Executive Summary

INTRODUCTION

This *Environmental Impact Statement* (EIS) has been prepared to support an application by Sutton Forest Quarries Pty Ltd ("The Applicant") for development consent to extract and process sand ("the Proposal") from within approximately 174ha of privately owned land ("the Site"). The Site is located west of the Hume Highway, approximately 1.7km southwest of the Sallys Corner Interchange, and approximately 12km west-southwest of Sutton Forest (**Figure A**).

The Sutton Forest Sand Quarry would supply the Sydney, Illawarra and Southern Highlands and Canberra construction markets with sand products principally for concrete manufacture, mortar for bricklaying, roof tile and fibre cement manufacture, plastering and production of concrete products. Sydney consumes an average of approximately 6 million tonnes of construction sand annually, approximately two-thirds of which is fine to medium-grained sand. With the recent closure of the quarries at Penrith Lakes and impending closure of quarrying at the Kurnell Peninsula, the Sutton Forest Sand Quarry would provide an important long term sand resource, relatively close to its key markets.

The Site was selected due to the existence of a viable sand resource and its proximity to the Hume Highway. The sand resources within the Site are located within the Hawkesbury Sandstone, the predominant sandstone unit outcropping within and around Sydney. The depth of the friable sandstones and the size gradings support its consideration as a regionally significant resource.

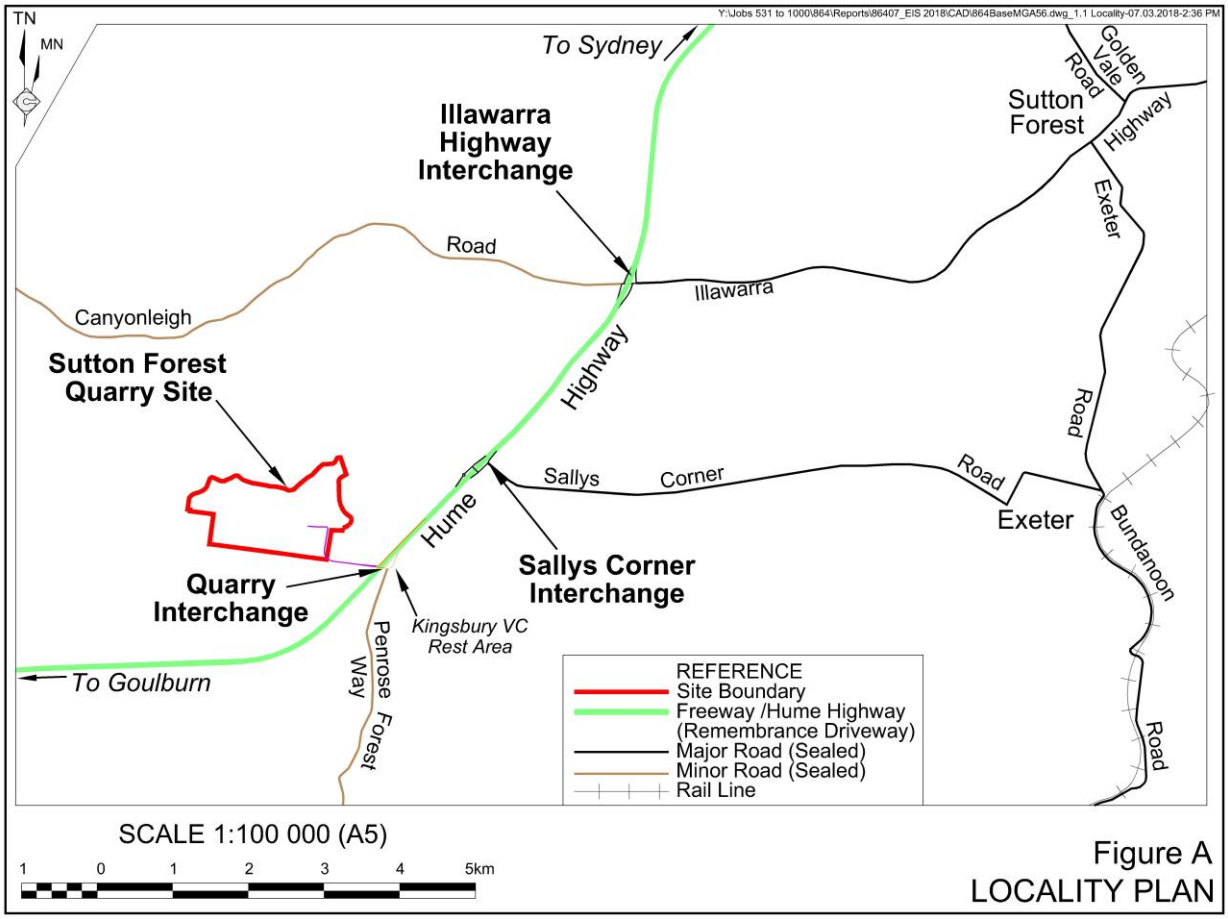

Figure A
LOCALITY PLAN

The Proposal would maximise the efficient recovery of the sand resource while operating in an environmentally responsible manner and progressively rehabilitating disturbed areas for future agricultural use and nature conservation. The majority of the Site would be secured as an on-site biodiversity offset area that would be managed in perpetuity to conserve remnant vegetation adjacent to the Site and along Long Swamp Creek. The Proposal would also provide local employment and other economic benefits associated with direct spending on consumables.

This summary provides relevant background information relating to the Proposal, an overview of key components of the Proposal and an overview of the environmental assessments completed for the Proposal, including the design and operational safeguards that would be adopted as well as summarising the predicted residual impacts on the environment both within and surrounding the Site.

THE APPLICANT

The Applicant for the proposed Sutton Forest Sand Quarry is Sutton Forest Quarries Pty Limited, a private company established as a Joint Venture (JV) partnership between the Tulla Resources Group Pty Limited and Mr Patrick Hallinan with each JV partner holding 50% equity in the Proposal.

OBJECTIVES

The Applicant's principal objectives for the Proposal centre upon:

- securing access to a long term sand resource for supply to the Sydney, Illawarra, Southern Highlands and Canberra construction markets at a market-competitive price;
- annual sales of up to 860 000 tonnes of sand products to meet the increasing supply demands of these markets for the first 30 years of a projected 45 year Quarry life, particularly as production is reduced or ceases at other existing sand sources;
- planning, extraction and processing the friable sandstone resource in a manner that maximises the quality and quantity of sand produced;
- operating the Quarry in an environmentally responsible manner that enables compliance with all relevant statutory requirements;
- progressively rehabilitating disturbed areas to provide for future agricultural and nature conservation land uses at the completion of operations; and
- increasing local employment levels.

THE PROPOSAL

The Resource and Production Levels

An estimated 34 million tonnes of friable sandstone has been defined within the Site capable of yielding approximately 21 million tonnes of high quality sand products during the first 30 years of a projected 45 year operation that would ultimately yield approximately 29 million tonnes. The Applicant proposes a maximum extraction rate of 1 million tonnes per annum (tpa) which would yield approximately 860 000tpa of sand products.

Key Proposal Components

The principal components of the Proposal would be as follows. **Figure B** displays the proposed layout for the Proposal.

- An extraction area covering approximately 47ha with its floor elevation typically between 630m AHD and 700m AHD.
- A processing and stockpiling area covering approximately 12ha incorporating a fixed wash plant involving crushing, washing, screening, dewatering and product stockpiling beneath radial and fixed stackers.

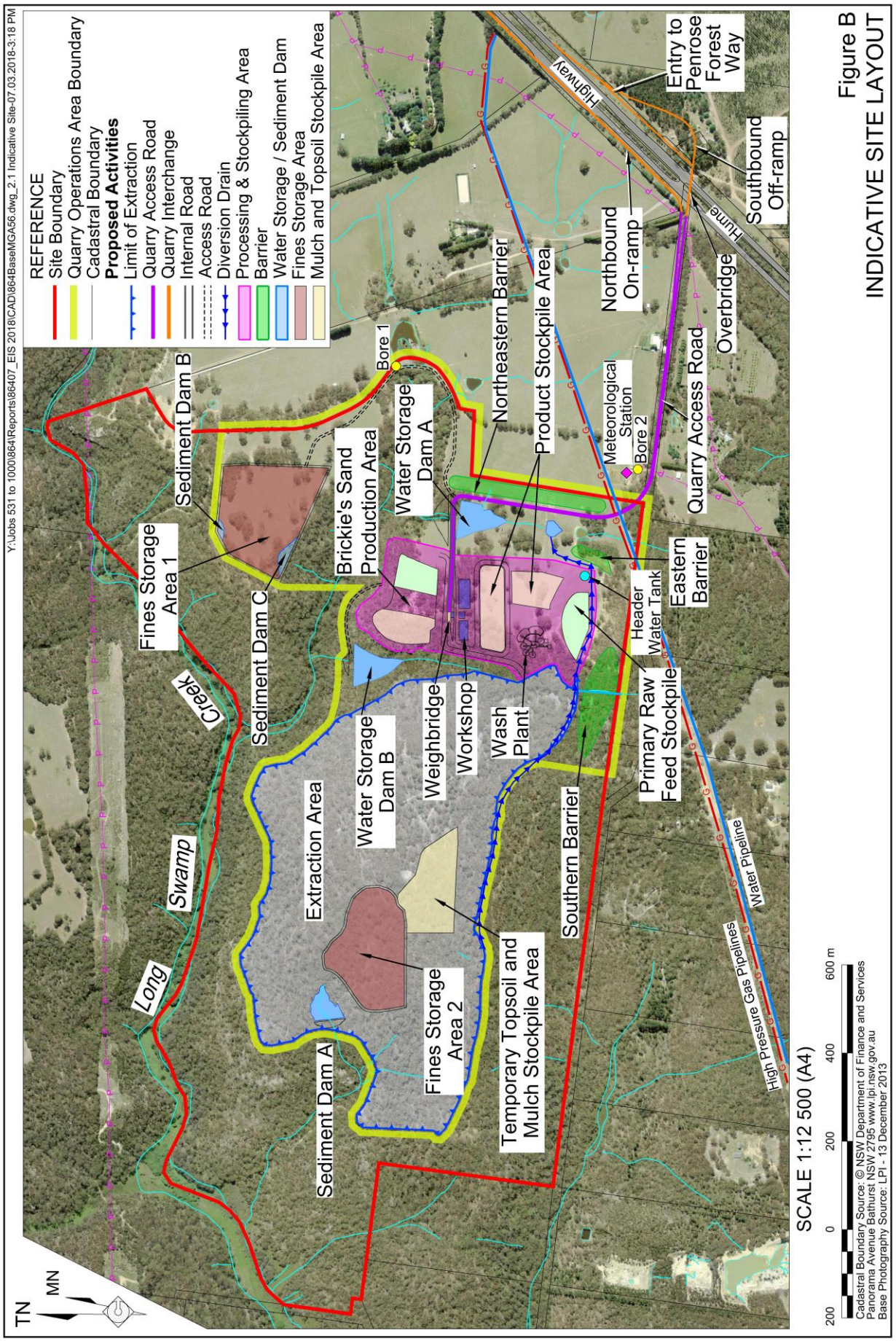
Figure B
INDICATIVE SITE LAYOUT
Y:\Jobs 531 to 10001864\Reports\86407_EIS 2018\CAD\864BaseMGA56.dwg_2.1 Indicative Site-07.03.2018-3:18 PM
REFERENCE
Site Boundary
Quarry Operations Area Boundary
Cadastral Boundary
Proposed Activities
Limit of Extraction
Quarry Access Road
Quarry Interchange
Internal Road
Access Road
Diversion Drain
Processing & Stockpiling Area
Barrier
Water Storage / Sediment Dam
Fines Storage Area
Mulch and Topsoil Stockpile Area
Entry to Penrose Forest Way
Highway
Southbound Off-ramp
Hume
Overbridge
Northbound On-ramp
Quarry Access Road
Meteorological Station
Bore 2
Bore 1
Northeastern Barrier
Product Stockpile Area
Water Storage Dam A
Brickie's Sand Production Area
Sediment Dam B
Fines Storage Area 1
Sediment Dam C
Creek
Swamp
Long
Extraction Area
Water Storage Dam B
Weighbridge
Workshop
Wash Plant
Header Water Tank
Eastern Barrier
Primary Raw Feed Stockpile
Southern Barrier
Temporary Topsoil and Mulch Stockpile Area
Fines Storage Area 2
Sediment Dam A
High Pressure Gas Pipelines
Water Pipeline
TN
MN
SCALE 1:12 500 (A4)
200 0 200 400 600 m
Cadastral Boundary Source: © NSW Department of Finance and Services
Panorama Avenue Bathurst NSW 2795 www.lpi.nsw.gov.au
Base Photography Source: LPI - 13 December 2013

- Two mobile brickie's sand plants would ultimately be located within the northern part of the processing and stockpiling area and/or close to the active extraction area.
- A temporary topsoil and mulch stockpile area within the footprint of the extraction area for the storage of topsoil recovered from the early extraction stages and mulched timber from the areas cleared.
- Two fines storage areas to contain fines produced from the sand washing process during the first three stages of extraction.
- Two water storage dams located to the east and west of the processing and stockpiling area to provide water for dust suppression as well as supplementary supply for the wash plant.
- Three amenity barriers to attenuate noise and reduce visual impacts.

Extraction Operations

Extraction operations would be undertaken using conventional extraction techniques involving ripping, pushing, loading and haulage of the extracted friable sandstone. The Applicant does, however, also intend to blast some areas of sandstone within the lower benches, where the sandstone becomes less friable and where the fragmentation from the blasting would save considerable effort through conventional ripping.

The sandstone resource would be extracted in eight stages with the first six stages completed during the first 30 years and the final two stages completed in the next 15 years.

Product Despatch

Access to and from the Quarry Operations Area would be from the Hume Highway via a proposed Quarry Interchange and a 1.4km Quarry Access Road.

A range of roadworks would be undertaken to construct the Quarry Interchange and Quarry Access Road.

All laden trucks departing the Site would travel northwards from the new northbound on-ramp at the end of the Quarry Access Road and enter the northbound kerbside lane of the Hume Highway.

Trucks travelling to the Site would enter the new Quarry Interchange via a southbound off-ramp from the Hume Highway.

Daily truck movements for the transportation of quarry products would average approximately 134 truck movements (67 loads) with a maximum of 332 daily truck movements (166 loads) occurring during peak sales periods.

Up to 50 truck movements (25 loads) would occur during any one hour (on a busy day). The most likely period for this level of truck traffic would be between 4:00am and 6:00am.

Approximately 95% of the sand products would be delivered to customers in the Sydney metropolitan area.

Rehabilitation

The Applicant is committed to an integrated approach to rehabilitation of all areas to be disturbed within the Site through the adoption of a progressive approach to development of the final landform and application of rehabilitation procedures. The Applicant's objectives for rehabilitation on the final landform are to:

- blend the created landforms and vegetation established on the post-extraction landform with that of the surrounding topography on the northern side of the extraction area; and
- provide a low maintenance, free draining, geotechnically stable and safe landform with minimal erosion, particularly within the extraction area and processing and stockpiling area.

Plans are provided in this document presenting the interim and long-term final landforms that would be created by the end of

extraction Stages 5 and 7. The rehabilitated long-term final landform would comprise the following features.

- A profiled backfilled surface at an elevation of approximately 660m AHD to 665m AHD which would direct surface runoff to a series of dams on the surface. Backfill materials would comprise process fines and imported virgin excavated natural material (VENM) and excavated natural material (ENM).
- Revegetated terminal benches that would provide for ongoing nature conservation.
- A profiled processing and stockpiling area with the central area gently sloping towards the northeast and northwest and provide additional land for agricultural activity.
- Internal access roads, where not of use to the landowner, would be ripped and revegetated.
- The Quarry Access Road and Quarry Interchange would be retained for access to each property served by the interchange.
- Water storage dams and sediment dams would be retained for use by the landowner.

All fixed plant and equipment would be removed. Buildings may remain in the landform for use by the landowner.

BIODIVERSITY OFFSET STRATEGY

Approximately 63.2ha of native vegetation would be progressively removed within the disturbance areas of the Site. The ecological assessment confirmed that this land was potential habitat for a range of threatened species and would require offsetting. An assessment of offsetting requirements using the Biobanking Assessment Methodology and Biobanking Credit Calculator was undertaken and concluded that 3 901 ecosystem credits would be required to satisfy offsetting requirements. A total of 54 species credits were identified to offset the removal of three individuals of the threatened plant Dwarf Phylotta (*Phylotta humifusa*).

The Applicant has reviewed options available under the Biodiversity Offset Scheme of the *Biodiversity Conservation Act 2016* to satisfy offsetting obligations. These include the following.

- An on-site offset area of approximately 102ha.
- An off-site offset area of approximately 200ha.
- Securing credits through purchase of available credits on the market.
- Financial contribution to a suitable biodiversity conservation action managed by OEH or to the Biodiversity Conservation Fund

An assessment of the proposed on-site offset area has concluded that securing this area would generate a total 1 117 ecosystem credits (of various types) and all required species credits for the Dwarf Phylotta. While technical assessment of the off-site offset area has not been completed, review of available aerial photography suggests that similar vegetation communities are likely to exist at this location and these would be suitable to satisfy the majority of remaining ecosystem credits required. Any remaining credits would be satisfied through purchase of available credits or financial contributions.

These options have been presented as a preliminary Biodiversity Offset Strategy in the EIS. It is anticipated that any offset area would be secured in perpetuity under a Biodiversity Stewardship Agreement which would require assessment under the Biodiversity Assessment Methodology to establish the final quantum of credits generated. These assessments and proposed options to secure all biodiversity credits would be presented in a final Biodiversity Offset Strategy. All credit requirements would be secured prior to the commencement

of any vegetation clearing. Based on this strategy, it is concluded that the Proposal, incorporating final rehabilitation of the Site, would maintain or improve biodiversity values in the medium to long term.

APPROVALS REQUIRED

Based upon the current design of the Proposal and understanding of environmental issues, the Proposal would require the following approvals to proceed.

1. Development consent under Part 4 of the *Environmental Planning and Assessment Act 1993* with the consent authority being the Minister for Planning, his or her delegate or the Independent Planning Commission as the Proposal has been classified as a "State Significant Development" under Schedule 1 (7(a)) *State Environmental Planning Policy (State and Regional Development) 2011*.
2. An Environment Protection Licence from the Environment Protection Authority, under Chapter 3 of the *Protection of the Environment Operations Act 1997* would be required for both the extraction and processing activities.
3. A licence from the Department of Industry – Crown Lands and Water under the *Water Management Act 2000* would be required to account for the in-flow of groundwater during the extraction operations.
4. A licence from the Department of Industry – Crown Lands and Water under the *Water Management Act 2000* would be required for the pumping of groundwater for use on site.
5. A Section 138 Permit from the Wingecarribee Shire Council or RMS under the *Roads Act 1993* would be required for the construction of the Quarry Interchange.

CONSULTATION

Consultation was undertaken during the planning and design of the Proposal with the following parties.

- Surrounding landowners.
- The local Aboriginal community.
- Relevant government agencies.

Feedback received during consultation was considered in the final design of the Proposal and issues raised by participants were considered in the assessment of potential environmental impacts.

ENVIRONMENTAL SAFEGUARDS AND IMPACTS

The environmental features of the Site and its surrounds that may be affected by the Proposal have been studied in detail. Information on existing conditions, proposed safeguards and controls and potential impacts the Proposal may have following the implementation of these measures is presented for all relevant issues.

Traffic and Transport

The Proposal would involve the construction of the Quarry Access Road as well as roadworks immediately north of the current Penrose Forest Way intersection which also provides entry to the Kingsbury VC Rest Area.

The roadworks would focus on modifications to the existing entry to the Kingsbury VC Rest Area and Penrose Forest Way and would include the construction of the Quarry Interchange comprising a southbound off-ramp, overbridge and northbound on-ramp.

A dual lane Quarry Access Road would be constructed within the Crown Road Reserve to the boundary of the Site that would link the Quarry Interchange to the Quarry Operations Area.

The Applicant would implement operational safeguards to ensure that motorists on the Hume Highway would be minimally impacted by the Proposal, including the implementation of a Traffic Management Plan to safely manage the traffic impacts during all phases of the Proposal.

Groundwater

The Site is located on the southwestern edge of the Sydney Basin where the main stratigraphic units also form the major hydrogeological units, namely the Hawkesbury Sandstone (aquifer) which is underlain by the less permeable Berry Formation (aquitard).

Groundwater beneath the Site occurs in two distinct systems namely; an upper (shallow) perched localised system controlled by the underlying geology and which is responsible for elevated spring discharge and a deeper, saturated system which was interpreted to be representative of the regional groundwater system that is responsible for base flows to Long Swamp Creek.

Long Swamp, situated to the northwest of the extraction area within Long Swamp Creek is identified as a groundwater dependent ecosystem (GDE) that is reliant upon the baseflow contribution from the regional groundwater system, including a contribution of groundwater from the Hawkesbury Sandstone beneath the Site.

The assessment also identified 43 registered bores within 24km^2 centred on the extraction area with the main purpose of these being stock and domestic watering or bottled water. One of these bores would be utilised as a supplementary water supply for the Proposal via an existing 45ML/year allocation.

The potential local and regional impacts of the Proposal on the groundwater environment, local groundwater users, local surface water systems, GDEs and the supply of supplementary water for processing and dust suppression for the Proposal have been assessed with the aid of a calibrated, transient groundwater flow model. Model development was aided by data collected from aquifer performance testing carried out at the Site.

The results of the modelling assessment indicate that the maximum modelled drawdown of the water table would be less than 0.5m at the four closest private bores (within 1.5km of the extraction area) and less than 0.1m at Long Swamp Creek, i.e. well below the 2m limit specified by the Aquifer Interference Policy. The modelled maximum baseflow reduction for Long Swamp Creek would be 2.6% of the current (calculated) average annual base flow. The reduction in baseflow and water table elevation are considered to be within the range of natural variation.

While the impact assessment has concluded that impacts upon the groundwater setting would be minimal, a monitoring program, incorporated into an integrated water management strategy, would be implemented to compare the actual outcomes with model predictions.

Surface Water

The surface water assessment identified that the Proposal could potentially impact surface water flow rates, surface water flow volumes and surface water quality directly or indirectly leaving the Site. At present, the Site comprises mostly vegetated, highly permeable catchments, which generate low levels of runoff as a consequence of high levels of infiltration into the sandy soils. This cycle is a factor in maintaining the hydrologic regime of the nearby Long Swamp.

The assessment also identified that surface water collected under harvestable rights (13.8ML) would be insufficient to meet the water requirements for sand processing and dust suppression and that alternate supplies would need to be secured by the Applicant. Groundwater supplies or a commercial supply agreement would be the source of supplementary water for the Proposal.

During site establishment and construction and operational stages, surface water would be managed through the adoption of best-practice guidelines and mitigation measures to minimise the risk that surface runoff from the Site might cause undue pollution of local watercourses.

The implementation of an integrated water management strategy, including water quality monitoring and associated response planning, would ensure the effectiveness of mitigation measures.

Noise and Vibration

The Proposal has been designed with the key objective to minimise the noise generated by sand extraction / processing activities and the transportation of sand products from the Site. The components of the Site have been designed to benefit from the natural topographic shielding to the south of the Quarry Operations Area. The processing and stockpiling area would be located within an area excavated up to 12m below natural ground level. This excavation and three amenity barriers to be constructed on site would assist to minimise noise propagation from the Site.

A number of operational safeguards would also be employed to reduce noise emitted by the range of activities undertaken on site, including regularly servicing equipment, grading internal roads when required, limiting use of exhaust brakes, and implementing speed limits on the Site. The Applicant would place particular emphasis upon communication with the Pauline Fathers regarding minimising adverse noise and vibration impacts from the Proposal upon the activities within the Shrine of Our Lady of Mercy – "Penrose Park".

A noise assessment for the Proposal employed modelling to predict noise emissions under three representative operational scenarios and two adverse weather conditions (a temperature inversion and gentle westerly wind). This assessment confirmed that the range of design and operational safeguards would be sufficient to avoid any noise exceedances at any surrounding residences for each of the assessed scenarios.

The assessment also established that noise criteria would also be satisfied over more than 75% of surrounding properties which would remove the need to address the Voluntary Land Acquisition and Mitigation Protocol.

Potential impacts of trucks transporting quarry product on the Hume Highway were also assessed to be within acceptable limits.

Assessment of the potential impacts relating to the proposed intermittent blasting activities considered the potential ground vibration and airblast overpressure at three representative residential locations as well as at the Grotto at the nearby Shrine of Our Lady of Mercy – "Penrose Park", an Aboriginal rock shelter and nearby water and high pressure gas pipelines. This assessment confirmed that the blast design and proposed blast locations would ensure all blast-related impacts would be well within human comfort and building structure protection criteria. No blasting is proposed within 0.5km of the Grotto on the Shrine of Our Lady of Mercy – "Penrose Park".

A noise monitoring program would be undertaken to confirm the predictions made in the assessment and ensure ongoing compliance with the relevant noise criteria. All blast events would be monitored at the Grotto of the Shrine of Our Lady of Mercy – "Penrose Park" to ensure compliance and inform blast design in an adaptive management process.

Terrestrial Ecology

A flora and fauna assessment identified five vegetation communities within the areas proposed to be disturbed, none of which are endangered. A threatened swamp community is located 100m beyond the disturbance area,

along Long Swamp Creek, which forms the northern boundary of the Site and would not be impacted by the Proposal.

The Proposal would result in the clearing of approximately 63.2ha of native vegetation. Two individuals of a single threatened flora species were identified in the disturbance area. Five threatened bird species and four threatened species of bat were identified during the surveys.

As the Proposal is State Significant Development, residual impacts to biodiversity need to be offset (residual impacts are those that cannot be avoided or suitably mitigated). To ensure that impacts to threatened flora and fauna are comprehensively described, an assessment of the significance of proposed impacts in accordance with Section 7.3 of the *Biodiversity Conservation Act 2016* concluded that while impacts to individual species would not be significant, the removal of 63.2ha of native vegetation would present a significant impact based on potential for vegetation clearing to exacerbate existing key threatening processes. The Applicant proposes to offset these impacts to native vegetation through a Biodiversity Offset Strategy.

Other strategies to avoid or mitigate impacts to native vegetation include aligning the proposed extraction area boundary such that the majority of cleared vegetation would be regrowth forests and partial revegetation of the final landform to create habitat for local fauna species. Biodiversity values within the Site would be managed under a Landscape and Rehabilitation Management Plan.

The Site lies within a regional wildlife corridor identified in the *Illawarra Regional Environmental Plan No. 1 the Wingecarribee Local Environmental Plan 2010 and the Southern Highlands Biolink*. The mitigation and offsetting proposals are designed in such a way that the Proposal would not significantly interrupt ecological connectivity with and beyond the Site.

An assessment of potential impacts to GDEs has concluded that vegetation within Long Swamp Creek and the nearby Long Swamp would not be significantly impacted by the Proposal.

The Proposal would also not impact known or potential Koala populations. However, it is acknowledged that the local community has identified a population of Koala in the past. Given that the Koala was not identified during ecological surveys, but feed trees were present, management of the Koala would be included in a Landscape and Rehabilitation Management Plan.

The Proposal would also not significantly impact matters of national environmental significance to the extent that a referral to the Commonwealth Department of the Environment and Energy (DoEE), would not be necessary.

Aquatic Ecology

An aquatic ecology assessment was undertaken for the Proposal to identify threatened species and stygofauna that may be affected by the Proposal.

Threatened species, populations and endangered ecological communities that may occur within and surrounding the Site were identified by reviewing the current listings on databases maintained by DoEE, DPI (Fisheries) and NSW Office of Environment and Heritage (OEH).

A field survey was conducted in March 2014 to provide a description of aquatic habitats and make notes on aquatic flora and fauna observed in Long Swamp Creek with no listed threatened fish species observed during the inspection.

Stygofauna sampling of six groundwater bores located on the Site was conducted in May 2016 with no stygofauna taxa being identified from the samples collected.

Two primary potential impacts to aquatic ecology due to the Proposal were identified.

1. Reduction in water quality in Long Swamp Creek following mobilisation and release of sediments (and other potential contaminants).
2. Loss of swamp habitat (and, thus, identified EECs and habitat for Giant Dragonfly) following reductions in groundwater and surface water contribution to receiving aquatic ecosystems.

The aquatic ecology assessment concluded that potential reductions in water quality could be managed through the implementation of an integrated water management strategy. This strategy would include water quality monitoring and associated response planning to ensure the effectiveness of mitigation measures including those to manage sediment-laden runoff.

Aboriginal Cultural Heritage

An Aboriginal Cultural Heritage Assessment was undertaken for the Proposal, including consultation with six Aboriginal stakeholders who registered interest in the Proposal.

No Aboriginal cultural heritage sites had been recorded on the Site prior to the surveys undertaken for the Proposal. Field surveys of the Site were conducted in November 2012, November 2013, September 2016 and February 2018, which identified nine Aboriginal cultural heritage sites. Eight of the sites comprised artefact scatters with one being a rock shelter. The artefact scatters are generally small in size ranging from two artefacts to 12 artefacts encountered in one scatter.

The rock shelter located to the west of the extraction area was assessed to be of high significance. This site has been avoided through modification of the extraction area so as to permit a 100m buffer around this site.

The Proposal would result in the full salvage of artefacts located at two sites within the proposed extraction area, full salvage of artefacts located within the alignment of the access track to Fines Storage Area 1 and partial salvage of another site adjacent to the alignment of the access track to Fines Storage Area 1. Five sites, including the Aboriginal rock shelter, would not be directly impacted by the Proposal as the Applicant has designed the Proposal to avoid these. The Applicant would arrange for a suitably qualified archaeologist to salvage the Aboriginal objects at the four Aboriginal cultural heritage sites which would be disturbed, in consultation with Aboriginal stakeholders.

Historic Heritage

There are currently no listed historic heritage items within or near the Site. A survey of the Site and its surrounds was undertaken in November 2012. One potential heritage item, "Bridgewater Lodge" (c. late 19th century), is located east of the Site. This building is not listed on any heritage registers but may be of some heritage value as an early surviving residence of the area.

It is not anticipated that there would be any impacts to "Bridgewater Lodge", which is the only item of potential heritage significance in the vicinity of the Site.

Air Quality

Dispersion modelling was used to assess the impact that dust emissions from the Proposal would have on local air quality. The modelling was undertaken to establish the effects of the Proposal alone and with background dust levels considered. Cumulative impacts with other nearby quarries were also considered.

The result of the air quality assessment for two operational scenarios (Stage 2 and Stage 4) concluded that the Proposal would comply with all impact assessment criteria for Total Suspended Particulates, PM_{10} and deposited dust for the relevant averaging

period. The modelling predictions for $PM_{2.5}$ were also below the National Environmental Protection Measures standards at all surrounding residences.

The assessment of Greenhouse Gas Emissions concluded that the Proposal would represent a minor impact when considered alongside national and global emission levels.

An air quality monitoring program would be implemented to confirm the conclusions of the impact assessment and demonstrate the compliance of ongoing operations.

Land and Soil Capability

Five Soil Landscape Units were identified within the Site, each reflecting their geological substrates, i.e. sand and/or clay.

Although topographic conditions varied across the Site, a soils assessment involving a site inspection, excavation of test pits and laboratory analyses, established that each of the Soil Landscapes present on the Site displayed similar characteristics in that the soils are:

- moderately erodible;
- massive, yet poorly structured;
- non-saline;
- infertile;
- non-dispersive;
- strongly acidic; and,
- highly permeable.

The soils assessment identified that the majority of the Site may be categorised as having Class 5 Land and Soil Capability due to significant soil acidity. Class 5 lands are not considered to be prime agricultural land due to severe limitations for high impact management (e.g. cropping).

During the site establishment and operational stages of the Proposal, any topsoils and subsoils requiring removal would be handled when moist only (not too dry or too wet) and separately stockpiled in an appropriate manner.

Based on the physical and chemical characteristics of the soils within the areas to be disturbed, the soils assessment established that, by using the appropriate management strategies, any Proposal-related activities would have minimal long-term impacts on the land and soil capability of the Site.

Visibility

The visual landscape within and surrounding the Site is influenced largely by the natural topography and remnant vegetation. The areas from where the proposed extraction area and other operational areas are currently visible are limited to elevated areas to the north and east of the Site. Views from areas to the south and west of the Site are prevented by the ridgeline to the south of the Site, which would be retained throughout the life of the Proposal. There are no views of the Quarry Operations Area from public vantage points such as the Hume Highway.

Views of the operations from one residence, situated east of the Site would largely be obscured by the northeastern amenity barrier and the retained eastern face of the processing and stockpiling area. Furthermore, it is predicted that views of the active extraction area from this residence would only occur at the Stage 2 of Quarry development, however, rehabilitation of the upper faces would progressively reduce this impact.

The Applicant would implement visibility mitigation measures, including a Lighting Management Plan, establish vegetation following construction of the southern, eastern and northeastern barriers as soon as practicable, and landscape areas adjacent to the Quarry Access Road with an emphasis on tree screening, to minimise visual amenity impacts from the Proposal.

Agricultural Resources

The majority of the Site covers areas not currently used for commercial agriculture. The land to be disturbed within the Site has limitations for agriculture, classified as

Class 5 land which is only suited to light grazing. Disturbed areas within the Site would be rehabilitated, and as such there would be minimal impact on agricultural resources. The proposed final landform would be developed to permit the landowner to continue the productive use of the land following the end of quarrying activities although a substantial proportion of the land would be incorporated within a biodiversity offset area in perpetuity.

Bush Fire Risk

The area of disturbance is generally classified as low bush fire hazard due to the distance between vegetation and operational activities. However, it is recognised that, even after vegetation is cleared from the Site, the area is directly adjacent to a heavily wooded area, and therefore the potential for bush fire to spread both within the Site and adjacent to the Site would be high if management measures are not adopted to mitigate this hazard. A *Bush Fire Management Plan* would be prepared in consultation with the local Rural Fire Service.

With the proposed safeguards and controls, it is considered that the bush fire hazard associated with the Proposal would be acceptable and would not significantly contribute to raising the risk of bush fires impacting the community, property or environmental assets.

Socio-Economic

The Proposal has, to the extent feasible, been designed to minimise the social and economic cost of the Proposal on the local community.

The Proposal provides for the extraction, processing and despatch of sand products recognised to be in short and diminishing supply within the Sydney hinterland. The need for sand resources and importance of the construction industry, not only in the local area but in the broader region, is recognised by the community. The Proposal would assist in generating local employment and improving the local economy, while drawing revenue to local businesses in the area. The economic benefits of a Proposal of this size are experienced locally and for the State of NSW.

Access to groundwater has an important social and economic component that is reflected in community concerns about livelihood and groundwater contribution to Long Swamp Creek. Traffic levels, noise and dust are also important to the community, especially considering the proximity of the Hume Highway.

Through the implementation of a range of management and mitigation measures, the Applicant would keep the community informed of progress, provide avenues for complaints or concerns to be expressed and engage positively with the local community. Feedback via monitoring, reporting and compliance auditing would provide a degree of accountability to these commitments.

The Applicant has made a range of commitments over-and-above requirements to satisfy standard environmental management criteria in order to minimise conflicts between the public and private use of the Shrine of Our Lady of Mercy – "Penrose Park" and the operation of the Quarry. Ongoing consultation with the Pauline Fathers would play an important role in further mitigating impacts at this location.

It is acknowledged that there would be changes to the local setting and residual impacts as a result of the Proposal. A range of potential social impacts have been identified and measures proposed to minimise or mitigate these changes. It is considered unlikely that the Proposal would significantly change the existing amenity experienced by the community and visitors alike and that the economic benefits would be significant to the local and regional economy.

EVALUATION AND JUSTIFICATION OF THE PROPOSAL

An evaluation of the Proposal has been undertaken by firstly re-assessing the risks posed to the local environment by project-related activities following the implementation of all operational controls, safeguards and/or mitigation measures, and secondly through consideration of the principles of ecologically sustainable development.

The evaluation found that, with the implementation of the proposed controls, safeguards and/or measures, the residual risk posed by each possible environmental incident or impact was reduced from its original level to predominantly either moderate or low, and therefore acceptable.

The approach taken in planning the Proposal has been multi-disciplinary, involved consultation with potentially affected local residents and various government agencies with an emphasis on the application of safeguards to minimise potential environmental, social and economic impacts. The design of the Proposal has addressed each of the sustainable development principles, and on balance, it is concluded that the Proposal achieves a sustainable outcome for the local and wider environment.

The Proposal has also been justified in terms of a wide range of biophysical, social and economic issues. These impacts have been justified in terms of the low risk of environmental impacts and the positive economic and social benefits that would result for the local community, Wingecarribee local government area, and the greater Sydney area, primarily through the provision of required construction materials.

CONCLUSIONS

The Proposal has been designed to address the issues raised by the community and all levels of government, as well as the principles of ecologically sustainable development. The Proposal provides for the extraction of the identified sand resource and general operation of the Quarry in a cost efficient and environmentally responsible manner. The Proposal also incorporates the progressive rehabilitation of the Site in order to provide for productive agricultural activities and ongoing nature conservation upon completion of quarrying activities.

In light of the assessments presented throughout this EIS, it is concluded that the proposed Sutton Forest Sand Quarry could be developed and operated in a manner that would satisfy all relevant statutory goals and criteria, environmental objectives and reasonable community expectations.

This document and the range of specialist consultant studies undertaken have identified that the Proposal should proceed because it would:

- contribute towards satisfying the demand for construction materials, particularly within the Sydney metropolitan region and the Southern Highlands;
- have a minimal and manageable impact on the biophysical environment;
- satisfy sustainable development principles;
- provide for continuing and future use of the Site for nature conservation and agriculture; and
- result in a net benefit for the local community, Wingecarribee Shire and the State of NSW.

SUMMARY OF KEY FACTS AND STATISTICS

Applicant	Sutton Forest Quarries Pty Ltd
Location	13,302 Hume Highway, Sutton Forest
Indicative Application Area	• Total area of disturbance = 67.9ha • Extraction Area = 47ha • Processing and Product Stockpiling Area = 12ha • Water Storage Dams = 1.2ha • Fines Storage Area 1 = 4.8ha • Amenity barriers (3) = 2.9ha
Material Extracted	• Friable Hawkesbury Sandstone to an elevation of 630m AHD or between approximately 20m and 60m below ground level
Resource	• Approximately 34 million tonnes of recoverable friable sandstone
Key Products	• Concrete sand, tiling sand and mortar sand
Total Products	• Approximately 29 million tonnes (following processing)
Sand Markets	• Construction industry (principally concrete) primarily in the Sydney Metropolitan Area and more locally in Goulburn, Illawarra, The Southern Highlands and Canberra
Project Life	• Project Life = 45 Years (Stages 1 to 7) • Development Consent sought for 30 years (Stages 0 to 5)
Extraction Method	• Ripping and pushing by bulldozer and haul truck to the processing plants. Occasional blasting (6 to 12 blasts per year)
Maximum Extraction	• 1 million tonnes per year
Maximum Sales	• 860 000 tonnes per year
Truck movements per day during operations (one load generates two movements)	• At 700 000 tpa - daily average 140 / daily maximum 274 • At 860 000 tpa - daily average 172 / daily maximum 344
Quarry Access Road	• A sealed road from the Quarry Operations Area to the Hume Highway (via a dedicated Quarry Interchange)
Employment	• Approximately 20 full time persons at the Quarry • Approximately 50 contractors transporting quarry product

Hours of Operation (The nominated periods reflect the periods in which the activity(ies) could occur – they would not be undertaken continuously within these periods)

Activity	Monday to Friday	Saturdays	Sundays or Public Holidays
Site Establishment and Construction[1]	6:00am to 10:00pm	6:00am to 10:00pm	Nil (unless required for external roadworks)
Extraction Operations	5:00am to 10:00pm	5:00am to 10:00pm	5:00am to 10:00pm
Blasting Operations (as required)	9:00am to 5:00pm	9:00am to 5:00pm	Nil
Processing Operations	24 hours / day	24 hours / day	24 hours / day
Product Despatch	24 hours / day	24 hours / day	24 hours / day
Maintenance	24 hours / day	24 hours / day	24 hours / day

1. Site establishment and construction activities beyond 6:00pm, Monday to Saturdays would be restricted to those activities that are not audible at surrounding residences.