marramarra National Park lies to the north-east. The location of the project area is shown in Figure 3.1 on the following page. Background noise monitoring positions representing individual residences or noise sensitive areas are labelled BG1, BG2 and BG3.

Positions BG2 and BG3 are representative of residential properties on Wisemans Ferry Road in close proximity to the proposed extractive operation. Position BG1 is adjacent the Maroota Public School on Old Northern Road and is considered to represent the existing noise climate at potentially noise sensitive locations along Old Northern Road.

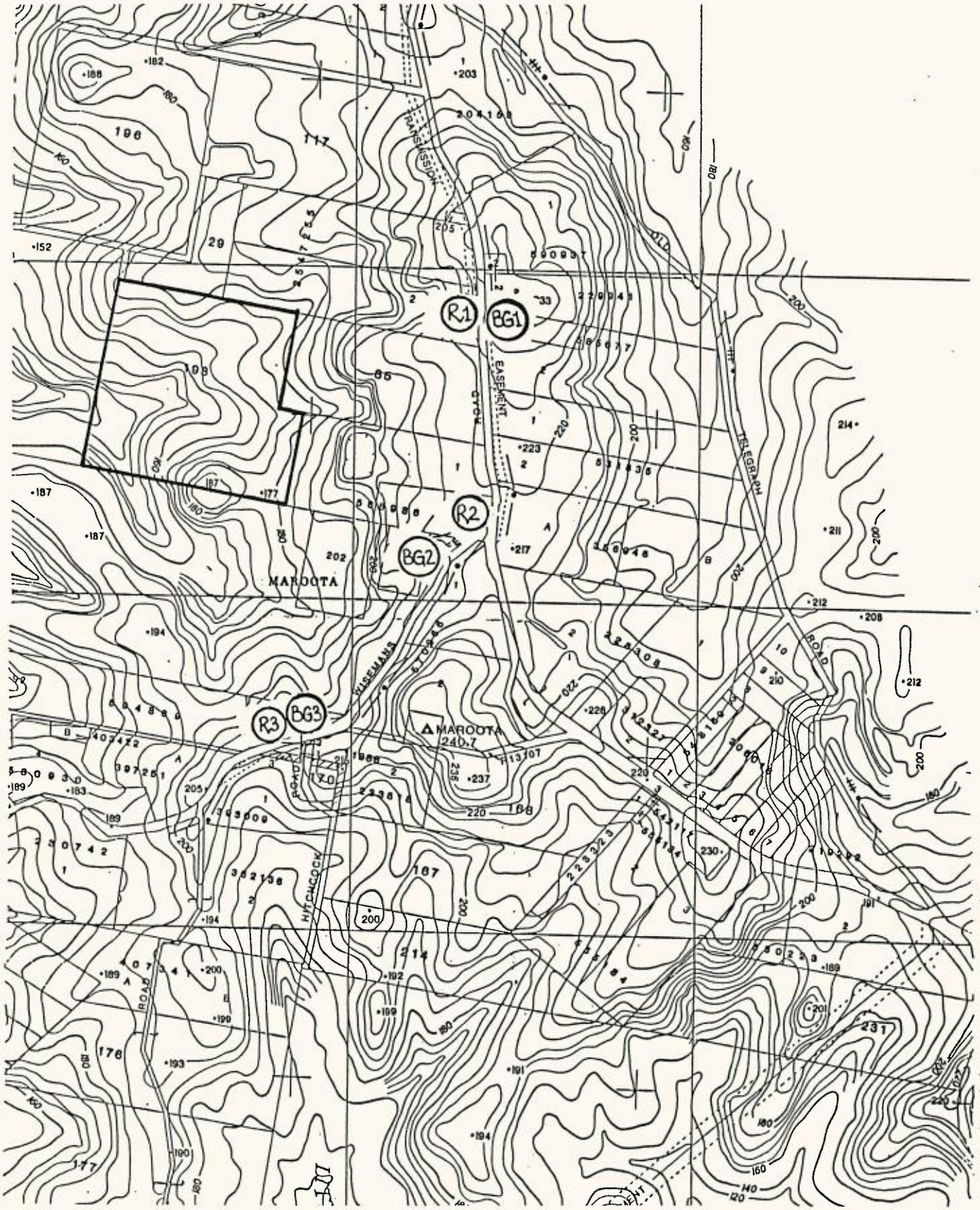
4. HOURS OF OPERATION

The proposed hours of operation for the Portion 198 extractive works are 6 am to 6 pm Mondays to Fridays and 6 am to 6 pm Saturdays. There will be no work on Sundays and Public Holidays.

5. TRAFFIC MOVEMENT

The project site is to be accessed by a 700 m long haul road which connects Wisemans Ferry Road to Portion 198 and thence to 196 and 117. The construction of this route will reduce the haulage distance between current operational sites and will result in heavy vehicles no longer utilising the 1.4 kilometres of main road to the north of the Old Northern and Wisemans Ferry Roads intersection. This latter factor enables trucks to avoid passing a cluster of roadside residences and the Maroota Primary School.

Figure 3.1: Project Location, Ambient Noise Survey Monitoring Sites and Receiver Locations



It is anticipated that a maximum of 200 customer truck movements will occur during the proposed operating hours. Vehicles will enter the site from Old Northern Road until the haul road is complete. Thereafter the Wisemans Ferry Road entrance only will be used. Vehicles will travel along the haul road to be loaded in the stockpile area. Exit routes will be along the haul road and vehicles will then travel to their destinations via Wisemans Ferry Road and Old Northern Road.

An anticipated maximum of 50 trucks (100 movements) per day is expected for PFF vehicles travelling along the haul road between Portion 167 and 198.

6. EXISTING NOISE ENVIRONMENT

6.1 Ambient Noise Surveys

Noise surveys to establish the existing noise environment in the vicinity of the proposed operations were carried out on 9 September, 1989.

Locations BG1, BG2 and BG3 were used for intermittent measurements of ambient sound levels. Sampling was carried out at each site for a fifteen minute duration. Following receipt of traffic count data from Collin C. Dongés and Associates, which showed a reasonably constant traffic volume between 0600 and 1800 hours weekdays and an increased volume on Saturdays, it was decided that measurements made at any time throughout the proposed working hours would be representative of the typical daytime noise environment of the area.

The ambient noise surveys were conducted in accordance with Australian Standard 1055-1989 "Acoustics - Description and Measurement of Environmental Noise" and the State Pollution Control Commission (SPCC) Environmental Noise Control Manual. The weather on the occasion of testing was fine with a light north/north-easterly breeze.

6.2 Instrumentation

Instrumentation for the survey comprised a Brüel & Kjaer Modular Precision Sound Level Meter Type 2231 fitted with a Brüel & Kjaer 12 mm Prepolarised Condenser Microphone Type 4155. The sound level meter was calibrated prior to and immediately following measurements using a Brüel & Kjaer Electronic Calibrator Type 4230. The drift in calibration did not exceed ±0.5 dBA.

6.3 Results

From the data obtained over the 15 minute sampling periods the L_1, L_{10}, L_{90} and L_{eq} levels were determined. The L_1, L_{10} and L_{90} are statistical descriptors representing the noise levels exceeded for 1%, 10% and 90% of the monitoring duration. These levels are often referred to as the maximum, average maximum and average minimum levels respectively. The L_{90} or average minimum, is used to approximate the background A-weighted sound pressure level.

The L_{eq} is the equivalent continuous sound level over the monitoring period.

The results of the ambient noise surveys are presented in Table 6.1 following:

Table 6.1: Ambient Noise Surveys - Results

MONITORING LOCATION	TIME	NOISE LEVELS (dBA) L1	L10	L90	Leq	NOISE SOURCES
BG1	1145 - 1200	79	63	43	65	Road traffic, birds, trees rustling
BG2	1210 - 1225	75	62	38	62	Traffic, birds, insects, trees rustling, distant machinery
BG3	1230 - 1245	70	53	37	56	Road traffic, birds, insects, trees rustling

7. MAJOR NOISE SOURCES

The major noise sources may be grouped into three distinct areas for the purpose of impact assessment. These are:

1. Mobile equipment
2. Processing plant
3. Product trucks.

The noise level of the processing plant comprises the individual emissions from the wash plant which will be relocated to Portion 198 and the dry screening plant which will be installed at a later date.

The levels used for these items were based upon measurements previously carried out by Dick Benbow and Associates Pty Ltd and presented in their report No EE1321CC for Portions 117 and 196.

Noise levels for items of mobile equipment and product trucks were individually input into the prediction programme on the basis of measurements made during previous studies.

The major noise sources and their associated noise levels are presented within Appendix A.

8. EVALUATION OF NOISE EMISSION LEVELS

8.1 Processing Plant and Mobile Equipment

In order to determine the acoustical impact of the processing plant and mobile equipment, a computer model was developed to represent the "worst case" scenario incorporating all proposed noise sources, the surrounding terrain and nearby noise-sensitive receivers.

The computer model was prepared utilising the Environmental Noise Model (ENM), a commercial software system developed in conjunction with the NSW State Pollution Control Commission. The series of sophisticated and complex algorithms utilised by this software have been developed and tested internationally and within Australia and are fully endorsed by the SPCC.

The model calculated the maximum contributed noise emission levels from the processing plant and mobile equipment to the following receiver locations:

R1 - Maroota Public School, Old Northern Road
R2 - Residence, cnr Old Northern and Wisemans Ferry Roads
R3 - Residence (Ramm), 145 Wisemans Ferry Road.

The predicted maximum noise levels for this "worst case" scenario are summarised in Table 8.1.

Table 8.1: Predicted Maximum Noise Levels

CONTRIBUTING NOISE SOURCES AT RECEIVERS	RECEIVER/NOISE LEVEL (dBA) R1	R2	R3
Bulldozers	38	37	38
Front End Loaders	29	24	32
Scraper	33	33	36
Truck Fleet	42	37	40
Wash Plant	26	28	31
Dry Screening Plant*	27	26	35

* Will be installed at a later date

8.2 Product Truck Operations

Calculations have been made in order to assess the compliance of the expected product truck operations associated with the new extraction operation with the various recommended criteria.

On public roads of traffic flow less than about 1000 vehicles/day, the $L_{Aeq,T}$ truck noise assessment method is recommended. Traffic counts on Old Northern Road and Wisemans Ferry Road at Maroota (supplied by Collin C. Dongés and Associates) revealed both roads carried approximately 1500 vehicles per day.

Where the existing traffic flow is greater than about 1000/day, the Calculation of Road Traffic Noise (CORTN) method is used.

However, due to the nature of the proposed operations and the 18 hour traffic flows being regarded as borderline with respect to use of the CORTN method of assessment, our predictions were made using the $L_{Aeq,T}$ method.

Predictions were made based on two truck volumes, 50 vehicles (100 movements) and 100 vehicles (200 movements) between the hours of 6 am and 6 pm weekdays.

Assuming a speed of 60 km/h for residences located 20 metres from the road, the predicted L_{Aeq} (60 min) for 100 and 200 vehicle movements respectively is 52 dBA and 55 dBA. These levels are applicable to residences and other potentially noise sensitive receivers on Old Northern and Wisemans Ferry Roads.

9. NOISE IMPACT ASSESSMENT PROCEDURES

9.1 Processing Plant and Mobile Equipment

The control of noise in New South Wales is vested in the State Pollution Control Commission which administers the Noise Control Act, 1975. In implementing its environmental noise control policy, the SPCC has two broad objectives:

(a) That noise from any single source does not intrude greatly above the prevailing background noise level.

(b) That the background noise level does not exceed the level appropriate for the particular locality and land-use.

In order to limit the potential offensiveness of noise from a specific source, any exceedance of the background noise level should generally not be more than 5 dBA. This increase is determined by the L_{10} noise level at the receptor with the potentially intrusive noise occurring and the L_{90} value determined in its absence.

The residences or residential areas around the proposed site potentially most affected by the noise of the proposed operations are represented by receiver locations R1, R2 and R3, shown on Figure 3.1 and by monitoring positions BG1, BG2, and BG3 as also shown in the location map in Figure 3.1.

In relatively undeveloped rural areas, the existing background levels can be quite low. When development is permitted to proceed in such areas (eg in view of its social worth or as a result of government decisions on resource use and infrastructure development), the land-use designation may change, and there will often be a change in the noise climate.

To assist in balancing the individual and community effects and benefits arising from such situations, the SPCC has drafted a schedule of recommended background noise levels for various land-use categories. An extract from the schedule relating to the three most stringent classifications appears in Table 9.1.

Table 9.1: Recommended Outdoor Background Levels at Residences

ZONING DESCRIPTION	TIME PERIOD (*)	RECOMMENDED LIMIT - L_{90} ACCEPTABLE	MAXIMUM
Residences in Rural Areas	Day	45 dBA	50 dBA
	Night	35 dBA	40 dBA
Residential Areas	Day	45 dBA	50 dBA
	Night	35 dBA	40 dBA
Residences Near Industrial Areas	Day	50 dBA	55 dBA
	Night	40 dBA	45 dBA

(* For Monday to Saturday, "day" is defined at 7.00 am to 10.00 pm)

The SPCC's objective is for the L_{90} background noise levels not to exceed the specified "acceptable" limit. Where the recommended "acceptable" level is not achievable (for technical or economic reasons), then the lowest level achievable may be permitted, provided the resultant noise levels at the receptors do not exceed the relevant "maximum" noise level limit.

Based on the measured background noise levels and the SPCC's recommended procedures, the (L_{10}) noise level design goals at the closest residences to the proposed sand extraction area have been taken as 48 dBA, 43 dBA and 42 dBA for receiver locations R1, R2 and R3 respectively. With regard to definition of daytime hours, we consider, owing to the consistency of traffic volume in the area from 6.00 am onwards, that in this instance "day" should be defined as 6.00 am to 10.00 pm.

Also, the background noise levels used to determine the daytime and night-time design goals are between 2 dB and 8 dBA lower than the SPCC's recommended "acceptable" limit for residences in rural areas. These are the long term levels which the SPCC recommends should not be exceeded at a receptor independent of this total number of contributing noise sources.

Consequently, in the absence of noise sources from other operations in the area, the acceptable (L_{90}) background noise levels for a single contributor could become 45 dBA daytime.

9.2 Product Trucks

Whilst operating on the property owned by the Company the noise assessment procedure for product trucks is as previously outlined in Section 9.1, ie the predicted L_{10} noise contributions are added to the predicted L_{10} noise level of the items of mining and processing plant and compared to the design goal.

Beyond the privately owned property ie on Old Northern and Wisemans Ferry Roads, different truck noise assessment criteria apply.

The Commission's criteria for truck operations on public roads having traffic flows of less than about 1000 vehicles per day are described under the section "Intermittent or Low Traffic Flow" in their Manual using an $L_{Aeq,T}$ descriptor. The time interval generally used is 60 minutes.

For rural situations the Manual recommends that residences should have an $L_{eq,T}$ of not more than 50 dBA for new developments and 55 dBA for existing situations.

On public roads of existing traffic flows greater than about 1000 vehicles per day, the Commission advocates the use of the Calculation of Road Traffic Noise (CORTN) method to assess the L_{A10} (18 hours) daytime and L_{10} (6 hours) night-time noise levels for existing traffic flows and proposed increased traffic flow, with particular emphasis on the increase in the percentage of heavy vehicles.

The criteria generally recommended are that the increases in the L_{10} (18 hours) daytime and L_{10} (6 hours) night-time noise levels due to traffic from the proposed operation do not exceed 2 dBA. Also, that the overall maximum L_{A10} (18 hours) daytime and L_{A10} (6 hours) night-time traffic noise levels do not exceed 63 dBA and 58 dBA respectively.

As discussed in Section 8.2, the $L_{Aeq,T}$ method was chosen as the more appropriate means for fairly and conservatively assessing the impact of heavy vehicle movements associated with the project.

10. ASSESSMENT OF NOISE IMPACT

10.1 Processing Plant and Mobile Equipment

The assumed "worst case" scenario used for the assessment of noise impact at the three closest receivers is based on the concurrent operation of all items of extractive, processing and mobile equipment. By the very nature of the operations however, only rarely would all items operate concurrently.

Also, the source noise levels used in the prediction program are maximum (or approximately L_1) noise levels. Noise impact assessment however is conducted by comparing the predicted L_{10} noise level of the combined operations at the receptor with the L_{90} level measured in their absence.

The difference between the maximum noise level from this type of operation and the L_{10} level is likely to be in the order of 2 dBA to 3 dBA.

Based on the above the likely L_{10} noise levels are given in Table 10.1

Table 10.1: Predicted L_{10} Noise Levels

PLANT	RECEIVER/NOISE LEVEL (dBA)		
	R1	R2	R3
Bulldozers	35-36	34-35	35-36
Front End Loaders	26-27	21-22	29-30
Scraper	30-31	30-31	33-34
PFF truck fleet	39-40	34-35	37-38
Wash Plant	23-24	25-26	28-29
Dry Screening Plant	24-25	23-24	32-33

As previously mentioned, operations will be restricted to between 6 am and 6 pm Monday to Saturday.

The predicted L_{10} noise levels for the period of operation are given in Table 10.2 together with the corresponding L_{10} noise level design goals.

Table 10.2: Predicted Total L_{10} Noise Level Contributions and Design Goals

RESIDENCE	TOTAL PLANT NOISE (dBA)	DESIGN GOALS (dBA)	SPCC RECOMMENDED ACCEPTABLE L_{90} (dBA)
R1	41-42	48	45
R2	40-41	43	45
R3	43-44	42	45

From the results shown in Table 10.2 above, it is apparent that the recommended assessment criteria are achieved at all receiver locations.

10.2 Product Trucks

As mentioned previously, whilst on land owned by the company, the additional L_{10} noise level contributions from the product trucks must also be considered. Using the ENM noise modelling programme, predictions were made of the maximum noise level contributions, at the three receiver locations considered, from a truck at various positions along the haul road.

These noise levels were then used to determine the predicted L_{10} truck noise levels given in Table 10.3. Predictions were based on a customer truck volume of 100 vehicles (200 movements) per day and a PFF truck volume of 50 vehicles (100 movements) per day transferring unprocessed sand from Portion 167. An average speed of 50 km/hour was assumed, although we understand company policy restricts speeds within the site to 20 km/hour.

Table 10.3: Predicted L_{10} Product Truck Noise Levels

RECEIVER	NOISE LEVEL (dBA)
R1	35
R2	35
R3	38

These levels clearly comply with the recommended assessment criteria. When added to the L_{10} contributions from the processing plant and mobile equipment, the resulting levels are 42-43 dBA, 41-42 dBA and 44-45 dBA at receivers R1, R2 and R3 respectively.
Therefore, the recommended design goals will be achieved at all receiver locations.

On public roads, the $L_{Aeq(1\ hour)}$ method was used to calculate the noise level received at locations an average minimum distance of 20 metres from the noise source, with 100 and 200 truck movements over the 12 hour weekday operating period. The predicted $L_{Aeq(1\ hour)}$ noise levels are 52 dBA and 55 dBA respectively.

Since the development proposed is not new to the area, the criteria for assessment of $L_{Aeq,T}$ as recommended by the SPCC is 55 dBA. Our predictions indicate this level will be achieved with both 100 and 200 vehicle movements per 12 hour day of operation.

11. CONCLUSION

Noise levels emitted by the proposed extraction and processing of sand at Portion 198 Maroota have been assessed at nearby potentially affected residences and at the Maroota Public School on Old Northern Road.

Predictions of the L_{A10} noise levels from processing plant, mobile equipment and on-site truck movements show that the (L_{10}) noise level goals will be achieved at all receivers. Predictions of $L_{Aeq(1\ hour)}$ noise levels at receivers along Wisemans Ferry and Old Northern Roads resulting from 200 truck movements per day show that the SPCC design goal of 55 dBA will also be met.

In conclusion, it is our opinion that the acoustical amenity of surrounding residents and other potentially noise-sensitive receivers will not be adversely affected by the proposed development.

APPENDIX A
Report C98-R1

NOISE LEVELS OF PROPOSED PLANT

ITEM	OCTAVE BAND SOUND POWER LEVEL dB re 10-12 W								
	31	63	25	250	500	1k	2k	4k	8kHz
Dozer D9H	119	120	119	106	110	109	107	99	93
Dozer D8H	103	107	113	107	109	106	102	99	96
FEL Cat 950B	102	115	105	97	95	101	98	96	96
FEL Volvo 4400	102	115	105	97	95	101	98	96	96
Wheel Loader L160	112	109	105	103	104	102	102	98	89
Scraper Cat 623B	116	116	115	109	107	106	104	97	92
Truck Fleet	114	111	110	111	105	105	102	92	85
Wash Plant	83	83	98	91	96	100	101	98	94
Dry Screening Plant	85	85	99	94	103	107	104	97	96

APPENDIX D

PORTION 198 - MAROOTA

VEGETATION

T.M. Straede B.Sc., PhD, M.E.I.A.

Portion 198, Maroota is primarily drained by one central (east to west) permanent stream (arising from springs both without and within the portion), which is joined by one intermittent stream draining from the north east corner of the site. Part of the portion to the north of this intermittent stream has been extracted, with extraction extending up to 2 - 3 m from the stream bed. Two areas have been cleared in the past, that to the south of the intermittent stream has been thoroughly disturbed, probably cultivated for a few years, and now supports a sward of introduced grasses (Andropogon virginicus "Whisky Grass"), a little bracken, and sparse regeneration of Acacia linifolia. The area between the permanent stream, and a high (187 m) rocky outcrop on the southern boundary of the site has been "scrubbed" but not cultivated. Considerable regrowth has taken place, as the natural soil profile remains relatively undisturbed, with its supply of perennial rootstocks and soil seed still largely intact. This area is not as yet infested by weeds.

The remainder of the site is naturally vegetated, with considerable variation in structure and species composition between the higher, more exposed slopes, and lower, more sheltered slopes along the drainage lines. The vegetation can be divided respectively into two major structural groups. Shrubby Low Open Woodland/Woodland, and Grassy Open Forest.

SHRUBBY LOW OPEN WOODLAND/WOODLAND

The rocky outcrop on the southern boundary of the site supports a Shrubby Low Open Woodland on its crown, grading to Shrubby Woodland at its base. From crown to base tree height increases, from 6 - 8 m to 12 - 15 m, and crown cover increases from 5% to 15%.

The upper storey consists of Eucalyptus haemastoma (Scribbly Gum), Eucalyptus eximia (Yellow Bloodwood) and Eucalyptus. gummifera (Red Bloodwood), often multistemmed, and of varied sizes and ages, over a very mixed shrubby understorey, containing large tree size Banksia serrata on the upper slopes, but in general a stratum 2 - 3 m tall of species such as Leptospermum attenuatum, Angophora hispida, Petrophile fucifolia, Calytrix tetragona, Lambertia formosa, Acacia suaveolens, Aotus ericoides, Dillwynia floribunda and Banksia ericifolia. In the area which has not been scrubbed, many of the shrubs are mature to overmature (specially noticeable for Banksia ericifolia and the trees very well grown with inconspicuous well healed fire scars, which suggests that this area has not suffered a wild fire for more than 10 years. The ground cover to 0.5 m consists of small shrubs e.g. Boronia ledifolia, Hibbertia bracteata Isopogon anemonifolius, Actinotus minor, Actinotus helianthi, Eriostemon australasius, Eriostemon hispidulus,

Grevillia sericea etc and a well developed sward of monocotyledons including Cyathochaeta diandra, Ptilanthelium deustum, Entolasia marginata, Lomandra multiflora, and Anisopogon avenaceus.

There is considerable local variation within this community, related generally to the overall drainage characteristics of the soil. On the highest rockiest point, where the sparse soil is always well drained, and often very dry, some signs of current drought damage (wilted and dead shrub) were observed, as well as overall low tree density, and small individual size of the tree stratum. On the lower, flatter areas, local spots are probably varied in soil water relations as patches where the understorey was dominated by the monocotyledon layer and a selection of intermittent waterlogging tolerant shrubs (eg. Banksia ericifolia, Banksia oblongifolia, Hakea dactyloides, Leptospermum arachnoides, Leptospermum flavescens and Micromyrtus ciliata) alternated with those with a more mixed and varied flora. These variations probably reflect the underlying structure of the Hawkesbury Sandstone bedrock, which weathers in a "block and step" pattern with local drainage controlled by the jonting within the bedrock, as well as the overall slope of the site.

These vegetation associations are destined to be almost completely removed by the proposed extraction, with the exception of the high knoll on the southern boundary, as they fall outside the 20 m from the creek shoulders extraction stand off. None of the species present, nor the combinations and associations are either rare or unusual, being well preserved in national parks throughout the Hawkesbury Sandstone system.

GRASSY OPEN FOREST

The Open Forest community also contains considerable variation in associated species, and also forms the setting for the specialised riparian associations occurring along both the permanent and intermittent stream beds. The open forest often has no distinct boundary with the woodland complex, forming long ecotones over gently sloping creek approaches, (especially on the south aspect) with more abrupt changes where steep rock faces cut into the lower slopes above the creeks (along the north aspect).

The Open Forest is best developed near to the creeks, with the overstorey dominated by forest form trees of Eucalyptus piperita, (Sydney Peppermint), Eucalyptus gummifera, (Red Bloodwood), Eucalyptus punctata (Grey Gum), Eucalyptus. oblonga (Stringy bark) and Angophora costata (Sydney Apple) from 15 - 30 m tall, with a crown cover of 30 - 45%. Small trees of forest Oak (Alocasuarina torulosa) form groups 10 - 15 m tall, with clusters of individual shrubs of Persoonia levis, Telopea speciosissima, Pultenaea retusa, Pultenaea fleyllis, Xylomelum linifolia pyriforme, Ceratopetalum gummiferum, Acacia linifolia etc forming an intermittant tall shrub stratum to 3 m, over a ground stratum composed of tussocks of grasses (Anisopogon avenaceus, Entolasia marginata, Microlaena stipoides), and other monocots (Lomandra longifolia, Xanthorrhoea arborea, Dianella caerulea), bracken (Pteridium esculentum) and small shrubs (eg. Bossiaca lenticularis, Hybanthus monopetalus, Lomatia silaifolia, Gompholbium latifolium, Boronia pinnata, Platysace linearifolia, Epacris pulchella

etc). A few very large, overmature Banksia serrata trees also occur sporadically in this community.

The majority of this community also shows little sign of any recent fire, or disturbance (with the exception of the N.E. corner along the boundary to Pit 2), with tree species present as mature, overmature, or pole size, with no saplings or seedlings representing recent post-fire regeneration; with any fire scars quite small due to healing, and the presence only of dead or very overmature specimens of Hakea sericea and Hakea propinqua both of which regenerate prolifically after a fire and generally live from 10 - 15 years. The litter build up on the forest floor is continuous and includes large unburnt wood. Grass tussocks showed the complete spectrum of age classes suggesting that natural cyclic processes have persisted for some time; (for some years postfire the oldest age class tussocks, representing immediate post fire regeneration tend to be over-represented).

This is a fine sample of Open Forest on Hawkesbury Sandstone, and through the 20 m standoff mechanism, a considerable portion of it will be preserved. This is most fortunate, because it contains, along the spring fed permanent stream a most interesting and somewhat unusual riparian association, dependent firstly on permanent ground water and in some cases the more humid and shady conditions created both by the overstorey and the stream.

THE RIPARIAN ASSOCIATIONS

The permanent stream passes over a series of rock steps in the sandstone - some of which are visible above ground, others of which control the surface slope and soil water retention characteristics. On the treads of these steps dense tangled masses of Bauera rubiodes and Gleichenia dicarpa with emergent tall shrubs of Callicoma serratifolia (Black wattle) alternate with, or are surrounded by dense stands of False Bracken (Culcita dubia) Bracken (Pteridium esculentum) and large tussocks of Gahnia aspera, also with emergent black wattle, and Acacia saliciformis often festooned by Similax glyciphylla (Sarsparilla Vine) and tangled masses of parasitic Cassytha pubescens. These areas could best be described as always moist, but free draining whereas other steptread associations which are dominated by beds of rushes and sedges, (eg Schoenus melanostachys, Lepidosperma neesii, Empodisma minus) with no emergent tree species, are probably almost always waterlogged, and without free drainage. There is generally no permanent free flowing surface water in these areas, any surface water forms pools, or oozes from the saturated underfoot.

Beds of Bauera and Sticherus are particularly numerous around RL160, where the sandstone beds are interrupted by a more clayey band, from which ground water oozes all the time. This is the level below which the streams become permanent, and the site of local "spring holes" dug by farmers, which give a permanent water supply.

Just below the rises of each step there appears to be an active stretch of the creek, with clear water flowing freely along a well defined if narrow channel often undercutting a rocky overhang on one side. These stretches of the creek are dominated by dense King Fern (Todea

barbara) stands, which with their short (to 1 m) but substantial trunks, and long fronds almost completely overshadow the stream. This particular riparian association is comparatively uncommon, and is probably restricted to permanent water courses. Todea itself, whilst cosmospolitan in distribution is generally found in higher rainfall coastal gullies in the Central Coast, or in the Blue Mountains Region, so that this low rainfall occurrence is in itself also unusual.

The intermittant stream has a poorly defined bed, with no indication that it acts as anything more than a floodway for periods of intense/prolonged rainfall. It occurs in a shallow, gently sloping depression which contains no distinguishing vegetation other than some clumps of Callistemon citrinus and a predominance of tussocks of Lepyrodia scariosa and Schoenus melanostachys.

At a point just prior to joining the permanent stream (approximately RL160) it turns abruptly to the south, plunging over a rock step, onto the same level as the permanent stream. At this point, a dense tangle of Bauera and Gleichenia and a few emergent black wattles have developed, hanging on to the almost vertical rock face, and underlain by a peaty build up of old roots and rhizomes. This mass of material is probably very important in controlling flood flows over the rock face, reducing the erosional impact of the falling water. Damage made at the side of this stand by heavy machinery crossing the rock face is showing signs of erosion, even though not at the focal point of water release.

In the upper part of this intermittant stream, considerable disturbance to the grassy open forest is evident, with signs of recent fire, and a large number of dead trees not necessarily attributable to fire. This drainage line has been severely effected by the total clearing of the area to the north which has also been extracted in the past few years, though the land surface is now partially restored. Extra side light and presumably alterations to the water table are probably responsible for the tree deaths as much as the local effect of a recent burn - eucalypts show signs of post fire regeneration (epicormic shoots) which have then died, with leaves intact upon the shoots.

To the south of the upper part of this intermittent stream is a large area of weed infested ex-cultivated land, which in combination with the signs of drainage channels dug within the natural drainage line, and the adjacent excavation gives this particular portion of the site little chance to regenerate satisfactorily even if it is left with a 20 m stand off.

RECOMMENDATIONS

1. The Conservation Zone

The Grassy Open Forest and Riparian vegetation will be protected within a conservation zone, demarcated by a minimum stand-off of 20 m from the bank edge.

a) To the south this coincides roughly with the rock face which separates the Grassy Open Forest from the Woodland complex, and will be

extended to the east as shown on Fig , where it can be seen that the truck access road will be built on a major bund wall, with a "toe" bund of lower profile on its northern margin, which will be topsoiled and encouraged to revegetate. This will provide both a physical and visual 'edge' to the conservation zone, whilst the revegated 'toe' bund will prevent weed seeds from entering the zone, provided that only clean topsoil is used to construct the 'toe' bund.

b) To the north, Pit 2 may eventually be extended to extract above RL160, otherwise the edge of Pit 2 forms the edge to the Conservation Zone up to approximately RL170. Above this point the extraction of Pit 2 can in the long term be extended to the south (as shown in Fig) provided that the downslope is protected from the weed seeds in the ex-cultivated area.

Both the Pit 2 - Conservation Zone boundary, and the ex-cultivation - Conservation Zone boundary require additional, immediate treatment, which is addressed in the next Sections.

2. Northern Boundary Repair and Restorations

Pit 2 ends 2 - 3 m from the bed of the intermittent creek along the Conservation Zone northern margin, and requires some immediate restoration work. The edge simply consists of a pile of logs, boulders and loose soil up to 2 m high, which as it settles and decays will shed loose sand into the creek line every heavy downpour. This needs to be "pulled back" - using the tree trunks on the surface of a low bund, which should be covered with weed free topsoil taken from the first extraction area around the treatment plant. This requires co-operation between a skilled driver and ecologist, on the spot, to arrive at a satisfactory and practical solution. This work is very important, and urgent, particularly at the close approach of RL160 just above the junction of the two creeks, where some erosion and deposition is already taking place in to the Conservation Zone.

Although the eastern section of the boundary could eventually be excavated with reshaping of the drainage head, this would provide "good practise" before more critical stretches were attacked; also this section of excavation is well into the future so that this bund will have a long life of its own.

3. Separation of ex-cultivated land from the Conservation Zone

Also to be carried out during initial top soil stripping, should be the protection of the Conservation Zone from weed incursion from the ex-cultivated land. Using the cleared land as an access route, clean top soil can be used to build a low, broad bund around the toe of the ex-cultivated land, providing a site for natural regeneration which will be well established, and providing good side

light protection long before the area is extracted. If this is left until the ex-cultivated land is extracted, it is possible that no suitably weed free top soil will be available to build the bund, or that any stored top soil will be so old, that its native seed store will be long since defunct.

There is no need to intrude into undisturbed vegetation at this stage, or to touch the actual bed of the intermittent stream. There will be some suitable top soil for these jobs when the area is finally extracted.

4. Heavy Machinery Haul Road

For reasons of safety, haulage of materials from neighbouring pits, and all heavy machinery movements are to be separated from truck and light vehicle movements. For this purpose a haulage road is to be constructed, on the site of an existing access track, across the western end of the site (see Fig 14). This route has been carefully chosen on the ground, to minimise disturbance to the Conservation Zone:

(i) by crossing the main creek on a rock ledge, necessitating a simple causeway construction;

(ii) by crossing the otherwise untouched creek in the south west corner over a high culvert , and cutting off for regeneration, an eroding old track which crosses the creek and climbs the ridge at a very steep angle; and

(iii) by minimising canopy disturbance by using an already cleared access track, over most of its length, and minimising damage over the rest of its length by using gentler gradients than the existing track.

5. Pit 2, Temporary Edge Stabilization

The existing western boundary of Pit 2 is at the moment largely unconsolidated, allowing wash into the downslope natural vegetation. Whilst much of this area is to be extracted in the long term, some experience in revegetating such slopes with natural vegetation should be gained by practising on this slope - particularly where it coincides with what will be the final extraction edge. The slopes at present are both too steep, and not fitted with any mechanism to reduce wash (eg. crosswise logs, brush etc), nor has native topsoil been applied. Introduced grasses and pasture species are not a suitable treatment for such slopes which are to eventually blend back into the natural vegetation; such improved pasture treatments should be confined to the large post excavation areas which do not drain directly into the natural vegetation, but rather into the internal dam.

CONCLUSION

With the application of the above recommendations, there is every reason to believe that the Conservation Zone should enjoy a long, natural life into the future. Attention to details of boundary treatments, bund wall construction and restoration of existing disturbed areas are crucial. The first few years after shaping and treating every effort should be made to optimise chances of natural revegation during the early phases; these "new communities" will then tend to look after themselves in the future. Early errors of treatment, especially the introduction of weed/pasture species, or non-stabilization of banks can only lead to a continued need to rework and reshape, as well as potentially damaging the adjoining native communities. Some regular professional assessment of regeneration progress, and the development of specific locally applicable skills are most desirable.

PF Formation has both the skills, interest and advice available to it to do an excellent job, it simply remains for these to be suitably harnessed.

SPECIES PRESENT ON
PORTION 198 - MAROOTA
PF FORMATION

FERNS & SPECIES	COMMON NAMES	EXTRACTION AREA	CREEK BUFFER ZONE
Ferns & Fern Allies			
OSMUNDACEAE			
Todea barbara	King Fern		+
SCHIZAEACEAE			
Schizaea bifida			+
GLEICHENIACEAE			
Gleichenia dicarpa	Pouched Coral Fern		+
Sticherus flabellatus	Umbrella Fern		+
CYATHEACEAE			
Culcita dubia	False Bracken		+
DENNSTAEDTIACEAE			
Pteridium esculentum	Bracken	+	+
LINDSAEACEA			
Lindsaea linearis		+	+
Flowering Plants - Dicots			
CASSYTHACEAE	Devils Twine		
Cassytha glabella		+	+
Cassytha pubescens			+
VIOLACEAE			
Hybanthus monopetalus		+	+
POLYGALACEAE			
Comesperma ericinum		+	
TREMANDRACEAE			
Tetratheca glandulosa		+	
Tetratheca thymifolia			+
Tetratheca rubioides			+
DROSERACEAE	Sun dew		
Drosera spathulata			+
HALORAGACEA			
Haloragis exalata, ssp exalata, var exalata		+	+
Gonocarpus teucrioides			+
THYMELAEACEAE			
Pimelea graciis		+	
Pimelea linifolia	Rice Flower	+	+

PROTEACEAE			
Petrophile pulchella	Cone Sticks	+	+
Isopogon anemonifolius	Drum Sticks	+	+
Conospermum longifolium sspmediale	Cone Seeds	+	
Persoonia levis	Geebung	+	+
Banksia ericifolia		+	+
Banksia spinulosa		+	+
Banksia oblongifolia		+	+
Banksia serrata		+	+
Hakea sericea		+	+
Hakea propinqua			+
Hakea dactyloides		+	+
Grevillea buxifolia		+	+
Grevillia sericea		+	+
Lomatia silaifolia			+
Telopea speciossissima	Waratah		+
Xylomelum pyriforme	Woody Pear		+
Lambertia formosa	Mountain Devil	+	+
DILLENIACEAE			
Hibbertia bracteata		+	+
Hibbertia empetrifolia		+	
Hibbertia diffusa			+
Hibbertia fasciculata		+	
PITTOSPORACEAE			
Billardiera scandens	Apple Berry		+
STERCULIACEAE			
Lasiopetalum ferrugineum var ferrugineum		+	+
EUPHORBIACEAE			
Micrantheum ericoides		+	+
CUNONIACEAE			
Callicoma serratifolia	Black Wattle		+
Ceratopetalum gummiferum	Christmas Bush		+
BAUERACEAE			
Bauera rubioides			+
MIMOSACEAE			
Acacia brownei		+	+
Acacia linifolia			+
Acacia suaveolens		+	+
Acacia terminalis			+
Acacia saliciformis			+
Acacia myrtifolia			
PAPILIONACEAE			
Hardenbergia violacea			
Hovea linearis		+	+
Mirbelia rubiifolia		+	+
Gompholobium latifolium		+	+
Aotus ericoides		+	+
Phyllota phylicoides		+	+
Dillwynia floribunda		+	+
Dillwynia glaberrima		+	+
Daviesia latifolia		+	+
Pultenaea flexilis			+
Pultenaea retusa			+
Bossiaea heterophylla		+	+
Bossiaea lenticularis			+
Glycine tabacina			+

Bossiaea obcordata			+
MYRTACEAE			
Callistemon citrinus			+
Angophora hispida		+	
Angophora costata	Sydney Apple		+
Eucalyptus oblonga	Stringybark	+	+
Eucalyptus haemastoma	Scribbly Bark	+	
Eucalyptus eximia	Yellow Bloodwood	+	+
Eucalyptus gummifera	Red Bloodwood	+	+
Eucalyptus piperita	Sydney Peppermint	+	+
Eucalyptus punctata	Grey Gum	+	
Leptosphermum attenuatum		+	+
Leptospermum arachnoides			+
Leptospermum flavescens		+	+
Baeckea brevifolia		+	+
Baeckea linifolia			+
Micromyrtus ciliata		+	+
Calytrix tetragona		+	+
Kunzea ambigua			+
CASUARINACEAE			
Allocasuarina torulosa	Forest Oak	+	+
OLACACEAE			+
Olax stricta			
STACKHOUSIACEAE			
Stackhousia nuda		+	
RUTACEAE		+	
Boronia ledifolia		+	+
Boronia pinnata		+	+
Eriostemon australasius		+	
Eriostemon hispidulus		+	
SAPINDACEAE			
Dodonaea triquetra	Hop Bush		+
UMBELLIFERAE			
Actinotus helianthi	Flannel Flower	+	
Actinotus minor		+	+
Xanthosia pilosa		+	+
Platysace linearifolia		+	+
Xanthosia tridentata			+
Platysace ericoides			+
EPACRIDACEAE			
Melichrus urceolatus			+
Monotoca scoparia		+	+
Leucopogon muticus		+	+
Epacris microphylla		+	+
Leucopogon ? parviflorus			+
Epacris pulchella		+	+
LOGANIACEAE			
Mitrasacme polymorpha		+	+
RUBIACEAE			
Pomax umbellata		+	+
Opercularia varia			

GOODENIACEAE			
Goodenia bellidifolia		+	+
Scaevola ramosissima			+
Dampiera stricta		+	+
COMPOSITAE			
Cassinea aculeata			+

Flowering Plants - Monocots

LILIACEAE			
Dianella caerulea		+	+
Tricoryne simplex			+
Laxmannia gracilis		+	+
Thysanotus tuberosus			+
SMILACACEAE			
Smilax glyciphylla	Sarsaparilla		+
IRIDACEAE			
Patersonia sericea		+	+
XANTHORRHOEACEAE			
Xanthorrhoea sp.	Grasstree	+	+
Xanthorrhoea arborea	Grasstree		+
Lomandra multiflora		+	+
HAEMODORACEAE			
Haemodorum planifolium	Bloodroot		+
Haemodorum corymbosum	Bloodroot	+	+
HYPOXIDACEAE			
Hypoxis hygrometrica			+
ORCHIDACEAE			
Cryptostylis subulata	Cow Orchid		+
JUNCACEAE			
Juncus planifolius			+
RESTIONCEAE			
Lepyrodia scariosa		+	+
Empodisma minus			+
Hypolaena fastigiata			+
CYPERACEAE			
Baumea rubiginosa			+
Cyathochaeta diandra		+	+
Schoenus ericatorum		+	+
Schoenus melanostachys			+
Ptilanthelium deustum		+	+
Lepidosperma neesii			+
Gahnia aspera			+
Caustis pentandra			+
Caustis flexuosa		+	+

GRAMINAE			
Entolasia marginata		+	+
Anisopogon avenaceus		+	+
Themeda australia	Kangaroo Grass	+	+
Andropogon virginicus	Whisky Grass	+	
Microlaena stipoides			+

APPENDIX E

An Investigation into the Natural Fauna of the Maroota Sand Ridge on the Hornsby Plateau near Sydney, January 1979, by Paul F. Buckingham BA (Zool. Macquarie University).

DESCRIPTION OF THE STUDY AREA.

The study region comprised a sand ridge of approximately 50 acres adjacent to the northern boundary of the Maroota State Forest. The greater part of the natural vegetation has been cleared and replaced with orchards. The remaining isolated clumps of native flora consist of medium density dry sclerophyll forest which were present along the boundaries of the sand ridge grade into banksia and heath vegetation. The remaining natural flora occupies some 25-30% of the sand ridge.

METHODS.

The study region was examined over two days and one night. Night time observations were restricted to the tracks that transverse the area. Observations over the two days were carried out from early morning to dusk with the type and location of species noted.

RESULTS.

In all a total of 17 species of birds were directly sighted with a further 3 probable sightings. No mammals or reptiles were sighted within the study area although a number of lizard species and the occasional wallaby droppings were noted amongst the sandstone outcrops immediately to the east and west of the sand ridge.

In addition to the direct observations (see Table 1), a further 3 species were sighted and although identification is not positive it is probable that the following species also inhabit the region:

Wood Duck - *Chenonetta jubata*
This species was identified by its call at night near a number of the dams. It is also probable that either the Painted Quail - *Turnix varia* or the Buff-banded Rail - *Rallus philippensis* with *R. philippensis* being the more likely of the two. *R. philippensis* was identified by, its call, an abundance of track marks through the muddy soil and the existence of runs through the reed vegetation.

Australian raven	-	*Corvus coronoides*
Black-faced cuckoo shrike	-	*Coracina novachollandiae*
Black-backed magpie	-	*Gymnorhina tibicen*
Silver Eye	-	*Zosterops lateralis* or *Z. l. lateralis*
Fairy martin	-	*Petrochelidon ariel*
Fork-tailed swift	-	*Apus pacificus*
Spine-tailed swift	-	*Hirundapus caudaetus*
White-backed swallow	-	*Cheramoeca leucosternum*
Welcome swallow	-	*Hirundo neoxena*
Red-Browed firetail	-	*Emblema temporalis*
Beautiful firetail	-	*Emblema bella*
Superb blue wren	-	*Malurus cyaneus*
Variegated wren	-	*Malurus lamberti*
White-throated tree creeper	-	*Climacteris leucophaea*
White-cheeked honeyeater	-	*Phylidonyris nigra*
Double-barred finch	-	*Poephila bickenovii*

Table 1 Species Observed on the Maroota Sand Ridge.

A survey of the literature indicates that the species, as set out in Table 2, may also inhabit the region.

Striated thornbill	-	*Acathiza lineata*
Yellow thornbill	-	*A. nana*
Little wattlebird	-	*Antochaera chrysoptera*
Noisy friabird	-	*Philemon corniculatus*
Bell miner	-	*Manorima melanophrys*
Noisy miner	-	*M. melanocephala*
Regent honeyeater	-	*Xanthomyza phrygia*
White-eared honeyeater	-	*Lichenostomus leucotis*
Brown-headed honeyeater	-	*Melithreptus brevirostris*
White-naped honeyeater	-	*M. lunatus*
New holland honeyeater	-	*Phylidonyris novaehollandiae*
Tawny crowned honeyeater	-	*P. melanops*
Eastern spinebill	-	*Acanthorhynchus tenuirostris*
European goldfinch	-	*Cardvelis cardvelis*
Spotted quail-thrust	-	*Cinclosoma punctatum*
Willie wagtail	-	*Rhipidura leucophrys*
Grey fantail	-	*R. fuliginosa*
Leaden flycatcher	-	*Myiagra rubecula*
Crested shrike tit	-	*Falcunculus frontatus*
Eastern yellow robin	-	*Eopsaltria australis*
Hooded robin	-	*Melanodryas cucullata*
Flame robin	-	*Petroica phoenicea*
Scarlet robin	-	*P. multicolor*
Blackbird	-	*Turdus merula*

Table 2 Species that may exist on the Maroota Sand Ridge.

Within the study area it is possible to delineate three regions within which the various species were observed, (see Table 3).

Grass and Disused Orchards	Natural Forest	Aerial
Emblema bella	*Emblema bella*	*Petrochelidon arid*
E. temporalis	*Climacteris*	*Apus pacificus*
Zosterops	*liucophoea*	*Hirundopus*
lateralis	*Phylidonyris nigra*	*caudactis*
Z. l. lateralis	*Malurus cyceneus*	*Cheramoeca*
Malurus cyaneus	*Malurus lamberti*	*leucosternum*
M. lamberti	*Coracina*	*Hirundo neoxena*
Poephila	*novachollandiae*	*Corvus coronoides*
bichenovii	*Gymnorhina tibicien*	

Table 3 Habitats occupied by Species on the Maroota Sand Ridge.

In addition to these species *Chenonetta jubata* was sighted on two of the dams. *Ardea pacifica* was also observed on one of the dams and is presumably a visit to the area and *Rallus philippensis* most probably inhabits the reeds within the area that is proposed for the plant site.

The species listed in Table 3 under Aerial do not inhabit the sand ridge only passing over it at various intervals during the day and the flocks were not observed to enter the study area at dusk indicating that they do not nest within the area. Those species observed within the disused orchards and surrounding grasses occupy these areas during the day but returned to the timbered sections at dusk.

SUMMARY.

A number of bird species were observed within and immediately adjacent to the study area. All species are common to very common within the sandstone country surrounding Sydney with species such as *Zosterops lateralis*, *Malurus cyareus*, *M. lamberti* and *Coracina novaehollandiae* entering the outer suburbs.

No evidence of rare or endangered species were found and no occurrence of mammals were noted within the study region.

Bibliography:

Slater, P.	A Field Guide to Australian Birds. Rigby 1970.
Frith, H.J. (ed.)	Complete Book of Australian Birds. Reader's Digest 1977.
Cawley, N.W.	What Bird is That? 5th Edition Angus and Robertson Ltd. 1974
McGill, A.R.	A Hand List of the Birds of New South Wales. Fauna Protection Panel 1960.

APPENDIX F

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17 FEB 1987

TRAFFIC IMPLICATIONS OF REGIONAL GROWTH.

Dear Sir

Thank you for your letter regarding the implications of traffic growth on Main Roads. I appreciate the concern of both yourself and your client that Main Roads should be available equally for all members of the community for use. The Environmental Planning and Assessment Act, which requires the preparation of an Environmental Impact Statement was designed to ensure that all impacts of a development are considered before approval is given.

One of these impacts is that of increasing traffic upon roads. Assessing the impact depends on the current use of the road, its pavement, its adjacent land use etc. That it might be a Main Road in no way alters the impact. There are several reasons why the nature of this traffic impact must be investigated and, if necessary, controlled. For example, if a development generated additional traffic directly onto a road the access must be designed such that such traffic interacts safely with the existing flow.

There are also weight limit regulations which must be adhered to in order to prevent premature pavement failure. Some activities, such as blasting, should not take place too close to the road for stability reasons. Spillage of material is another matter for which adequate provision should be made.

If a development meets planning approval under the legislation, then Main Roads may be used for traffic up to the applicable weight and dimension limits with adequate provision for the safety of road users in general.

Any advantages of the development to the community should be made known in the EIS so that these may be weighed against any possible adverse impacts which the development may generate.

I hope that this letter will be of assistance to you in communicating to your clients the importance of Environment Impacts Statements in ensuring the safety and general amenity of all members of the community.

Yours sincerely

W McL Cable
W McL Cable
Secretary