8. Environmental Management & Conclusions

Environmental management strategies to be incorporated into the project are provided in this section of the EIS and a summary of the key findings of the environmental studies undertaken as part of this EIS is given. A list of mitigation measures proposed to meet environmental performance criteria is also provided.

8.1 Benefits of the Proposal

The Newnes Kaolin Project will allow the efficient extraction and use of a valuable state resource, consisting of kaolin and sand, while supplying sand products to Sydney markets that are being rapidly exhausted of supplies. The project will provide additional jobs for the local workforce, as well as benefiting the community through expenditure from the mine and personnel. The primary benefits of mining the resource include the:

- regional significance of the friable sandstone resource and the range of kaolin and silica products to be produced and marketed;
- need to optimise the State's resources and to develop a valuable resource that is recognised by the NSW Department of Mineral Resources;
- ongoing and increasing need to meet demand for a range of construction sands from local and regional markets as alternative sources continue to be exhausted;
- location of the resource away from densely populated areas and close to existing rail loading facilities, thereby eliminating the need to road haul product off site.

8.2 Potential Environmental Impacts

8.2.1 Project Specific Impacts

Specific environmental impacts that will result from the construction and operation of the proposed kaolin mine are summarised below:

- potential negative effect on property in the village of Newnes Junction;
- the final topography of the site will be altered, leaving a final void in the landscape which could be used a wetland providing habitat for native flora and fauna species;
- the sandy soils on site are susceptible to erosion when the ground cover is disturbed. Erosion of the active mining area and final walls may occur if rehabilitation and stabilisation is not undertaken in an appropriate time frame;
- visual impacts will include changes in the landscape associated with clearing of vegetation on site, exposing underlying sandstone material and constructing

infrastructure required in the mining operations. The most sensitive sites in relation to the visual impacts are local residences and viewing locations within the adjacent Blue Mountains National Park, including Bald Trig, a section of the unformed track leading to Gouches Crater, and the rock pagodas at the edge of the National Park;

- a maximum of approximately 25 ha of native woodland vegetation will be destroyed. This will also result in the loss of fauna habitat;

- the noise modelling has shown that during each stage establishment period the recommended goals are satisfied at 5 Sandham Road (Location 1). Exceedances of 3-5dB(A) (Stage 5-calm), 2dB(A) (Stage 5-west wind) and 1-3dB(A) (Stage 6-calm) have been predicated at Sandham Road (Location) during stage establishment activities;

- for mining operations, recommended noise goals are generally satisfied for Stages 1-4 (approximately 9 years of mining activity) at Sandham Road (Location 2) during both calm and west wind meteorological conditions. The predicted 1dB(A) exceedance during Stage 4 with two (2) dozers operating would be considered marginal. The results show that during Stage 5 noise exceedances of 8-11dB(A) (calm) and 6-9dB(A) (west wind), and during Stage 6 of 11-15dB(A) (calm) and 8-11dB(A) (west wind) are predicted.

- the noise predictions during the conclusion of extraction for all stages, has shown that the recommended goals are satisfied at 5 Sandham Road (Location 1). During Stage 5 noise exceedances of 3-5dB(A) (calm) and 1-3dB(A) (west wind) are predicted at Sandham Road (Location 2).

- a minor drawdown will be created on the local water table, resulting in ground water being drained into the mine. This has been assessed as not significant and will not impact on other groundwater users or ecosystems.

All other impacts will be controlled to ensure that an acceptable level of environmental management is maintained.

8.2.2 Cumulative Impacts

This EIS has identified and assessed the key environmental issues relating to the proposed kaolin mine at Newnes. As with all development projects, there will be some environmental impacts. The purpose of this EIS is to identify and quantify these impacts and to assess their significance.

The results of the various environmental investigations have demonstrated that resultant impacts are within acceptable criteria with regard to dust, traffic and transportation, flora, fauna, archaeology and water quality implications. Noise impacts are acceptable for the first 4 stages of mining, following which impacts exceeding criteria have been predicted.

It is important with any development project to monitor its ongoing environmental performance. An ongoing environmental monitoring program for the kaolin mine will

be developed, allowing early identification of potential problems.

8.3 Compilation of Mitigation Measures

Impacts resulting from the project will be mitigated by the application of the mitigation measures outlined in the previous sections. These are summarised in **Table 8.1**.

Table 8.1 - Summary of Mitigation Measures

Issue	Proposed Mitigation Measures
Landuse	- A buffer zone of 200 m between the mining lease and the closest residential dwellings will be maintained to limit the impact of the operation on these dwellings. These houses will have no direct views of the operation and land use in the area will remain residential. - An additional 50 m minimum buffer between the mine and the Blue Mountains National Park
Air Quality	Careful management procedures will be employed including: - minimising disturbance to natural ground cover where possible - enclosing stockpiles and conveyor belts to minimise wind blown dust generated by materials handling - revegetation of disturbed areas in accordance with the erosion and sediment control plan - watering of internal haul roads if necessary - all equipment used on site is maintained in a good condition and operated in a proper and efficient manner.
Noise	-a "Construction Noise Management Plant" (CNMP) is to be prepared to address the issue of construction noise; - all construction activities shall only take place between the 7.00am – 6.00pm Monday to Saturday, and 8.00am-6.00pm Sunday and public holidays; - the tree mulcher shall be located as far as practicable within the valley located adjacent the northern boundary of the lease area; - all construction site plant and equipment shall satisfy the acoustic performance specified; - all loading and building conveyor systems shall be belt type conveyors; - where practical train loading shall be restricted to the hours of 7.00am – 6.00pm Monday to Saturday, and limited to one (1) movement per twenty four (24) hour period; - all permanent site plant and equipment shall satisfy the acoustic performance specified; - where practical all permanent site mobile plant shall be fitted with secondary/ residential grade noise controls and acoustic treated engine enclosures; - where practical audible alarms shall be replaced with flashing lights or a similar warning system; - during Stages 1 to 6 of mining operations a bund shall be formed from stockpiled overburden and/or topsoil to a height not less than three (3.0) metres above the existing ground level. The bund shall be constructed on the western and southern perimeter during Stages 1 to 6 as close as practicable to the finished pit limits; - a "Noise Management Plan" (NMP) shall be implemented
Hydrology	- 3 boreholes will be maintained to monitor the quality of water and detect any potential water quality problems.
Water Quality	- In order to protect the local water and soil resources in the area a comprehensive Soil and Water Management Plan will be prepared. - numerous water quality and erosion and sedimentation control measures will be incorporated into the mine design - a water treatment system will be installed to treat water make to a suitable quality so it can be discharged
Flora & Fauna	- the area of cleared vegetation is to be kept to a minimum at all times.
Waste Disposal	- waste will be recycled where possible; - contractors will remove oils and tyres etc off site as required; - domestic wastes will be collected and removed from site.
Visual	- a 50 m vegetated buffer will be maintained between the site and the adjacent National Park. - the remaining vegetation occurring between the residences in Newnes Junction and the proposed mine limits will be maintained. - the mine has been designed with shallow benches which will be rehabilitated with native vegetation as soon as possible. - surface infrastructure will be coloured green to blend in with the surrounding bushland. - infill vegetation planting will be undertaken to further screen the site from local residents if required.

Table 8.1 - Summary of Mitigation Measures

Issue	Proposed Mitigation Measures
Archaeological Heritage	In the event that an item of archaeological heritage is discovered during mining, all activities will cease and the NPWS contacted so a management plan can be prepared.
Soils	A range of soil erosion controls will be implemented on site. The area of exposed soils will be kept to a minimum at all times. All topsoil will be stockpiled for later use in rehabilitation.

In this context, and provided the environmental safeguards are observed, a basis is provided for approval of the proposed kaolin mine.

8.4 Approvals Required

Schedule 2(7) of the Environmental Planning and Assessment Regulation (1994) requires that an EIS should contain a list of any approvals that must be obtained under any other Act or law before the development activity may lawfully be carried out.

The following describes the circumstance, Act or law and the approval that may be required by NKPL prior to, or during the operation of the proposed kaolin mine. The final decision as to which approvals are required will be made during detail design and construction.

The principal approval required for the project is development consent that is sought from the Minister for Infrastructure and Planning. Other approvals required include:

- **Mining Lease -** Kaolin is defined as a mineral in Regulation 1 and Schedule 4 of the *Mining (General) Regulation 1997*. Consequently, a mining lease is required under the *Mining Act* from the Department of Mineral Resources.

- **Extractive Industries** License – Apart from being a mining project under the jurisdiction of the Mining Act with its operational and rehabilitation obligations, the project is also extractive industry which may require a licence from the Department of Land and Water Conservation.

- **Environment Protection Licence** - In addition to planning approvals required under the environmental planning and mining legislation, an Environment Protection licence will be required from the Environment Protection Authority (EPA) for the ongoing operation under the *Protection of the Environment Operations Act*, *1997.*

8.5 Environmental Management System

In order to facilitate an integrated management system for the environmental aspects of the project and Environmental Management System (EMS) will be developed by NKPL to ensure:

- all work complies with all relevant environmental statutes, regulations and standards;

- environmental factors are taken into account during the planning and execution of activities on site and;

- regular audits are performed to confirm compliance with environmental policies and standards.

8.5.1 Objectives of the EMS

An EMS is a structured approach to managing the environmental aspects of a company's operations. It provides a quality assurance system that enables a company to establish, and assess the effectiveness of, environmental policy and objectives, achieve conformance with them and demonstrate that conformance to others. The aim of such a system is to support environmental protection and prevention of pollution in balance with socio-economic needs.

The EMS would be developed in accordance with ISO 14001 and would include the following core components:

- environmental policy;
- planning;
- implementation and operation;
- checking and corrective action; and
- management review.

An integral component of the EMS is the Environmental Management Plan (EMP). The EMP provides a system of reporting and monitoring that can be used to review the company's operations against established environmental performance indicators. It would also provide NKPL management with an improved view and control of the operation's environmental performance. An EMS incorporating the EMP would provide the following benefits:

- assistance in compliance with regulatory authorities;
- demonstration of due diligence;
- reduction in environmental liability; and
- effective planning for future environmental and rehabilitation costs.

The principal objectives of the EMP are to provide:

- a framework for ongoing environmental management and monitoring;
- a basis from which reporting to relevant government authorities can be made; and
- specific guidelines for the operation including environmental control systems and initiatives.

8.5.2 Outline of the EMP Components

Specifically, the EMP outlines the mining plan for each year, monitoring results, the rehabilitation program and incorporates requirements of EPA licences and approvals, and planning consent conditions.

In addition to the normal reporting requirements of the EPA and DMR, the following records and data will be held on site:

- details of all transport movements generated by the operation;
- monthly water quality sampling results;
- monthly dust deposition results;
- noise results;
- complaints protocol that will detail the nature of any complaints and procedures to deal with them. Any additional mitigation measures incorporated or changes to normal practices as a result will also be documented;
- details of areas which are rehabilitated and self sustaining. All data will include total areas to date and incremental annual areas for each given year; and
- rainfall data.

Copies of all relevant documentation will be kept on site including licenses, leases and planning consents. The EMP will report on the status of these documents and requirements and will be produced annually and submitted to the DMR and EPA.

8.6 Environmental Reporting

Environmental activities and progress will be reported through the NSW Department of Mineral Resources Mining, Rehabilitation and Environmental Management Process (MREMP). This will involve preparing a Mining Operations Plan (MOP) and an Annual Environmental Management Report (AEMR) for the project.

The MOP will outline the proposed development for a period of a number of years. It will include the mining and rehabilitation activities planned and the relevant environmental controls and requirements necessary for the operation to comply with the mining lease conditions. The MOP will be prepared to cover environmental aspects of the development from the development stage through to the operational stage.

The AEMR would provide a regular annual assessment and report of the performance of the development in terms of the requirements of the MOP and environmental activities. This process allows for regular stakeholder input and review of the activities on site.

8.7 Environmental Monitoring and Verification Process

It is proposed to undertake an environmental monitoring program for water, noise, and air quality. Environmental monitoring will provide the verification of the impact predictions made in this document. It will also allow the environmental performance

of the operation to be assessed and will give the opportunity to fine tune the development works as they proceed.

The proposed monitoring program is outlined below, while the monitoring locations are shown on **Figure 8.1**. It has been assumed that monitoring dust and noise emissions at the nearest residential receptors will provide the necessary data to accurately verify the impact predictions made in this EIS.

8.7.1 Water Quality Monitoring

Surface water – Surface water quality monitoring would be conducted at two sites along drainage lines adjacent to the site for pH, electrical conductivity, suspended solids, and selected metals, oil and grease. It is proposed to sample the background waters weekly during controlled discharge and monthly at other times.

Samples of the water quality within the sediment control dams on site will also be taken prior to discharge to ensure that the water quality is suitable before it is released.

Groundwater - A network of monitoring bores will be established during construction to monitor the potential impact of the project. It is proposed to install three monitoring boreholes to the west of the proposed pit, at increasing distances from the western boundary of the pit. These holes will be established prior to commencement of mining to enable background water quality to be determined. The holes will be sunk to a minimum depth of 50 m and fitted with 50 mm slotted PVC and gravel filter and be completed as permanent observation holes with a surface concrete block and cap fitted in the usual manner.

Water samples taken will be analysed for pH, electrical conductivity, and the major ionic constituents to establish baseline conditions for the active and post mining period. During the first few years of operation all bores will be monitored on a monthly basis. Thereafter, following discussion with authorities, sampling may be reduced to approximately twice per year.

Water level measurements will also be conducted initially on a monthly basis in each hole over time to establish seasonal trends and then at 3 monthly intervals to verify the impacts predicted.

8.7.2 Meteorology and Air Quality Monitoring

An automated meteorological station will be installed to record temperature, rainfall, evaporation, wind direction and wind speed. The data would be maintained on a database to provide information relevant to the environmental management of the site.

The air quality monitoring programme will be established to assess the compliance of the operation with air quality objectives and any relevant EPA licence conditions. Monitoring of dust is proposed at two locations and will involve measurement of dust deposition and total suspended particulates.

Dust monitoring will involve two dust gauges positioned to monitor dust deposition at nearby residences. Samples would be collected monthly and analysed for ash content, combustible matter and insoluble solids. The exact location and nature of the monitoring programme will be developed in consultation with the authorities.

8.7.3 Noise Monitoring

Based on the findings and recommendations of the specialist noise assessment undertaken as part of this EIS, noise monitoring will be conducted during initial stages of mine development to confirm the current findings and predictions, and to establish the practicability of additional noise controls where required.

Noise levels will be monitored during construction and operation at selected residences in the vicinity of the project to verify the predictions of the noise impact assessment and assess compliance with relevant noise criteria.

8.7.4 Erosion and Sediment Control

Erosion and sediment control structures will be inspected on a regular basis and following rainfall events in order to monitor the structural integrity of the structures and assess their effectiveness. The inspection will be used to identify any remediation required.

8.7.5 Rehabilitation

Routine monitoring of rehabilitation activities would be undertaken to assess the condition of the terraced benches, the growth rates and performance of the revegetation and the status of the rehabilitated areas. This monitoring will be conducted to ensure that any areas requiring additional attention are treated promptly.

8.8 Conclusions

This EIS has identified and assessed the key environmental issues relating to the proposed Newnes Kaolin Mine. As with all development projects, the proposed development will cause some environmental impacts. The purpose of this EIS is to identify and quantify these impacts and to assess their significance.

The results of the various environmental investigations have demonstrated that most of the resultant impacts are well within acceptable criteria, and the impact on the environment will be minimal. Noise impacts are anticipated to be acceptable for the first 4 stages of mining providing mitigation measures are incorporated into the project. In Stages 5 and 6 of mining noise exceedences are predicted at residential dwellings in Newnes Junction. Purchase of these residences or alternative arrangements would be required for mining to proceed beyond Stage 4.

An ongoing environmental monitoring program will allow early identification of potential problems. The proposed development is consistent with the requirements of the Department of Mineral Resources for the efficient use of the State's industrial mineral resources. The development will provide significant economic benefits to the

local and regional economy. The balance between environmental impacts and benefits resulting from the proposal clearly favours the development proceeding.

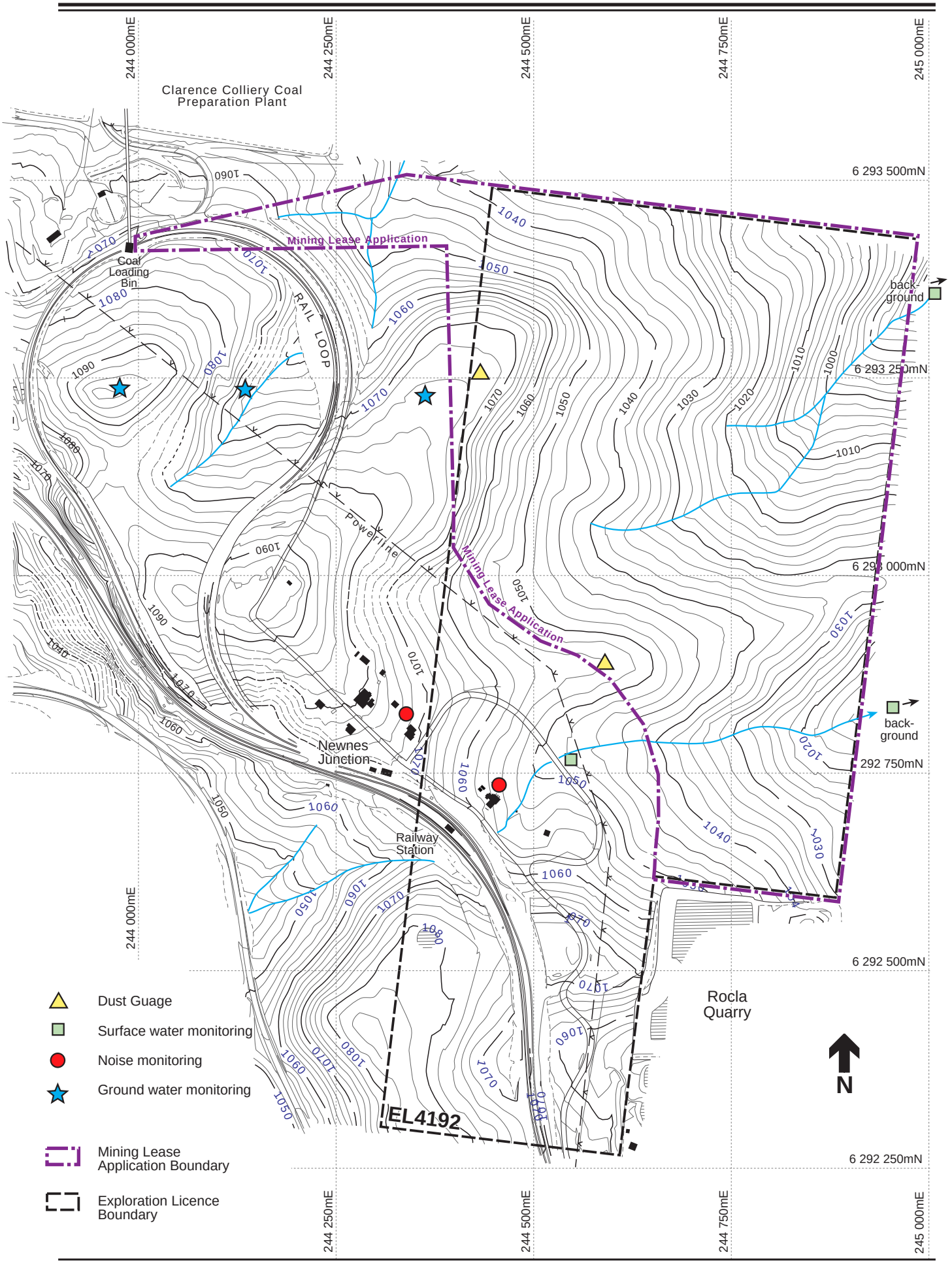

FIGURE 8.1
Newnes Kaolin - Proposed Monitoring