# ENVIRONMENTAL ASSESSMENT REPORT
# LUDDENHAM CLAY & SHALE QUARRY
# EPIC MINING PTY LIMITED
# 275 ADAMS ROAD LUDDENHAM NSW

**Prepared for:** Samuel Tarabori, Epic Mining Pty Limited
The Secretary, Department of Planning and Environment

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## ABBREVIATIONS & GLOSSARY OF TERMS

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| **Applicant** | Epic Mining Pty Limited |
| **Appropriate Regulatory Authority (ARA)** | Generally, the appropriate regulatory authority is the EPA for licensed premises and local Council for non-licensed premises. There are exceptions to this definition as stated in Clause 6 of the POEO Act. |
| **AS** | Australian Standard |
| **BCA** | Building Code of Australia |
| **Council** | Liverpool City Council |
| **DCP** | Development Control Plan |
| **Department** | Department of Planning and Environment |
| **DG** | Dangerous Goods |
| **DP** | Deposited Plan |
| **DoPI** | NSW Department of Planning & Infrastructure |
| **EAR** | Environmental Assessment Report |
| **EPA** | NSW Environment Protection Authority |
| **EP&A** | Environmental Planning & Assessment Act 1979 |
| **EPL** | Environment Protection Licence |
| **Environment** | As defined in the POEO Act, *"environment" means components of the earth, including:*<br>*(a) land, air and water, and*<br>*(b) any layer of the atmosphere, and*<br>*(c) any organic or inorganic matter and any living organism, and*<br>*(d) human-made or modified structures and areas,*<br>*and includes interacting natural ecosystems that include components referred to in paragraphs (a)-(c).* |
| **Harm** | As defined in the POEO Act, *"harm" to the environment includes any direct or indirect alteration of the environment that has the effect of degrading the environment and, without limiting the generality of the above, includes any act or omission that results in pollution.* |
| **Immediately** | Promptly and without delay. |
| **INP** | Industrial Noise Policy |
| **LEP** | Local Environmental Plan |
| **LGA** | Local Government Area |
| **Material risk of harm** | "Material risk of harm to the environment" is defined under Section 147 of the POEO Act as:<br>*(a) harm to the environment is material if:*<br>*(i) It involves actual or potential harm to the health or* |

*safety of human beings or to ecosystems that is not trivial, or*

*(ii) It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and*

(b) *loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.*

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| **NPI** | National Pollutant Inventory |
| **NPWS** | National Parks and Wildlife Service |
| **Occupier** | As defined under the POEO Act, *"occupier" of premises means the person who has the management or control of the premises.* |
| **POEO Act** | Protection of the Environment Operations Act 1997 |
| **Pollution** | As defined under the POEO Act*, "pollution" means:*<br>*(a) water pollution, or*<br>*(b) air pollution, or*<br>*(c) noise pollution, or*<br>*(d) land pollution.* |
| **Pollution Incident** | The *Environmental Guidelines: Preparation of pollution incident response management plans* defines a pollution incident as:<br>"…an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise." |
| **Premises** | As defined under the POEO Act*, "premises" includes:*<br>*(a) a building or structure, or*<br>*(b) land or a place (whether enclosed or built on or not), or*<br>*(c) a mobile plant, vehicle, vessel or aircraft.* |

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| **Prevention of pollution** | Use of processes, practices, materials or products that avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.<br>Note: The potential benefits of prevention of pollution include the reduction of adverse environmental impacts, improved efficiency and reduced costs. |
| **Proposed Stockpiling Site** | 285 Adams Road (also known as 2470 Elizabeth Drive) Luddenham |
| **RMS** | Roads & Maritime Services |
| **SWMP** | Site Water Management Plan |
| **Scheduled activity** | "scheduled activity" means an activity listed in Schedule 1 of the POEO Act. Scheduled activities must be licensed under the POEO Act. |
| **Site** | 275 Adams Road, Luddenham |
| **Spill kit** | A set of equipment used to isolate or control an accidental overflow or release of a substance or material. |
| **Epic** | Epic Mining Pty Limited which is the operator of the business subject to this application. It is also called applicant. |

# EXECUTIVE SUMMARY

This Environmental Assessment Report (EAR) has been prepared by National Integrated Creative Solutions on behalf of Epic Mining Pty Limited (the applicant). The EAR is based on the original Environmental Impact Statement (EIS) and the previous EAR which was prepared for Modification No 3. This report provides some information that was contained in both reports previously submitted to the NSW Department of Planning and Environment (Department) and it includes references to all previously (some are very recent) undertaken environmental assessments such as Air Quality Impact Assessments, Noise Impact Assessments, Site Water Management Plan and additional studies to ensure that the report adequately addresses the requirements of the planning and other regulatory authorities.

The applicant proposes to modify its existing consent DA No 315-7-2003 (a copy of the modified consolidated consent is included in **APPENDIX A**) to relocate stockpiling of excavated clay and shale to an adjacent site, and to relocate the small scale approved composting activities to the paddock in the northern portion of the previously approved site in combination with the approved works at 275 Adams Road, Luddenham. In addition to the above proposed modifications, the matters outlined below are also addressed in this report as requested by the applicant and consistent with the advice obtained from the Department:

- to relocate the approved stockpiling of clay and shale in combination with the approved work at the adjacent land known as 285 Adams Road, Luddenham which is also known as 2470 Elizabeth Drive, Luddenham (Lot 281 in DP 571171),
- to relocate the approved composting activities to the northern portion of the applicant's approved site,
- to review the locations of all environmental monitoring and discharge points due to the construction and future operation of the proposed Western Sydney Airport on the Commonwealth land located east and south of the applicant's site where most monitoring and discharge points are currently located,
- to review current monitoring and reporting requirements in accordance with previous consultation with both the Department and the NSW Environment Protection Authority (EPA),
- modify the parameters of Air Quality Assessment to reflect current NSW parameters due to changes in the Air Assessment parameters,
- to modify relevant Consent Conditions associated with the Luddenham Quarry Community Consultative Committee to reflect the alternative program approved by the Department, and
- to review the current noise criteria specified in the Consent due to the ongoing changes in the local environment surrounding the applicant's site including the construction and operation of Western Sydney Airport, the increase of industrial activities in the adjacent suburbs and the significant increase in traffic on Elizabeth Drive.

The EAR has considered all aspects of the proposed modifications and it will be demonstrated that the proposed modifications as designed will readily satisfy all statutory requirements in current planning and environmental legislation.

The operations at the premises were commenced in January 2010 by Blue Sky Mining (Aust) Pty Ltd. Soon after Epic Mining Pty Limited (the applicant) was formed and took over the operations at that site.

The applicant holds an Environment Protection Licence No 12863 (EPL) which was issued by the EPA on 5 June 2009 and was modified on four (4) occasions for different reasons (a copy of the current EPL is included in **APPENDIX B**).

The EPL authorises the applicant to quarry materials within the scale of 100,000 – 500,000 tonnes per year, however the Consent was granted for a maximum of 300,000 tonnes per year for 15 years. This upper limit has not been reached so far and it will remain the same throughout the life of the project. The proposed modifications do not alter the scale or the upper limit.

The existing development was classified as State Significant Development under section 76A(7) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The quarry operation was also classified as Integrated Development due to its proximity to Oaky Creek (and proposed construction of a road to Elizabeth Drive).

The development was classified as Designated Development due to the requirements for other approvals/licences from other authorities.

The original application, lodged in 2004, was prepared on the basis of the quarry operating as a 'shovel and truck activity'. Changes to operational circumstances of suppliers, has meant that there is a need for the product to be stored on-site rather than at the site of the brick works. Also stockpiling of product on-site ensures that the necessary scouring and fretting process of the extracted raw material occurs in a controlled and well managed environment. Stockpiling enables greater flexibility to provide the correct clay/shale mixes and allows for the removal of unwanted shale-sandstone materials. This process ensures that the best quality of raw material is delivered to local brickworks.

Some of the stockpiling works will continue to be contained within the approved quarry operation area as well as at the proposed new adjacent site which is now owned by an affiliated company.

It will be demonstrated that appropriate environmental measures and management practices will be put in place to minimise any potential impacts (i.e. environmental, social or economic) associated with the proposed new stockpiling and composting sites. Furthermore, no changes are required to the existing quarry operations to facilitate the proposed relocation of these activities.

It will also be demonstrated in this EAR that all proposed modifications to the existing activities will have negligible impact on human health and the environment provided that all recommended additional mitigation measures and amelioration strategies, where required, are implemented.

Copies of the approved and proposed site layouts are included in **Section 1** and **APPENDIX C**.

It is anticipated that there will be no changes to current staffing numbers or arrangements as a result of the proposed modifications.

The aspects that have been addressed in this EAR are: **Statutory Environmental and Planning Context, Risk Assessment, Land, Water (Groundwater, Surface Water and Flooding), Biodiversity (Flora and Fauna), Heritage (Aboriginal and Cultural Heritage), Noise, Air, Transport (including traffic), Public Safety, Resource, Waste Management, Visual, Rehabilitation, Environmental Monitoring and Reporting, Environmental Monitoring and Discharge Points, Composting Activities, Consultation, Hours of Operations.**

Statutory Environmental and Planning Context

The existing development is subject to several pieces of planning and environmental legislation as well as planning policies and plans.

The proposed modifications do not alter in any way these requirements as will be demonstrated in details in **Section 3** of this report. This Section includes all applicable legislation, policies and plans under Commonwealth, State and Local Governments.

Risk Assessment

A comprehensive risk assessment including an environmental risk assessment has been undertaken to demonstrate that the activities in general do not pose any risk to human health or the environment and in particular the proposed modifications do not alter the low risk associated with these activities. **Section 4** includes details on the risk assessment aspects.

Land

The land proposed for the stockpiling activities has been developed and used for over 50 years as rural residential, dairy, cropping and Grazing. The new site will continue to accommodate a residential dwelling and related rural sheds.

**Section 1 and 5** include details on the aspects associated with the proposed land to be used for stockpiling.

Groundwater & Surface Water & Flooding

The status of the groundwater will not be affected by the development modifications since the groundwater is not altered or disturbed by the proposed modifications (only relocation of stockpiling and composting activities) which will be undertaken above ground.

In addition to the fact that the applicant has implemented a "*Nil Water Discharge*" policy since day one of its operations, surface water within the site will not be affected by the stockpiling activities to a great degree and this is addressed in **Section 6** of this report. Also, surface water of the stockpiling activities within both the approved area and the proposed new location will be managed as described in this report.

No adverse impact on the stormwater system or any waterway is likely to eventuate as a result of the modifications provided that the recommended mitigation measures are implemented on site. **Section 6** includes detailed information regarding this aspect.

Flooding aspects are also addressed in **Section 6**.

Biodiversity (Flora and Fauna)

Despite the fact that the site was subjected to extensive flora and fauna studies as part of the preparation of the EIS and as part of the assessment undertaken for the Western Sydney Airport at Badgerys Creek, it was determined that an assessment of the proposed new site be conducted by suitably qualified consultants to confirm the previous findings. No fauna or flora impact was found due to the proposed development modifications. **Section 7** includes detailed information regarding this aspect. A copy of the comprehensive flora and fauna report is included in **APPENDIX I**.

Aboriginal and Cultural Heritage

Based on previous assessments by qualified consultants conducted at the site and on adjoining properties as part of the proposal's EIS, and the assessments associated with the Western Sydney Airport at Badgerys Creek, in nearby properties including the proposed stockpiling site, no Aboriginal or European items of cultural heritage were identified or found within the areas subject to the modifications. However, the area adjacent to the Riparian Zone (within the applicant's previously approved site) has been identified as possibly containing some items of Aboriginal Heritage and hence it is fully segregated and protected from the remainder of the site, fenced and locked. Access to this zone is available to authorised people and the Aboriginal community only. In addition, other sites of Aboriginal cultural values have been identified within the Commonwealth land east of Oaky Creek but none was identified within the proposed new site. **Section 8** includes detailed information regarding this aspect.

Noise

The applicant has always complied with the criteria specified in both the EPL and Consent. Both the stockpiling and composting activities were included in the Noise Impact Assessment undertaken in 20111 by SLR. This assessment confirmed that the cumulative noise impact from all activities undertaken on site would comply with the 41 dB(A) $L_{Aeq}$ noise criterion. We believe that the noise levels from the proposed modifications will comply with the EPA's Industrial Noise Policy as well as the criteria specified in both the EPL and Development Consent. **Section 9** includes detailed information regarding this aspect. The applicant has also noted the comments received so far from the Acoustic Consultants in relation to the current background

noise levels in the area and the fact that due to ongoing changes in the area in the past 10-12 years, has caused the background noise levels to be much higher than those used during the preparation of the EIS at which time the project specific noise level was set to 41 dB(A). In addition, the construction and future operation of Western Sydney Airport in the adjacent land east and south of the applicant's site will also significantly change the background noise level of the whole region not just the local area. The applicant is of the opinion that this limit be reviewed in light of the current environmental status of the area excluding its activities within the site.

Air Quality

Air emission assessment has been based on our extensive experience with similar activities and subsequently for the proposed activities it is anticipated that no additional air, odorous or nuisance impact is likely to occur as a result of the modifications. The assessment took into consideration previous assessments and the continuance compliance of the activities with the criteria specified by the Department. This arises from the nature of the materials being handled which are dominantly clay and shale for stockpiling and garden organics/dry mulch for composting in addition to the very convenient new locations. There are no chemical reactions undertaken at the site or any chemical processes that may result in air emissions other than some minor localised dust from normal quarry activities. **Section 10** includes detailed information regarding this aspect.

Transport

A comprehensive traffic impact assessment was conducted as part of the preparation of the original EIS. As a result of the assessment an access road was built from the quarry to Elizabeth Drive. The intersection of Elizabeth Drive with the access road was upgraded in accordance with RTA's (now RMS) requirements. The proposed development modifications do not alter or change the traffic as previously assessed but improves the flow of traffic by splitting the light vehicle traffic of employees from the heavy vehicle traffic. There will be no change in the number of vehicle movements as a result of the proposed modifications. **Section 11** includes detailed information regarding this aspect.

Public Safety

Since only a small quantity of oil and grease will be stored in a shed at the new site and only Epic employees are entering the area in addition to the fact that the whole site will be segregated from the outside world by landscaped earth bunds, the risk for safety of the public is very low. This in combination with the fact that public access is not permitted to the stockpiling or composting sites, the risk of public safety is even lower. It should also be note that the applicant does not operate a retail but rather a wholesale outlet where general public is not allowed on site ad orders are taken from large companies by written communication means such as emails, fax or normal mail.

**Section 12** includes details on the Public Safety aspects.

Resource

We understand that at this stage the sites proposed for stockpiling and composting activities will be used for their intended proposed purpose only, no other resources will be investigated or assessed at this stage. However, if the applicant wishes to investigate other options for the use of site resources, formal relevant assessments will be required.

**Section 13** includes details on the Resource aspects.

Waste Management

Due to the nature and scale of activities, waste is not generated on site except from the employees and the workshop. The proposed modifications do not influence the generation or management of waste on site. **Section 14** includes detailed information regarding this aspect.

Visual Impact

Due to the fact that quarrying activities are located away from residential premises and are shielded by the installation of earth berms, the visual impact was determined to be low. The proposed activities within and outside the approved areas have been assessed for potential visual impact and the outcomes of the assessments are included in the relevant Sections of this report. Generally, the visual impact is greatly reduced by the general topography of the area. The visual impact will be further reduced provided that the recommended mitigation measures are implemented by the applicant. **Section 15** includes detailed information regarding this aspect. **APPENDIX J** includes the Visual Analysis for both the approved and proposed sites

Rehabilitation

Rehabilitation of the quarry site is unlikely to occur for at least another eight (8) years since the materials to be excavated will take that long to remove. Following the completion of the excavation, the applicant may have other plans for filling the void depending of the Local, State and Federal Governments priorities at that time for that area. If no pressures or priorities imposed on the applicant by the Government, the previously approved rehabilitation plan will be implemented.

Due to the extensive experience (over 20 years) of the applicant's Operations Manager with similar activities, in particular the last 5-6 years of stockpiling and composting activities within the adjacent Commonwealth land, we are confident that the land will be restored to as good as or better than original conditions when this project is completed. This was recently demonstrated when the previously used composting site was restored by the applicant and handed back to the Commonwealth.

**Section 16** includes details associated with the rehabilitation aspects.

Environmental Monitoring and Reporting

The applicant has so far been complying with all monitoring and reporting requirements included in all statutory instruments.

Following consultation with the EPA regarding the provision included in the EPL which requires the EPA to review the monitoring and reporting requirements after 12 months of operations, comprehensive environmental inspections and reviewing of monitoring and reporting results, the EPA advised the applicant that these requirements should be reviewed in consultation with relevant parties including the Department since these modifications will require changes to the Development Consent. **Section 17** includes detailed information regarding this aspect.

Environmental Monitoring and Discharge Points

Following several (at least seven (7)) site inspections by EPA officers and environmental consultants, and reviewing of environmental monitoring results, both parties advised that it is necessary to review the locations of some of these points to ensure that they reflect the impacts from the activities conducted by the applicant only rather than from other activities that are not associated with the applicant. Furthermore, due to the construction and future operation of Western Sydney Airport in the adjacent Commonwealth land east and south of the applicant's site where most monitoring points are located, it is advisable that these points be located elsewhere. Recently, due to the above matters, the applicant has approved a temporary alternative monitoring points for some of the environmental aspects.

**Section 18** includes detailed information regarding this aspect.

Composting

Despite the fact that this activity has been approved by the Department in the previous modification (No 3) based on a comprehensive assessment which was evaluated by both the Department and the EPA, it was considered appropriate to include detailed information on this activity since there were several environmental statutory changes associated with the materials received on site and composting in general. These changes are of administrative nature only and will have no bearing on the composting activities since they mainly relate to definitions, and Resource Recovery Orders and Exemptions.

An assessment of these activities at the proposed new location has been undertaken and is included in **Section 19**. Based on that assessment these activities will have a positive rather than negative impact on the environment.

Community Consultation

Despite the fact that the applicant has attempted to form a Community Consultative Committee in accordance with the development consent conditions, its attempts failed to attract any nominations from the community. As a result of the lack of community interest, the applicant submitted an alternative program of community consultation which was approved by the

Department on 31 August 2015. The Department advised the applicant that relevant consent conditions should be modified to reflect the alternative community consultation program approved by the Department. The consultation aspect is addressed in **Section 20**.

Hours of Operations

The applicant has always complied with the hours of operations specified in the development consent and the EPL.

The modifications do not require any changes to these approved hours of operations and the applicant is committed to comply fully with the approved hours. **Section 21** includes detailed information regarding this aspect.

Justifications for the Modifications

**Section 22** provides comprehensive list of justifications for the modifications in addition to addressing the Ecologically Sustainable Development (ESD) considerations.

It is noted that the proponent has always acted in good faith in its attempt to comply with all statutory requirements as specified by various government departments. In relation to the proposed stockpiling and composting sites we believe that they will provide positive rather than negative impacts on the environment. In any case, detailed assessments of the potential impacts of these activities show that these activities do not have any adverse impact on human health or the environment.

Concluding Remarks

**Section 23** includes a list of concluding remarks derived from all sections of the document to reassure that the proposed modifications are highly likely to have positive rather than negative impacts on human health and the environment having regards to maintaining the financial viability of the development without compromising the health and safety of employees.

Details of the Environmental Assessment Report (EAR) are provided within this document.

Approval from the Department in respect of the proposed modifications is requested.

Nicolas Israel
Director

Kieran Horkan
Scientific Director

Credentials of both authors are included in **APPENDIX O**.

# 1. INTRODUCTION

National Integrated Creative Solutions (NICS) was commissioned by Epic Mining Pty Limited (the applicant) to prepare an Environmental Assessment Report (EAR) to support a modification (No 4) to their current development application for their clay and shale quarry. The modification involves mainly the relocation of the already approved stockpiling of excavated clay and shale to an adjacent site and relocation of the composting activities to the paddock located at the northern portion of the applicant's approved site in combination with the approved works at 275 Adams Road, Luddenham.

This report is based on the original Environmental Impact Statement (EIS) and subsequent Environmental Assessment Reports previously submitted to the Department of Planning and Environment (Department) with a focus on assessments of several aspects as advised by the Department and the inclusion of additional information for completeness and adequacy purposes.

This Environmental Assessment Report (EAR) considers the potential impacts of the development with respect to the following aspects:

**Statutory Environmental and Planning Context, Risk Assessment, Land, Water (Groundwater, Surface Water and Flooding), Biodiversity (Flora and Fauna), Heritage (Aboriginal and Cultural Heritage), Noise, Air, Transport (including traffic), Public Safety, Resource, Waste Management, Visual, Rehabilitation, Environmental Monitoring and Reporting, Environmental Monitoring and Discharge Points, Composting Activities, Consultation, Hours of Operations.**

These are assessed in differing levels of details depending on the relevancy to the proposed modifications and the potential impacts on human health and the environment.

## 1.1 BACKGROUND

The applicant commenced communications with relevant officers of both the Department of Planning and Environment (Department) and the NSW Environment Protection Authority (EPA) in the last quarter of 2015. The communications were followed by a formal meeting with each Authorities' representatives early this year to ensure that the authorities were fully informed of the applicant's proposed modifications and to seek the authorities' expected assessment requirements. This approach was considered by all parties to be the most efficient and productive manner to achieve the best environmental outcomes. This report was prepared as a supporting document for the modification application submitted pursuant to the provisions of section 75W of the Environmental Planning and Assessment Act 1979 requesting modification of existing development consent No 315-7-2003.

The original development consent for works at the subject site was issued on 23 May 2004 to undertake the following activities:

*"The development and operation of a clay/shale quarry on Lot 3, DP 623 799 and the*

*construction and use of an access road and service facilities on Lot 1, DP 838 361."*

The original Development Consent was subsequently modified three times and the modified consent is included in **APPENDIX A.**

The original Development Consent was issued to Badger Mining Company P/L being the original applicant. The applicant and company in charge of the mining operation on-site is currently Epic Mining Pty Limited.

We understand that the existing development was classified as State Significant Development under section 76A(7) of the Environmental Planning and Assessment Act 1979.The quarry operation was also classified as Integrated Development (owing to the need for the applicant to obtain other licences/approvals/permits from other government departments, its proximity to Oaky Creek and works proposed to a main road – Elizabeth Drive) and Designated Development (because it would disturb a total surface area of more than 2 hectares of land by clearing or excavating).

The development consent relates to the quarrying of clay and shale products for the manufacturing of bricks off site. Under the development consent conditions the applicant is permitted to quarry up to 300,000 tonnes per year of any combination of products. The Consent is valid for 15 years which means that the development consent would expire on 31 December 2024 unless the applicant applies for an extension of quarrying beyond that date.

Works on-site have commenced in accordance with the development consent including payment of the environment bond. All environmental procedures and management requirements were installed and maintained. The roadworks were completed and the weighbridge and office amenities have been installed. Clay and Shale products along with ancillary overburden and Minchinbury sandstones have been extracted from the approved quarry.

Inspections conducted by officers of the Department of Planning and Infrastructure (the Department), the Environment Protection Authority (EPA), Liverpool Council and Environmental Consultancies have revealed that the quarry is operating in accordance with current guidelines and conditions of respective licences/approvals.

The applicant has prepared a consolidated site plan/layout including updated survey work, inclusion of the road and bridge over the creek in its approved location, inclusion of the location of the site office and weighbridge and the approved location of stockpiles within the approved quarry area, the proposed location of the new stockpiling site and the proposed location of the composting activities within the northern portion of the applicant's approved site. **APPENDIX C** includes a copy of the previously approved site layout and a copy of the proposed site layout.

The applicant seeks with the subject application to further amend the development consent so as to permit the relocation of the approved stockpiling of extracted clay and shale products within an adjacent site located north of the applicant's existing site at 285 Adams Road,

Luddenham and to relocate the approved small scale composting activities to the northern portion of the already approved site at 275 Adams Road, Luddenham. Some additional modifications are also requested in this report in accordance with the Department's instructions and they are outlined in details in **Section 2** of this document.

## 1.2 THE APPLICANT

The applicant is *Epic Mining Pty Limited (previously called Blue Sky Mining Pty Ltd)* with an ABN 86 144 713 931. Based on the ASIC search, the applicant is an Australian owned and operated Company which was registered on 21 June 2010.

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| Physical Address: | 275 Adams Road, Luddenham NSW 2745 |
| Site Entry: | 2420 Elizabeth Drive, Badgerys Creek NSW 2555 |
| Postal Address: | PO Box 177 Kemps Creek NSW 2178 |

Current applicant contact details are:

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| Phone: | (02) 4774 9334 |
| Fax: | (02) 4774 9338 |
| Contact Person: | Samuel Tarabori |
| Email: | info@epicmining.com.au |

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| Grid reference: | 289000E and 6249400N |
| Local Government Area: | Liverpool City Council |
| Zoning: | RU-1 Primary Production |

Since 2010 the applicant has built a reputation of excellence in the extractive industry within Sydney Metropolitan Area. The long standing experience in the extractive industry of its Operations Quarry Manager has proven to be very useful in establishing excellent relationships with all stakeholders including, community, Government and non-Government Organisations and clients. The applicant's reputation is attributed to its strong commitment to Quality, Occupational Health and Safety, Environmental and Community Management Systems. The applicant works closely with its clients to complete projects as per the specifications and requirements of the contract and within budget. The applicant is dedicated to maintaining efficient, transparent yet detailed Management Systems.

The applicant's management has brought a consistent, highly motivated and energetic commitment to meet its obligations for the protection of the environment and human health under current planning and environmental legislation. The applicant's management has always been very proactive in seeking continual improvement in all aspects of its business including environmental and will be working in collaboration with its employees to ensure that they are also committed and fully trained in environmental protection, when and if required.

## 1.3 THE APPROVED SITE

The approved site is legally identified as Lot 3 in DP 623799 and part of Lot 1 in DP 838361, and its street address is No 275 Adams Road Luddenham. The subject site is battle-axe in shape and benefits from approved truck access off Elizabeth Drive via a Right Of Way (ROW) over the adjoining Commonwealth Government land.

Given the authorised access from Elizabeth Drive, the subject site is known by clients and Government Authorities as No 2420 Elizabeth Drive, Badgerys Creek NSW 2555.

Land use in the surrounding area comprises a mix of agricultural, rural industrial and rural residential development set within a rural landscape. Prominent rural land uses in the surrounding area include a commercial German social club called the Hubertus Country Club to the west of the site. This club was recently purchased by Blacktown Workers Club and both its name and future use are unknown.

Rural residential development is the dominant land use in the surrounding area to the north, east and south. The nearest residence to the Project Site is approximately 190m to the northwest of the site, beside the battle-axe handle accessed off Adams Road. It is noted that this residence is now within a land recently purchased by the applicant's affiliated company. This house is currently the subject of an application for demolition being lodged with Liverpool City Council by the new landlord.

The subject site is located in Luddenham, approximately 25 kilometres southwest of the city of Parramatta, in the Parish of Bringelly, County of Cumberland and in the Liverpool Local Government Area. The subject site consists of two Lots; Lot 1 in DP 838361 (Part of) and Lot 3 in DP 623799. The total area incorporating the two lots is approximately 71 hectares. The clay-shale quarry is located on Lot 3 which is relatively flat, sloping gently from the southwest to the northeast within the upper parts of the Oaky Creek catchment.

Oaky Creek forms the boundary between Lots 1 and 3 and is an ephemeral drainage which only flows following significant rainfall events in the upper part of the catchment. An off-line dam is located in the north-western corner of Lot 1 and a smaller storage occurs on the southern end. An off-line dam is located in the northeast part of Lot 3.

The majority of Lot 3 is cleared land with a mixture of working sheds, horse yards and property roads. Small clusters of remnant vegetation occur along the eastern Oaky Creek boundary, adjacent to the off-line dam in the northeast corner and in the horse yards on the western boundary. There are also several mature native and exotic trees scattered across the site. Surrounding properties are modified rural, consisting of grazing, poultry farms, glass house and igloo crops and some dwellings.

A summary of site details are provided in **Table 1-1**.

**Table 1-1: Summary of Site Details**

| | |
|---|---|
| **Location** | Lot 1 DP 838361 and Lot 3 DP 623799, 275 Adams Road, Luddenham |
| **Total Area** | Approximately 71 hectares |
| **Topographic Maps** | 1:25000-scale Penrith 9030-3N & Warragamba 9030-3S |
| **Grid Reference (GDA94 – MGA Zone 56)** | 289000E 6249400N (Penrith topographic map) (approximate) |
| **Local Government Area** | Liverpool City Council |
| **Existing Land Use** | The environment of the site and surrounding properties is modified rural, consisting of grazing, poultry farms, crops in hot house environments and some dwellings (Douglas Nicolaisen & associates 2003) |
| **Current Zoning** | RU1 – Primary Production |
| **Approved Development** | Clay/Shale Quarry |

The site is also known to use its access from Elizabeth Drive as its physical address to facilitate finding the site by clients. This is the approved entry/exit point by Government Authorities.

### 1.3.1 Site Location, Current and Proposed Land Use

The subject site is located within SREP No 9, Extractive Industry (No2) Schedule 1, Division 1 and is identified as being of state significance.

The subject site was also included in the Planning NSW document Shaping Western Sydney and identified as a significant resource that should be utilised before sterilisation by unsympathetic development. The document was developed to promote and manage Sydney's growth and outline a vision for the future to 2031 based on anticipated population, economic and demographic trends.

The subject site is surrounded to the east and south by Commonwealth owned land. This land is currently being prepared for the construction of and subsequent use as Western Sydney Airport. When the airport is developed on the adjoining land the current operation will not be adversely affected. The quarry site sits independent of any land set aside for this airport. Additionally it is envisaged that the acoustic, water, dust etc. considerations, which currently exist will be less onerous for the future quarry operations when this airport become operational.

**Figure 1-1** shows the approved site location in the local context. **Figure 1-2** shows a recent aerial view of the approved site. **Figure 1-3** provides an aerial view of the site and surrounds. **Figure 1-4** shows the approved site layout.

**Figure 1-1: Approved Site Location in the local context**

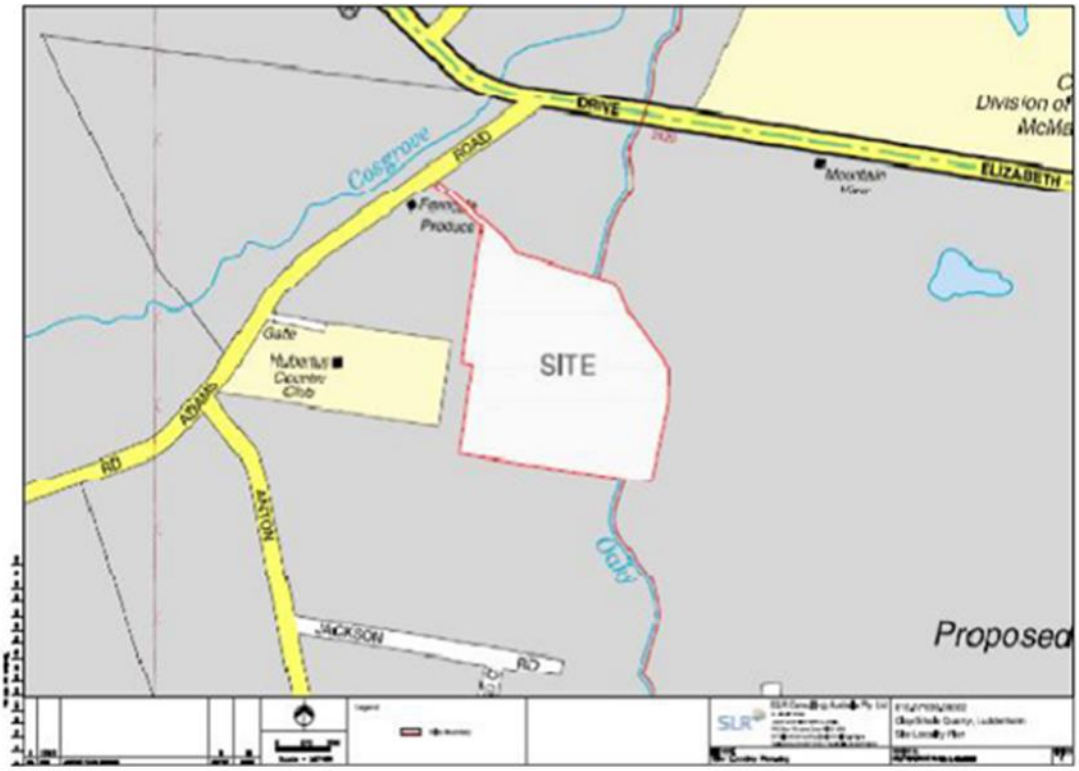
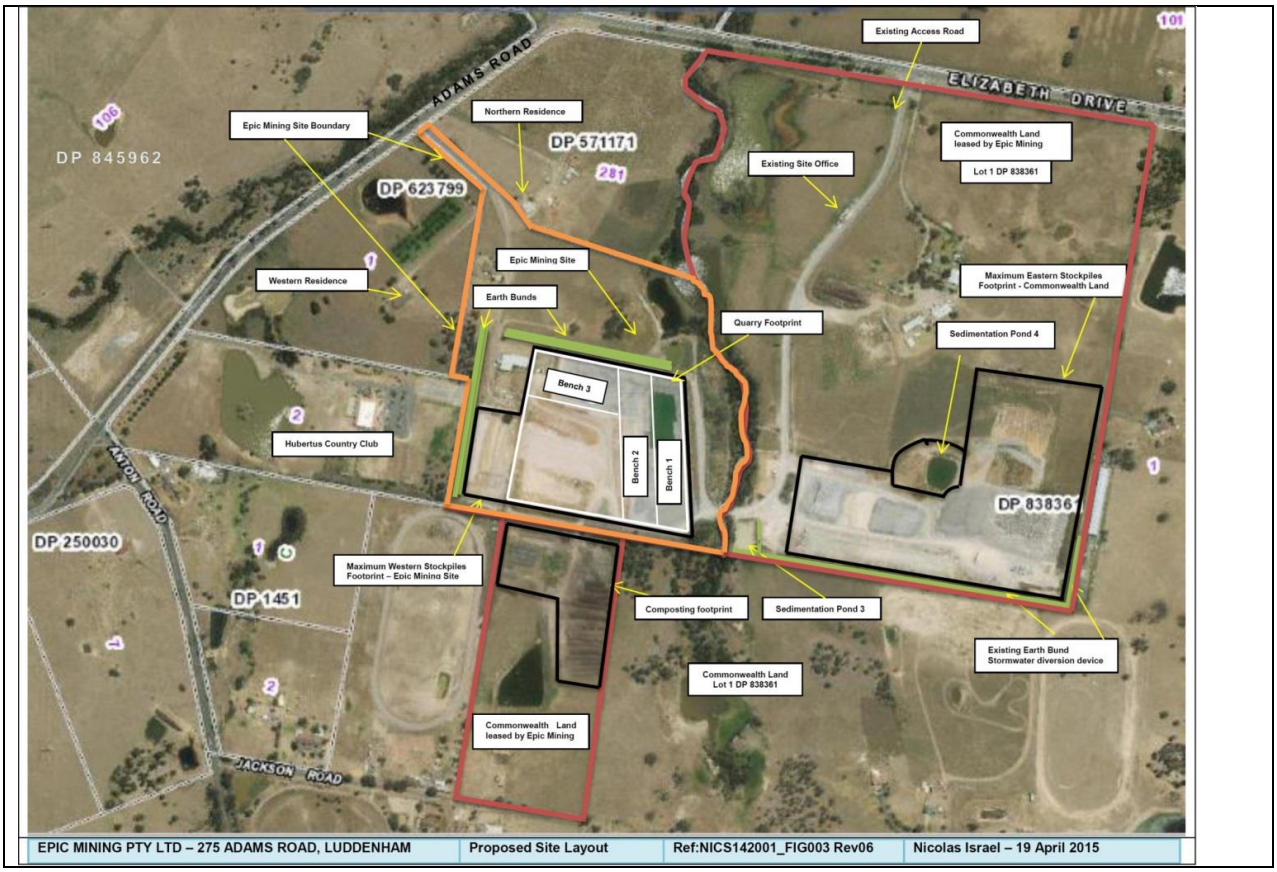



**Figure 1-2: Recent Aerial View of the Approved Site**

**Figure 1-3: Aerial View of the Site in the Regional Context prior to Quarrying Activities**

**Figure 1-4: Approved Site Layout**



## 1.4 PROPOSED STOCKPILING SITE

The proposed stockpiling site is located at 285 Adams Road which is also known to be 2470 Elizabeth Drive in the suburb of Luddenham and the Local Government area of Liverpool City Council in the State of New South Wales. Full details of the proposed stockpiling site location are provided in **Figures 1-5, 1-6 and 1-7** as well as **Table 1-2**. More Specifically, **Figure 1-5** presents an aerial view of the proposed stockpiling site in the local context, **Figures 1-6 and 1-7** present a closer aerial view of the site where site features can be easily identified including the dwellings and sheds that are the subject of the recently approved Development Application which was submitted by the new landlord to Liverpool City Council. In relation to the current land zoning of the site, full details are provided in **Section 1.11** of this document.

**Figure 1-5: Aerial View of the Proposed Site in the Local Context**

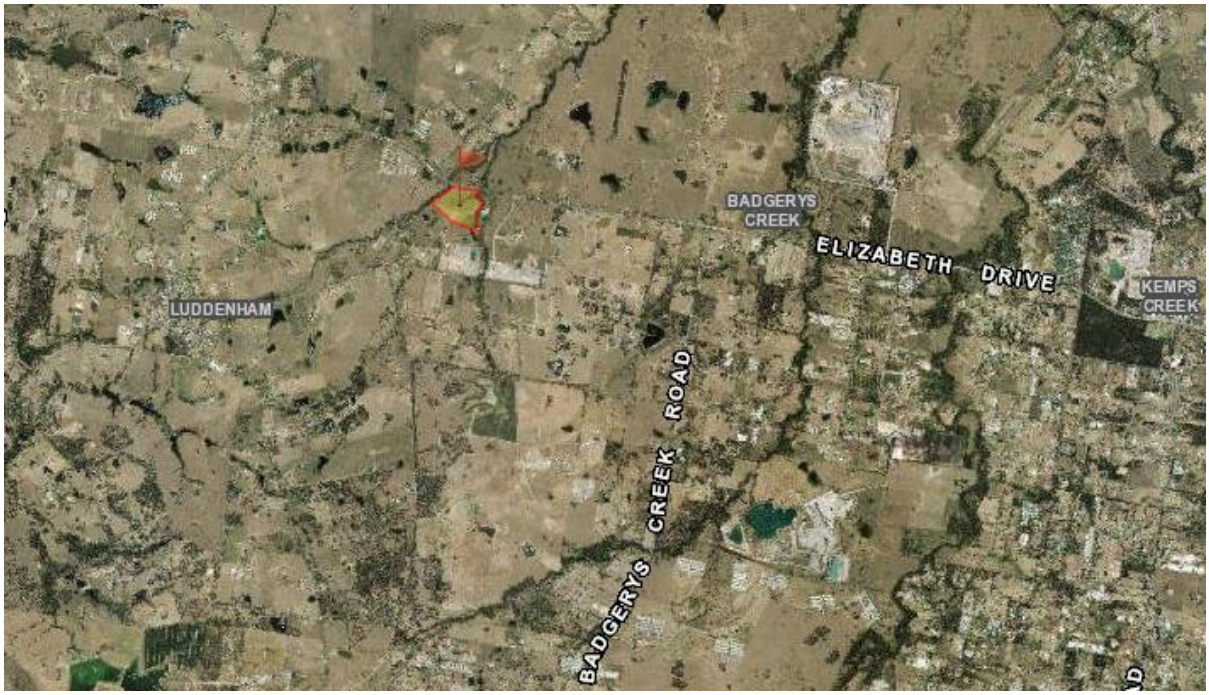
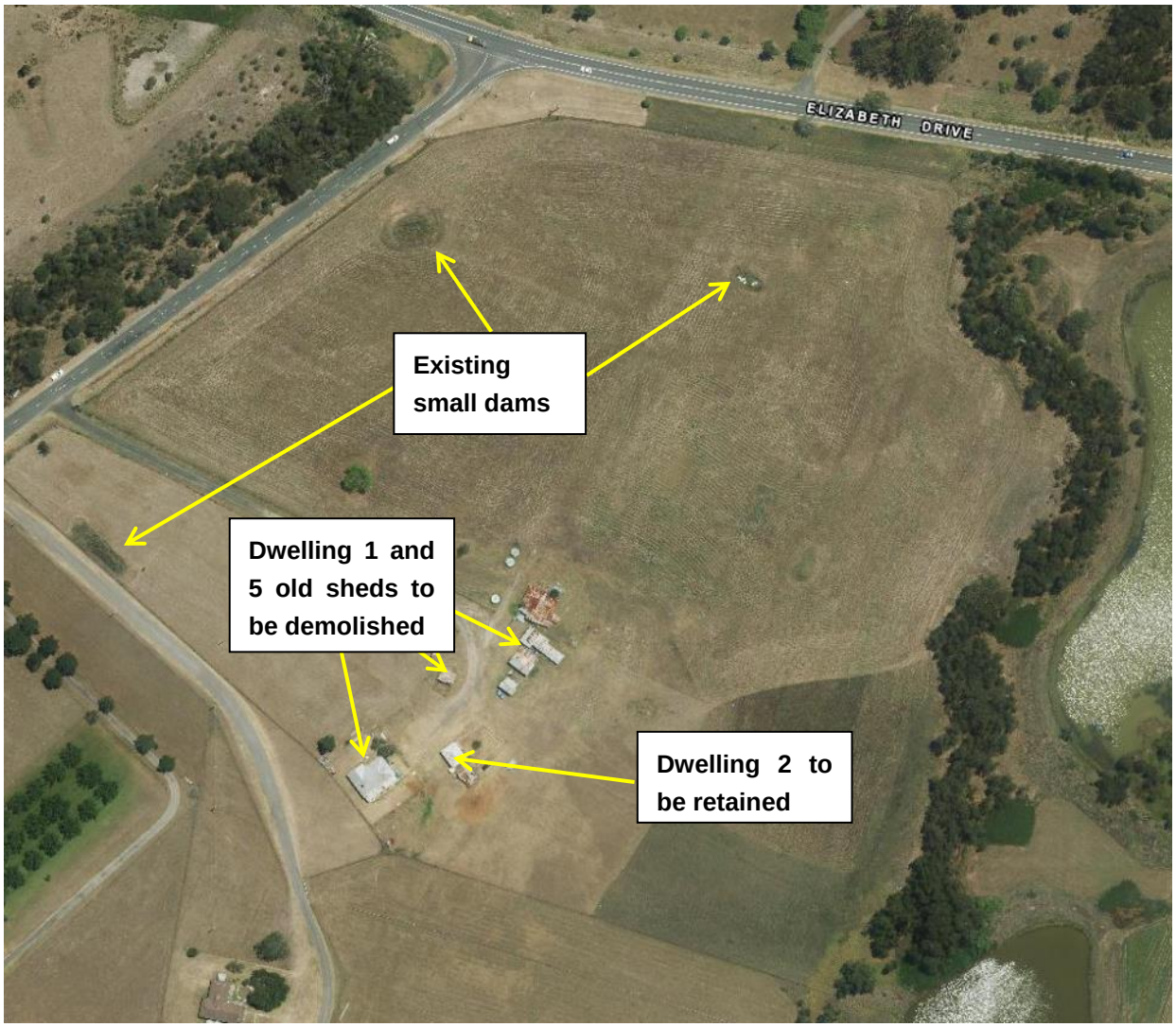


**Figure 1-6: Aerial View of the Proposed Site – Closer View**

**Figure 1-7: Another Aerial View of the Proposed Site – Closer View**




### 1.4.1 Proposed New Site Description

The proposed new site is located in Luddenham, approximately 27 kilometres southwest of the city of Parramatta (direct line) or 34 kilometres by road, in the Parish of Bringelly, County of Cumberland and in the Liverpool Local Government Area. The subject site consists of one (1) Lot; Lot 281 DP 571171. The total area of the lot is approximately 11 hectares (or 110,000 $m^2$). The proposed development is located at the end of the existing access road/driveway where that Section of the land is relatively flat, sloping gently towards the East and South East.

Oaky Creek forms the boundary between this site and Lot 1 DP 838361 (Commonwealth owned land) and is an ephemeral drainage which only flows following significant rainfall events in the upper part of the catchment. An offline dam is located in the north-western corner of Lot 1 and a smaller storage dam occurs on the southern end. The southern boundary of the site is mainly with Lot 3 DP 623799 which is currently occupied by Epic Mining Pty Limited.

A summary of proposed new site details are provided in **Table 1-2**.

**Table 1-2: Summary of Proposed New Site Details**

| | |
|---|---|
| **Location** | 285 Adams Road or 2470 Elizabeth Drive, Luddenham - Lot 281 DP 571171 |
| **Total Area** | Approximately 11 hectares or 110,000 $m^2$ |
| **Grid Reference (GDA94 – MGA56)** | Middle of site = Easting: 288979 Northing: 6249826 Elevation: 65 |
| **Local Government Area** | Liverpool City Council |
| **Existing Land Use** | The environment of the site and surrounding properties is modified rural, consisting of grazing, poultry farms, crops in hot house environments and some dwellings |
| **Current Zoning** | RU1 – Primary Production |
| **Proposed Development** | Relocation of stockpiling activities |

### 1.4.2 Surrounding Development

Land use in the surrounding area comprises a mix of agricultural, rural industrial and rural residential development set within a rural landscape. Prominent rural land uses in the surrounding area include a commercial German social club called the Hubertus Country Club to the south west of the site. Elizabeth Drive is to the north of the site and Adams Road is to the west of the site.

Rural residential development is the dominant land use in the surrounding area to the north, east and south. The nearest residence to the proposed new stockpiling site is about 94 m north of the proposed new stockpiling site on the opposite side of the very busy Elizabeth Drive and the second nearest residence is more than 100 m to the southwest of the site (within Lot 1 DP623799), beside the battle-axe handle accessed off Adams Road.

### 1.4.3 Existing Development

Currently, there are no developments (only residential) on the site and no activities undertaken other than normal maintenance of existing grassed areas and the two dwellings that were recently vacated by the previous landlord. The main derelict dwelling (or dwelling 1) has extensive damage as well as being heavily infested with termites. The main dwelling became uninhabitable while it was still under the possession of the previous landlord. This is one of the main reasons for the new landlord's decision to demolish the unusable structures (dwelling 1 and 5 sheds) and install a new prefabricated steel shed. However, we understand that the site was used as a dairy for over 50 years by previous owners. The site was also excavated tens of times for cropping purposes as well as other uses.

There will be a change in the existing use of the site and there will also be improvement to the presentation/aesthetics and safety of people living on site especially when the old rusty sheds

and partly damaged dwelling 1 are removed. The proposed stockpiling activities are consistent with the land zoning being RU1 – Primary production.

Another positive aspect is the reduction of covered areas by more than 400 $m^2$ after removing the old dwelling and sheds and the installation of the new shed.

### 1.4.4 Topography and Drainage

A comprehensive topographical survey was undertaken by Monaghan Surveyors Pty Ltd which is operated by very experienced Registered Land and Engineering Surveyors. The survey included all site features such as the dwellings and sheds proposed to be demolished, the utilities visible to the surveyor, the natural surface levels, natural surface contours and the trees in the vicinity of the demolition and construction site (development area). The survey included also the accurate dimensions of the site boundaries, the centreline of Oaky Creek and a 40 metres wide buffer strip along Oaky Creek. This demonstrates that the proposed development will be at least 40 m away from the closest waterway (Oaky Creek).

#### 1.4.4.1 Existing and Proposed Drainage

Based on the information obtained from the previous landlord, discussions with previous tenants and the observations made during site inspections, we confirm that due to the rural nature of the site, the development area is not connected to Council's stormwater system, Sydney Water's sewer or water supply lines. The existing drainage system that has been used for over 50 years is comprised of an in-ground septic tank for each dwelling and several rainwater tanks for the collection of roof water and use as potable water. Any water collected in the relatively small dams has been used for landscaping purposes when and if required.

Since one of the dwellings will be retained, there will be no changes to current drainage arrangements in relation to both roof water and sewer for that dwelling. In relation to the other dwelling, since the new shed will be installed at approximately the same footprint as that dwelling, existing drainage arrangements will be maintained and connected to the sheds facilities.

It is common knowledge that well maintained septic tanks do not pose any health risk, if operated properly. Most problems occur when septic tanks are overloaded. It is anticipated that the load on the septic tanks will be reduced due to the fact that the existing septic tanks were designed to cater for a large family (in the main dwelling to be demolished) whilst the proposed number of people that is likely to use the amenities will not exceed two on any one day. Hence, we believe that no changes are required to current septic tanks arrangements.

Similarly for the roof water, existing rainwater tanks are very large and capture rainwater from several roofs to cater for the large families that resided in the two dwellings as well as some other workers on site. The new demand for potable water will be reduced due to the relatively small number of hours workers will be on that site since most of them will be there for a short period of time during loading or unloading only. Hence, no change to current rainwater/potable water is required.

### 1.4.5 Vegetation

Based on the aerial views obtained from Google Earth, SixMaps and the recent site survey, it appears that there are some trees along the Eastern Boundary of the site adjacent to Oaky Creek. The site is now covered with grass as the site has been used previously for different purposes including cropping and a dairy and possibly some minor agriculture activities for decades. However, the section of site subject to this development is well established and only minor clearing of grass is required. There appears to be two (2) trees nearby. Liverpool city Council officers advised the landlord that these two (2) trees should be removed to facilitate the demolition and construction stages of the recently approved development. Most of the site's stormwater runoff drains naturally either directly to Oaky Creek or to the existing three (3) small retention dams. The natural surface water flow will be altered slightly to ensure that any surface water run-off from the stockpiling area is diverted to the proposed and especially designed sediment pond to be located in the south eastern corner of the site as detailed in **Section 6.**

### 1.4.6 Zoning

As previously stated the subject site is also known as Lot 281 DP 571171 which is approximately 11 Hectares in area and it is currently zoned as RU1 – Primary Production under Liverpool Local Environmental Plan 2008 (LLEP 2008). The objectives of that zone, the activities permitted with or without Consent and those that are prohibited are included below.

**Zone RU1 Primary Production**

**1 Objectives of zone**

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To ensure that development does not unreasonably increase the demand for public services or public facilities.
- To ensure that development does not hinder the development or operation of an airport on Commonwealth land in Badgerys Creek.
- To preserve bushland, wildlife corridors and natural habitat.

**2 Permitted without consent**

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations.

**3 Permitted with consent**

Agriculture; Airstrips; Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Flood

mitigation works; Forestry; Hazardous storage establishments; Health consulting rooms; Helipads; Heliports; Home businesses; Home industries; Landscaping material supplies; Offensive storage establishments; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural industries; Rural supplies; Secondary dwellings; Veterinary hospitals; Water recreation structures.

**4 Prohibited**

Any development not specified in item 2 or 3.

**Figure 1-8** presents the location of the site in the Liverpool City Council Area to provide the reader with a better understanding of its location in the Council context.

**Figure 1-9** presents the location of the site in the RU1 Zone – Primary Production as depicted in zoning maps included the Liverpool Local Environmental Plan 2008.

**Figure 1-10** presents a closer view of the location of the site in the RU1 Zone – Primary Production as depicted in zoning maps included the Liverpool Local Environmental Plan 2008.

**Figure 1-8: Site Location in the Liverpool City Council Area**

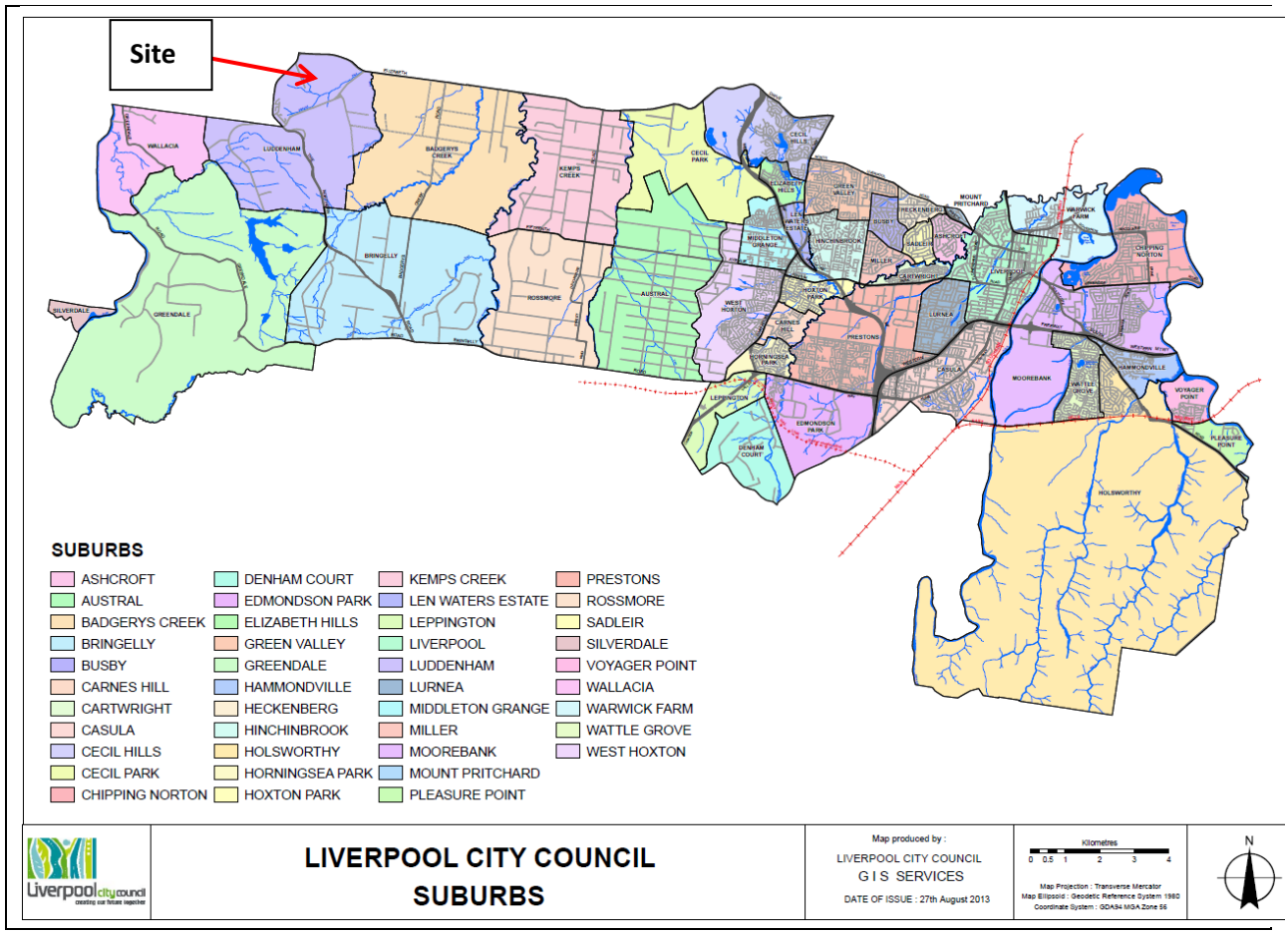


**Figure 1-9: Site location in the RU1 Zone – Primary Production**

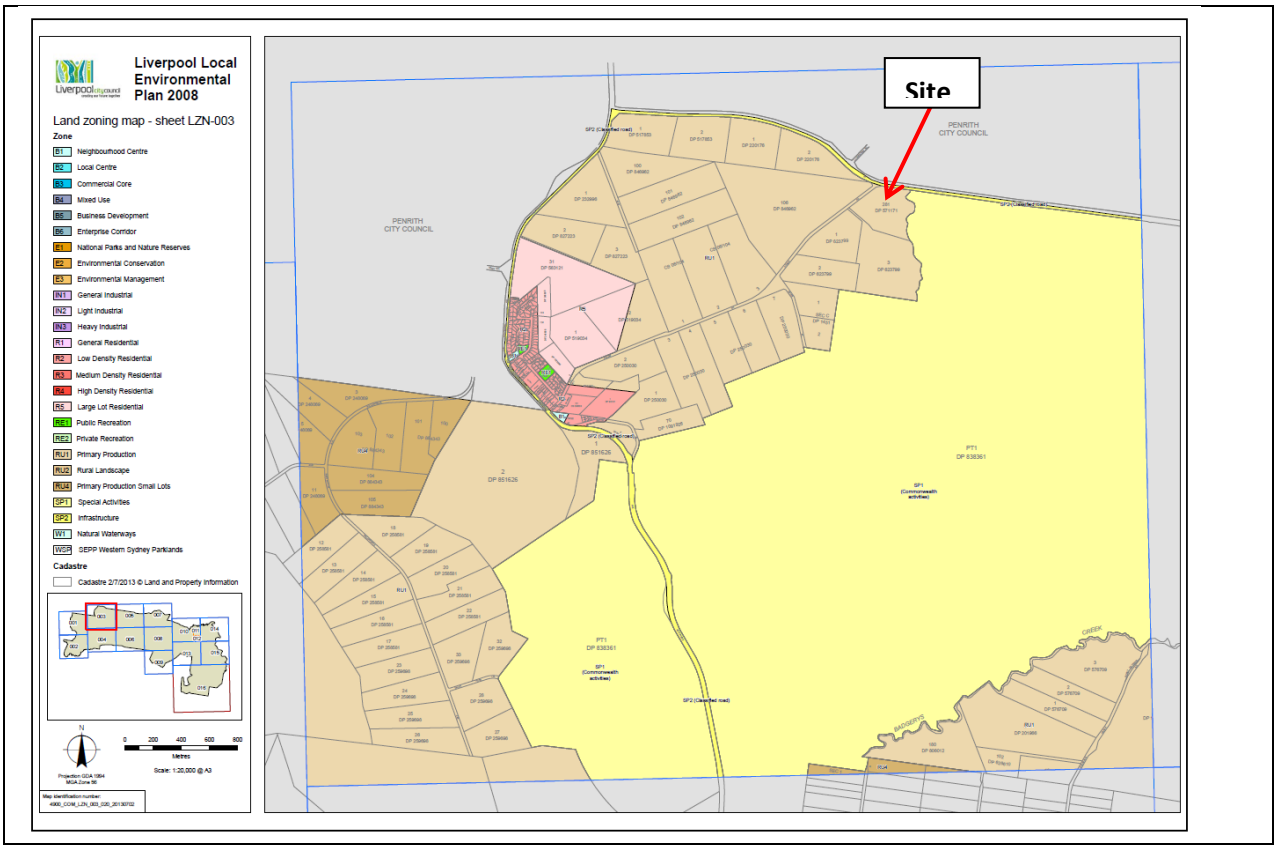
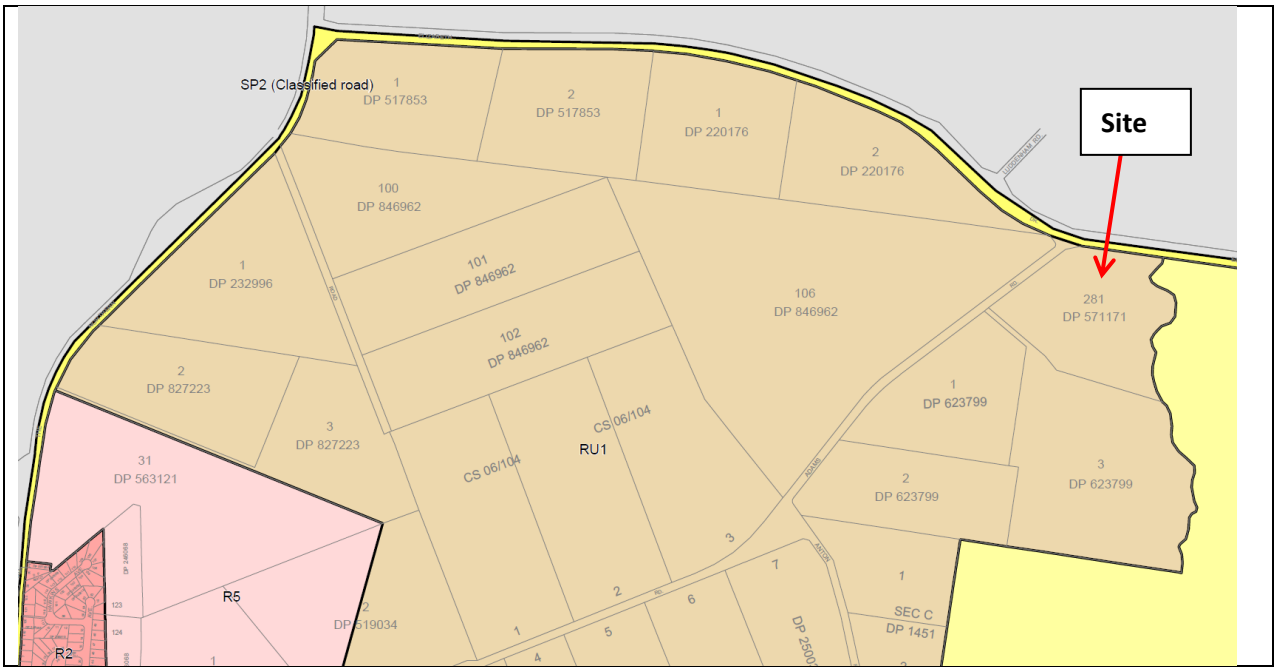



**Figure 1-10: Site location in the RU1 Zone – Primary Production – Closer View**



## 1.5 OPERATIONS

### 1.5.1 Approved Operations

The approved operations are the same with any typical operations of an open cut mine with no underground activities being undertaken.

The approved operations include the quarrying activities within the approved footprint as shown in **Figure 1-4**. The original approved operations included also the installation of a conveyor from within the quarrying area to the surface where trucks will be waiting to load the excavated materials directly onto them. This means that the excavated materials (clay/shale) will be conveyed from the quarry to the trucks directly and the trucks will transport the materials off site to the brick manufacturing companies. It appears that at the time of the initial assessment, the assessors including environmental consultants, applicant's representatives and representatives of relevant government and non-government organisations were not fully aware of the requirements of the brick manufacturing companies and the brick making processes especially prior to firing the bricks with these materials. Also, not all excavated materials are useful for brick manufacturing since there is a percentage of that material that cannot be used for brick manufacturing and is only suitable as top soil and/or fill.

The current industry best extraction method for brickmaking selective mined technique of ripping and cross ripping of shale/sandstone/clay with a bulldozer and pushing up material into stockpiles, to be loaded into articulated dump trucks and then layered into stockpiles for external sale, will be used and maintained. This selective extraction technique gives the greatest flexibility to provide the correct clay-shale mixes, reduce colour variations, increases fretting and scouring and removes unwanted shale-sandstone materials.

The raw material product types currently extracted from the site include: Red Clay, Pink-White Clay, Brown Shale, Apricot Shale, Sandstone and Cream Shale. These materials are being stockpiled separately behind the operational mine face and loaded out for sale to the brick manufacturing industry using an excavator or front-end loader.

Extraction will progress from the East towards the West from Oaky Creek and will continue with benches and batters at heights as required. A typical benching, slopes, ramp design and batters are shown in **Attachment E** of the **Mining & Extraction Operational Plan** which was previously submitted to and approved by the Department following some amendments**. Figures 1-11, 1-12 and 1-13** include a representative typical benching and batters.

Furthermore, stockpiling within the quarry footprint and within the leased portions of the Commonwealth land was approved as part of the last modification (No 3). Small scale composting activities and other modifications were also approved as part of the last modification (No 3) completed in May 2015.

**Figure 1-11: Luddenham Quarry Stockpiling & Quarry Layout**

**Figure 1-12: Luddenham Quarry Original Layout**

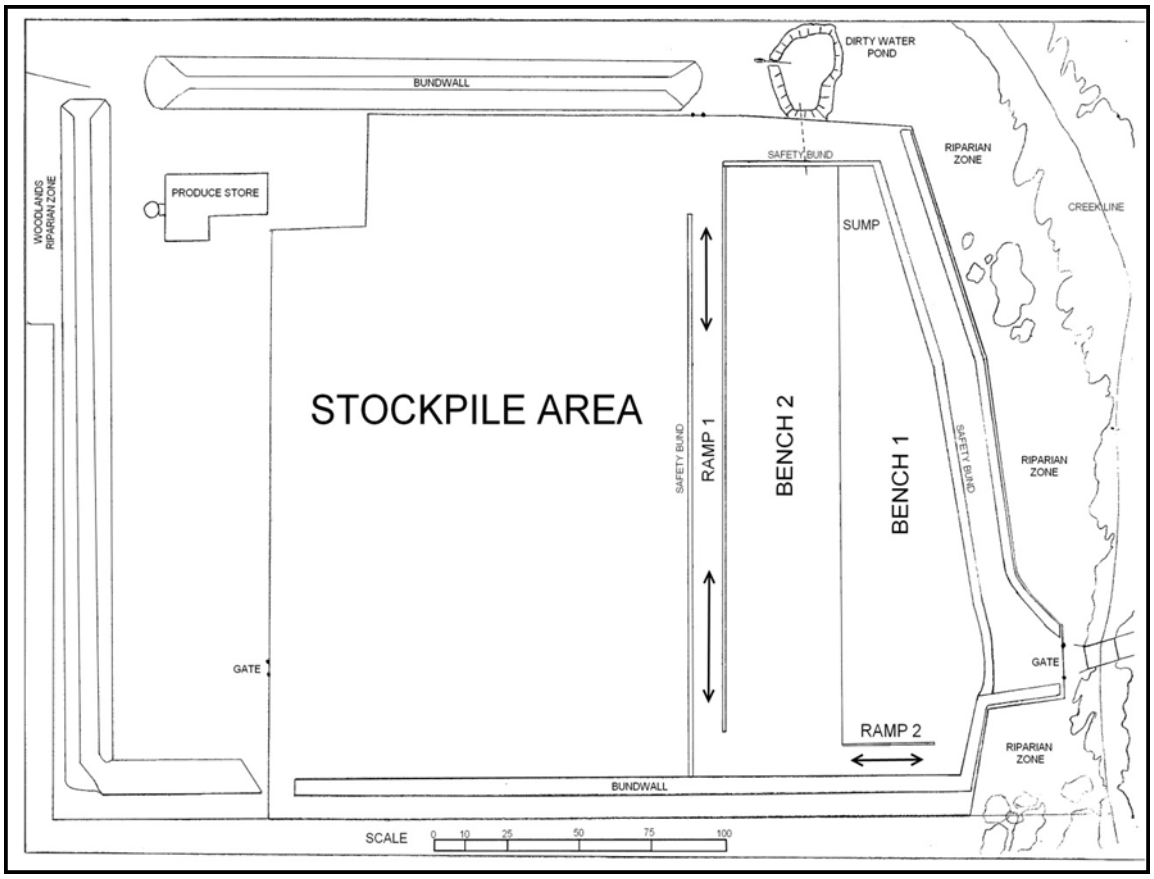
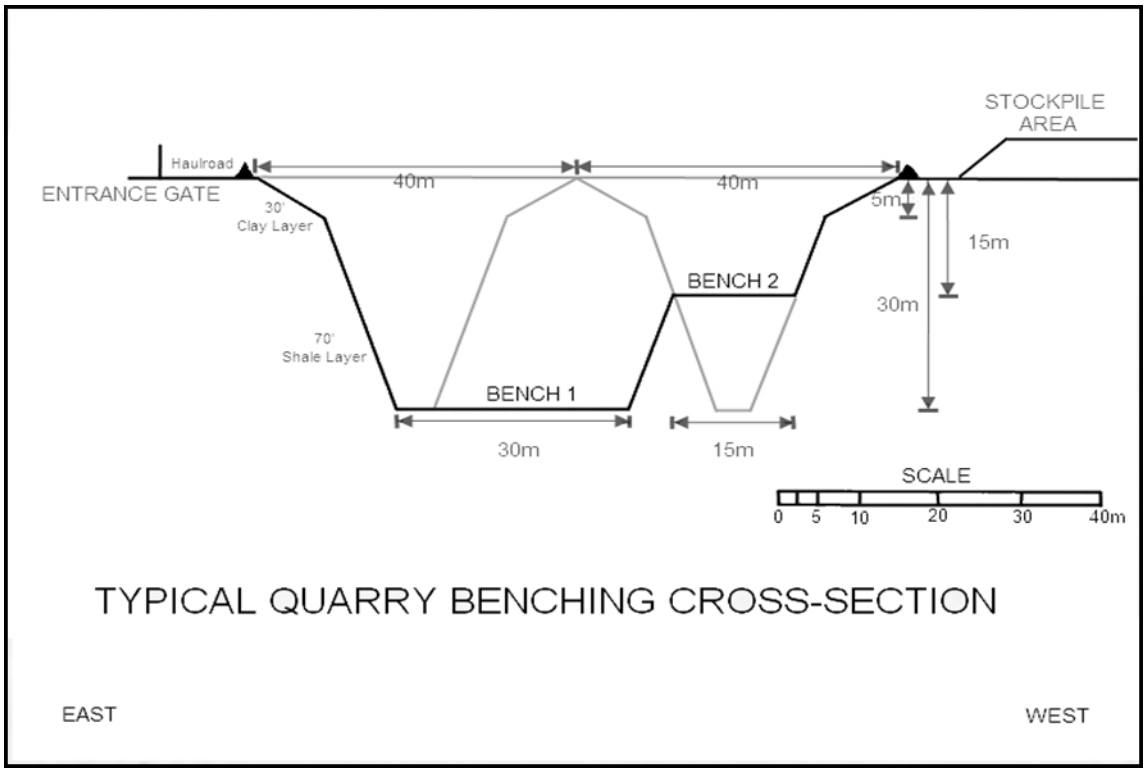



**Figure 1-13: Luddenham Quarry Layout Cross Section**



### 1.5.2 Proposed Operations

The proposed operations are identical to the approved operations in all aspects except that the approved stockpiling activities (only stockpiling within the Commonwealth land) will now be undertaken within the adjacent site and the approved composting activities will be undertaken within the northern portion of the approved site.

Stockpiling of the materials is of utmost importance to the manufacturing of the bricks and most importantly to achieving the quality and consistency of bricks produced including the reduction of brick wastage. Stockpiling of excavated materials is required to ensure that the necessary scouring and fretting process occur in a well-managed and controlled environment prior to being transported in a more environmentally responsible manner to the brick manufacturing companies.

Both approaches; the stockpiling of materials and the campaign principle are very consistent with similar quarry operations within Australia and across the world.

The maximum area that is likely to be used for stockpiling activities is 72,000 $m^2$ within the applicant's approved site (up from 60,000 $m^2$) and 65,000 $m^2$ within the proposed new site (down from 140,000 $m^2$ within the leased Commonwealth land). However, on average, stockpiling is likely to occupy 40,000 $m^2$ (up from 30,000 $m^2$) within the applicant's approved site and 55,000 $m^2$ within the proposed new site (down from 60,000 $m^2$ within the Commonwealth land).

The maximum volume of clay and shale to be stockpiled is 100,000 $m^3$ (no change) within the applicant's approved site and 150,000 $m^3$ within the proposed new site (down from 190,000 $m^3$ within the Commonwealth land). However, as discussed in the EAR, this is a very dynamic activity and the average quantities stored at any one time are likely to be much lower than these values.

Due to the requirements for the clay and shale to be stored for a certain period of time to ensure that it is ready for manufacturing and the slow demand by the construction industry in recent years, it is evident that the excavated materials should be stored in the vicinity of the site to ensure easy access to the materials since there was insufficient space within the approved site to do so. This may not be the case in future and stockpiling will be reduced accordingly.

Storage and handling of clay/shale stockpiling at the new site is very much the same with the stockpiling activities conducted previously at the approved site within the Commonwealth land. They are very consistent with any stockpiling activities on a quarry, on a construction site, as part of a road construction, as part of raw materials storage within a concrete batching plant, etc... . However, below is an outline of storage and handling of clay/shale stockpiling by the applicant.

- excavation of materials
- site preparation of the stockpiling area

- carting of materials
- unloading of the materials
- reshaping of the stockpiles
- loading of materials on road trucks
- transporting of materials

Under normal circumstances, the mobile plants included in **Table 1-3** are used.

**Table 1-3: Mobile Plants/Machinery Used for the Stockpiling Activities**

| Activity Associated with Stockpiling | Mobile Plant/Machinery Used |
|---|---|
| During the excavation of materials | Excavator, Bulldozer, Dump Truck and Front End Loader |
| During the site preparation of the stockpiling area | Bulldozer |
| During the carting of materials from the quarry face to the storage/stockpiling area | Excavator and Dump truck |
| During the unloading of the materials | Dump truck and Bulldozer |
| During reshaping of the stockpiles | Bulldozer and Excavator |
| During the loading of materials onto road trucks | Front End Loader and road trucks |
| During the transporting of materials to external clients | Road trucks |

It should be noted that the stockpiles located within the applicant's approved site are less dynamic than the stockpiles to be located within the new site simply due to the fact that the materials stored within the applicant's approved site are mostly clay whilst the materials proposed to be stored within the new site are shale. Also, the materials to be stored within the new site are those that were previously approved to be stored on the Commonwealth land. These materials will provide more popular colours when fired in the kilns.

In addition, for the construction of bricks, it is required to have 70% of shale and 30% of clay to ensure that bricks are of good quality and strength.

The stockpiles within the applicant's approved site have a life cycle of approximately 12-15 months whilst the stockpiles within the new site (previously stored within the Commonwealth land site) will have a life cycle of approximately 4-7 months.

It should be noted that the materials currently stored within the Commonwealth land will not be transferred to the new site but rather they will be depleted to reduce the potential for any potential environmental impacts due to transporting these materials from one site to another. New fresh stockpiles will be formed within the proposed new site. It is understood that this may take 6-9 months to reach the average quantity stated above.

# 2. PROJECT PROPOSAL

## 2.1 PROPOSED MODIFICATIONS

The applicant is seeking to vary its Development Consent to incorporate the modifications summarised below and included in Section 1 of this document. Greater details are provided in relevant Sections of this document. These modifications have been previously discussed with both the Environment Protection Authority (EPA) and the Department of Planning and Environment (Department). The applicant was advised that it is wise to include in this application the modifications outlined below to ensure that in addition to the initial proposed modifications, certain other matters that have been the subject of recent consultations with both organisations are also included. These modifications are assessed at different levels of details in accordance with advice from the Department. .

1. Relocating the approved stockpiling activities from the Commonwealth Land (they were called Eastern Stockpiles) to a new site at 285 Adams Road (or 2470 Elizabeth Drive), Luddenham. They are now called Northern Stockpiles.

2. Relocating the approved composting activities from the Commonwealth land to the northern section of the applicant's approved site at 275 Adams Road, Luddenham. This area is located between the quarry footprint and the new stockpiling area at 285 Adams Road, Luddenham.

3. Modify the locations of several environmental monitoring and discharge points to reflect the proposed locations of activities as well as the construction and future operation of the Western Sydney Airport at the adjacent Commonwealth land east and south of the applicant's approved site.

4. Modify monitoring and reporting requirements in accordance with previous requests and consultations with both the Department and the EPA.

5. Modify the parameters of Air Quality Assessment to reflect current NSW parameters due to changes in the NSW Air Assessment parameters.

6. Modify relevant Consent Conditions associated with the Luddenham Community Consultative Committee to reflect the alternative program/method approved by the Department.

7. To review the current noise criteria specified in the consent due to the changes in the local environment surrounding the applicant's site including the construction and operation of Western Sydney Airport, the increase of industrial activities in the adjacent suburbs and the significant increase in traffic on Elizabeth Drive.

Following the assessments required by the Department to address all environmental and planning aspects associated with the above modifications, we believe that the proposed

modifications are likely to have positive rather than negative impact on all potential stakeholders and the surrounding environment.

The application is being made to the Department of Planning and Infrastructure being the consent authority under the provisions of section 75W of the EP&A Act 1979.

The following sub-sections provide details and comparison between approved and proposed activities to assist the Department in making a fair and proper assessment on the modification application.

## 2.2 NON-COMMERCIAL COMPOSTING ACTIVITIES

Following several consultation sessions with both the Department and the EPA prior to the approved modification No 3, it was determined that small scale non-commercial composting activities are more environmentally and financially viable option to be conducted on site rather than importing required materials off site for the implementation of rehabilitation, vegetation and landscaping plans including materials required for the Vegetated Riparian Zone.

### 2.2.1 Approved Activities

Currently, these activities are approved by the Department and became part of the modified consolidated Consent up to 5,000 tonnes per year in addition to some reference to a plant nursery which was intended to assist in the rehabilitation of the site on a long term basis. However, despite the fact that they were previously approved verbally and in writing by the both the Department and the EPA, changes to the environmental legislation in 2014 necessitated that additional assessments be undertaken and submitted to both the Department and the EPA at different occasions and as recently as November 2015 for the EPA.

### 2.2.2 Proposed Activities

The proposed activities are identical to those previously approved except that these composting activities will be undertaken within the applicant's approved site at 275 Adams Road, Luddenham rather than within the previously leased Commonwealth land. Despite the fact that these activities are approved we have included detailed assessment of potential environmental impacts of these activities in **Section 19** and other Sections of this document to ensure that the Department and other Government authorities have full details of these activities in one document rather than having to refer to different reference documents previously submitted to the Department and other authorities.

The proposed location of the composting activities is shown in **Figure 2-1**. A copy of the proposed site layout is included also in **APPENDIX C** as **(NICS_162001_FIG001 Rev01**).

## 2.3 STOCKPILING ACTIVITIES WITHIN COMMONWEALTH LAND

Despite the fact that following the determination of this modification application, it is expected that the stockpiling activities will be moved from the previously approved Commonwealth land

to the new site, we consider it appropriate to address this matter in case there will be a transitional period until the new site is established with all required mitigation measures, structures and features.

### 2.3.1 Approved Activities

Stockpiling activities were previously approved by the Department following relevant assessments and modification application in accordance with current legislation policies and guidelines. This approval applies to both the stockpiling activities within the approved site and within the leased portion of the Commonwealth land.

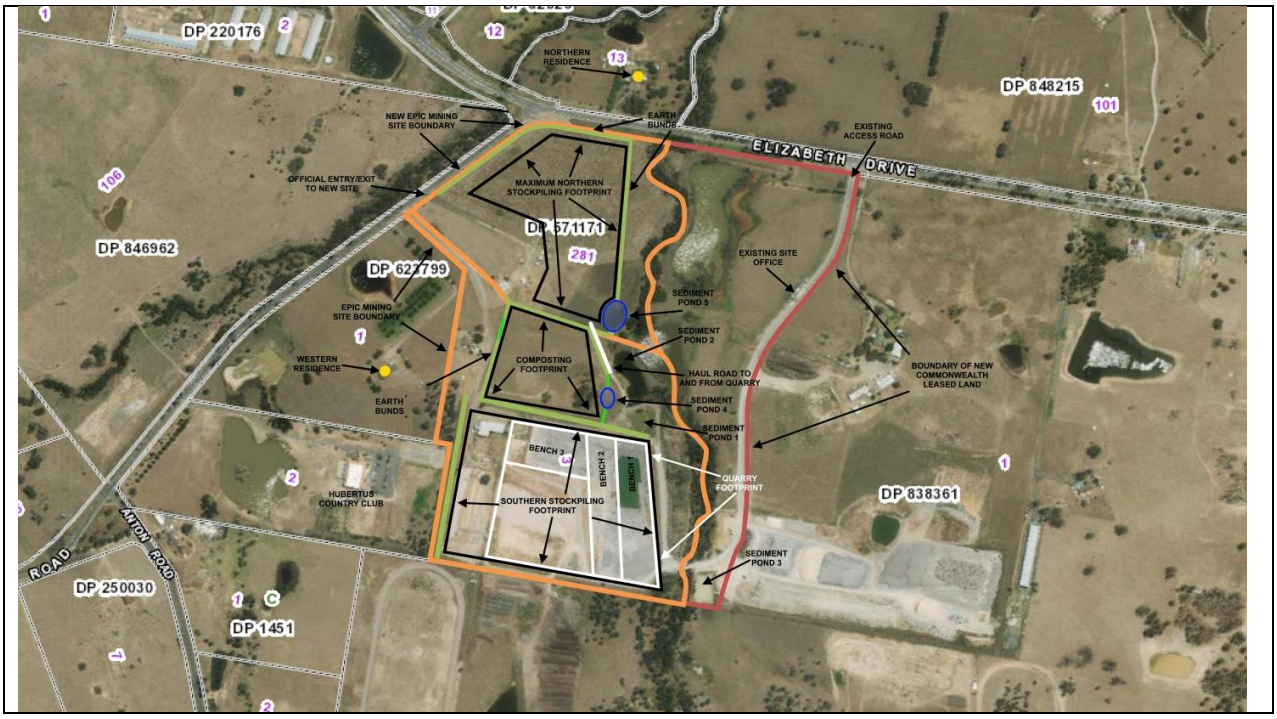
### 2.3.2 Proposed Activities

The proposed stockpiling activities are identical to the previously approved stockpiling activities except for the location..

It is requested that the Department considers the transitional period between the existing approved site within the Commonwealth land and the proposed new site to give the applicant the flexibility to undertake all necessary works required to ensure full compliance with all requirements at the new site prior to commencing the stockpiling activities at that location. It is suggested that the Department considers the inclusion of a condition to permit continuation of the stockpiling activities within the adjacent Commonwealth-owned land until the new site is well established and ready to be used for stockpiling activities.

The proposed location of stockpiling activities is shown in **Figure 2-1**. A copy of the proposed site layout is included also in **APPENDIX C** as **(NICS_162001_FIG001 Rev01**).

**Figure 2-1: Proposed Site Layout**




## 2.4 ENVIRONMENTAL MONITORING AND REPORTING REQUIREMENTS

Currently, the approved requirements for environmental monitoring and reporting are included in both the development consent No 315-7-2003 (Consent) and the Environment Protection Licence No 12863 (EPL). The EPA recommended that these requirements be varied to ensure compliance with EPL conditions and current relevant environmental monitoring policies, however the EPA advised that the EPL will be varied after the Consent is varied to ensure consistency between the requirements of the two statutory instruments.

### 2.4.1 Approved Requirements

**Air**

The Air Quality Impact Assessment criteria are included in condition 1 of Schedule 4 of the Consent. They include Total Suspended Particulate (TSP) matter, Particulate matter <10µm ($PM_{10}$) and deposited dust. Due to changes in NSW Air Quality Assessment requirements in the last 5-6 years TSP is no longer required to be included in the assessment since the EPA itself no longer monitors for TSP in its Air Quality Monitoring Stations across NSW. It is, therefore recommended that the TSP be removed from this condition.

The approved air quality monitoring requirements are included in condition 7 of schedule 4 of the Consent and they are:

*"7. The Applicant shall establish air quality monitoring stations at a minimum of 4 locations around the site, (including the "northern" residence in the EIS, and locations representative of*

*the most-affected residences in Jackson Road, Ferndale Road and adjoining landowners to the east of the site) to monitor, by sampling and obtaining results by analysis, dust deposition to the satisfaction of EPA and the Secretary, using the specified averaging period, frequency, and sampling method in Table 4:*

| *Pollutant* | *Units of Measure* | *Averaging Period* | *Frequency* | *Sampling Method*[1] |
|---|---|---|---|---|
| *Dust Deposition* | *g/m$^2$/month* | *Month, Annual* | *Continuous* | *AS-3580.10.1*[2] |
| *Siting* | | | | *AM-1* |

*Table 4: Air quality monitoring*

**Noise**

The approved noise monitoring requirements are included in condition 15 of schedule 4 and they are:

> ***"**15 The Applicant shall prepare noise compliance assessment of the operations at the site, within 3 months of the commencement of operations, and at intervals of 3 months thereafter, unless otherwise agreed by the Secretary and the EPA. The assessment shall be carried out by a suitably qualified and experienced acoustical consultant, approved by the Secretary, and submitted to the EPA and the Department."*

### 2.4.2 Proposed Requirements

The proposed requirements are included in **Section 17** of this report and they are associated with the noise monitoring and reporting. These are:

> ***"**15 The Applicant shall prepare noise compliance assessment of the operations at the site, within 3 months of the commencement of operations, and at intervals of 3 months thereafter, unless otherwise agreed by the Secretary and the EPA. The assessment shall be carried out by a suitably qualified and experienced acoustical consultant, approved by the Secretary, and submitted to the EPA and the Department. **Following the first 12 months of monitoring, the monitoring shall be conducted on a yearly basis, unless otherwise directed by the Secretary**".*

## 2.5 ENVIRONMENTAL DISCHARGE AND MONITORING POINTS

Following previous extensive consultation with the EPA and review of the previously approved locations of environmental discharge & monitoring points in combination with the results of monitoring, the EPA had recommended that some of these locations be changed to better reflect the potential impacts of the applicant's activities on the surrounding environment rather than a combination of activities that may not necessarily be associated with the applicant's activities as it is the case for the monitoring points located within the Hubertus Country Club's car park where dust and exhaust car emissions make a significant contribution to the dust

monitoring results at that location. Similarly, for noise monitoring within this commercial site where the level of noise generated by their activities is higher than the level of noise generated by the quarry when measured within the Club's car park. Following the last modification (No 3), the original environmental discharge and monitoring points were re-located. A copy of these approved locations is included in **Section 18** and **APPENDIX G**.

### 2.5.1 Approved Requirements

The approved requirements are included in the Consent. Specifically, the requirements are included in conditions 7 and 19 of the Consent's schedule 4 and they are:

*"7. The Applicant shall establish air quality monitoring stations at a minimum of 4 locations around the site, (including the "northern" residence in the EIS, and locations representative of the most-affected residences in Jackson Road, Ferndale Road and adjoining landowners to the east of the site) to monitor, by sampling and obtaining results by analysis, dust deposition to the satisfaction of EPA and the Secretary, using the specified averaging period, frequency, and sampling method in Table 4:*

| *Pollutant* | *Units of Measure* | *Averaging Period* | *Frequency* | *Sampling Method*[1] |
|---|---|---|---|---|
| *Dust Deposition* | *g/m$^2$/month* | *Month, Annual* | *Continuous* | *AS-3580.10.1*[2] |
| *Siting* | | | | *AM-1* |

*Table 4: Air quality monitoring*

*1 NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.*
***2****Standards Australia, 1991, AS 3580.10.1-1991, Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.*

> ***"****19 Prior to carrying out…….a program for monitoring noise generated by the development at a minimum of 4 locations around the site. (including the "northern" residence in the EIS, and locations representative of the most-affected residences in Jackson Road, Ferndale Road and adjoining landowners to the east of the site) which includes a noise monitoring protocol for evaluating compliance with the criterion in condition 12; and continuation of the program of quarterly monitoring for a period of 12 months, in order to reassess changes in noise emissions; monitoring may be reduced, if the Secretary is satisfied with the outcome of the 12 months of quarterly monitoring."*

### 2.5.2 Proposed Requirements

Due to the fact that the Commonwealth has commenced establishing its land for the construction of Western Sydney Airport within Lot 1 DP 838361 which surrounds the applicant's site from both east and south sides, the applicant will have no access to the monitoring points located within that land. Following discussions with the Department, it was agreed that new environmental monitoring points be nominated by the applicant for consideration by the Department and subsequently by the EPA. The proposed locations of these points are included

in **Section 18** and **APPENDIX G**. It should be noted that the Department has recently approved alternative monitoring requirements as a result of the Commonwealth closure of most roads in the vicinity of the Western Sydney Airport footprint following an application by the applicant.

## 2.6 LUDDENHAM COMMUNITY CONSULTATIVE COMMITTEE

This matter is addressed in more details in Section 20 of this report.

### 2.6.1 Existing Development Consent Requirements

Condition 7 of the modified Development consent requires the applicant to establish and operate a Community Consultative Committee in accordance with its guidelines. The applicant followed the Department's guidelines but was unable to establish a Committee due to lack of interest from the community.

### 2.6.2 Approved Alternative Consultation Program

Following the failure to establish a Community Consultative Committee in accordance with the Department's guidelines, the applicant submitted a request to undertake community consultation by adopting an alternative program/method. The Department approved the applicant's request with slight changes to the alternative consultative program/method in line with provisions of the Department's guidelines.

## 2.7 NOISE CRITERIA

This matter was previously raised by the applicant with both the Department and EPA. Both Government agencies were sympathetic to the applicant's request but were reluctant in making a determination on this matter.

### 2.7.1 Existing Noise Criteria

The existing noise criterion is $L_{Aeq,15min}$ = 41 dB(A) at any residential or sensitive receiver not associated with the development. This criterion was determined during the preparation of the EIS. This criterion is included in the Development Consent condition No 12 of Schedule 4.

### 2.7.2 Proposed Noise Criteria

As previously stated, the area in the vicinity of the quarry is being modified at a very fast pace due to changes that are based on decisions by local, state and federal Governments. These decisions meant that more growth centres are being built in the south western area of Sydney, more industries and commercial centres are being built in the vicinity of the quarry. In addition, Western Sydney Airport is being constructed on the adjacent land. The applicant is seeking reconsideration of the noise criterion or a more flexible condition associated with the noise criterion to avoid any non-compliance issues.

## 2.8 SUMMARY OF PROPOSED MODIFICATIONS

**Table 2-1** includes a summary of proposed modifications and any possible changes to the approved activities.

**Table 2-1: Summary of Proposed Modifications**

| Modification | Type | Location | Hours of Operations | No of Employees | Extraction Rate | Quantity | Area | Traffic |
|---|---|---|---|---|---|---|---|---|
| **Stockpiling** | Operational | New | Same | Same | Same | Less | Less | Same |
| **Composting** | Operational | New (within quarry site) | Same | Same | Same | Same | Less | Same |
| **Environmental Monitoring & Reporting Requirements** | Administrative | N/A | N/A | N/A | N/A | | N/A | N/A |
| **Environmental Monitoring & Discharge Points** | Operational | New | N/A | N/A | N/A | | N/A | N/A |
| **Community Consultative Committee** | Administrative | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Noise Criterion** | Operational & Administrative | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | |

# 3. STATUTORY PLANNING AND ENVIRONMENTAL CONTEXT

This Section outlines the statutory requirements relevant to the assessment of the proposed Modification. It also provides a discussion for the proposed modifications on economic, social and environmental grounds when considered against the objects of the Environmental Planning and Assessment Act 1979 (EP&A Act).

## 3.1 APPLICABLE LEGISLATION, POLICIES AND PLANS

For the existing development and the proposed modifications of the development, there are several statutory environmental and planning legislation, policies and plans that would apply despite the fact that the proposed activities are already approved by both the Department and EPA. These statutory instruments include the following:

- Environment Protection and Biodiversity Conservation Act 1999
- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2000
- Protection of the Environment Operations Act 1997
- Water Act 1912
- Water Management Act 2000
- Threatened Species Conservation Act 1995
- Native Vegetation Act 2003
- State Environmental Planning Policy (Major Development) 2005
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
- State Environmental Planning Policy (Sydney Region Growth Centres) 2006
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Industries
- State Environmental Planning Policy No. 44 – Koala Habitat Protection
- State Environmental Planning Policy No. 55 – Remediation of Land
- Sydney Regional Environmental Plan No.9 – Extractive Industries (No2)
- Liverpool City Council Local Environment Plan
- Liverpool City Council Development Control Plan

We believe that the applicant's activities have been undertaken in compliance with all statutory requirements included in the above documents and we see no reason why the proposed re-location of some of these activities will not comply.

## 3.2 COMMONWEALTH LEGISLATION

### 3.2.1 Environment Protection and Biodiversity Conservation Act 1999

The objective of the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) is to provide for the protection of those aspects of the environment that are of

*national environmental significance.* Proposals that are likely to have a significant impact on a matter of environmental significance are defined as a *controlled action* under the EPBC Act. Proposals that are, or may be, a controlled action are required to be referred to the Commonwealth Minister for the Environment, Water, Heritage and the Arts for determination as to whether or not the proposed action is a controlled action.

Based on the assessments conducted during the preparation of the EIS and further Flora & Fauna and Ecological assessments conducted previously by BioDesign and recently by Lesryk Environmental Pty Ltd (refer to **APPENDIX I**) for the proposed new stockpiling site, it is concluded that there are no aspects of the environment that are considered to be of national environmental significance. Hence no further action is required under this Act.

### 3.2.2 Commonwealth and the Applicant Lease Arrangements

On the subject of leasing arrangement with the Commonwealth, we confirm that part of Lot 1 DP 838361 as shown in **Figure 3-2** with Ref: **NICS142001_FIG005** were leased from the Commonwealth and have been used since 2007. Specifically, Epic Mining Pty Ltd (previously called Blue Sky Mining) entered into a leasing arrangement with the Commonwealth for a three (3) years lease plus three (3) years option for renewal giving the applicant a total of six (6) years commencing on 1/06/2007. The modification application (No 3) was lodged with the Department on 10 December 2010 which was well within the leasing period. However, for a variety of reasons a new lease was not drawn up after that date since it was mutually agreed between the two parties that such a formal arrangement was not required as outlined below.

**Figure 3-1** with Ref: **NICS142001_FIG001** shows the relationship between the Commonwealth land (Lot 1 DP 838361) and the applicant's approved site (Lot 3 DP 623799). It can be clearly seen, the size of the applicant's approved site is very small when compared with the size of the Commonwealth land in that specific area.

As you may be aware, while the modification application was being considered by the Department, several events have occurred in the area including this year's final decision for the construction of the Western Sydney Airport in Badgerys Creek. The second airport will be constructed within Lot 1 DP 838361 but may not encroach on the areas currently used by the applicant for temporary stockpiling activities. The applicant was advised that within this specific Commonwealth land, there are approximately 400 tenants that have been leasing from the Commonwealth for many years and for a diverse range of activities. The Commonwealth had informed all tenants that no long-term new leases will be drawn at this stage but rather renewed on a monthly basis until the exact locations of all airport associated facilities have been decided. This is consistent with most State laws for commercial, residential and industrial leasing arrangement. The Commonwealth had also informed the tenants that they may continue with their activities as per usual until they are directed to vacate the specific areas, if required. This is required to give the Commonwealth flexibility to make fast decisions on the tenants who will go and those who could remain based on confirmation of the final airport designs.

Based on the latest advice (April 2016) by relevant staff from the Commonwealth, it appears that the part of the Commonwealth land used by the applicant that is east of the access road from Elizabeth Drive to the quarry will have to be vacated much sooner than was previously requested by the Commonwealth. A new lease was drawn to this effect between the applicant and the Commonwealth as shown in **Figure 3-3** which includes the new applicant's controlled premises.

**Figure 3-1: Relationship between the Commonwealth Land (Lot 1 DP 838361) and the Applicant's Approved Site (Lot 3 DP 623799)**

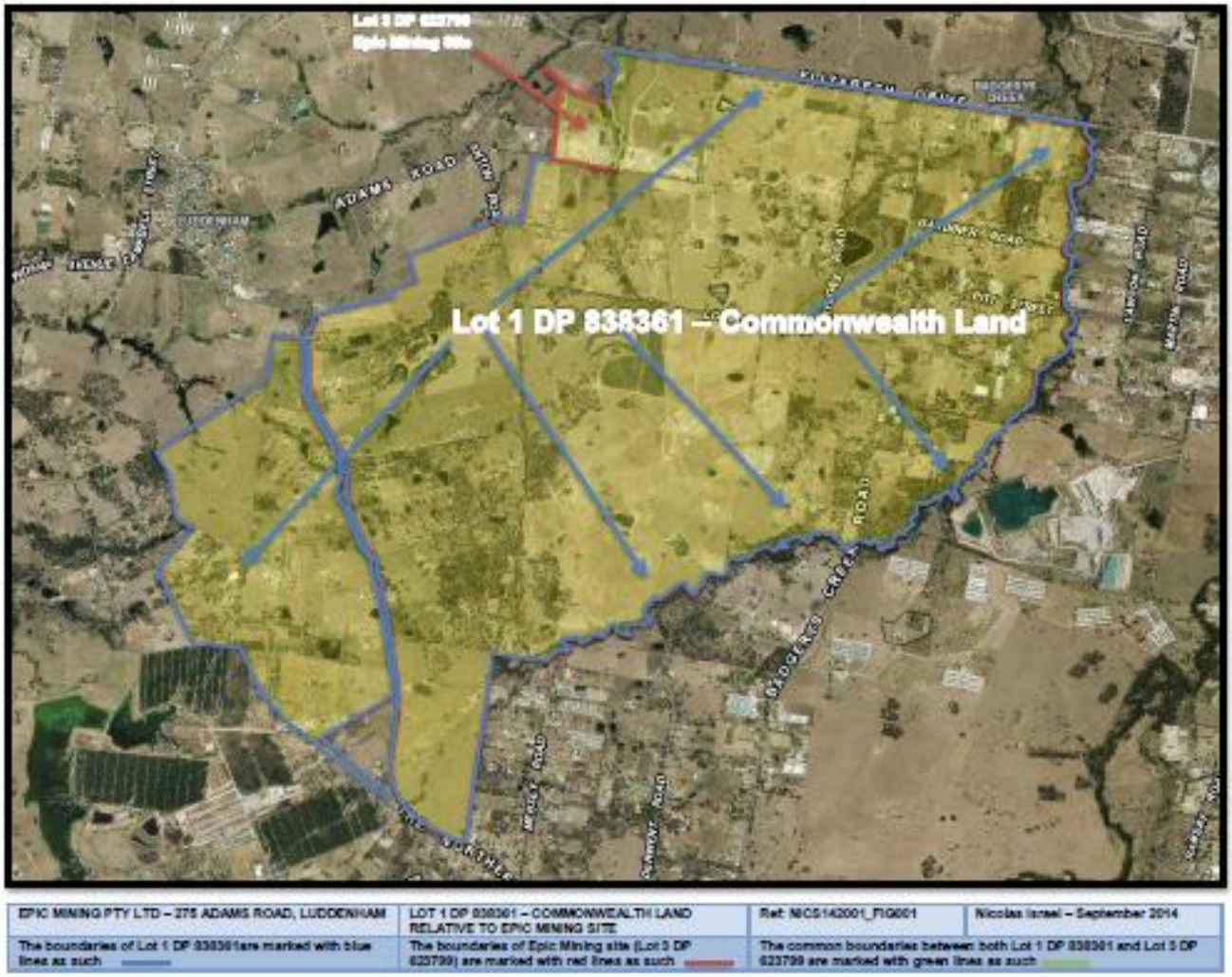


**Figure 3-2: The Areas previously under the Applicant's Control**

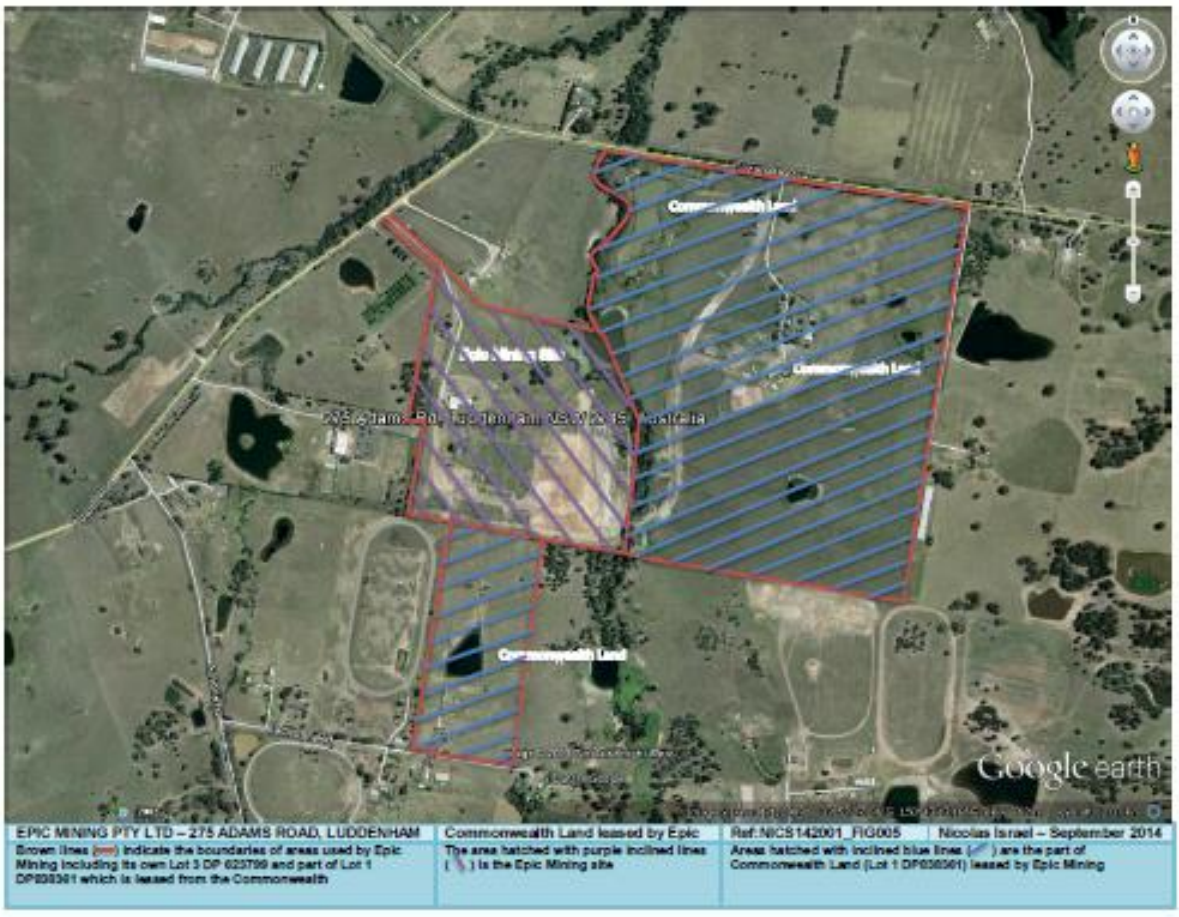
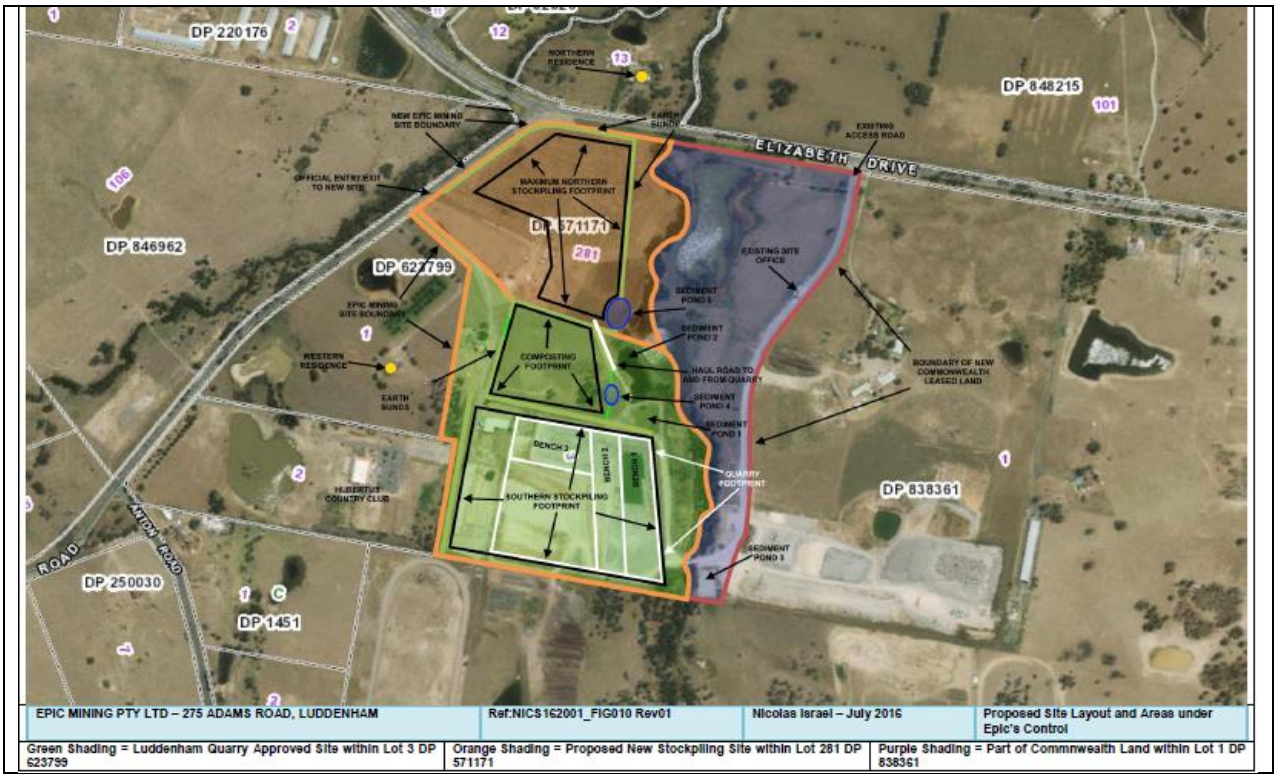



**Figure 3-3: The Proposed New Areas under the Applicant's Control**

**Figure 3-4: Proposed Site Layout and Epic's Controlled Areas**




## 3.3 NSW LEGISLATION

### 3.3.1 Environmental Planning and Assessment Act 1979 and Regulation 2000

The Environmental Planning and Assessment Act 1979 (EP&A Act) and *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) set the framework for planning and environmental assessment in NSW. Modification of the applicant's Development Consent is sought under section 75W, which falls within Part 3A of the EP&A Act.

Section 75W of the EP&A Act states:

**75W Modification of Minister's approval**

*(1) In this section:*

***Minister's approval*** *means an approval to carry out a project under this Part, and includes an approval of a concept plan.*

***Modification of approval*** *means changing the terms of a Minister's approval, including:*

*(a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and*

*(b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.*

*(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.*

*(3) The request for the Minister's approval is to be lodged with the Director-General. The Director- General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.*
*(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.*

Accordingly, an approval granted by the Minister under Part 3A of the EP&A Act to carry out a project may be modified under section 75W.

In addition, clause 8J(8) of the EP&A Regulation provides that certain development consents granted under Part 4 of the EP&A Act may also be modified under section 75W of the EP&A Act. Clause 8J(8) of the EP&A Regulation relevantly states:

**8J Transitional Provisions**
*(8) For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*
*…*
*(b) a development consent granted by the Minister under State Environmental Planning Policy No 34—Major Employment-Generating Industrial Development,*
*(c) a development consent granted by the Minister under Division 4 of Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,…*

*The development consent, if so modified, does not become an approval under Part 3A of the Act.*

The subject quarry operation was approved by the Minister for Infrastructure, Planning and Natural Resources (being the consent authority) in May 2004- DA No 315-2003. This approval was granted under the NSW Environmental Planning and Assessment Act 1979. The development was determined to be State Significance Development, Integrated Development and Designated Development as outlined below.

The proposed modifications continue to be assessed as submitted pursuant to the transitional provisions.

**State Significance Development**

The proposal was classified as being "***State Significance Development*** *under section 76A(7) of the Environmental Planning and Assessment Act 1979 because it is a class of development listed in the Minister's declaration of 3 August 1999*" (as described on the front page of the consent).

It should be noted that section 76A(7) has since been repealed, however 'Transitional Arrangements' have been facilitated under Schedule 6A clause 12 of the EP&A Act 1979

enabling the continued assessment of the application as follows:

***12 Continuing application of Part 3A to modifications of certain development consents***

*Section 75W of Part 3A continues to apply to modifications of the development consents referred to in clause 8J (8) of the Environmental Planning and Assessment Regulation 2000, and so applies whether an application for modification is made before or after the commencement of this clause*.

**Integrated Development**

The proposal was classified as **Integrated Development** under section 91of the Environmental Planning and Assessment Act 1979 because it required approvals under some of the following:

- Protection of the Environment Operations Act 1997;
- Rivers and foreshores Improvements Act 1948;
- Water Act 1912; and
- Roads Act 1993.

Pursuant to the Protection of the Environment Operations Act 1997, licence No 12863 was issued by the Environment Protection Authority on 14 December 2009 and was varied on various occasions thereafter. The scheduled activity approved was for *'Land-based extractive activities'*. The approved scale is 100,000-500,000 tonnes per year.

Approval for road works in Elizabeth Drive were obtained from the Roads and Traffic Authority and all necessary works off and on-site have been completed in accordance with the RTA's requirements. In addition, extensive consultation was conducted with Liverpool and Penrith City Councils during the planning stages to ensure that any local traffic/transport requirements were complied with.

**Designated Development**

The proposal was also classified as **"D*esignated Development"*** *under section 77A of the Environmental Planning and Assessment Act 1979 because it would disturb a total surface area of more than 2 hectares of land clearing or excavating and consequently meets the criteria in Schedule 3 of the Environmental Planning and Assessment Act Regulation 2000*" (as described on the front page of the consent).

### 3.3.2 Protection of the Environment Operations Act 1997

In preparing this report and particularly this Section of the report, relevant sections of NSW environmental legislation (i.e. POEO Act) were used to illustrate complete compliance with statutory requirements. Some of the sections referred to are outlined below:

#### 3.3.2.1 General Provisions

The Protection of the Environment Operations Act 1997 (POEO Act 1997) establishes the NSW environmental regulatory framework and includes a licensing requirement for certain activities.

The POEO Act contains a list of activities that require an environment protection licence. These are listed in Schedule 1 of the POEO Act 1997.

Environment Protection Licences are a central means to control the localised, cumulative and acute impacts of pollution in NSW. In particular they aim to:

- protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development;
- provide increased opportunities for public involvement and participation in environment protection;
- ensure that the community has access to relevant and meaningful information about pollution;
- rationalise, simplify and strengthen the regulatory framework for environment protection;
- improve the efficiency of administration of the environment protection legislation; and
- reduce risks to human health and prevent the degradation of the environment by the use of mechanisms that promote the following:
    - pollution prevention and cleaner production,
    - the reduction to harmless levels of the discharge of substances likely to cause harm to the environment,
    - the reduction in the use of materials and the re-use or recycling of materials,
    - the making of progressive environmental improvements, including the reduction of pollution at source, and
    - the monitoring and reporting of environmental quality on a regular basis.

#### 3.3.2.2 Specific Provisions

The current activities conducted on site are classified as premises-based scheduled activities under the provisions of the POEO Act 1997 being:

***land-based extractive activity***, meaning the extraction, processing or storage of extractive materials, either for sale or re-use, by means of excavation, blasting, tunnelling, quarrying or other such land-based methods.

1. In this clause, ***extractive materials*** means clay, sand, soil, stone, gravel, rock, sandstone or similar substances that are not minerals within the meaning of the *Mining Act 1992*.
2. Each activity referred to in Column 1 of the Table to this clause is declared to be a scheduled activity if it meets the criteria set out in Column 2 of that Table.

**Table**

| **Column 1** | **Column 2** |
|---|---|

| Activity | Criteria |
|---|---|
| land-based extractive activity | involves the extraction, processing or storage of more than 30,000 tonnes per year of extractive materials |

The proposed modifications that include the stockpiling activities within both the approved area and the Commonwealth land are not classified as scheduled activities under the provisions of the POEO Act 1997 but rather part of the land-based extractive activity. Hence, no separate licensing requirements are required for the stockpiling activities on their own.

Due to the fact that the proposed modifications may result in modifications of the site's Environment Protection Licence No 12863 issued by the Environment Protection Authority, it was considered appropriate that relevant requirements be addressed in this section.

The applicant would need to make a separate application to the EPA for consideration of the proposed modifications following approval by the Department. The applicant has advised that the proposed modifications were approved, in principle, by the EPA and an appropriate application for a licence variation was lodged with the EPA last year.

**Section 45 of the POEO Act includes the matters to be taken into consideration in licensing functions (i.e. licence variation application) is outlined in Table 3.1 including comments, where relevant.**

**Table 3-1: Factors to be considered under Section 45 of the POEO Act**

| Clause No | Requirements | Relevance |
|---|---|---|
| A | any protection of the environment policies, | No |
| B | the objectives of the EPA as referred to in section 6 of the *Protection of the Environment Administration Act 1991*, | Yes |
| C | the pollution caused or likely to be caused by the carrying out of the activity or work concerned and the likely impact of that pollution on the environment, | Yes |
| D | the practical measures that could be taken:<br>1) to prevent, control, abate or mitigate that pollution, and<br>2) to protect the environment from harm as a result of that pollution, | Yes |
| E | any relevant green offset scheme, green offset works or tradable emission scheme or other scheme involving economic measures, as referred to in Part 9.3, | No |
| F | whether the person concerned is a fit and proper person (as referred to in section 83), | Yes |
| f1 | in relation to an activity or work that causes, is likely to cause or has caused water pollution:<br>1) the environmental values of water affected by the activity or work, and | Yes |

| Clause No | Requirements | Relevance |
|---|---|---|
| | 2) the practical measures that could be taken to restore or maintain those environmental values | |
| G | in connection with a licence application relating to the control of the carrying out of non-scheduled activities for the purpose of regulating water pollution—whether the applicant is the appropriate person to hold the licence having regard to the role of the applicant in connection with the carrying out of those activities, | No |
| H | in connection with a licence application—any documents accompanying the application, | Yes |
| I | in connection with a licence application—any relevant environmental impact statement, or other statement of environmental effects, prepared or obtained by the applicant under the *Environmental Planning and Assessment Act 1979*, | Yes |
| J | in connection with a licence application—any relevant species impact statement prepared or obtained by the applicant under the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994*, | No |
| K | in connection with a licence application, any waste strategy in force under the *Waste Avoidance and Resource Recovery Act 2001*, | No |
| L | in connection with a licence application:<br>1) any public submission in relation to the licence application received by the appropriate regulatory authority under this Act, and<br>2) any public submission that has been made under the *Environmental Planning and Assessment Act 1979*, in connection with the activity to which the licence application relates, and that has been received by the appropriate regulatory authority, | No |
| M | if the appropriate regulatory authority is not the EPA—any guidelines issued by the EPA to the authority relating to the exercise of functions under this Chapter | No |

**Section 44 of the POEO Act includes clarification on the <u>integration of licensing</u>**

1) Licences may be issued or varied so as to cover either or both scheduled development work or scheduled activities.
2) Licences with respect to scheduled development work or scheduled activities may regulate all forms of pollution (including water pollution) resulting from that work or those activities.
3) Licences with respect to non-scheduled activities may also regulate any form of pollution in addition to water pollution resulting from those activities.

Licences authorising or controlling an activity carried on at any premises may also regulate pollution resulting from any other activity carried on at the premises to which the licence applies.

**Section 58 of the POEO Act provides the following provisions for any applications for variation of licences:**

(1) The appropriate regulatory authority may vary a licence (including the conditions of a licence).
(2) A variation includes the attaching of a condition to a licence (whether or not any conditions have already been attached), the substitution of a condition, the omission of a condition or the amendment of a condition.
(3) A licence may be varied on application by the holder of the licence or on the initiative of the appropriate regulatory authority.
(4) A licence may be varied at any time during its currency, including on its being transferred to another person.
(5) A licence is varied by notice in writing given to the holder of the licence.
(6) If:
(a) the variation of a licence will authorise a significant increase in the environmental impact of the activity authorised or controlled by the licence, and
(b) the proposed variation has not, for any reason, been the subject of environmental assessment and public consultation under the *Environmental Planning and Assessment Act 1979*, the appropriate regulatory authority is to invite and consider public submissions before it varies the licence.

**Section 59 of the POEO Act provides the following provisions for restrictions on making applications for variation of licences**

(1) An application for the issue of a licence that relates to premises may be made only by or with the consent in writing of the occupier of the premises.
(2) An application for the variation of a licence may be made only by or with the consent in writing of the holder of the licence.
(3) An application for the transfer of a licence may be made only with the consent in writing of the holder of the licence.

### 3.3.3 Licensing

The Environment Protection Licence No 12863 (EPL) was issued by EPA on 5 June 2009 and it was varied on various occasions by either the EPA or at the request of the applicant. The EPL was initially issued to Blue Sky Mining Pty Ltd and then transferred to the current occupier Epic Mining Pty Limited on 18 January 2011. The EPL is subject to periodic compliance and monitoring requirements and its review was scheduled for 5 June 2014 unless the EPA decided to review it earlier as provided in the Protection of the Environment Operations Act 1997 (POEO Act 1997).

The EPL includes criteria which are specified in accordance with current environmental legislation, policies, guidelines and industry standards for water, noise and dust emissions. In addition, it includes monitoring and reporting conditions to ensure that the activities conducted on site are in compliance with the EPL conditions and the criteria referred to above.

### 3.3.4 Water Act 1912

Licences for water conservation, irrigation, water supply or drainage as well as changing the course of a river can be applied for under the Water Act 1912.

The proposed modification does not involve works for water conservation, irrigation, water supply or drainage and does not involve works that would change the course of a river. Water would be sourced from the existing earth dams. Therefore, the Water Act 1912 does not apply.

### 3.3.5 Water Management Act 2000

The Water Management Act (WMA) 2000 provides requirements for the extraction of water, water use, floodplain and drainage management, the construction of works such as dams and weirs, and undertaking activities on or near water sources in NSW. This Act also incorporates the provisions of various Acts relating to the management of groundwater and surface water in NSW, and provides a single statute for the regulation of water use and works that affect groundwater and surface water, both marine and fresh. The New South Wales Office of Water administers this Act.

Approvals for the extraction and use of water and for the construction of works relating to water use can be obtained under the Act. However, the proposed modifications do not require the extraction of water from any Regulated River Water Source. Therefore, no approval is required under this Act.

### 3.3.6 Threatened Species Conservation Act 1995

Any proposals (including modifications of existing activities) that are required to be determined by a NSW statutory authority are required to be assessed in accordance with the EP&A Act, as amended by the Threatened Species Conservation Act 1995.

A comprehensive assessment for the whole site was conducted during the preparation of the original EIS. No changes have occurred, within the approved area, which are likely to change these findings.

In relation to the parcel of land within the Commonwealth land a Flora and Fauna Assessment was conducted and it is included in Section 7 of this report. This assessment concluded that the proposed modifications are unlikely to have a significant impact on any threatened species or ecological communities since none exist in that area. Similarly, for the proposed stockpiling site a comprehensive Flora and Fauna assessment was undertaken by a qualified environmental company.

### 3.3.7 Native Vegetation Act 2003

Clause 12 of the Native Vegetation Act is administered by the Office of Environment and Heritage (OEH) and requires consent from the Minister for the clearing of native vegetation. The proposed modifications do not include the clearing of any native vegetation.

## 3.4 STATE ENVIRONMENTAL PLANNING POLICIES

Despite the fact that there are no changes to the already approved stockpiling and composting activities, we consider it appropriate to include details of all relevant State Environmental Planning Policies (SEPP) for completeness. The following SEPPs may be relevant to the proposed modifications.

### 3.4.1 State Environmental Planning Policy (Major Development) 2005

Defines certain developments that are major projects to be assessed under Part 3A of the Environmental Planning and Assessment Act 1979 and determined by the Minister for Planning. It also provides planning provisions for State significant sites. In addition, the SEPP identifies the council consent authority functions that may be carried out by joint regional planning panels (JRPPs) and classes of regional development to be determined by JRPPs. Note: This SEPP was formerly known as State Environmental Planning Policy (Major Projects) 2005.

### 3.4.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The Policy establishes appropriate planning controls to encourage ecologically sustainable developments.

***State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries),***
***2007***

The SEPP (Mining, Petroleum Production and Extractive Industries), 2007 (Mining SEPP), which commenced on 16 February 2007, regularises the various environmental planning instruments that previously controlled mining activities.

Clause 5(3) of the Mining SEPP gives it primacy where there is an inconsistency between the provisions of the Mining SEPP and the provisions of any other environmental planning instrument (except the Major Development SEPP, *State Environmental Planning Policy No. 14 [Coastal Wetlands]* and *State Environmental Planning Policy No. 26 [Littoral Rainforest]*).

• ***Clause 2***

Clause 2 sets out the aims of the Mining SEPP as follows:

*(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and*
*(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and*
*(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.*

• ***Clause 12***

Clause 12 of the Mining SEPP requires that, before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

*(a) consider:*
*(i) the existing uses and approved uses of land in the vicinity of the development, and*
*(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and*
*(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and*
*(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and*
*(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

Land use in the vicinity of the applicant's quarry is dominated by rural and agriculture in the flatter and more fertile areas to the south and west privately-owned land and the vacant Commonwealth-owned land to the east. The land in the immediate vicinity of the proposed modification is mainly owned by the Commonwealth. Accordingly the proposed modification would be generally consistent with the preferred use of the land in the vicinity of the previously approved development.

Noise and air quality impact assessments have been conducted for the modifications and these assessments indicate that it would result in none to minimal additional impacts on adjoining land uses near the approved quarry and proposed stockpiling site.

As described in Section 6, the modifications would not have any impact on regional water resources or users, and is not incompatible with the existing land uses within the vicinity of the approved quarry. As described in this report, the modifications would result in continued employment and business opportunities in the Liverpool LGA and other adjoining LGAs.

The applicant would, where practical, continue to implement environmental management measures to avoid or minimise incompatibility with existing and future land uses in the vicinity of the quarry, if and when they arise.

• ***Clause 14***

Clause 14(1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:

> *(a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,*
> *(b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,*
> *(c) that greenhouse gas emissions are minimised to the greatest extent practicable.*

In addition, clause 14(2) requires that, without limiting clause 14(1), in determining a development application for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programmes or guidelines concerning greenhouse gas emissions.

The greenhouse gas emissions from the modifications were considered to be less than what was previously approved and are minimal in relation to the overall activities conducted by the applicant. Hence, it was determined that such assessment was not warranted for the proposed modifications.

The potential impacts of the modifications on surface water and groundwater resources are discussed in Section 6, including measures to minimise potential impacts. The potential impacts of the modifications on threatened species and biodiversity are discussed in Section 7, including measures to minimise potential impacts.

• ***Clause 15***

Clause 15 of the Mining SEPP requires that:

> *(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.*
> *(2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.*
> *(3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.*

A review of potential quarry production indicated that the changes associated with the proposed modifications would ultimately result in more efficient recovery of shale, clay and other Excavated Natural Materials (ENM).

• ***Clause 16***

Clause 16 (1) of the Mining SEPP requires that, before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following:

> *(a) require that some or all of the transport of materials in connection with the development is not to be by public road,*
> *(b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,*
> *(c) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.*

The proposed modifications do not involve any changes to the approved transport routes or traffic numbers.

Clause 16 (2) of the Mining SEPP requires that, if the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within seven days after receiving the development application, provide a copy of the application to each roads authority for the road, and the NSW Roads and Maritime Services (RMS) (if the RMS is not a roads authority for the road).

In addition, Clause 16 (3) of the Mining SEPP requires that the consent authority:

> *(a) must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application,*

The applicant will continue to consult with the RMS as and when required in regard to traffic and road transport.

### 3.4.3 State Environmental Planning Policy (Sydney Region Growth Centres) 2006

This SEPP provides for the coordinated release of land for residential, employment and other urban developments in the North West and South West growth centres of the Sydney Region (in conjunction with Environmental Planning and Assessment Regulation relating to precinct planning). At this stage, the applicant is unaware of land being developed or released for residential occupancy within the immediate vicinity of the quarry.

### 3.4.4 State Environmental Planning Policy No 33 - Hazardous and Offensive Development

This SEPP provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of a proposal. The consent authority must carefully consider the specifics of the case, the location and the way in which the proposed activity is to be carried out. The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy.

For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA). The policy does not change the role of Councils as consent authorities, land zoning, or the designated development provisions of the Environmental Planning and Assessment Act 1979.

The proposed modifications do not significantly alter the activities assessed previously and approved by the Department and the EPA. In addition and since the operational activities on-site would generally remain unchanged, the modifications would not change the potential impact mechanisms to the environment, public and public property, and their associated consequences or likelihoods, to the extent that risk levels would change from those previously assessed.

In any case, the quarry operates in accordance with the environmental management plans and management procedures required by the existing Development Consent. These plans and procedures have been developed to minimise the environmental risks associated with operation of the quarry.

### 3.4.5 State Environmental Planning Policy No. 44 – Koala Habitat Protection

Encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range. The policy applies to 107 local government areas. The Department cannot approve a development in an area affected by the policy without an investigation of core koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of koalas and their habitat. No koalas were found or observed within the site or adjoining properties during the preparation of the EIS or during the preparation of this report and as part of the overall assessment including the Flora and Fauna Assessment.

### 3.4.6 State Environmental Planning Policy No. 55. – Remediation of Land

Introduces state-wide planning controls for the remediation of contaminated land. The policy

states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the EPA, has prepared *"Managing Land Contamination: Planning Guidelines"*.

The proposed modifications areas are located within an area that has always been used for rural residential, a dairy and other agriculture (cropping and grazing) rather than industrial activities. As a result no change of use is proposed and no comprehensive land contamination investigation is required. Despite the above, Section 5 included a comprehensive site evaluation/assessment in accordance with current relevant planning and environmental guidelines.

### 3.4.7 Sydney Regional Environmental Plan No 9 – Extractive Industries (No2)

To facilitate the development of extractive resources in proximity to the population of the Sydney Metropolitan Area by identifying land, which contains extractive material of regional significance.

Under this plan, the site was identified as a "clay/shale extraction area of regional significance".

## 3.5 LOCAL PLANNING INSTRUMENTS

### 3.5.1 Liverpool Local Environment Plan 2008 (LLEP)

This Plan aims to make local environmental planning provisions for land in Liverpool in accordance with the relevant standard environmental planning instrument under section 33A of the Act.

Under Division 1 of Schedule 1 of SREP No 9 – Extractive Industries, the subject site is identified as being a clay/shale extraction area of regional significance. Consideration was given to the issue of development consent to the heads of consideration contained in the SREP.

Notably Council is identified as being the consent authority under the SREP. However due to the circumstances at the time, it was considered more appropriate that the consent authority should be the Department of Planning. Subsequently, the development consent was issued by the Minister**.** As a result of that decision, the Department of Planning remains the consent authority for planning issues associated with this site. This also includes any applications for modification of the development consent.

No significant issues or considerations arise from the above planning instrument in respect of the proposed modification.

### 3.5.2 Liverpool Development Control Plan 2008 (LDCP)

The objectives of Liverpool Development Control Plan 2008 (LDCP) are provided at Clause 1.2 as follows:

*"The objectives of this DCP are:*

*a) To provide more detailed provisions for regulating the carrying out of development.*
*b) To protect and improve the natural environment in the City of Liverpool.*
*c) To protect and improve the amenity of the City of Liverpool.*
*d) To protect personal safety and to minimise the risk of damage to areas subject to environmental hazards, particularly flooding.*
*f) To promote a high standard of urban and environmental design.*
*g) To conserve, protect and enhance the environmental heritage of the City of Liverpool.*
*h) To encourage a diversity of housing to meet the needs of the residents of the City of Liverpool.*
*j) To facilitate development that is environmentally sustainable."*

There are also additional specific objectives for each section of each part of the DCP. The objectives of the LDCP were addressed previously as part of the EIS and subsequent reports to Liverpool City Council and the Department.

In any case, we believe that there are no aspects of the proposed modifications which are considered to be contrary to those objectives.

## 3.6 EXISTING EPIC MINING QUARRY APPROVALS

As described in Sections 1 and 2, Epic Mining involves extraction and overburden placement of clay and shale, and transport of materials to a number of brick manufacturing plants. These activities are covered by various approvals and licences, key components of which are summarised in **Table**Error! Reference source not found. **3-2**.

**Table 3-2: Existing Epic Mining Quarry Approvals/Licences/Permits**

| ISSUING /RESPONSIBLE AUTHORITY | TYPE OF APPROVAL | NUMBER | DATE OF ISSUE | EXPIRY DATE | COMMENTS |
|---|---|---|---|---|---|
| **Department of Planning and Infrastructure** | Development consent | DA 315-7-2003 | 23/05/2004 | 23/05/2022 | Modified in 2006, 2010 and 2015 |
| **NSW Environment Protection Authority** | Environment protection licence | 12863 | 5/06/2009 | Not applicable | Modified In 2010, 2011 and twice in 2015 |

| | | | | | |
|---|---|---|---|---|---|
| **Department of Mineral Resources** | Approval for Exploration | M(Mo)LA3 | 13/11/12 | Entire project life | Previously PMA 17 |
| **NSW Office of Water** | Not required | | | | |
| **Federal Government** | Lease of land | Not specified | | | |
| **NSW Department Of Trade and Industry, Regional Infrastructure and Services** | Mining lease | EL 7683 | 7/01/2011 | 06/01/2014 | In the process of submitting a final report |

Some management plans (e.g. Dust Management Plan) may require revision to reflect updated environmental management measures or changes to Development Consent (DA315-7-2003) conditions resulting from the modifications.

# 4. RISK ASSESSMENT

The Department has requested that consideration should be made as to whether the proposed modifications (i.e. relocation of stockpiling and composting activities) are considered to be hazardous or potentially hazardous industry under the State Environmental Planning Policy (SEPP) 33 – Hazardous and Offensive Industries.

Section12 includes a list of chemicals that will be stored in the workshop away from the stockpiling and composting activities. These small quantities are similar to any household in Australia except for the lubricating oils and greases where it is expected to have approximately 100 L in total at any one time.

In accordance with the screening method provided by the Department's document "*Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines - 2011*" (2011 Guidelines), this Section provides details of the determination as to the classification of the proposed modifications under SEPP 33.

Industries or projects that are determined to be hazardous or potentially hazardous would require the preparation of a Preliminary Hazard Analysis (PHA) in accordance with Clause 12 of the SEPP 33. However, no further assessment is required under SEPP 33 for industries or projects that are not considered hazardous following a SEPP 33 Risk Assessment.

Hazardous materials are defined in the 2011 Guidelines as substances that fall within the classification of the Australian Code for Transportation of Dangerous Goods by Road and Rail (Dangerous Goods Code). The only materials that fall within this definition would be those included in **Table 4-1** below.

**Table 4-1: Hazardous Materials stored on site**

| Hazardous Material | Classification | Description | Storage Quantity | Storage Location |
|---|---|---|---|---|
| Lubricating oils and greases | Class 3 C2 | Flammable liquids – flashpoint above 150$^{o}$C | 100L | Workshop |

The transport information of the hazardous materials is included in **Table 4-2** below.

**Table 4-2: Hazardous Materials Transport Information**

| Hazardous Material | Average No of loads per year | Load size |
|---|---|---|
| Lubricating oils and greases | 6 | 100L |

Due to the small quantity of lubricating oils and greases that will be stored on site and the fact that these are not stored adjacent to any other hazardous materials since there are no other hazardous materials on that site, the 2011 Guidelines do not require these to be considered further.

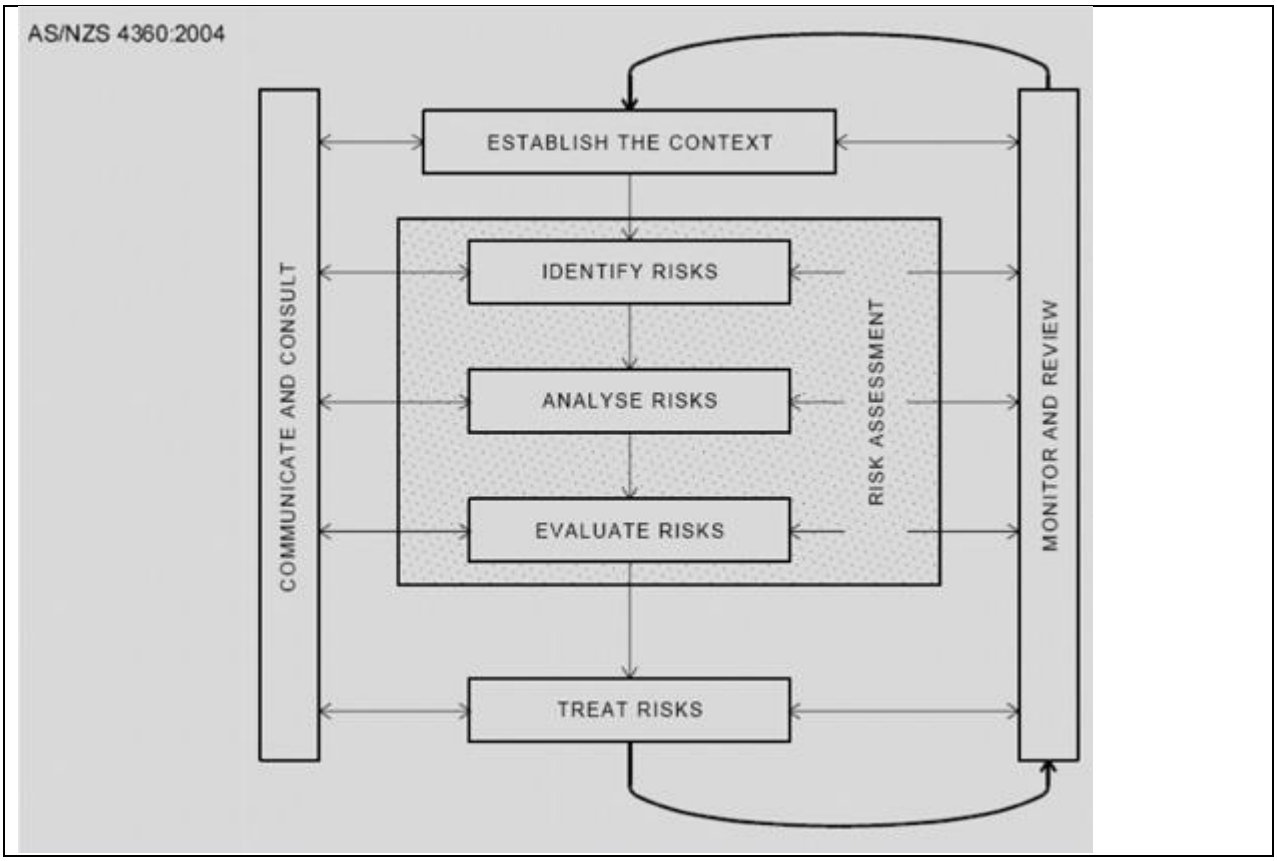
Therefore, based on the risk screening method included in the 2011 Guidelines, SEPP 33 does not apply to the proposed modifications.

## 4.1 ENVIRONMENTAL RISK ASSESSMENT

The Department has also requested that an Environmental Risk Assessment be undertaken in accordance with relevant NSW policies/guidelines and Australia Standard AS/NZS 4360:2004 and HB 203:2006.

According to the Australian / New Zealand Environmental risk management standard (HB 203:2006) and Security risk management standard (HB 167:2006) the risk management process involves communicating and consulting with stakeholders, setting the context, identifying risks, then analysing, evaluating, treating and monitoring risks. As illustrated by the feedback pathways in **Figure 4-1**, the entire risk management process proposed is iterative and may be repeated with additional or modified risk evaluation criteria, leading to a process of continual improvement.

**Figure 4-1: Risk management process overview (AS/NZS 4360:2004)**




Due to the fact that this is a simple modification of existing activities that have been evaluated and assessed previously, a full and comprehensive risk assessment is not required. Hence, it was considered more appropriate to use the risk assessment matrix included in **Table 4.3** to

determine the risk of each individual environmental aspect relevant to both the construction and operation stages of the proposed modifications. The level of risk determined from the matrix will assist in identifying the most appropriate and level of mitigation measures required for the relevant environmental aspect. These risks will then be mitigated through the application of specific measures as outlined in **Table 4-5** and **Table 4-6**.

**Table 4-3: Risk Assessment Matrix**

| | | Probability | | | | |
|---|---|---|---|---|---|---|
| | | A | B | C | D | E |
| Consequence | 1 | H | H | H | H | M |
| | 2 | H | H | H | M | M |
| | 3 | H | H | M | M | L |
| | 4 | M | M | M | L | L |
| | 5 | M | L | L | L | L |

| L = Low | M = Medium | H = High |
|---|---|---|

**Table 4.4** includes explanatory notes on the selection of the consequences and probability for each aspect.

**Table 4-4: Risk Matrix Explanation**

| Probability | | | Consequence | | |
|---|---|---|---|---|---|
| A | Almost Certain | Expected to occur, quite common. | **1** | Major | • Major environmental harm e.g. major pollution incident causing significant damage or potential to health or the environment.<br>• Fines and prosecution likely |
| B | Likely | Will probably occur, has happened. | **2** | Significant | • Long term or serious environmental damage.<br>• many complaints received.<br>• Potential for prosecution.<br>• Loss of reputation. |
| C | Possible | Might occur at some time. | **3** | Moderate | • Moderate environmental impact.<br>• Will cause complaints.<br>• Possible fine. |

| | | | | | |
|---|---|---|---|---|---|
| **D** | Unlikely | Could occur at some time although unlikely. | **4** | Minor | • Minimal environmental harm.<br>• Potential for complaints.<br>• Fine unlikely. |
| **E** | Rare | Might occur at some time in exceptional circumstances. | **5** | Insignificant | • Little or no environmental harm.<br>• Little potential for fines or complaints. |

**Table 4-5: Risk Assessment Matrix Results (Construction Stage)**

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | Residual Risk Ranking |
|---|---|---|---|---|---|---|
| **Visual Amenity** | Degraded visual amenity due to untidy construction site and presence of equipment and machinery | D | 4 | Low | Ensure that all equipment and machinery are located correctly where they are required and they are stored in the dedicated areas at the end of each working day | Low to None |
| **Air** | Equipment, machinery and vehicle emissions | C | 3 | Medium | Ensure that equipment and machinery are not left to idle unnecessary for too long Ensure that all equipment and machinery are well maintained | Low |
| | Dust generated as a result of site preparation works including the construction of earth mounds, diversion drains and | C | 3 | Medium | Implement already successfully implemented mitigation measures Minimise disturbed areas | Low |
| **Noise** | High noise levels for short durations | C | 4 | Medium | Construction activities will be undertaken | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | Residual Risk Ranking |
|---|---|---|---|---|---|---|
| | during weekdays | | | | during day time where high noise levels are already occurring in the surrounding environment due to traffic, plane and other activities Normal low noise level machinery will be used | |
| **Transport (Traffic & Access)** | Traffic increase due to additional construction vehicles | D | 4 | Low | Since most existing stockpiles will be reduced to nil, vehicular traffic will be reduced during construction | Low to None |
| | Traffic disruptions due to detours | D | 4 | Low | No detours are proposed since the site is accessible through a haul road for construction machinery and through Adams Road for small vehicles | Low to None |
| **Sustainability and Climate Change** | Emissions associated with use of resources | C | 4 | Medium | Reduce the use of unjustified resources Re-use, recycle where possible | Low |
| | Inefficient use of resources and equipment | C | 4 | Medium | Avoid double handling of materials | Low |
| **Water (Groundwater, Surface Water, Flooding)** | Discharge of non-clean water into Oaky Creek | D | 3 | Medium | Ensure that sediment & erosion controls are installed and maintained | Low |
| | Discharge of contaminated | D | 3 | Medium | Contain and clean-up spills | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | Residual Risk Ranking |
|---|---|---|---|---|---|---|
| | surface water runoff due to chemical spills | | | | immediately Activate existing PIRMP | |
| | Potential groundwater contamination | E | 3 | Low | Activities only above ground on partially impervious surface Not possible since groundwater table is 62-65 m BGL | Low to None |
| | Potential flooding | E | 4 | Low | Site is not in a flood prone zone Surface water management is in place | Low to None |
| **Contamination** | Contaminated soil found during excavation | D | 4 | Low | Site was only used for residential, cropping and grazing. Will notify relevant authorities for advice, if necessary | Low to None |
| | Contamination of localised soil due to chemical spills | D | 4 | Low | Spill containment and clean-up kits will be made available Staff is already trained on pollution incident response management | Low to None |
| **Socio-economic** | Disruption of residents amenity | C | 3 | Medium | Mitigation measures will be implemented | Low |
| | Disruption of nearby businesses | D | 3 | Medium | There are no businesses located in the vicinity of the site | Low |
| | Safety and Access impacts | D | 3 | Medium | Only the applicant's employees are permitted entry to the | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | Residual Risk Ranking |
|---|---|---|---|---|---|---|
| | | | | | site during construction | |
| **Waste Management** | Non-compliance with waste hierarchy and WARR Strategy | D | 4 | Low | Very little waste is likely to be generated. Waste management plan already implemented on site will be used to prevent non-compliances | Low to None |
| | Inappropriate handling of waste materials | D | 4 | Low | Dedicated bins will be located in the vicinity of the site to ensure that materials are placed in the correct bins for recycling or disposal | Low to None |
| **Heritage (Aboriginal & Cultural)** | Impact on any item of cultural heritage value | E | 4 | Low | None identified in the area subject to this modification If any found, relevant authorities will be notified | Low to None |
| **Biodiversity (Flora & Fauna)** | Impact on any identified threatened flora or fauna | E | 4 | Low | None identified within the proposed development area which is outside the Vegetated Riparian Zone | Low to None |
| **Resource** | Potential negative impact from exploration results | D | 4 | Low | The site could be explored in future No exploration licence in place yet | Low to None |
| **Rehabilitation** | Potential impact during rehabilitation works | D | 4 | Low | The site has only been used for residential and occasionally for cropping and grazing | Low to None |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | Residual Risk Ranking |
|---|---|---|---|---|---|---|
| **Land** | Potential impact on the land | D | 3 | Medium | The land will only be slightly levelled and compacted to best industry's practice<br>Only stockpiling activities will occur on that site | Low |
| **Cumulative Impacts** | Cumulative impacts on surrounding environment including community | C | 4 | Medium | A range of mitigation measures will be implemented and maintained to minimise the potential cumulative on the surrounding environment | Low |

**Table 4-6: Risk Assessment Matrix Results (Operation Stage)**

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | |
|---|---|---|---|---|---|---|
| **Visual Amenity** | Degraded visual amenity due to untidy site and presence of equipment and machinery | D | 4 | Low | Ensure that all equipment and machinery are located correctly where they are required and they are stored in the dedicated areas at the end of each working day | Low to None |
| **Air** | Equipment, machinery and vehicle emissions | C | 3 | Medium | Ensure that equipment and machinery are not left to idle unnecessary for too long<br>Ensure that all equipment and machinery are well maintained | Low |
| | Dust generated as a result of normal activities including stockpiling, | C | 3 | Medium | Implement already successfully implemented mitigation measures<br>Deploy water | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | |
|---|---|---|---|---|---|---|
| | loading and unloading | | | | cart<br>Reduce potentially dust generation activities during adverse weather conditions | |
| **Noise** | High noise levels for short durations during weekdays | C | 4 | Medium | Construction activities will be undertaken during day time where high noise levels are already in the surrounding environment due to traffic, plane and other activities<br>Normal low noise level machinery will be used | Low |
| **Transport (Traffic & Access)** | Traffic increase due to additional vehicles | D | 4 | Low | Since most existing stockpiles will be reduced to nil, vehicular traffic will be reduced during construction | Low to None |
| | Traffic disruptions due to detours | D | 4 | Low | No detours are proposed since the site is accessible through a haul road for construction machinery and through Adams Road for small vehicles | Low to None |
| **Sustainability and Climate Change** | Emissions associated with use of resources | C | 4 | Medium | Reduce the use of unjustified resources<br>Re-use, recycle where possible | Low |
| | Inefficient use of resources and equipment | C | 4 | Medium | Avoid double handling of materials | Low |
| **Water (Groundwater, Surface Water, Flooding)** | Discharge of non-clean water into Oaky Creek | D | 3 | Medium | Ensure that sediment & erosion controls are installed and maintained<br>Ensure | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | |
|---|---|---|---|---|---|---|
| | | | | | diversion drains, earth mounds and sediment pond are operating efficiently | |
| | Discharge of contaminated surface water runoff due to chemical spills | D | 3 | Medium | Contain and clean-up spills immediately Activate existing PIRMP | Low |
| | Potential groundwater contamination | E | 3 | Low | Activities only above ground on partially impervious surface Not possible since groundwater table is 62-65 m BGL | Low to None |
| | Potential flooding | E | 4 | Low | Site is not in a flood prone zone Surface water management is in place | Low to None |
| **Contamination** | Contaminated soil found during extraction activities | D | 4 | Low | Site was used for residential, cropping and grazing only. Will notify relevant authorities for advice, if any found | Low to None |
| | Contamination of localised soil due to chemical spills | D | 4 | Low | Spill containment and clean-up kits will be made available Staff are already trained on pollution incident response management | Low to None |
| **Socio-economic** | Disruption of residents amenity | C | 3 | Medium | Mitigation measures will be implemented | Low |
| | Disruption of nearby businesses | D | 3 | Medium | No businesses that are likely to be disrupted, are located in the vicinity of the site | Low |
| | Safety and | D | 3 | Medium | Several | Low |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | |
|---|---|---|---|---|---|---|
| | Access impacts | | | | strategies including specific safety signs will be placed at strategic locations<br>The site manager will monitor access to and from the site | |
| **Waste Management** | Non-compliance with waste hierarchy and WARR Strategy | D | 4 | Low | Very little waste is likely to be generated.<br>Waste management strategies outlined in this report will prevent non-compliances | Low to None |
| | Inappropriate handling of waste materials | D | 4 | Low | Dedicated bins will be located in the vicinity of the site to ensure that materials are placed in the correct bins for recycling or disposal | Low to None |
| **Heritage (Aboriginal & Cultural)** | Impact on any item of cultural heritage value | E | 4 | Low | None identified in the area subject to this modification<br>If any found, relevant authorities will be notified | Low to None |
| **Biodiversity (Flora & Fauna)** | Impact on any identified threatened flora or fauna | E | 4 | Low | None identified within the proposed development area which is outside the Vegetated Riparian Zone | Low to None |
| **Resource** | Potential negative impact from exploration results | D | 4 | Low | The site could be explored in future | Low to None |
| **Rehabilitation** | Potential impact during rehabilitation works | D | 4 | Low | The site has been used for residential and occasionally for | Low to None |

| Aspect | Potential Impacts | Probability | Consequence | Risk Ranking | Controls | |
|---|---|---|---|---|---|---|
| | | | | | cropping and grazing only | |
| **Land** | Potential impact on the land | D | 3 | Medium | The land will only be slightly levelled and compacted Only stockpiling activities will occur on that site | Low |
| **Cumulative Impacts** | Cumulative impacts on surrounding environment including community | C | 4 | Medium | A range of mitigation measures will be implemented and maintained to minimise the potential cumulative impact on the surrounding environment | Low |

Based on the above two (2) tables; **Table 4-5** and **Table 4-6**, the **environmental risk is Medium to Low.** However, **this risk will be reduced to Low to None** provided that the recommended strategies, mitigation measures and controls are implemented and maintained during both the construction and normal operation stages.

# 5. LAND

Based on discussions with the previous landlord and tenants of the site as well as the landlords of neighbouring properties, it is clear that the site had been used as a dairy for over 50 years in addition to the rural residential use. This use ceased a few years ago. The site had also been used for cropping and grazing for a similar duration.

On that basis, it was considered that the best assessment approach would be an initial evaluation in accordance with "*State Environmental Planning Policy No. 55 – Remediation of Land"* and the Department of Planning Guidelines titled: "*Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land - 1998"* (Guidelines).

Despite the fact that we believe that previous activities are considered non-contaminating, it was considered appropriate to undertake an initial evaluation based on Section 3.2 of the Guidelines. These Guidelines state *"This initial evaluation can be based on **readily available factual information** and should be carried out **regardless of the nature of the proposed use or the current use**. Readily available information may include: current zoning and permissible uses, records from previous rezonings, development applications and building applications for the site, property files, information provided by the owner or proponent should be checked against information held by the planning authority on the subject land and, if available, adjoining properties. ….. However, it is recognised that a site inspection may not be feasible or practical in all cases and it is not suggested as a mandatory requirement".*

This initial evaluation included searches of relevant local and state databases which should provide a clear indication of possible contamination on site, if any. Furthermore, the site included two dwellings where two families lived on that site for over 50 years without any concerns

Based on Liverpool City Council, the following can be concluded:

- The site does not include or comprise a crucial environmental habitat,
- The site is not within a conservation area,
- An item of environmental heritage is not situated within the site,
- There are no matters arising under the Contaminated Land Management Act 1997.

In addition, we understand that:

- The site has been excavated for cropping purposes tens of times in the last 50 years.

We confirm that based on our comprehensive site inspections, there are no signs of any contamination. Our site inspections included the whole site but focussed on the areas within and adjacent to the existing old sheds and dams where contamination may accumulate over the years.

It should be noted that a Development Application was lodged with Liverpool Council in late October 2015 which was approved on 23 March 2016 for the demolition of dwelling 2 and 5 old sheds, and the erection of a rural shed. This demonstrates further that the site is not contaminated otherwise the Council would have asked for a comprehensive preliminary contamination assessment under SEPP 55 or a Phase I Contamination Assessment under the Contaminated Land Management Act 1997 (CLM).

A search of the EPA's POEO Public Register on 5 May 2016 revealed that no notices have been issued for any matter associated with the site.

A search of the EPA's register for contaminated lands on 5 May 2016 revealed that this site is not the subject of any notice under the Contaminated Land Management Act 1997.

As previously stated the site is within the land zone RU1 – Primary Production where extractive industries which include stockpiling of materials is permitted with consent. Previous discussions with Liverpool Council town planners revealed that Liverpool Council encourages the use of land in line with the objectives of the land zone. The proposed stockpiling activities, being part of a primary production activity, mean that the land will be used in a consistent manner with land zone objectives.

We believe that our site evaluation is very comprehensive and consistent with SEPP 55 and CLM. Hence, a more comprehensive preliminary contamination assessment for the proposed new site is not warranted for the reasons provided above.

# 6. WATER

Due to the changes in relation to the water management on site in the previous and proposed modifications, it was considered appropriate to provide a detailed drawing that includes all water related structures, locations and activities on site. **Figure 6-6** includes an illustration of all structures and features listed below. **APPENDIX F** includes an A3 size sheet to give a better view of these structures and features.

- Sediment pond 1 (existing)
- Sediment pond 2 (existing)
- Sediment pond 3 (existing)
- Sediment pond 4 (proposed)
- Sediment pond 5 (proposed)
- Pit sump (existing)
- Southern stockpiling footprint (existing)
- Northern stockpiling footprint (proposed)
- Composting footprint (proposed)
- Quarry footprint (existing)
- Haul road (existing and proposed)
- Access road (existing)
- Site office (existing)

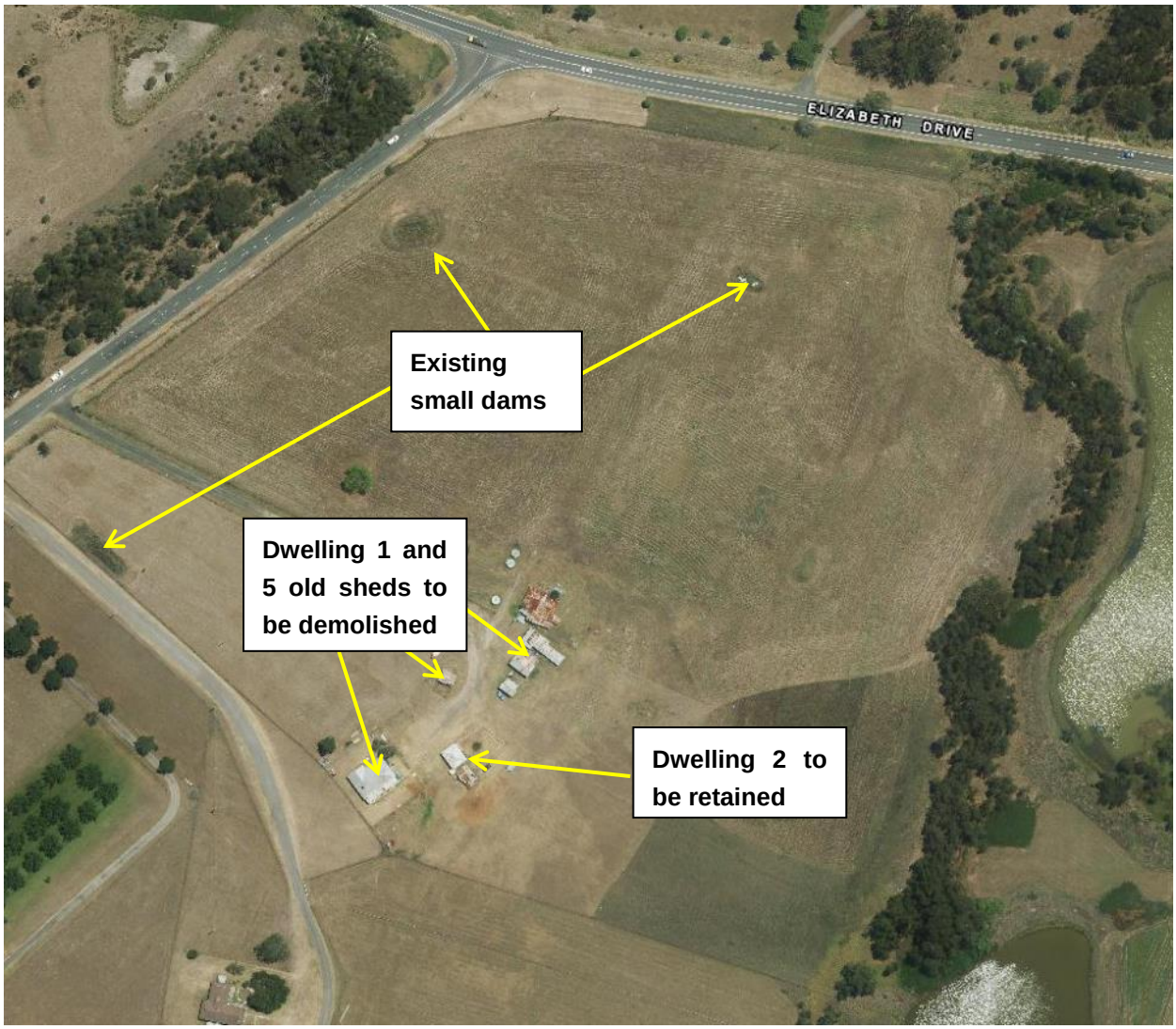
In relation to the three (3) very small existing dams located within the proposed stockpiling site, they are not considered part of the stormwater management system due to:

- ❖ They have very small capacities compared with other ponds,
- ❖ They are empty most of the year, and
- ❖ They appear to capture water directly from rainfalls and very little from water runoff due to their locations and topography of adjacent areas.

In addition, the smallest dam located to in the middle of the northern portion of the site is so small that there is hardly any water in it any time.

**Figure 6-1** shows existing features of proposed stockpiling site including the very small dams.

**Figure 6-1: Aerial View of the Proposed Site Showing Existing Features**




No adverse impact on the stormwater system or any waterways is likely to eventuate as a result of the modifications provided that the recommended mitigation measures are implemented and maintained on site.

Furthermore, detailed schematic flow charts for both surface water and potable water are included in this Section and in **APPENDIX F** (larger sized drawings)

This section presents the existing and proposed conditions and mitigations measures proposed to for implementation by the applicant for groundwater, surface water and flooding aspects to ensure that groundwater and nearby waterways are well protected, and flooding is prevented on site.

## 6.1 GROUNDWATER

### 6.1.1 Existing Conditions

Groundwater management on-site was fully addressed in a report titled: "*Groundwater Management Plan – Blue Sky Mining Clay-Shale Quarry – 275 Adams Road Luddenham – Report No 09103-A"* (GMP) prepared by Larry Cook & Associates Pty Ltd on behalf of Blue Sky Mining Pty Ltd dated February 2009. This report was prepared to satisfy the requirements of conditions 24 and 26 of the development consent.

The groundwater considerations arise from the quarrying operations and not from stockpiling of materials above ground especially for the proposed new stockpiling site which is several hundred metres away from the quarrying activities. Similarly for the composting activities which will be undertaken above ground in a very well-sealed area.

### 6.1.2 Existing Mitigation Measures

All mitigation measures recommended in the EIS and the above report were implemented on site to prevent any potential adverse impact on the groundwater. Since the activities commenced in January 2011, groundwater has not been altered or changed in any way. One of the main reasons is that groundwater is found much deeper than the lowest point reached so far at the quarry. So in this case avoidance of encroachment on groundwater has been proven to be a very successful strategy.

### 6.1.3 Potential Impacts of Proposed Modifications

Under normal circumstances, stockpiling activities have the potential to increase the speed of water run-off from the stockpiling area. This means that the proposed sediment pond and other stormwater retention ponds could fill slightly quicker than previously occurred. At the same time, the stockpiles would absorb some of the rainwater falling on them. However, due to the proposed surface water management strategies and diversions already implemented and/or proposed on site, the fact that stockpiling activities occur above ground levels rather than deep in ground and that groundwater is so much deeper than ground level it is highly unlikely that these activities will have any adverse impact on groundwater. In addition to the above, the characteristics of the stockpiled materials will assist rainwater to slow down rather than accelerate as it is moving on the stockpiles.

Accordingly there will be no anticipated change to groundwater as the quarry operation is occurring as per the approval with no change to any of the parameters that are likely to change the behaviours of groundwater such as the extraction depth or area of operation.

In conclusion, the proposed modifications will have no impact on any aspect associated with groundwater. Nonetheless, the Groundwater Monitoring Program is currently being reviewed by the proponent as a result of the previous Modification to ensure that it continue to reflect the previously approved extraction activities within the quarry footprint.

### 6.1.4 Proposed Mitigation Measures

Since the mitigation measures already implemented on site, the topography of the subject areas and the depth of groundwater have assisted in preventing any adverse impact on groundwater, no additional mitigation measures are required in respect of potential impact of the re-location of stockpiling and composting activities except for the following:

1 The composting pad should be constructed in a manner that will make it as impervious as possible to minimise the infiltration of potentially contaminated water into the soil and subsequently into groundwater. In any case, this will be in accordance with the EPA's *"Environmental Guidelines – Composting and Related Organics Processing Facilities – Dec 2004"*. This strategy was implemented in the previously used area for composting within the Commonwealth land and was proven to be extremely successful based on the inspections of the land following completion of composting activities. It was noted that officials from the Commonwealth were extremely pleased with the manner the composting activities were undertaken on their land and the minimal impact on the soil from the composting activities.

2 The proposed stockpiling pad is required to be semi-impervious since the materials proposed to be stored within the new area are Virgin Excavated Natural Materials that are clean from any contaminant. These materials are extracted from the quarry and transported directly to that area without any alteration. These materials will not generate any contaminated water and the only potential impact will be as a result of sediment-laden water flowing from the stockpiles. Hence, the proposed semi-impervious pad will assist in filtering through the sediment-laden water by removing the sediments, it will reduce the flow of the water due to water infiltration into the soil and it will reduce the velocity of the water due to the slightly porous characteristics of the stockpiling pad.

The above two additional mitigation measures will also have positive impact on surface water and flooding management as detailed below.

## 6.2 SURFACE WATER

Since the commencement of activities on site, the management of the quarry has implemented a *"Nil Water Discharge"* Policy on site. This has so far been achieved by implementing several mitigations measures including the installation of diversion drains, the de-silting of existing ponds and the use of the void to capture most of the water from that particular catchment. In addition, the use of rainwater for dust suppression on site including the stockpiling areas, irrigation of areas included in the rehabilitation and landscaping plan, and the Vegetated Riparian Zone also help to achieve a "*Nil Water Discharge*".

### 6.2.1 Existing Water Supply within the applicant's approved site

The existing surface water management practice is to redirect and capture all sediment laden runoff to the existing pit sump void. The surface water is then used within the site for dust suppression and vegetation/landscaping management.

The stockpiling will not have any effect on increasing the volume of surface water being captured as per current site operations. The proposal will have the effect of possible increase in the sediment runoff within these waters. Although the pit sump void is adequately capable to cope with this increase.

The subject site continues to operate with a "*Nil Water Discharge"* policy to the environment and will continue to do so under the proposed modifications unless extremely adverse weather conditions are much worse than the design parameters of the existing water management structures.

It should be noted that the work was completed in 2015. A comprehensive refurbishment of sediment ponds 1, 2, 3 and 4 (old number within the Commonwealth land) has also occurred. This work included de-silting to remove any excess material and increase their capacities by increasing depth, shore stabilisation to assist in erosion/sediment controls and to have cleaner water for use on-site. Also the compaction of the bottom and side walls was undertaken to ensure that water does not escape from the ponds. Following completion of all abovementioned works, the capacities of these sediment ponds have been increased by more than 100%.

In accordance with the site's approved Stormwater Management Plan (SWMP), surface runoff flows via roadways and open grassed drains from parts of the site to the main Pit Sump during periods of peak rainfall. Rainfall also contributes directly to water stored in the Pit Sump. Surface water detained in the Pit Sump is re-used for dust suppression and vegetation management activities across the site.

Clean water diversions from undisturbed land is captured and channelled to Sediment ponds 1 and 2 to the Northeast boundary for storage and use in the site's dust suppression & vegetation management activities.

More detailed schematic flowcharts and drawings of surface water and potable water management for both the approved and proposed areas are included in **APPENDIX F**.

**APPENDIX F** includes also the proposed schematic flowcharts and drawings of surface water and potable water.

### 6.2.2 Water Use on Site

#### 6.2.2.1 Existing Circumstances

Below is **Table 6-1** which illustrates the current use of water for the different areas of the site to ensure that water is always available in all ponds/dams and that all areas and water requirements are met including dust suppression needs.

**Table 6-1: Current Water Use Arrangements**

| Activity/Area | Water Drawn | | |
|---|---|---|---|
| | **First Preference** | **Second Preference** | **Third Preference** |
| **Dust suppression** | Pit Sump | Sediment Pond 1 | Sediment Pond 2 |
| **Irrigation Paddock** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Western Stockpiles** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Northern Stockpiles** | Sediment pond 5 | Sediment pond 2 | Sediment Pond 1 |
| **Bund Walls** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Riparian Zone and other Landscaping** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Offices, Workshop and Amenities** | Potable water | Potable water | Potable Water |

**Figures 6-2** and **6-3** show the existing site drainage and surface water management within the approved site. This arrangement will not change as a result of re-locating the stockpiling and composting activities.

**Figure 6-2: Site Drainage and Surface Water Management within the Approved Site**

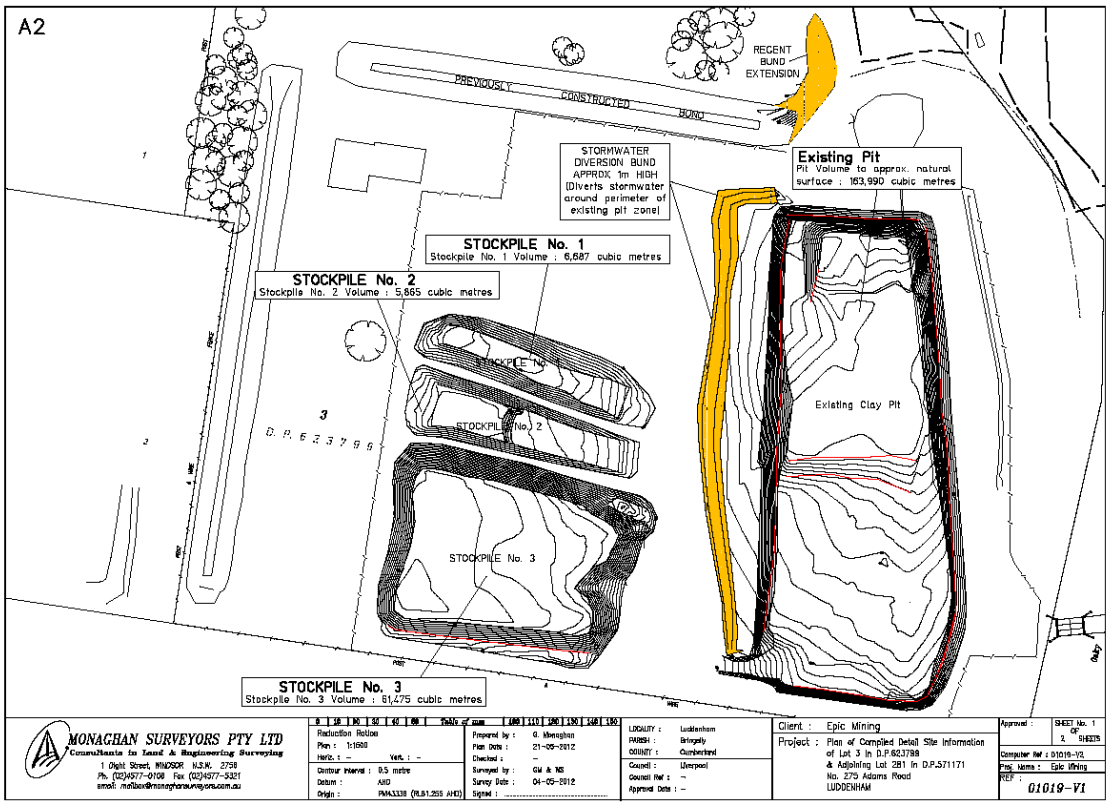
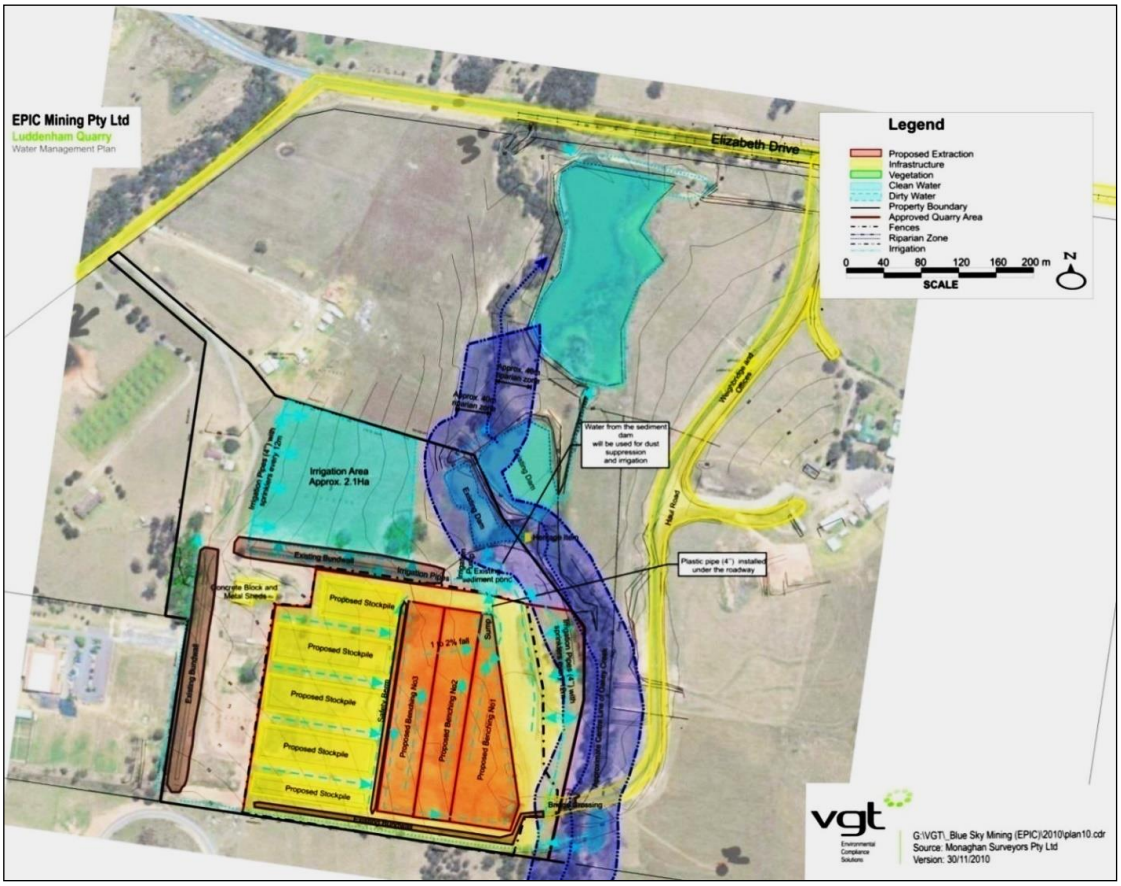


**Figure 6-3: Approved Surface Water Management within the Approved Site**




### 6.2.2.2 Existing and Continued Mitigation Measures

Soil and water management on the subject site is well established and the existing operation is managed under a SWMP with nil discharge to the receiving environment. The SWMP investigated the existing stormwater catchment areas and identified management measures which have been implemented on the site. These management measures include bunding, diversion drains, silt fences, sediment ponds, an emergency spill kit and stormwater reporting and testing for monitoring purposes.

As a result of Modification No3, the SWMP was updated to comply with the modified consent and to reflect the approved activities that were included in that modification. Most of the water management practices implemented within the approved areas will not change significantly for the remainder of the quarrying activities. However, if significant changes are made to the activities undertaken within the approved area, the SWMP will need to be updated to reflect these changes. Recommendations with regard to the management of stormwater runoff include the following:

a. Further reconfiguration of the disturbed surface water catchment to proportion runoff to the Main Pit Sump. This would maximise the timeframe before any discharge would be required.

b. Investigation of options for the reuse of water stored on-site for beneficial use in order to increase the materials extraction regime to improve on-site storage capacity.

c. Monitoring of storage levels in the Main Pit Sump and both sediment ponds 1 and 2 such that spill risk is managed and the need for additional storage and/or extraction can be readily identified. Under normal operating conditions, both sediment ponds are operated at 30-80 % of their capacity for two reasons; the first is to ensure that the bottom of the pond is not disturbed where sediments are likely to be pumped out and the second is to prevent the ponds from overflowing into Oaky Creek in case of extremely high rainfall events. In addition, and in such an emergency situation, the applicant has the flexibility of pumping water between the Main Pit Sump and the two sediment ponds 1 and 2 depending of water levels and rain duration and intensity.

Additional mitigation measures to be implemented on the site in relation to proposed operations include:

- The continued use of drains, silt fences and bunding to direct site runoff into appropriate sediment ponds and to control erosion;
- Stabilisation of slow-moving stockpiles to minimise the risk of erosion;
- The use of flocculants in sediment ponds to increase sediment removal rates if required;
- The maintenance of a buffer Vegetated Riparian Zone of over 40m in width along Oaky Creek; and
- Routine maintenance and inspections of drains, sediment ponds and earth bunds.

### 6.2.3 Site Water Demand

Based on previous calculations as part of the original EIS and the previous modifications, it was determined that the site would have a yearly minimum water requirement of approximately 24.8ML for the currently approved activities including stockpiling and composting activities.
Since the activities are not changing but simply being re-located to different sites, the yearly water demand is not expected to change unless other additional major changes occur on site. The Company is not anticipating any such change in the near future.

Dust Suppression is undertaken with the use of the site's own 20,000L water truck (cart). Irrigation of the site's vegetation is undertaken by the use of a network of pipe work and sprinklers as well as the use of the site's water truck (cart). Water demand will be slightly reduced as the excavation of the pit increases and more stockpiling can then be transferred to the pit floor.

### 6.2.4 Capacity of the Ponds

**Table 6-2** presents the sizes and capacities of the existing and proposed sediment ponds.

**Table 6-2: Sizes and Capacities of Existing and Proposed Sediment Ponds**

| | Surface Area $m^2$ | Depth m | Volume $m^3$ | Volume ML |
|---|---|---|---|---|
| **Sediment Pond 1** | 1,015 | 11 | 11,165 | 11.165 |
| **Sediment Pond 2** | 2,825 | 11 | 31,075 | 31.075 |
| **Sediment Pond 3 Near Bridge** | 1502 | 10 | 15,020 | 15.020 |
| **Sediment Pond 4* Composting Area** | TBD | TBD | 800 | 0.8 |
| **Sediment pond 5 New stockpiling area** | TBD | TBD | 2,040 | 2.040 |
| **Main Pit Sump** | 37,000 | 30 | 1,110,000 | 1,110.0 |
| **Total Capacity** | | | **1,169,300** | 1,169.3 |

*Note that the water stored in this pond (No4) will not be included in the surface water storage capacity since it will only be used within the composting area

It is noted that **Table 6-2** does not include clean water storage/diversion dams that are located within the Oaky Creek line as they are not used by the applicant for any purpose.

Based on the document: "*Managing Urban Stormwater: Soil & Construction – (Landcom 2004 and (DECC 2008)"*, we have undertaken the calculations for sediment ponds 4 and 5 to ensure that current NSW requirements are met. Detailed calculations are included in **APPENDIX L**.

The proposed sediment ponds 4 and 5 storage volumes were found to be at least 0.723 ML and 1.858 ML respectively. As previously stated, they were sized according to the Blue Book to have sufficient capacity to contain the 5-day, 90$^{th}$ percentile rainfall event using rainfall data for Wallacia (48.4 mm) which is considered to be the closest location to the site as included in the Blue Book. In this case, the volumetric runoff coefficient ($C_v$) was considered to be 0.70 (Blue Book) as a conservative approach.

Notwithstanding the above, we recommend that the sizes of these two ponds be increased by 10% as a safety factor to ensure that they are able to capture surface water runoff under adverse weather conditions that are outside the design parameters. Hence, it is recommended that sediment pond 4 be designed for 0.8 ML (or 800 $m^3$) capacity. A complying design could be 20 m Long x 6 m Wide x 6.7 m Deep. It is also recommended that sediment pond 5 be designed for 2.04 ML (or 2040 $m^3$). A complying design could be 30 m Long x 10 m Wide x 6.8 m Deep

It should be noted that the surface water runoff from the quarry extraction area flows directly into the main Pit Sump. Then, if required, it can be pumped into the sediment ponds 1, 2 or 3. However, the proposed composting area will flow directly into sediment pond 4 and the proposed stockpiling area will flow directly into sediment pond 5.

The capacity of the current Pit Sump is capable of storing more than 50 times the quantity of rainfall (5 day, 90$^{th}$ percentile rainfall event data of 48.4 mm) without discharge to the local water course.

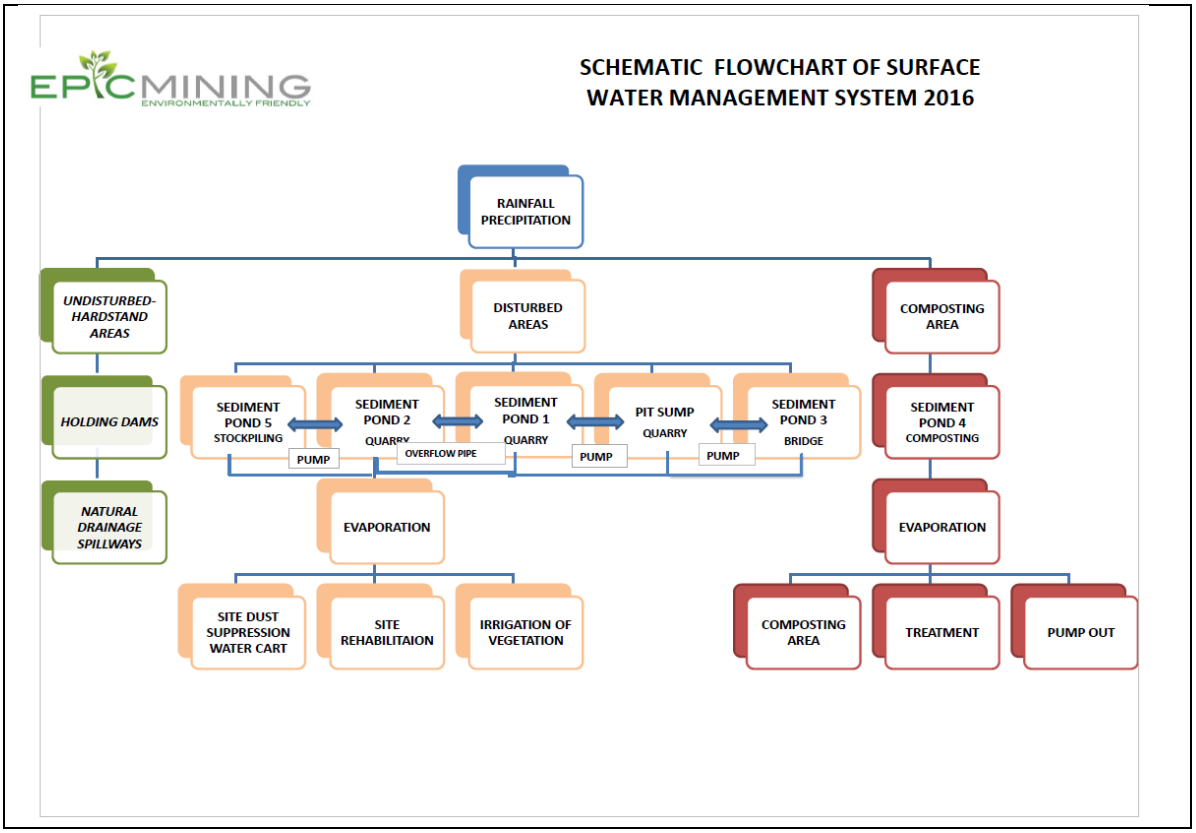
As future extraction of clay/shale continues in a westerly direction the capacity of the excavated cell will continue to increase and therefore be able to hold and store more surface water runoff.

The proposed water use arrangements are included in **Figure 6-4, Figure 6-5** and **Table 6-3**.

An illustration of the overall surface water management on site including the proposed new site is shown in **Figure 6-6** (Ref: **NICS162001_FIG003 Rev01**).

All water related Figures, drawings and plans are included in **APPENDIX F**.

**Figure 6-4: Schematic Flowchart of Surface Water Management**




Notes: 1 - The composting area will be isolated from all other areas and water collected in Sediment Pond 4 will only be re-used within that area, treated or pumped out by a licensed transporter to be treated elsewhere.

2 – Holding Dams are located within Oaky Creek and are included here for completeness purposes only. None of the proponent's activities will impact on these holding dams.
3 – Irrigation areas are clearly identified in this EA to be the Vegetated Riparian Zone, landscaping activities across the site, earth berms/mounds, dust suppression across the site including haul roads and stockpiling.

**Figure 6-5: Schematic Flowchart of Town Water Management**

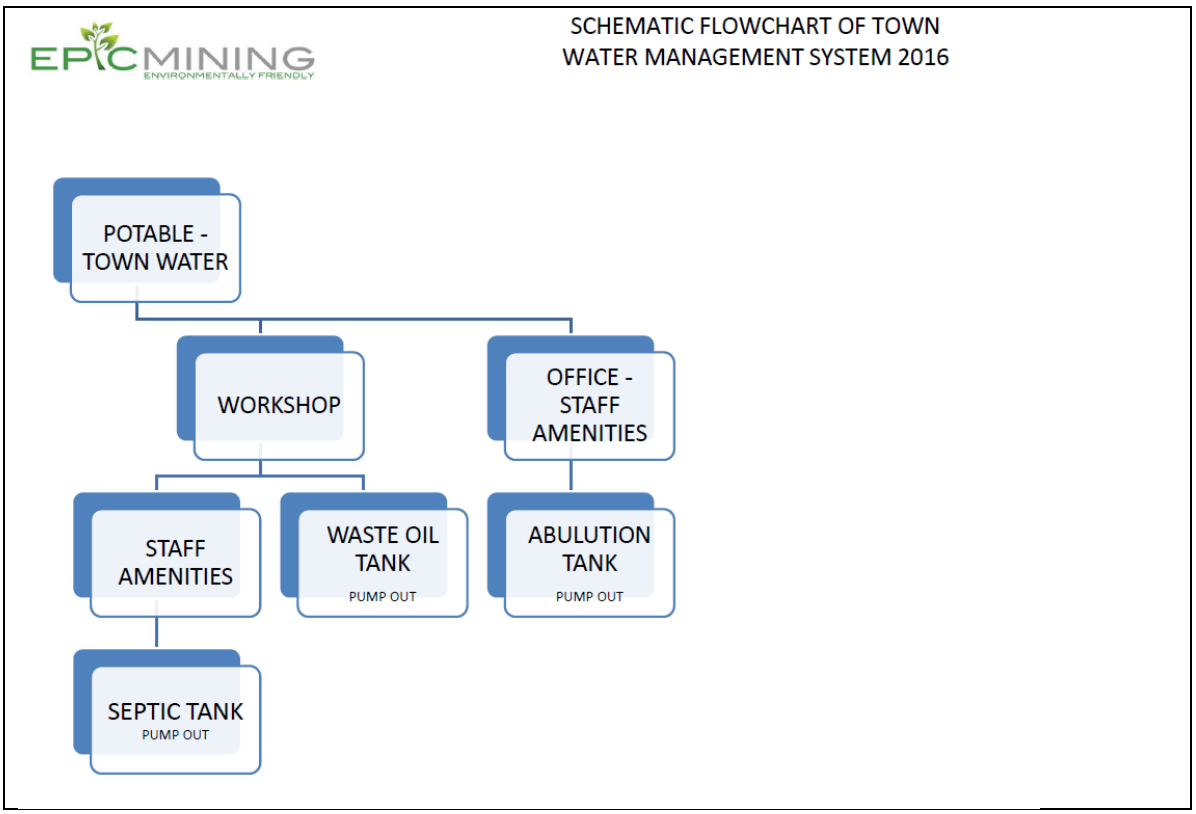


**Figure 6-6: Surface Water Management**

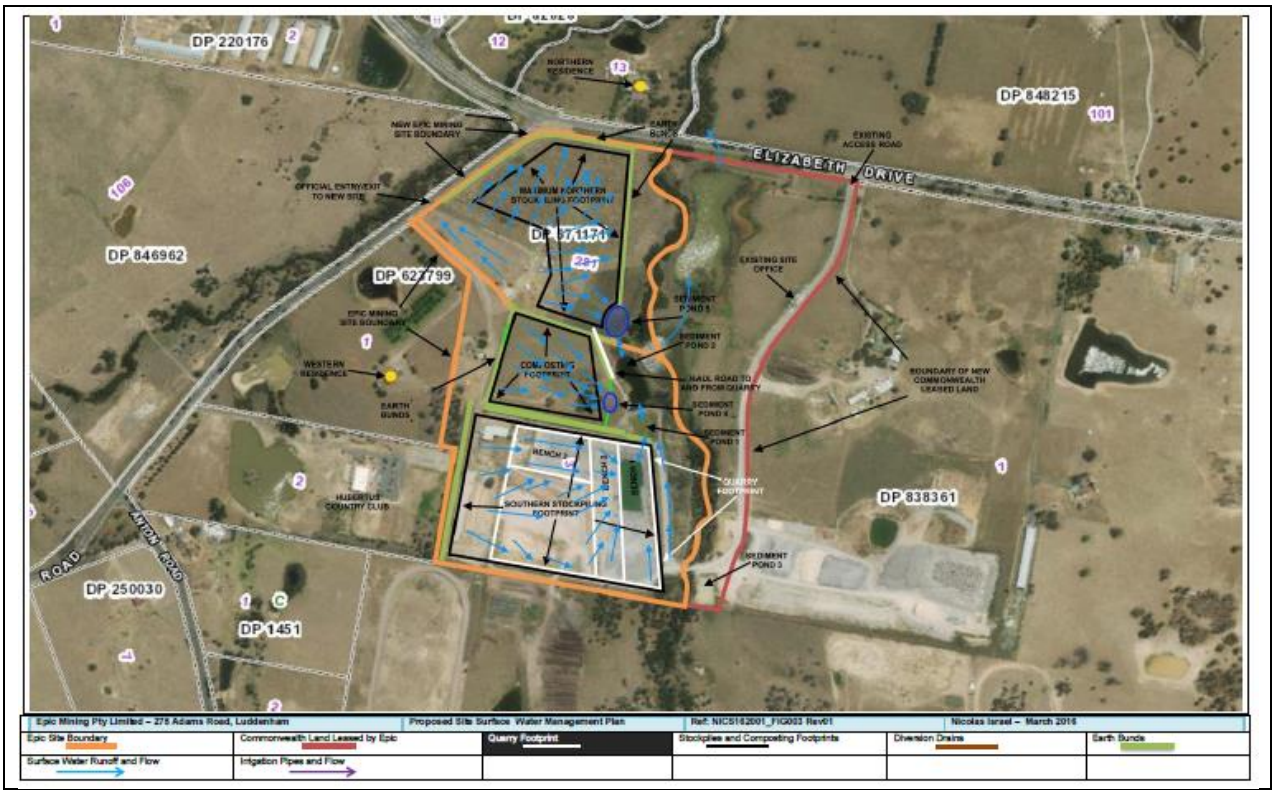



**Table 6-3** shows the proposed water usage arrangements which are depicted in the schematic flowchart shown in **Figure 6-4.**

**Table 6-3: Proposed Water Use Arrangements**

| Activity/Area | Water Drawn | | |
|---|---|---|---|
| | **First Preference** | **Second Preference** | **Third Preference** |
| **General Dust suppression** | Pit Sump | Sediment Pond 1 | Sediment Pond 2 |
| **General Irrigation** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Southern Stockpiles** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Northern Stockpiles** | Sediment pond 5 | Sediment pond 2 | Pit Sump |
| **Composting area** | Sediment pond 4 | Sediment pond 5 | Sediment pond 2 |
| **Earth bunds in new stockpiling and composting locations** | Sediment pond 5 | Sediment pond 2 | Sediment pond 1 |
| **Bund Walls** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Riparian Zone and other Landscaping** | Sediment Pond 1 | Sediment Pond 2 | Pit Sump |
| **Offices, Workshop and Amenities** | Potable water | Potable water | Potable Water |

### 6.2.5 Proposed Modifications within the Approved Area

At this stage, there are no proposed modifications of existing surface water-related arrangement within the approved area especially within the quarry footprint and the approved stockpiling footprint in that area since there are no proposed changes to any of the activities in that area.

Water sourced for these operations, which include the stockpiles, will be the same as the existing operations as the amount of water captured during rainfall will not increase.

There will be no increase to the site's overall water usage figure, due to the increase in dust suppression activities associated with the stockpiling. Extra water, if required, for these activities will be sourced in times of drought from existing properties that the applicant currently holds and the proposed surface water collection pond to be constructed within the proposed location of the stockpiling activities.

It must be noted that the original Oaky Creek line was altered some decades ago (30-40 years prior to any quarrying activities commencing on-site) to divert creek water flows into two large holding dams built on Lot 1. A very small portion of this land is currently leased by the applicant from the Commonwealth.

Any water collected from on-site activities run-off will be fully contained within the existing pit sump, sediment pond 1 and sediment pond 2. No water runoff from any disturbed area including the stockpiling areas will leave the site to Oaky Creek. No creek water flows directly into or through the sediment ponds used by the applicant in its SWMP. Therefore the sediment ponds only capture surface water runoff from the specific sub-catchment areas and the clean water diversions from within the extraction operations area. This will change since the area previously used for irrigation purposes will now be dedicated for composting activities whereby water run-off will be diverted to a proposed new surface water collection pond.

The current site operation uses some 24.8ML per year of water. This figure comprises the use of 10.8ML pa to irrigate the 2.1Ha paddock located to the north on Lot 3 and an estimated, low range figure of 14ML pa for the site used for Dust Suppression and Vegetation Management. The high range water usage figure for Dust Suppression and Vegetation Management could be in the order of 30ML pa. Due to the removal of the irrigation area from the water balance calculation and the inclusion of the stockpiling and composting activities, we believe that the overall water demand will be sufficient to cover all current and proposed activities under the management of the applicant. Furthermore, the increase in the volume of the pit sump gives a greater flexibility in water management since this pit sump alone can hold more than 40 times the water demand of the site without taking into consideration the other five (5) sediment ponds.

### 6.2.6 Potential Environmental Impacts due to Proposed composting activities

It is anticipated that the proposed composting location would not have any significant impacts on surface water on the site or on the surrounding waterways. The composting pad will be constructed in accordance with the EPA's *"Environmental Guidelines – Composting and*

*Related Organics Processing Facilities – Dec 2004"* and the whole composting site will be isolated from the outside environment. Any sediment-laden water from the proposed composting area will be captured by the mitigation measures to be implemented in that area including diversion drains, earth mounds and a surface water collection pond (sediment pond 4) designed specifically to capture all potential surface water runoff from that catchment. This water will mainly be diverted and channelled into the proposed collection pond, and it will be re-used on that site for either dust control and/or vegetation management. Any silt collected in that pond will be removed on a regular basis and blended with the normal composting materials since they will be the same materials. The quality of water in that pond should be tested on a regular basis to determine whether any treatment is required prior to being re-used in that area.

### 6.2.7 Potential Impacts due to Proposed stockpiling activities within the proposed site

It is anticipated that the proposed stockpiling location would not have any significant impacts on surface water on the site or in the surrounding waterways. Any sediment-laden water from the proposed stockpiling area will be captured by the mitigation measures to be implemented in that area including diversion drains, earth mounds and a sediment pond (No 5) designed specifically to capture all potential surface water run-off from that sub-catchment. In addition, that site has already two water dams that captures water run-off from two small sections of that area. Any water run-off from the remainder of that area will be diverted and channelled into the proposed sediment pond, and it will be re-used mainly on that site for dust control on the stockpiles, landscaping and vegetation of the earth mounds and other vegetation management aspects within that area. If excess water is available in that sediment pond, it can be pumped into sediment pond No 2 for re-use in other areas as well. Any silt collected in that pond will be removed on a regular basis and blended with the clay extracted from the quarry and sold to the brick manufacturing companies since they will be the same materials. Despite the fact that the water quality in that pond will most likely be free of any contaminants since only clean materials will be stockpiled in that area, it is suggested that the quality of water in that pond be tested once a year to determine whether there are any abnormal contaminants in that water for unknown reasons.

Furthermore, if for reasons that are beyond the control of the applicant such as extremely adverse weather conditions which are too far away from the design criteria of the pond as well as having all other water structures full, the water will be treated to a quality approved by the EPA prior to being discharged to Oaky Creek. We believe that this scenario will never occur.

### 6.2.8 Proposed Mitigation Measures for the Approved Area

As previously stated, the proposed mitigation measures for the composting activities within the applicant's approved site are included in the SWMP prepared by NICS and included in **APPENDIX F**. These measures will be implemented as soon as the new location for the composting activities is approved on that site. Based on the previous experience with the previous composting site, it has been confirmed that the mitigation measures proposed to be

implemented on that site would be adequate to manage surface water to prevent any potential impact on the surrounding environment and in particular Oaky Creek especially with the proposed additional surface water collection pond.

Provided that all these structures and mitigations measures are fully maintained by the applicant and the "*Nil Water Discharge*" policy is adhered to, no additional mitigation measures are required for this area.

Currently there are two licensed water discharge points in accordance with the EPL #12863. Condition M2 of the EPL requires regular monitoring for a variety of pollutants. Test results of sampling conducted so far indicate that the natural water flow in Oaky Creek is of high sediment when tested upstream of the site. Due to the fact that this water travels through the natural sedimentation process into the two larger holding dams built on the diverted Oaky Creek line, the water tested downstream of the site is significantly cleaner.

### 6.2.9 Proposed Mitigation Measures for the proposed Stockpiling Area

The stockpiling activities are proposed to be conducted within the "***Maximum Stockpiling Footprint"*** shown in the proposed Site Layout (drawings No **NICS_162001_FIG001 Rev01**) which covers about 65% of Lot 281 DP 571171 of the new site. However, the site survey undertaken by Monaghan included all of Lot 281 DP 571171 to ensure that firstly any sub-catchments in that land that may have impact on the surface water flow is considered in the preparation of the Surface Water Management Plan (SWMP) for that portion of land as shown in **APPENDIX F**, and secondly to ensure that any activities associated with the quarry and are likely to encroach on that area are also addressed in the SWMP for that portion of land.

The topographical site survey for the stockpiling, which was not previously surveyed, was conducted by Monaghan Surveyors Pty Ltd on 12 August 2015 and it is included in **APPENDIX D**.

As previously stated, the modifications include the stockpiling of excavated materials in the majority of the subject land. The stockpiles run in an East-West direction parallel to Elizabeth Drive for the reasons outlined below.

(a) To facilitate the safe and easy access to these stockpiles from the quarry through the haul road following the traffic lines as detailed in the traffic Section of this report,
(b) The safe and easy access to the car parking area by the applicant's employees through the driveway of that site (285 Adams Road), and
(c) To provide a better surface water management to ensure that the applicant's "*Nil Water Discharge"* policy continues to be met and is implemented in this area as well.

As stated in different Sections of this document, the applicant has always implemented a "*Nil Water Discharge*" policy since the commencement of normal activities associated with the extraction of clay and shale on site.

The applicant is proposing to implement similar strategy in the stockpiling area of the proposed site. To enable the applicant to achieve the above commitment, the mitigation measures

outlined below will be implemented in addition to any existing proven mitigation measures at all other sections of the approved site.

1) An earth berm of approximately 4.5 metres high would be maintained along the northern, eastern and western boundary of that area. The berm would extend along the majority of the southern boundary at a height of 3.0 m,
2) This earth berm would be combined with a grassed dish drain (also called diversion drain) along the length of the earth berm and located at the base of the upstream side of the earth berm. However, for the width of the haul road and any other access road to the site, a subsurface flexible pipe would be used in combination with a speed hump to ensure that no water runoff would leave the site without passing through the proposed sediment pond without compromising the safety of employees and contractors while entering and leaving the stockpiling area,
3) Install appropriate geo-fabric materials and sandstones at the entry points to the relevant sediment pond (No5) to prevent scouring of the walls and to reduce turbulence that may cause sediment disturbance,
4) The proposed earth berms and diversion drains within the stockpiling area should prevent surface water from entering Oaky creek and redirect it to the sediment pond (No 5) which is located in the south eastern portion of this area near the haul road,
5) Ensure that no sediment-laden water is discharged to Oaky creek under any circumstances,
6) Ensure that all sediment ponds and the Pit Sump are monitored regularly by visually inspecting them to ensure that they continue to operate at 30-80 % levels. This should prevent sediment-laden water from being used for dust suppression, landscaping and rehabilitation purposes and prevent the ponds from overflowing into Oaky creek or other areas,
7) Ensure that all sediment ponds and the Pit Sump are maintained regularly including de-silting to ensure their capacity is maintained at a close range within their intended capacity, and
8) All sediments removed from these ponds should be blended with the extracted materials and sold to brick manufacturing companies.

## 6.3 FLOODING

We understand that flooding can cause significant damage, both tangible and intangible, with potentially short term and long term impacts on properties and living things (people, animals, birds, etc.….). So to protect our future livelihood, Governments at all levels especially at the local government levels have adopted a number of Floodplain Risk Management Plans wherever a potential for flooding exists.

Following a review of several documents associated with flood risk management, it is clearly evident that flooding in any of the areas occupied by the applicant including the proposed locations of the stockpiling and composting activities is not possible for the reasons outlined below.

1. The only nearby waterway that may cause flooding is Oaky Creek which is an ephemeral waterway which flows only after heavy rainfall events in its upper catchment.

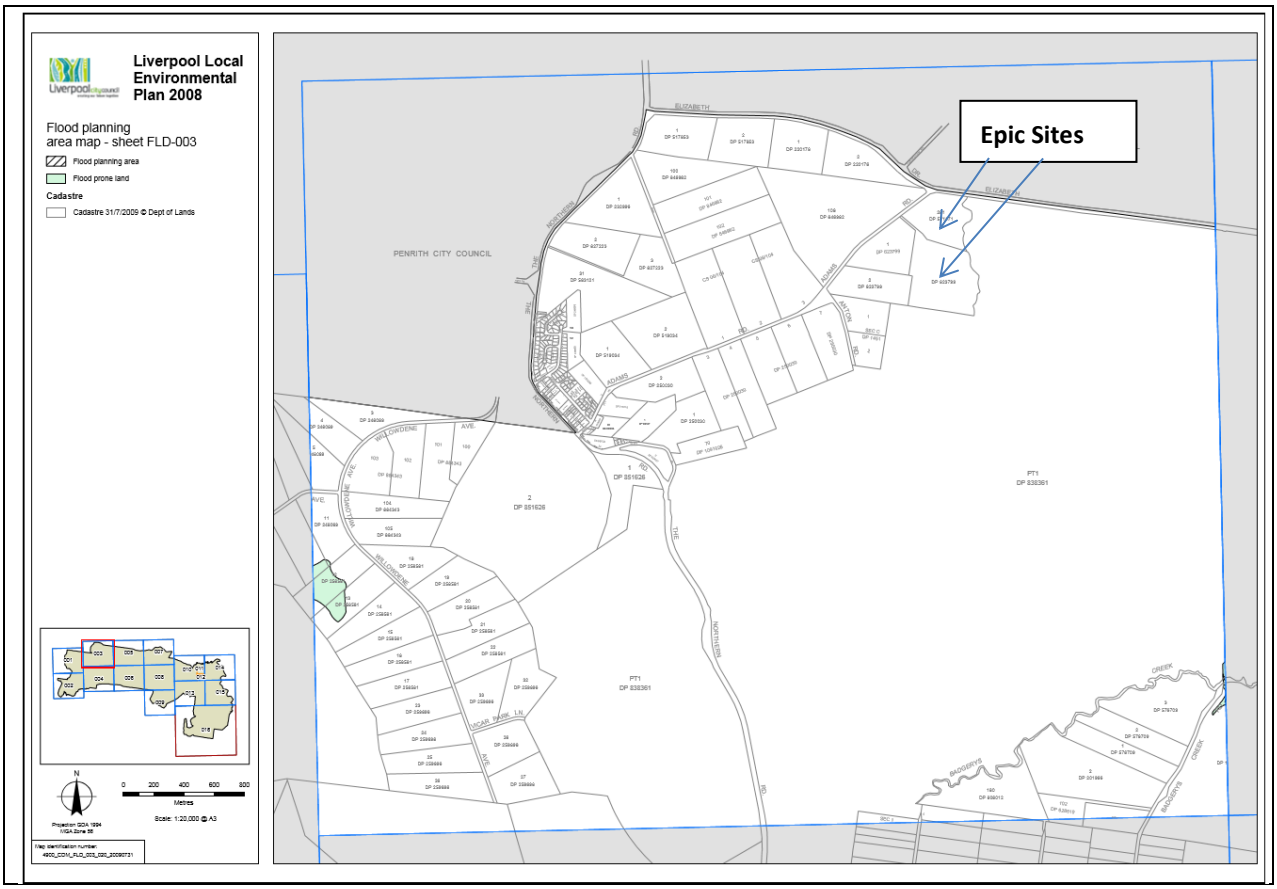
The water level in Oaky Creek has never reached the high bank marks in the last 5-6 years that the applicant and its predecessors occupied the site adjacent to it,

2. The topography of the proposed location for stockpiling will make it impossible for the water level of Oaky Creek to cause any flooding especially with the 4.5 m high earth mounds proposed to be constructed along the 40 m wide Vegetated Riparian Zone,
3. The topography of the proposed location for composting will make it impossible for the water level of Oaky Creek to cause any flooding since there is an existing 1.5 m high earth bund at the most downstream area of that site adjacent to the sediment pond which in turn is adjacent to Oaky Creek. (refer to **APPENDIX** F for more detailed drawings),
4. The surface water within the proposed stockpiling site will flow into three different surface water collection ponds that have more than adequate capacities to capture the surface water from the site's catchment,
5. Similarly, the surface water within the proposed composting area flows into a collection pond which is designed to capture water from the whole composting site catchment in accordance with current NSW guidelines.

Furthermore, following review of relevant flood management documents and maps at Liverpool City Council website, we drew the following conclusions:

- None of the areas occupied by the applicant or proposed to be occupied by the applicant are within any of the potentially flood prone zones,
- **Figure 6-7** shows that none of the applicant's sites are within or near any of the flood prone zones within Liverpool City Council area,
- The list of floodplain areas does not encroach on the areas occupied by the applicant or proposed to be occupied by the applicant.

**Figure 6-7: Liverpool LEP 2008 – Flood planning area map**




## 6.4 SEWERAGE DISPOSAL

Sewage is discharged from the Main Office & related amenities into a 3,000L septic holding tank. The septic tank is monitored visually as part of a monthly site inspection report and is pumped out by using approved licensed contractors when required.

No change is anticipated to sewerage use on-site as the proposed modifications will not increase the generation of septic waste.

## 6.5 CONCLUSION

The potential water quality and management impacts associated with the proposed modifications include an increase in the volume of on-site water storage, through future clay and shale extraction as well as an increase in the amount of water reused onsite. This is a direct result of the proposed modification works as the site would continue to operate with a "*Nil Water Discharge"* policy.

For the stockpiling activities within the approved area, all captured sediment laden water is diverted away from the stockpiles and captured within the extracted pit void. All sediments captured from this process will be blended with the extracted clay products and sold to the

brick manufacturing companies.

For the stockpiling activities within the proposed new site, all water will be diverted away from the stockpiles and Oaky Creek, and drained into the proposed sediment pond 5. All sediments removed from this pond will be blended with the extracted materials and sold to brick manufacturing companies.

For the composting activities within the applicant's approved site, all water will be diverted away from the composted materials and Oaky Creek, and drained into the proposed sediment pond 4. Since all materials received on site for the composting activities are pre-tested and comply with current NSW guidelines, it is not anticipated to have any contaminants above the limits specified in these guidelines. Hence, sediments removed from this pond will be blended with the composted materials.

The increased risk of sediment-laden runoff entering nearby waterways due to increased surface disturbance and increased duration of the existing quarrying activities at the site will be significantly reduced by the containment of water on-site.

In relation to the overall potential change in the quantity of surface water runoff being discharged to Oaky Creek, this is unlikely to change since the areas previously used for composting and stockpiling activities are very similar in size with the proposed areas.

Based on the above, it can be concluded that no additional or potential additional impact of surface water on the adjacent waterways or lands are likely to eventuate as a result of the modifications provided that the applicant complies fully with all recommended mitigations measures included above, and continues to implement a "*Nil Water Discharge"* policy and maintains all installed and proposed mitigation measures.

**Figure 6-6** shows a photo of Sediment Pond 1, **Figure 6-9** shows a photo of sediment Pond 2 and **Figure 6-10** shows three photos of Sediment Pond 3 during and after refurbishment in 2015.

Figure 6-11 shows the proposed stockpiling area with the surface water management plan and the riparian zone for that specific area.

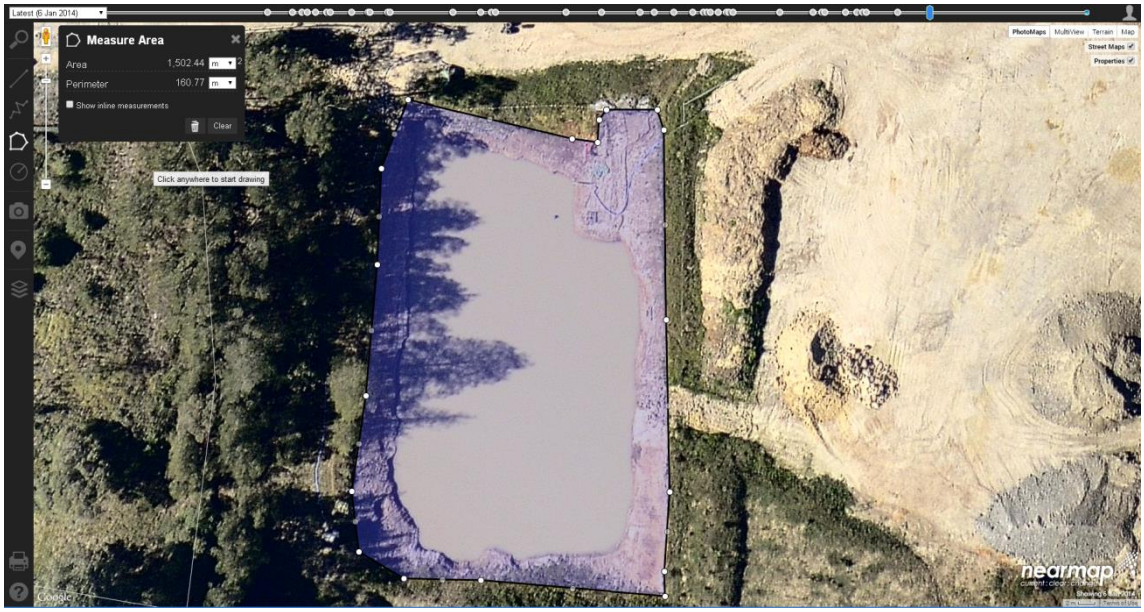
**Figure 6-8: Photo of Sediment Pond 1**

**Figure 6-9: Photo of Sediment Pond 2**

**Figure 6-10: Photos of Sediment Pond 3**

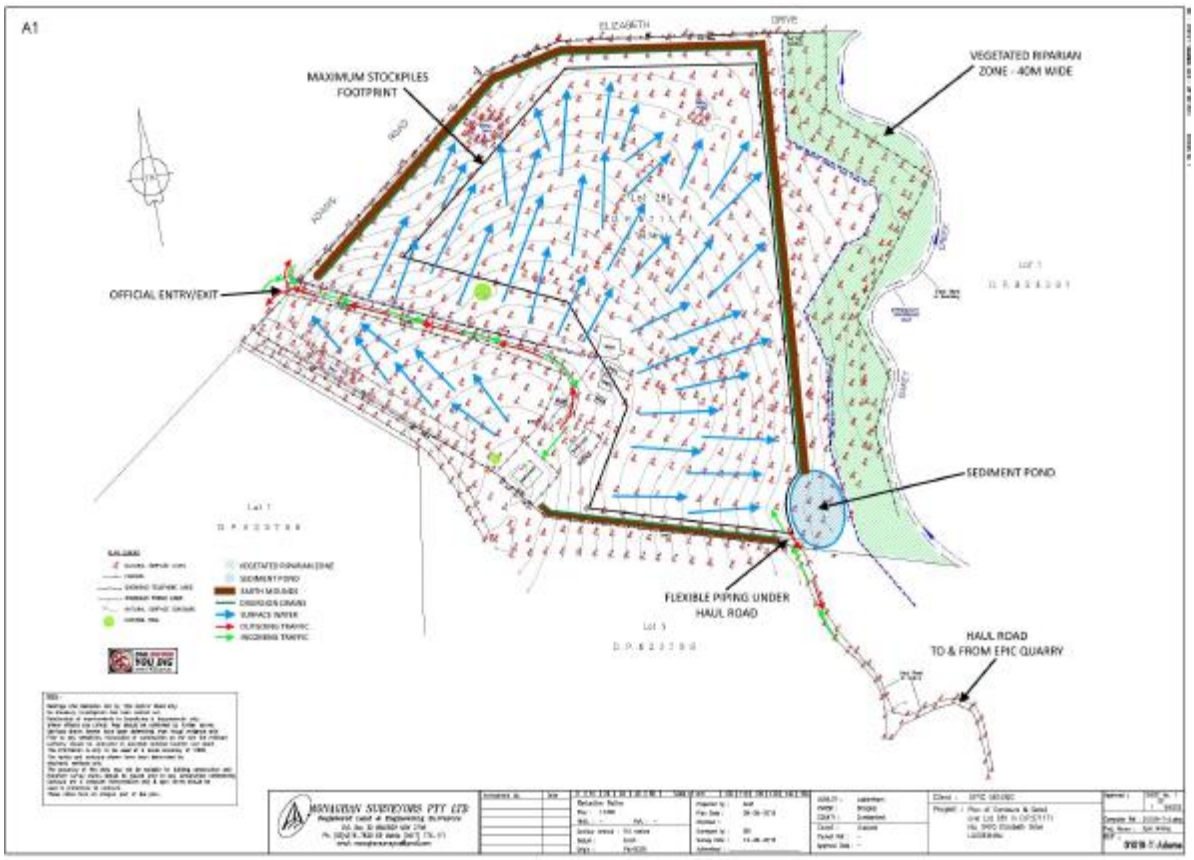
Sediment pond 3 – Near empty

Sediment Pond 3 being de-silted




Aerial view of Sediment Pond 3 after completion of de-silting and refurbishment

**Figure 6-11: Proposed Stockpiling Area with Riparian Zone and Surface Water Flow**



# 7. BIODIVERSITY (FLORA AND FAUNA)

The proposed modifications include the relocation of stockpiling and composting activities to two different sites from those previously used for these purposes. The stockpiling activities will be relocated to a new site (Lot 281 DP 571171) which is outside the boundaries of the previously approved site (Lot 3 DP 623799 and Lot 1 DP 838361) whilst the composting activities will be relocated to an area that is within the boundaries of the previously approved site.

Since all areas previously occupied by the applicant had been subjected to comprehensive Flora and Fauna Impact Assessments at different times of the development including the last modification (No 3), it was considered unwarranted to undertake further assessments of the same areas but rather focus on the proposed new site for the stockpiling activities.

Notwithstanding the above, it was considered appropriate to include some relevant information associated with the areas previously assessed to give the reviewer a better picture of the biodiversity within these areas.

Therefore, it was determined that it was appropriate to engage the services of qualified and experienced professional environmental consultants to undertake a Flora and Fauna Impact Assessment for the proposed stockpiling site since we were unaware of it being previously subjected to such an assessment.

It was noted that all previously recommended mitigation measures associated with the areas occupied by the applicant will continue to be implemented within these areas to ensure full compliance with current NSW guidelines. However, the mitigation measures previously recommended for the areas that fall within Western Sydney Airport (Commonwealth land) will not be maintained after these portions of land are handed over to the Commonwealth since the applicant will have no future access to these portions of land.

## 7.1 WITHIN THE APPROVED AREA

### 7.1.1 Background

A flora and fauna assessment was first undertaken by UBM Ecological Consultants Pty Ltd on 19 February 2009 prior to the issuing of the development consent by the Department.

This assessment was included in a report titled: "*Vegetation Management Plan for a Clay Shale Quarry, Adams Road, Luddenham*" which was prepared by UBM Ecological Consultants Pty Ltd on behalf of Blue Sky Mining Pty Limited and dated 19 February 2009 (VMP). This report was prepared to satisfy the requirements included in Condition No 34 of the Development Consent which required the preparation of a Site rehabilitation Plan in accordance with the rehabilitation guidelines of Sydney Regional Environmental Plan No 9 – Extractive Industry (No 2) – Planning Report. The Plan was required to incorporate a Vegetation Management Plan and hence the report was prepared by UBM.

The footprint of the temporary western stockpile area falls within the already approved quarry extraction footprint. Accordingly, no impacts to flora or fauna are likely to occur as a result of the western stockpile.

### 7.1.2 Identified Flora and Fauna within the Approved Area

The Vegetation Management Plan (VMP) referred to in the above Section was implemented immediately before the commencement of any works on site.

Planting along the Creek bed in accordance with the VMP was undertaken approximately five (5) years ago comprising of local native woodland shrubs and trees. The riparian zone is isolated and has restricted access via fencing and signage. ***The riparian zone will not be adversely affected by the proposed modification works.***

Based on previous studies conducted during the planning stages, it can be concluded that no identified rare or threatened fauna species required protection within the footprint of the approved quarry site.

### 7.1.3 Mitigation Measures Implemented

Current measures include spraying of weed species at least once every 3 months. Regular watering and maintenance of plants is also undertaken on-site on a regular basis. Details of mitigation measures are outlined in the VMP.

The proposed modifications will not alter or require modifications of these mitigation measures.

### 7.1.4 Watering

Currently the site draws water for vegetation through the use of a water truck (cart) and a network of pipes and sprinklers. Irrigation water is either drawn from the two sedimentation ponds (1 & 2) or from the main pit sump.

Watering of vegetation is conducted concurrently with the site's dust suppression management plan. There is enough water from surface water runoff and plenty of storage capacity to satisfy all requirements of the vegetation plan and the dust emission management plan.

As previously stated the site operates on a '*Nil Water Discharge"* policy.

In the very unlikely event that the site exhausts all water stored on-site. Water would be drawn from neighbouring ponds located on adjacent properties. So far, this has not occurred yet.

### 7.1.5 Potential Modification Impact

All requirements included in the Vegetation Management Plan (VMP) have been fully complied

with including the rehabilitation and revegetation of the native riparian vegetation on the western banks of Oaky Creek, site preparation, including weeding, ripping and soil remediation and the stand of Eucalypt Woodland on the western property boundary –a remnant of the State and Federally-listed Cumberland Plain Woodland Ecological Community.

***The proposed modification will have no impact on the requirements of the VMP.***

In addition, the existing timetable for the implementation of works was included in the Plan. A generic set of performance indicators and a basic monitoring program to assess the progress of the rehabilitation works were also provided. So far, the applicant has been in full compliance with the timetable.

### 7.1.6 Conclusions

The proposed modification will have no impact on the site's Flora and Fauna. The 40m riparian zone set back from Oaky Creek is not impacted by any works associated with the stockpiling activities as the temporary stockpiles are contained within the approved quarry footprint and these are located hundreds of metres away from the Riparian Zone. Similarly the proposed composting activities are well outside the Vegetated Riparian Zone and will be well managed to prevent any non-clean water from leaving that area as outlined in the Water Section.

## 7.2 WITHIN THE COMMONWEALTH LAND

A Flora and Fauna Statement was prepared by BioDesign and Associates in late 2014. This statement has been reproduced in this Section.

### 7.2.1 Background

This statement relates to the ecological values associated with the portion of land identified as Lot 1 DP 838361 which lies approximately 600 metres south of Elizabeth Drive on the eastern side of Oaky Creek, in the suburb of Badgerys Creek (the site). The southern section of this site is currently used for stockpiling of shale and clay material extracted by the applicant from its quarry which is located in the adjacent land (Lot 3 DP 623799) at Adams Road, Luddenham. The statement is based on site visits conducted on 2nd September 2013 by Wendy Wright (landscape architect/horticulturist) and by Susan Hobley (ecologist) on 1st October 2013. Weather conditions were fine during the first visit. During the second visit conditions were initially fine but later on they became windy and overcast during the inspection. Rain began to fall shortly after completion of the inspection.

Due to the time of the year (a few snakes were sighted by workers during the period covered and during the assessment a large red-bellied black snake was observed) and difficulties of accessing perimeter areas from the earth berms installed around the site, it was not possible to carry out a detailed survey of the vegetation in the creek corridor.

Nevertheless, the assessment was able to confirm the literature review findings with regard to the ecological community.

### 7.2.2 Site Overview

The site is located in the South Creek catchment of the Hawkesbury – Nepean River, due east of the settlement of Wallacia. It is roughly rectangular in shape and has a frontage to Oaky Creek to the west. Further to the west beyond Oaky Creek, the applicant is carrying out an extractive industry to mine clay and shale for brick making purposes.

The southern boundary of the site is fenced and adjoins land to the south that is cleared in a manner typical of pastoral uses. An artificial soil berm has been constructed along the full length of the site between the boundary fence and the areas containing the stockpiles and the sedimentation pond. To the east, the site adjoins a property that has been substantially cleared and contains a large agriculture shed close to the boundary in a pastoral/agricultural land – use setting. The land between the site and Elizabeth Drive to the north is similarly cleared and contains a residential dwelling in a rural setting. The site and the adjoining properties have been substantially or entirely cleared of native vegetation. Other than a few isolated specimens or small clumps of remnant trees, the only remnant vegetation consists of forbs, grasses, sedges and rushes amongst introduced grassland species and woody weed shrubs.

The site drains mainly to Oaky Creek, the south – eastern branch of Cosgrove Creek, a tributary of South Creek which flows into the Hawkesbury River. The riparian corridor of Oaky Creek contains the only intact, continuous stay of remnant vegetation within the surrounds of the site. The vegetation in the corridor between the applicant's extraction area and the subject site is being managed to control weeds and support regeneration of the native vegetation community. Practices include restorative plantings.

Access to the site is via a partly sealed, partly unsealed road that continues into the applicant's site to the west. The road separates the stockpiling areas of the site from Oaky Creek and gives access to the stockpiles and to a turning area/parking area suitable for large trucks in the south – western portion of the site. A large sedimentation pond is situated in the south western section of the site between the turning bay/parking area and Oaky Creek. A small landscape area near the midpoint of the north to south line of the road within the site contains a small, dense clump of semi–mature *Casuarina glauca* (swamp sheoak) specimens that have germinated from the Riparian zone. Seed–stock introduced into the area as part of the rehabilitation program and restoration activities (in accordance with the original approved rehabilitation plan).

In the perimeter areas of the site, a few swampy areas were noted, including a small former dam within the site itself.

### 7.2.3 Ecological Overview

The ecological values of the site are extremely low due to the absence of any canopy cover, shrub thickets or native vegetation, and its active use as a stockpiling facility. It would once

have been covered with woodland ecological communities associated with the Cumberland plain but the only remnants now occur along the edge of its creek frontage and in the few swampy places around the perimeter. Other vegetation across the site consists of herbaceous, graminaceous plants and weeds.

The preliminary ecological assessment involved a "walk–over" to determine whether any detailed surveys or studies were required. In view of the highly disturbed and degraded ecological context of the property, the condition of the site itself, the proposed extent of site usage, and the existing mitigation measures in place to protect and manage the Riparian corridor of Oaky Creek, no further comprehensive flora or fauna survey was deemed necessary. A literature search was, however, carried out to establish the ecological context of the site (geology, soils and vegetation) as the basis for future landscape management.

The site is mapped within a Blacktown soil landscape A and a South Creek fluvial soil landscape (Hazelton et al, 1989). The stockpile site stands on mapped Blacktown soils and the Riparian Zone along Oaky Creek is mapped as South Creek – fluvial soils.

According to JOZER (2003), the most likely ecological communities associated with the site would be Riparian woodland (map unit 5) (along Oaky Creek) and shale plain woodland (map unit 10) (in the area now containing the stockpiles and associated infrastructure) of the Cumberland Plain vegetation communities. Riparian woodland occurs within the creek lines and adjacent swampy areas draining Wianamatta shale soils. The dominant tree species include Casuarina glauca, Eucalyptus amplifolia and Melaleuca styphelioides. The shrub stratum is not present, however the ground stratum would be dense including Alternanthera denticulata, Carex appressa, Persicaria decipiens and Juncus usitatus. Dominant tree species in the shale plain woodland community include Eucalyptus molluccami,E. tereti cornis with E. crebra, E. eugenioides and Corymbia maculata occurring less frequently. The shrub stratum is dominated by BursariasSpinosa and the ground cover species include Dichondra repens, Aristida vagans, Microlaena stipoeides, Themeda austalis and other herbs and grasses.

The more detailed site assessment revealed that the perimeter areas of the site to the north, east and south, including the earth berm along the southern boundary, contain invasive species of exotic grasses, forbs and small shrubs. In the few swampy areas (south east of the sedimentation pond and in the vicinity of the former dam), two indigenous wetland species were found: Juncus usitatus (common sedge) and Persicaria decipiens (slender Knot Weed). The Riparian corridor contains a dominant over storey of Casuarina Glauca (Swamp Sheoak) with scattered specimens of Melaleuca stypholliоides (Prickly Paper Bark). Bursaria spinosa (Thorn Bush) was surveyed in the under storey shrub layer where solar access was high. Cynodon dactylodon (Couch Grass) was surveyed on a section of the berm in the north eastern section of the site and the presence of what appeared to be Microlaena stipoides (Weeping Grass) was noted in the inaccessible lower areas below the southern edge of the earth berm.

### 7.2.4 Recommendations

1. The Vegetated Riparian Zone along the creek frontage should continue to be maintained as an exclusion zone where no activities associated with the site's stockpile uses are

permitted. Vegetation management should be carried out to control weeds and support the Cumberland Plain Riparian woodland ecological community in the Vegetated Riparian Zone.

2. The site should be managed to minimise soil erosion and sediment–laden runoff into Oaky Creek. Due to the proposed future establishment of an airport, the feasibility of re–establishing shale plain woodland around the perimeter of the site is unknown. Large scale tree plantings in this area are unlikely to be acceptable if Western Sydney Airport is constructed. Nevertheless, a reasonable goal would be to control weeds and establish native grasses and forbs in these areas. While the site is actively being used for stockpiling associated with an extractive industry, a revegetation program is not practical. When extraction ceases and the area is decommissioned, the ecological improvement of the site should form part of the remediation strategy. Species selection for any future plantings on the site should be based on the proposed location (Riparian corridor or shale plain) and the ecological communities associated with them (Cumberland Plain Riparian Woodland or shale plain woodland).

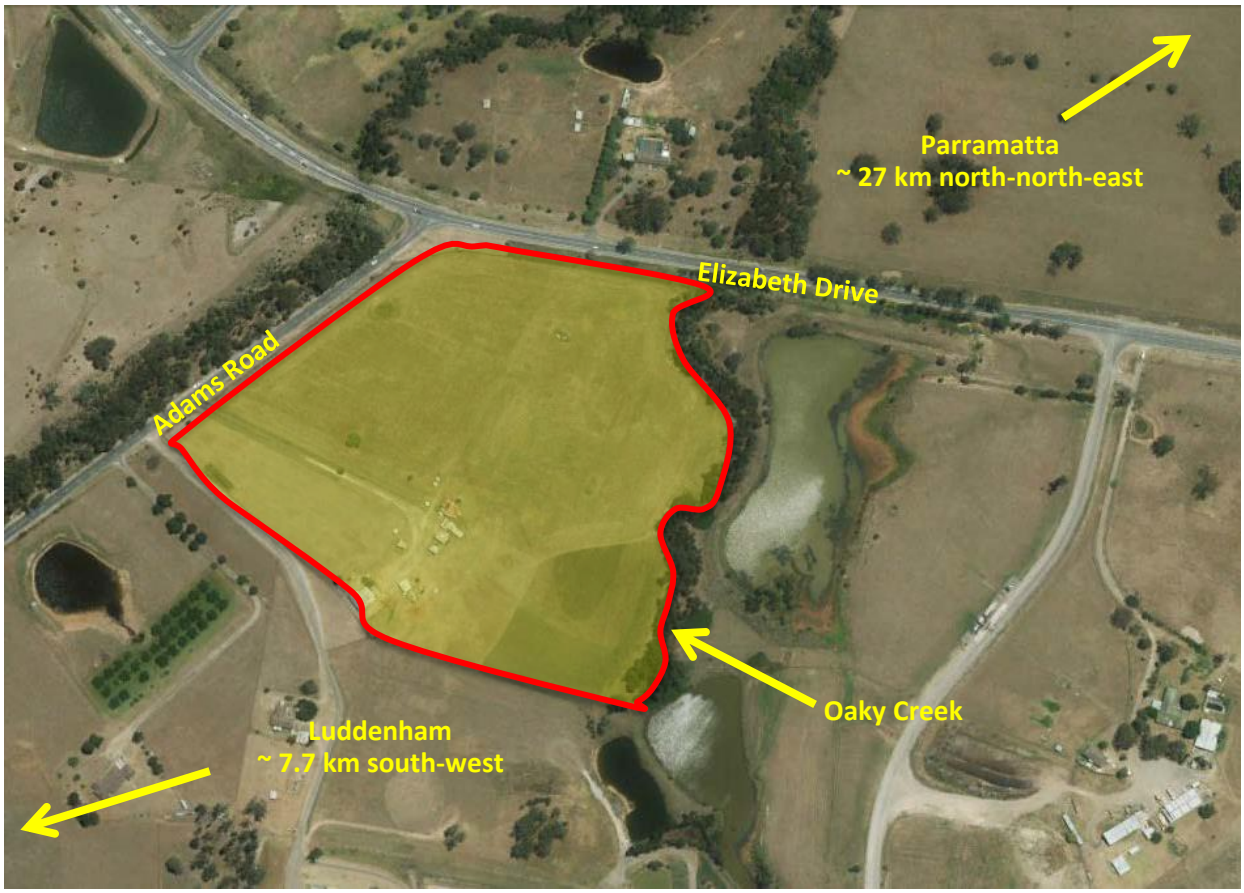
## 7.3 WITHIN THE PROPOSED STOCKPILING SITE

### 7.3.1 General

A comprehensive Flora and Fauna investigation (survey and assessment) was undertaken by Lesryk Environmental Pty Ltd in March 2016. A copy of the full assessment report is included in **APPENDIX I**. It is noted that Figure 1 of the Lesryk report was hand-marked incorrectly and it did not reflect the study area which was subjected to the field investigation. Lesryk has confirmed in writing that the study area included the whole site and submitted another amended figure which is now presented as **Figure 7-1** below. Furthermore, during the field investigation Nicolas Israel, Director of NICS and Sam Tarabori, the applicant's Operations Manager were present and confirm that the field investigation included the whole site including the areas near the existing dwelling and old sheds as well as the southern and south eastern portion of that land.

The assessment of possible impacts associated with the proposed stockpiling activities of the former farming area was based on a field investigation of the subject site, a literature review of previous studies undertaken in both the region and this portion of the Liverpool City Council LGA, the consultation of standard databases and a consideration of the objectives of the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act), NSW *Environmental Planning and Assessment Act 1979 (*EPA Act), NSW *National Parks and Wildlife Act 1974 (*NPW Act) and NSW *Threatened Species Conservation Act 1995/Amendment 2002* (TSC Act), and any relevant SEPP.

**Figure 7-1: Study Area included in Lesryk's Field Investigation**




### 7.3.2 Conclusion

By the completion of the field investigation, no ecological communities, flora or fauna species, or populations listed under the EPBC or TSC Acts were recorded. Similarly, none would be reliant upon the subject site for any of their necessary nesting, roosting, or foraging requirements. As such, no assessments using the criteria provided under the EPBC Act (i.e. Significant Impact Guidelines) or Part 1, Section 5A of the EPA Act were carried out.

Referral of the matter to the Federal Minister for the Environment for further consideration or approval in relation to the proposed work would not be necessary; nor would the preparation of an SIS to further assess the scope of work proposed be required.

By the completion of the field investigation, no limitations to the proposal proceeding as planned were identified. Adoption of those mitigation measures provided would ensure that the works proposed are carried out in an ecologically sustainable manner.

### 7.3.3 Recommendations

Based on the principles of Ecologically Sustainable Development, as identified in Schedule 2 of the Environmental Planning and Assessment Regulation, the following recommendations are provided:

- Install erosion, sediment and water quality controls to prevent any surface runoff entering Oaky Creek.

- Newly exposed surfaces should be stabilised as soon as possible in order to reduce the potential for soil erosion. This should be done through the planting of native species endemic to the study area or non-invasive grasses.

- Any shrub or tree plantings to be undertaken as part of landscaping works should include a suite of native plants endemic to the study locality.

- The riparian buffer that is to be retained between the vegetation that lines Oaky Creek and the proposed stockpile site should be clearly marked on site by way of fencing and on any site plan that is to be produced. This area should be a no-go zone and all works personnel must be made aware of it.

- If the stockpiles are to be retained in-situ for an extended period of time, they should be sown with grass to reduce the potential for dust and sediment runoff.

**Appendix 1.** Photographic record of the study area

**Plate 1.** Character of the exotic grassland present in the subject site.

**Plate 2.** Character of the Casuarina woodland that lines Oaky Creek.

# 8. CULTURAL HERITAGE

## 8.1 BACKGROUND

As previously advised the applicant has requested that a Due Diligence heritage assessment be undertaken for the proposed stockpiling site at 285 Adams Road, Luddenham. The Due Diligence Assessment is focussed on the surface impacts associated with the proposed stockpiling activities at the above site.

A comprehensive review of the landscape disturbance levels within the site and the location of previously recorded Aboriginal items/sites in the vicinity of the site as outlined in this section, demonstrated that the application of the National Parks and Wildlife Regulation 2009 and the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (Due Diligence Code – DECCW 2010) was the most appropriate pathway for the assessment of Aboriginal heritage issues associated with the proposed stockpiling site.

## 8.2 WITHIN THE APPROVED AREA

Despite the fact that the approved sites have been previously assessed on several occasions during the preparation of the original EIS for the Luddenham Quarry and the comprehensive assessments undertaken, on more than one occasion as part of the environmental and heritage assessments, for the construction and operation of the Western Sydney Airport, it was considered appropriate to include relevant information for completeness purposes only.

### 8.2.1 Existing Approved Site

Two archaeological assessments were carried out as part of the original EIS. An area of Aboriginal cultural significance was identified within the Vegetated Riparian Zone on the western side of Oaky Creek. A suitable development consent condition was framed requiring the fencing of the area so as to prevent vehicle access, stormwater or other discharges to be directed across the site. This area of Aboriginal cultural significance is distant from the proposed stockpiling and composting activities. Hence, this area will not be affected by the proposed modification.

A search of the NSW State Heritage Register concluded that there were no other Heritage listed sites within the vicinity of the subject site under the NSW Heritage Act. The site itself is not listed as being a heritage item or containing heritage items under the Liverpool Local Environmental Plan (LLEP) 2008.

### 8.2.2 Mitigation Measures Implemented

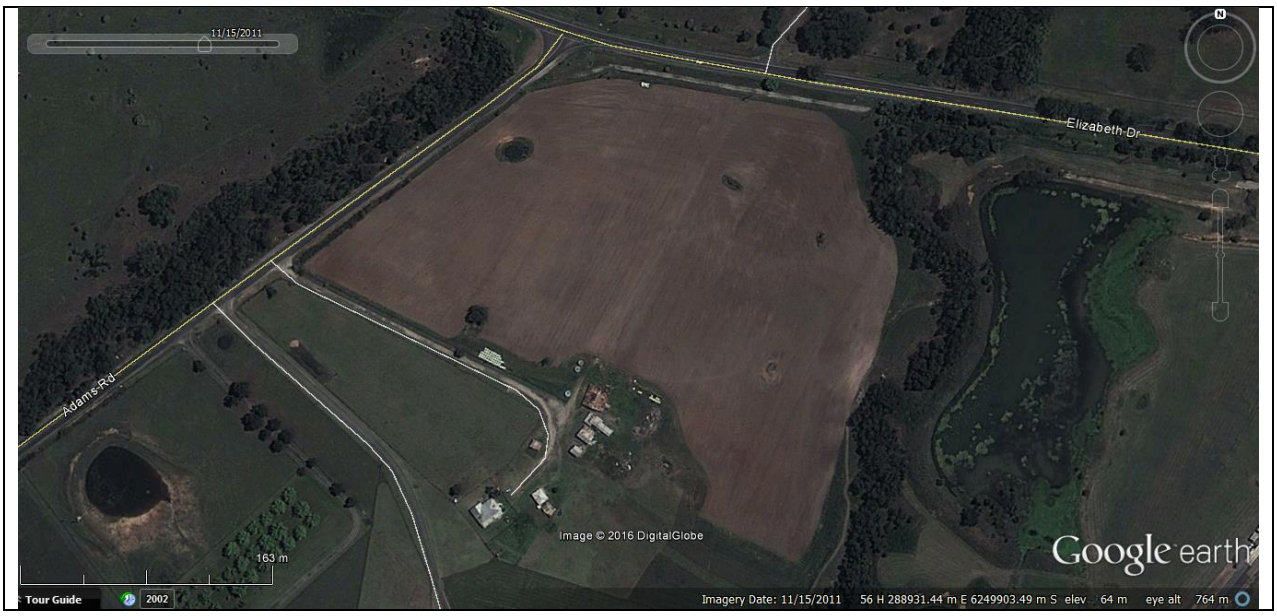
All relevant stormwater management and drainage strategies have been implemented on the approved site to prevent any interference with the area identified as being of Aboriginal cultural heritage significance. This area has been fenced off and locked to prevent unauthorised access by employees, visitors, contractors or strangers. Only authorised employees and Aboriginal people are allowed to enter this area.

## 8.3 WITHIN THE PROPOSED STOCKPILING AND COMPOSTING SITES

Despite the fact the proposed composting site, which is part of the applicant approved area, was subjected to a comprehensive environmental and heritage assessment as part of the original EIS, it was considered appropriate to include some information for completeness.

In relation to the proposed stockpiling site, the site is extremely disturbed and has been used for cropping and grazing for over 50 years in addition to the dairy that was used for a similar period and for residential purposes as well for an even longer period. Based on the previous landlord and tenants, the whole site except where the dwellings and sheds are located was excavated on hundreds of occasions. The latest excavation was undertaken in 2011. This is confirmed in an aerial view dated 15 November 2011 (**Figure 8-1)**. Despite the above, we have undertaken some heritage assessment using available databases, field surveys/inspections and previous assessments undertaken for the area. We have also attempted on more than one occasion to engage in formal consultation with relevant parties including the NSW Aboriginal Land Council and the Deerubbin Local Aboriginal Council as outlined in this Section.

**Figure 8-1: Aerial View of the Proposed Stockpiling Site dated 15 November 2011**




The aerial view in **Figure 8-1** and several other historical aerial views demonstrate that the area proposed for stockpiling activities has been significantly modified such that should Aboriginal sites have existed there in the past, they would no longer remain extant.

### 8.3.1 Existing Environment

Both the proposed stockpiling and composting sites are vacant land with grassed areas and a few trees except for the proposed stockpiling site where some dwellings and old sheds were constructed mainly as part of the dairy which was established tens of years ago and was fully operational until recent years. A comprehensive inspection by experienced environmental consultants (total experience is over 50 years) undertaken on 10 February 2016 could not find

or identify any places or objects that might contain any Aboriginal or Archaeological artefacts. Furthermore, based on the review of the Liverpool Local Environmental Plan 2008, there appears to be no Aboriginal or Archaeological Sites or items of Aboriginal heritage found or identified within the boundaries of the proposed stockpiling and composting sites. In any case, the stockpiling will be conducted within an area where previous dwellings and sheds had been erected in addition to a dairy which was well established on that parcel of land and operating for nearly 50 years in addition to some cropping and grazing for over 50 years. This site is considered to be very disturbed and unlikely to have any place or object of Aboriginal cultural or archaeological value.

Furthermore, based on the recent Flora and Fauna assessment by highly qualified and experienced professional scientists including a comprehensive inspection of the whole site, they indicated that the site appears to be very disturbed. Lesryk stated: *"The subject site exhibits a history of agricultural practices (including dairy farming). Due to the undertaking of these practices, the area proposed to be used for the stockpiling of material has been cleared, contoured and sown with exotic pasture grasses. As would be expected for such a highly disturbed and modified rural site, few native species were recorded*". Refer to the complete Flora and Fauna assessment report included in **APPENDIX I**.

The proposed composting site is part of the approved site which was previously subjected to comprehensive heritage assessments as mentioned above.

It was also considered appropriate to review whether there are any Heritage-related issues associated with adjacent sites that are in Liverpool Local Government area. Based on Schedule 5 – Part 1 Heritage items of Liverpool Local Environmental Plan 2008 (Liverpool LEP) titled *"Environmental Heritage*"; it is clearly evident that there are no sites or objects of heritage values found or identified within or adjacent to the site.

Based on the same Schedule the closest such sites, which all are of local significance, are listed below in **Table 8-1**. These sites are however located between 2 and 5 km from the closest boundary of the proposed site.

**Table 8-1: Heritage Listed Items Located Between 2-5 km Radius of the Site within the Liverpool LGA**

| Item No | Item Name | Address | Property Description | Significance |
|---|---|---|---|---|
| 2 | St John's Anglican Church Group, including church and cemetery | Pitt Street, Badgerys Creek | Part Lot 1, DP 838361 | Local |
| 3 | Badgerys Creek Public School | Corner of Pitt Street and Badgerys Creek Road | Part Lot 1, DP 838361 | Local |
| 5 | Former OTC Site Group, including radio receiving station and site of former staff housing | Badgerys Creek Road, Bringelly | Lot 1, DP 109666 | Local |
| 6 | Dwelling and rural lot ("Mount Pleasant") | 3 Shannon Road, Bringelly | Lot 44, DP 581187 | Local |

| | | | | |
|---|---|---|---|---|
| 50 | Willmington Reserve | 17 Jamison Street, Luddenham | Lot 7004, DP 93052 | Local |
| 51 | Vicary's Winery Group including woolshed, slab horse shed, land area, main house and garden | The Northern Road, Luddenham | Part Lot 1, DP 838361 | Local |
| 52 | Luddenham Public School | The Northern Road, Luddenham | Lot 1, DP 194409 | Local |
| 53 | Lawson's Inn site (former "The Thristle" site) | 2155 The Northern Road, Luddenham | Lots 1 and 2, DP 851626 | Local |

In addition to reviewing Liverpool LEP 2008, it was also considered appropriate to review whether there are any Heritage-related (European or Aboriginal) issues associated with nearby sites that are in the Penrith Local Government area.

Based on Schedule 5 – Part 1 Heritage items of Penrith Local Environmental Plan 2010 (PLEP) titled *"Environmental Heritage*"; it is clearly evident that there are no sites or objects of heritage values found or identified adjacent to the site. Based on the same Schedule the closest such sites, which all are of local significance, are listed below in **Table 8-2**. These sites are located between 1.6 and 5 km from the closest boundary of the proposed site.

**Table 8-2: Heritage Listed Items Located Between 1.6-5 km Radius of the Site within the Penrith LGA**

| Item No | Item Name | Address | Property Description | Significance |
|---|---|---|---|---|
| 832 | The Fleurs Radio Telescope site | 885(a) Mamre Road, Kemps Creek | Lot 21, DP 258414 | Local |
| 857 | McGarvie-Smith Farm | 1793-1951 Elizabeth Drive, Badgerys Creek | Lot 63, DP 1087838 | Local |

In addition to the above findings, the whole area (including the proposed stockpiling and composting sites) was subjected to several rigorous and comprehensive studies associated with the proposed Western Sydney Airport at Badgerys Creek. These studies confirmed that no Aboriginal or European items of heritage significance were found or identified within the proposed stockpiling site but rather on the opposite (eastern) side of Oaky Creek, within the Commonwealth land.

Notwithstanding the above, on 14 February 2016 we undertook a new search through the Aboriginal Heritage Information Management System (AHIMS) to confirm previous findings. The results are included below for an area with a buffer of 50 m. The search has revealed the following: "*2 Aboriginal sites are recorded in or near the above location*" and
"*0 Aboriginal places have been declared in or near the above location*".

Further searches revealed that these two (2) identified sites are located on the eastern side of Oaky Creek within the Commonwealth land which is part of the Western Sydney Airport footprint as outlined below. **Figure 8-3** includes the results of the AHIMS search undertaken on 14 February 2016.

We have reviewed the latest Aboriginal and European heritage assessments undertaken by GHD for the Commonwealth land proposed for the Western Sydney Airport. These assessments were undertaken in 2015. Based on these assessments, it is confirmed that the two (2) identified sites of being of Aboriginal heritage values are located on the eastern side of Oaky Creek within the Commonwealth land as shown in the attached map (**Figure 8-2**). These two (2) sites are No B94 and B95 in addition to the previously identified site within the Vegetated Riparian Zone which is within the applicant's approved site, as previously stated.

**Figure 8-2: Map of Aboriginal and European Heritage Sites in the Vicinity of the Proposed Stockpiling Site**

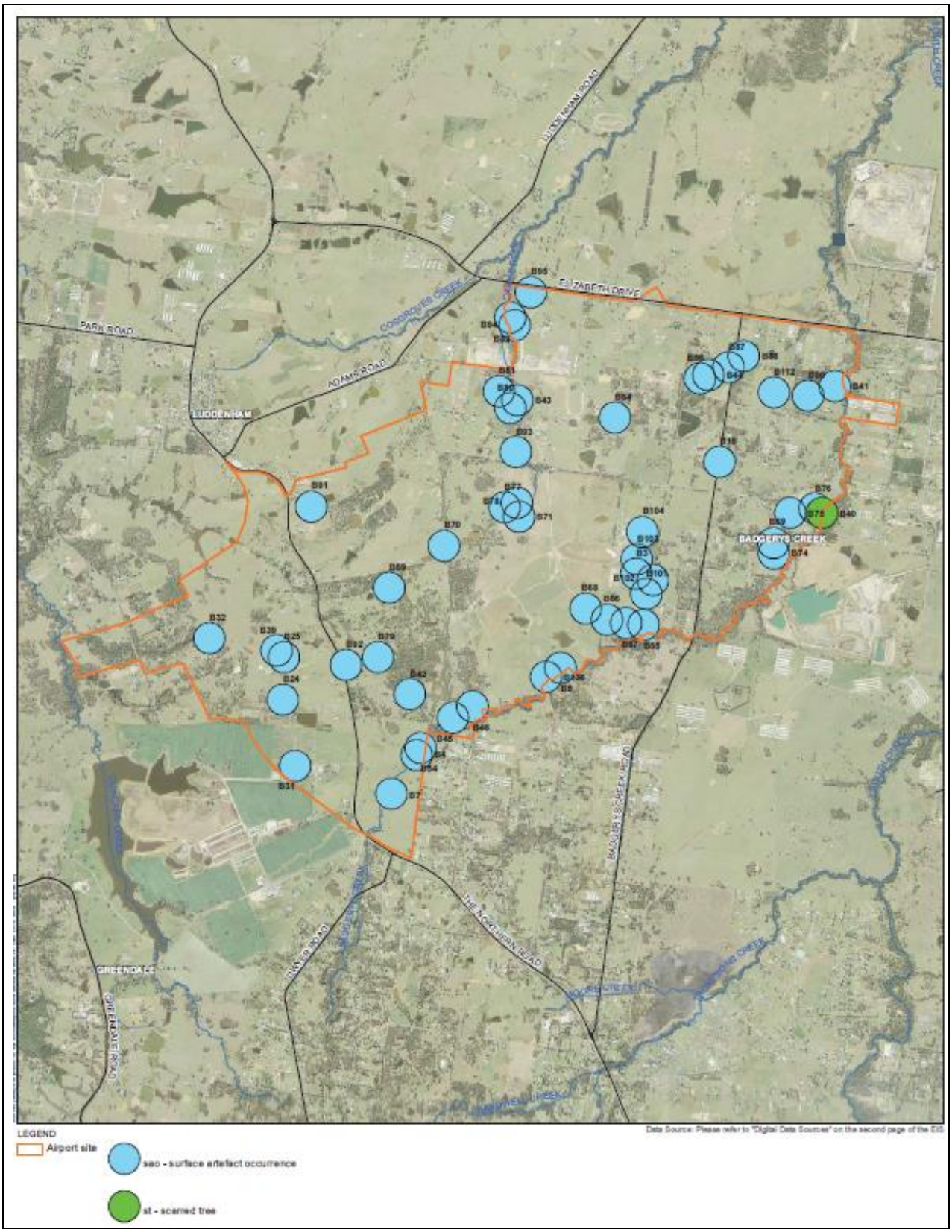


**Figure 8-3: Results of the AHIMS search conducted on 14 February 2016**

Office of Environment & Heritage
NSW GOVERNMENT

**AHIMS Web Services (AWS)**
**Search Result**

Purchase Order/Reference : 2470 Elizabeth Dr 2
Client Service ID : 211521

Nicolas Israel
63 Johnson Avenue
Seven Hills New South Wales 2147
Attention: Nicolas Israel
Email: 20nicolas15@gmail.com

Date: 14 February 2016

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 281, DP:DP571171 with a Buffer of 50 meters, conducted by Nicolas Israel on 14 February 2016.

**The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.**

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

| | |
|---|---|
| 2 | Aboriginal sites are recorded in or near the above location. |
| 0 | Aboriginal places have been declared in or near the above location. * |

## 8.3.2 Mitigation Measures Implemented

Since no items of heritage significance were identified in the proposed stockpiling site, no mitigation measures have been implemented and none are required.

### 8.3.3 Proposed Mitigation Measures

No impact on the Aboriginal cultural significance area previously identified within the Riparian Zone due to its considerable distance from the proposed stockpiling and composting sites**.** In addition existing and future surface water is and will continue to be directed via a formal system away from the Aboriginal cultural significance area.

For the same reasons outlined above, no mitigation measures are proposed for the proposed stockpiling and composting sites. We believe that it is sufficient to continue implementing appropriate surface water management and drainage strategies. No additional mitigation measures are required due to the proposed modifications.

## 8.4 FURTHER ACTIONS TAKEN BY THE APPLICANT

Despite the above conclusion and as part of its due diligence assessment, the applicant requested that communications be established with relevant Government Departments to seek further advice on the matter. Discussions with staff from the Office of Environment and Heritage (OEH) in February 2016 revealed that the Aboriginal Land Council be approached to seek their views about the site. The NSW Aboriginal Land Council was called on three (3) occasions and we were referred to the Local Aboriginal Land Council based in Penrith and called the "***Deerubbin Local Aboriginal Land Council***". We have communicated with the Deerubbin Local Aboriginal Land Council on several occasions verbally and in writing but no feedback or comments were received despite the fact that our communication commenced in mid-February 2016 and ended in August 2016. Refer to **APPENDIX N** for a copy of the last letter sent to the Deerubbin Local Aboriginal Land Council on 2 August 2016. This letter provides a summary of the communications with the Aboriginal Land Councils.

## 8.5 CONCLUSION

Based on the review undertaken above, the application of the NPW Regulation 2009 and the Due Diligence Code (DECCW 2010), the impacts from the stockpiling activities has been assessed as unlikely to pose a threat to any Aboriginal heritage sites or objects since none was identified within the proposed stockpiling site. In addition, due to the high level of surface disturbance across the whole proposed development area of the site and the fact that the site had been the subject of several developments including rural residential, dairy, cropping and grazing. Furthermore, Liverpool City Council granted a Development Consent for the landlord in March 2016 to demolish an existing dwelling and 5 old sheds and construct a large rural shed on the site. Liverpool Council did not raise any issues associated with Cultural Heritage values as part of this Development Application process.

In conclusion, there are no identified sites or objects of heritage values within the proposed locations of the stockpiling or composting activities. The proposed activities will not have any

impact on the sites identified of being of heritage values outside the boundaries of the proposed locations due to the distance, local topography and riparian zones (buffer zones) that will be maintained by the applicant.

In the event that Aboriginal artefacts are located within the development area, all works in that area should cease immediately and the NSW Office of Environment and Heritage should be notified seeking advice on the way to proceed.

# 9. NOISE IMPACT ASSESSMENT

## 9.1 BACKGROUND

A Noise Management Plan prepared by Golder & Associates, dated December 2009 (Report Number 087623124 001 R Rev2), has been established and implemented for the project. This Noise Management Plan was submitted to the Department of Planning and the EPA in order to meet the requirements of the Development Consent and the Environment Protection Licence (EPL). Following the recently approved Consent modification (No 3), the Department has also approved the stockpiling activities and composting activities based on comprehensive environmental impact assessments for both these activities. In addition to the noise assessment for the composting activities, which is included in the composting section of this EAR, it was considered appropriate to include a noise assessment based on all activities undertaken on site which are the same in all aspects except the change in locations for the stockpiling and composting. The methodology used in the previous assessment, which was accepted by both the Department and the EPA, will be used in this assessment as well.

The general approach for this assessment is based on the following facts:

1. A comprehensive noise impact assessment was undertaken in 2011 by an independent highly qualified acoustic consultant. The noise assessment included all activities undertaken on site including stockpiling and composting,
2. There are no changes to any of the approved activities including stockpiling and composting,
3. Based on the last 20 rounds of noise testing over a 5-year period, the applicant has always complied with the noise criterion specified by the Department,
4. There are only two (2) potentially sensitive receivers.

As previously stated, Epic has continuously complied with the noise criteria specified in the Consent and EPL at all nominated noise monitoring points. Since we supplied the Department with all the up to date noise data in the previous EAR (modification No 3), we provide in this Section the noise testing results for the three (3) previous years (2013, 2014 and 2015). These results will be used as part of our methodology to assist the Department to better understand that since all Epic activities remain the same, the potential minimal impact on any sensitive receiver will not be different for the new proposed locations. On the contrary, with implantation of the recommended mitigation measures, the applicant will comply more easily and comfortably with the noise criterion specified by the Department.

### 9.1.1 Existing Noise Sources

All existing noise sources will continue to have a noise contribution at different levels and depending on the activities conducted at these times will have different impacts. Based on the latest noise assessments, the noise sources outside the boundaries of the site appear to be making a greater contribution since the EIS was produced in 2003 but have been steady in 2015 with a slight increase in 2016 due to the demolition and excavation works undertaken by the Commonwealth on the adjacent land. Examples of external noise sources were identified as

being heavy vehicles traffic on Elizabeth Drive, flight training exercises of light aircrafts in the air space above the quarry and the use of neighbouring land as a dirt bike track. This has the potential of increasing the background noise levels that the initial EIS did not take into consideration. In this regard, consideration should be given to the review of the current background level in the area and the re-establishment of a new and more realistic project-specific noise level which would be based on the current activities in the area including the proposed construction and future operation of Western Sydney Airport which has already started to be built.

Noise sources within the boundaries of the site remain totally the same.

### 9.1.2 Potential Impacts

The noise from the stockpiling activities at the proposed location may have the potential to slightly increase the potential noise impact on two residences as shown in **Figure 9-2**. At the same time, all potential noise impacts on all other sensitive receptors previously identified either during the preparation of the EIS or the last modification application (No 3) will be reduced to be insignificant. In any case, we believe that by implementing the appropriate noise mitigation measures on-site by the applicant, the potential noise impact on those two potentially sensitive receptors will be reduced to be insignificant. Hence, it is strongly recommended that these mitigation measures are fully implemented to ensure that any increase in noise levels does not cause any exceedances of the specified noise criterion but rather they remain within the acceptable criteria at the receptors' premises. It should be noted that the Northern residence is located north of Elizabeth Drive and based on the results of noise testing recently undertaken and presented in **Table 9-4**, this residence is already experiencing very high noise levels due to the very heavy vehicle movements on Elizabeth Drive.

All noise monitoring required in accordance with the Development Consent and the EPL was undertaken by appropriately qualified and very experienced Acoustic Consultants to ensure that the monitoring complies with all statutory requirements, Australian Standards and NSW Government policies and guidelines.

### 9.1.3 Existing and Continued Mitigation Measures

The applicant continued to apply all recommended noise mitigation measures on site in accordance with the EIS, follow-up noise surveys conducted by Golder & Associates, SLR Environmental, Global Acoustics and other highly qualified environmental consultants.

The applicant achieves the criteria by applying all feasible and reasonable mitigation measures requested by government authorities and as required by the relevant NSW guidelines including the construction of earth bunds (noise barriers) and the regular service/maintenance of all vehicles/plant/equipment used on-site including those used in the excavation and stockpiling activities to ensure that sound power levels of these items is not altered or increased due to wear and tear issues.

All implemented noise mitigation measures have been extremely successful and this is evident

by the fact that:

- So far neither the company nor the authorities have received any noise-related complaints associated with the activities carried out on-site; and
- All measurements results conducted so far have shown that the levels of noise emanating from the activities conducted on site including stockpiling and composting is in compliance with the noise criteria specified in the Development consent and the EPL.

### 9.1.4 Modification Impact

SLR Consulting Australia Pty Ltd (SLR Consulting) has undertaken comprehensive noise monitoring since the activities commenced on-site in January 2011. The noise monitoring including computer modelling simulating the activities conducted on-site. The modelling included most probable operating combinations of noise sources (plant and equipment) to ensure that worst case scenarios were taken into consideration especially for stockpiling activities which are the subject of this modification application. The project computer noise model was prepared using Renzo Tonin & Associates Software's Environmental Noise Model (ENM) for Windows, Version 3.06), a commercial software system developed in conjunction with NSW EPA. The acoustical algorithms utilised by this software have been endorsed by the EPA and all State Environmental Authorities throughout Australia as representing one of the most appropriate predictive methodologies currently available.

It should be noted that the regular noise testing has been undertaken by Global Acoustics of Newcastle for the last three (3-4) years.

We understand that the project-specific noise level was determined to be 41 dBA $L_{Aeq(15min)}$, however, the *Industrial Noise Policy (INP)* provides recommended $L_{Aeq}$ noise levels from industrial noise sources in *"table 2.1-amenity criteria"*. For residential receptors in rural areas, the recommended acceptable $L_{Aeq}$ noise level is 50 dBA and the recommended maximum $L_{Aeq}$ noise level is 55 dBA.

Hence, based on the same table, the noise levels determined for all receivers and for all scenarios are well below the recommended acceptable criteria of 50 dBA $L_{Aeq}$ and that for most modelled scenarios the noise levels comply with the 41 dB(A) $L_{Aeq(15min)}$ criterion.

Following the review of noise monitoring results for the first four rounds of monitoring, the applicant, the EPA and the acoustic consultants have agreed that the potential of noise impact on residential receptors as a result of the introduction of the stockpiling activities was minimal.

Recent noise monitoring has indicated that the surrounding land and air activities contribute a higher noise background level than the 41 dB(A) $L_{Aeq(15min)}$ noise criterion set for the site.

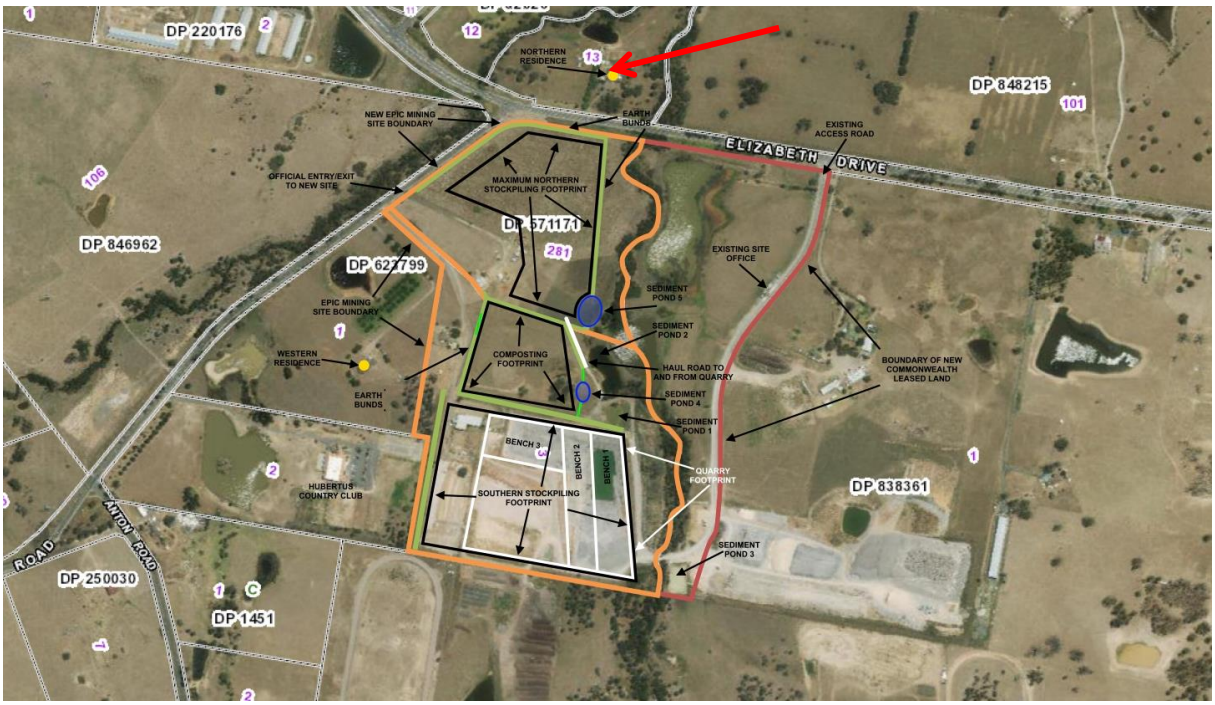
### 9.1.5 Potential Additional Noise Sensitive Receivers

The proposed modification to the applicant's activities by relocating the stockpiling and composting activities may have the potential to require modification to the anticipated noise emissions at surrounding representative receptors.

No additional residential properties have been constructed nearby since the quarrying, stockpiling and composting activities have commenced on site. On the contrary, all residential dwellings previously located within the Commonwealth land south and east of the Epic's site have now been vacated and demolished as part of the site preparation for the construction of the Western Sydney Airport. However, with the stockpiling activities being relocated to a new proposed site, a new potentially sensitive receptor has been identified as shown in **Figure 9-1** below. The address is 2111 Elizabeth Drive, Luddenham. This residence was previously approached by the management of Epic as part of the initial community consultation process but showed no interest in Epic's activities at that time since they were too far away from the residence. Epic management will be approaching them again since the stockpiling activities will be undertaken on the southern side of Elizabeth Drive just on the opposite side of this residence.

Notwithstanding the above and to address potential noise impacts at sensitive receivers arising from the proposed relocations of stockpiling and composting activities, a noise assessment was undertaken as practically as possible in accordance with the EPA's Industrial Noise Policy (INP) and current best practices.

**Figure 9-1: Newly identified potentially sensitive receiver**



## 9.2 NOISE ASSESSMENT APPROACH

Following extensive consultations with stakeholders including government authorities and the proponent, it was determined that the best and most appropriate noise impact assessment approach should include the following steps:

- Consider the results of the Noise Impact Assessment undertaken by SLR in 2011 to confirm that for all possible scenarios the noise levels will comply with the pecified criterion of 41 dB(A) as $LAeq_{,(15min)}$
- Review all results of the regular noise monitoring conducted in the last three (3) full years (2013, 2014, 2015) for all activities including quarrying, stockpiling and composting, attended noise monitoring at the previously approved noise monitoring locations. A copy of these results is included in **APPENDIX H**,
- Analyse the results of these three years and obtain the highest $LAeq_{,(15min)}$ level for each monitoring point,
- Measure the distances from each monitoring point to the closest point of the approved composting and stockpiling locations,
- Conduct attended noise monitoring at all environmental monitoring points under normal operating conditions to confirm that the activities continue to comply with the criteria specified in both the Consent and EPL and that they are in line with the results obtained for the last three full years. The most recent noise monitoring was undertaken by Global Acoustics in March 2016 and submitted to the EPA,
- Conduct attended noise monitoring at close proximity of the two potentially sensitive receivers to get a better understanding of the current noise environment prior to any stockpiling or composting activities being undertaken at the new sites. This will be extremely helpful during future noise monitoring to determine whether the stockpiling and composting activities would have any contribution to the noise levels measured at these two potentially sensitive receivers, and
- Compute the noise levels ($LAeq_{,15min}$) from the source to the identified closest residential receivers to determine the noise levels at these receivers for two different scenarios by using the logarithmic formula used to calculate the noise level between two different locations ($L2 = L1 - [20 \times \log (r_2/r_1)]$; one scenario without the implementation of any noise mitigation measures and the other with the installation of appropriate noise barriers.

## 9.3 MEASURED NOISE LEVELS

The noise testing was undertaken on 25 February 2016 between the hours of 12.30 pm and 3.30 pm. The time was chosen to be outside the normal morning peak traffic hours to ensure that the traffic would have a lesser influence on the noise assessment due to a reduced number of heavy vehicles travelling on the roads especially to and from the industrial/commercial sites in the vicinity of both proposed sites and to ensure that the noise testing results are representative of the noise levels to be experienced during the normal activities during the day time period (7.00 am to 6.00 pm) as proposed. Despite the time factor, a large number of all types of vehicles were still travelling along the busy Elizabeth Drive. The noise from these

vehicles was very audible at the measurement point near the northern residence and audible at the measurement point near the western residence.

A relatively smaller number of heavy vehicles were travelling along the access road east of the proposed site and these vehicles were inaudible during the measurements. **Table 9-1** includes the meteorological conditions that were obtained mainly from a portable weather station which was placed in the vicinity of the active working area and proposed site during the noise testing to ensure that site specific weather data are obtained with the exception of wind speed and wind direction which were observed during the noise testing. The wind speed and wind direction were obtained from the Bureau of Meteorology earlier in the morning and as previously stated were observed during the noise testing since it is an important consideration for the noise assessment.

**Table 9-1: Meteorological Conditions on 25 February 2016**

| | |
|---|---|
| **General** | Very hot and dry |
| **Temperature ($^{o}$C)** | 40.6 |
| **Relative Humidity (%)** | 38.5 |
| **Barometric Pressure (mbar)** | 1009.2 |
| **Wind Speed (m/s)** | 11 |
| **Wind Direction** | N |

We used the Svantek Svan 957 Sound Level Meter and Frequency Analyser Type I Serial No. 15336. The sound level meter was calibrated before and after the measurements at each site to ensure that any deviations are within the specifications. No significant deviations were noted. Both calibrations were at 93.0 dB(A).

During the noise measurements at both locations, the most dominant sources of noise were traffic on Elizabeth Drive, birds, insects and other unrelated sources.

We have also undertaken 1/3 Octave frequency analysis of the measured noise to determine whether there are any tonality components that may need special attention. This was not the case for the noise as it was measured on that day. **Table 9-2** includes the results of noise testing at 2111 Elizabeth Drive, Luddenham (measurement point 1) and **Table 9-3** includes the 1/3 Octave frequency analysis of noise measured at the same location whilst **Table 9.4** includes the results of noise testing 265 Adams Road, Luddenham (measurement point 2) and **Table 9.5** includes the 1/3 Octave frequency analysis of noise measured at the same location.

**Figure 9-2** shows the locations of noise measurement points undertaken near both potentially sensitive receivers.

**Figure 9-2: Locations of Noise Measurement Points 1 & 2**

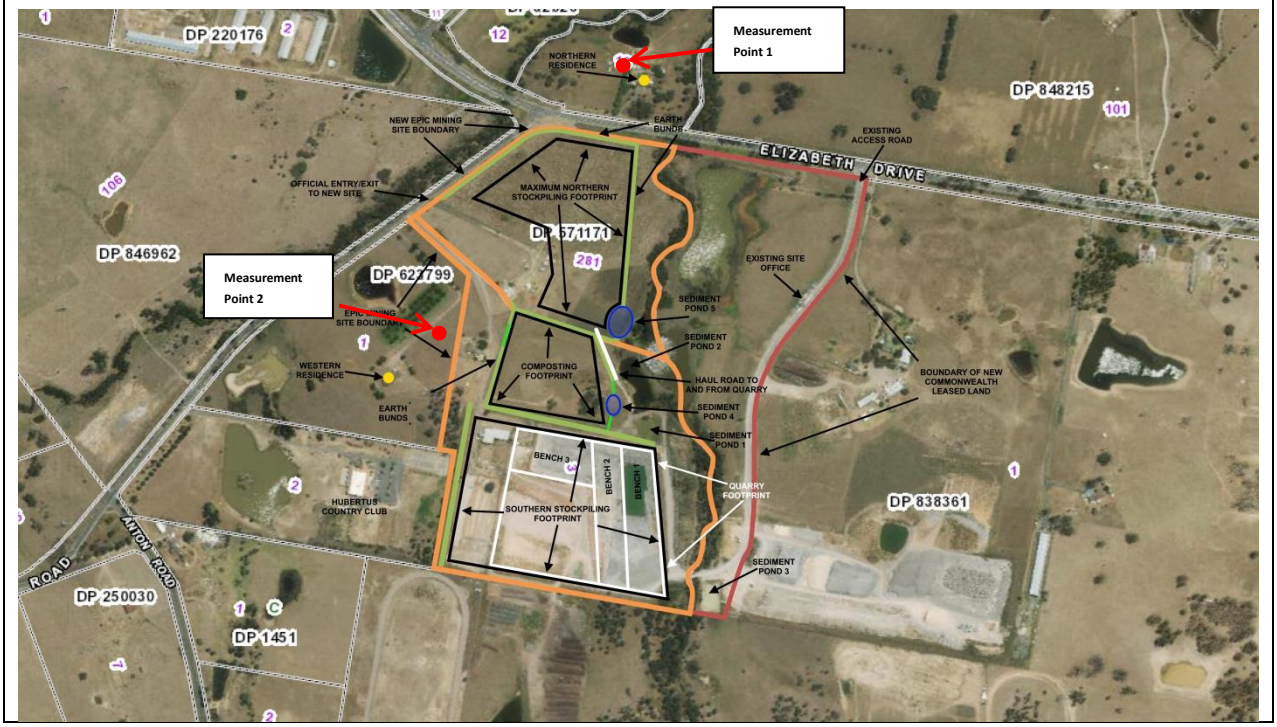



**Table 9-2: Results of Noise Measurement at 2111 Elizabeth Drive Luddenham**

| Date | Time | Location | Audibility | Dominant Sources | Noise levels dB(A) |
|---|---|---|---|---|---|
| 25/02/16 | 12.29 pm | Calibration | N/A | Calibrator | LAeq= 93.0<br>SPL = 93.0 |
| 25/02/16 | 12.32 pm | Approximately 1 m from the fence of the residence<br>Easting = 289107<br>Northing = 6250020<br>Elevation = 61 m | Audible | Traffic on Elizabeth Dr<br>Other ambient noise from birds and insects | LA90 = 62.2<br>LAeq = 69.3 |
| 2/02/16 | 12.51 pm | Calibration | N/A | Calibrator | LAeq = 93.0<br>SPL = 93.0 |

Note: All coordinates were taken using a GPS set at UTM GDA94 – MGA 56 Zone

**Table 9-3: 1/3 Octave frequency Analysis of Measured Noise - LAeq**

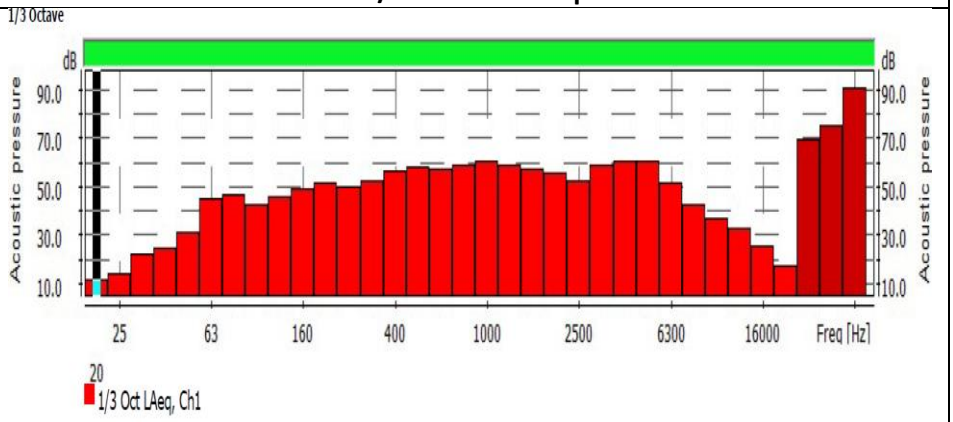
| Date | Time | 1/3 Octave - LAeq |
|---|---|---|
| 25/02/16 | 12.32 pm |  |

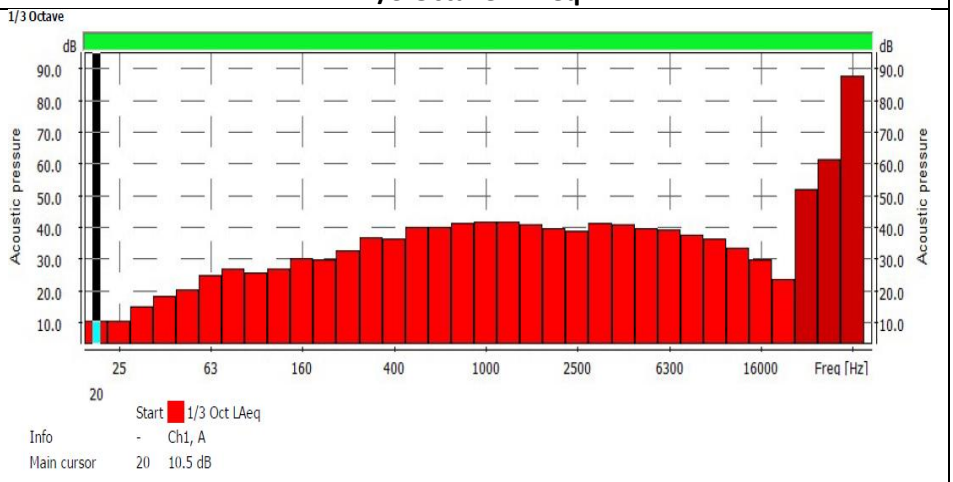


**Table 9-4: Results of Noise Measurement at 265 Adams Road, Luddenham**

| Date | Time | Location | Audibility | Dominant Sources | Noise levels dB(A) |
|---|---|---|---|---|---|
| 25/02/16 | 3.08 pm | Calibration | N/A | Calibrator | LAeq= 93.0<br>SPL = 93.0 |
| 25/02/16 | 3.12 pm | Approximately 1 m from the fence of the residence<br>Easting = 288810<br>Northing = 6249553<br>Elevation = 71 m | Audible | Traffic on Elizabeth Dr<br>Other ambient noise from birds and insects | LA90 = 37.7<br>LAeq = 51.9 |
| 2/02/16 | 3.31 pm | Calibration | N/A | Calibrator | LAeq = 93.0<br>SPL = 93.0 |

Note: All coordinates were taken using a GPS set at UTM GDA94 – MGA 56 Zone

**Table 9-5: 1/3 Octave frequency Analysis of Measured Noise - LAeq**

| Date | Time | 1/3 Octave - LAeq |
|---|---|---|
| 25/02/16 | 3.12 pm |  |

## 9.4 ASSUMPTIONS MADE FOR NOISE CALCULATIONS

In establishing the foundation for noise calculations based on the generally accepted formulas, it is acceptable to make several reasonable assumptions. Each assessment-specific assumption has been detailed below:

- The proposed facility will not operate outside the day time period as defined in the INP (i.e. 7.00am to 6.00pm Monday to Saturday and 8.00am to 6.00pm on Sunday), therefore only the day time period has been assessed;
- In the calculations, the operations have been assumed as a constant source throughout the day for a worst case assessment, i.e. all the noise sources generate noise continuously throughout the operational hours;
- Receiver locations are presented in **Figure 9-1**;
- Receiver heights were set at 1.5 m;
- All machinery has been assumed to be point sources;
- All machinery was assumed to be operating adjacent to the boundary closest to the residential receivers for very conservative distance attenuation calculations;
- Model scenarios are presented in Section 9.2; and
- Off-site topographical information was obtained from the Department of Lands, Six Viewer and Google Earth.

**Table 9-6** includes all distances that were considered relevant to the calculations despite the fact that during the noise measurements undertaken in the last five (5) years by different environmental/acoustic consultants the observations made that the noise measured at N3 was influenced mainly by the composting activities and to a lesser degree by the stockpiling within the quarry footprint whilst the noise measured at N4 was influenced by the stockpiling activities within the Commonwealth.

**Table 9-6: Distances of different activities to noise monitoring points and residences**

| | | **Previously Approved Locations Commonwealth Land** | | **Potential Sensitive Receivers** | | **Proposed Locations** | |
|---|---|---|---|---|---|---|---|
| | | **Eastern Stockpiles** | **Composting** | **Western Residence** | **Northern Residence** | **Northern Stockpiles** | **Composting** |
| **Previously Approved Monitoring Points** | **N1** | 600m | 466m | 218m | 428m | 44m | 10m |
| | **N2** | 152m | 825m | 1123m | 942m | 795m | 771m |
| | **N3** | 430m | 55m | 662m | 1145m | 737m | 573m |
| | **N4** | 365m | 552m | 1140m | 1350m | 1004m | 860m |
| | **D1** | 600m | 466m | 218m | 428m | 44m | 10m |
| | **D2** | 152m | 825m | 1123m | 942m | 795m | 771m |
| | **D3** | 702m | 294m | 685m | 1281m | 879m | 692m |
| | **D4** | 5m | 446m | 882m | 983m | 668m | 550m |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Potential sensitive Receivers** | **Western Residence** | 669m | 366m | 0m | NR | 257m | 153m |
| | **Northern Residence** | 778m | 861m | NR | 0m | 94m | 420m |
| **Proposed Locations** | **Northern Stockpiles** | 458m | 453m | 257m | 94m | 0m | NR |
| | **Composting** | 350m | 291m | 153m | 420m | NR | 0m |

## 9.5 NOISE LEVEL CALCULATIONS FOR RESIDENTIAL RECEIVERS

Following the determination of the highest $LAeq_{,15min}$ values for the existing noise monitoring points, it was considered appropriate to calculate the noise levels at the potentially sensitive receivers based on the value of 41 dB(A) being the highest measured value at N3 and N4 approved monitoring points.

Based on this value at these locations, the noise levels at the closest identified receivers were calculated without any noise barriers to determine the extent of the exceedances at these residences so appropriate noise barriers could be designed and recommended. **Table 9-7** provides the results of these calculations based on the noise monitoring location N4 and **Table 9-8** provides the results of these calculations based on the noise monitoring location N3.

### 9.5.1 Noise Calculations without Noise Barriers Using N4 value and distances

**Table 9-7: Calculated Noise Levels at Residences without Noise Barriers – Reference N4**

| Receiver | Activities | Attenuation due to Distance | Attenuation due to Vegetation | Total Attenuation | Resultant $L_{Aeq,15min}$ dB(A) |
|---|---|---|---|---|---|
| Northern Residence | Stockpiling | +11.8[1] | 0 | +11.8 | 52.8 |
| Northern Residence | Composting | +2.4 | 0 | +2.4 | 43.4 |
| Western Residence | Stockpiling | +3 | 0 | +3 | 44 |
| Western Residence | Composting | +11.1 | 0 | +11.1 | 52.1 |

**[1] The (+) sign indicate that the noise level increases rather than decreases due to a shorter distance**

### 9.5.2 Noise Calculations without Noise Barriers Using N3 value and distances

**Table 9-8: Calculated Noise Levels at Residences without Noise Barriers – Reference N3**

| Receiver | Activities | Attenuation due to Distance | Attenuation due to Vegetation | Total Attenuation | Resultant $L_{Aeq,15min}$ dB(A) |
|---|---|---|---|---|---|
| Northern Residence | Stockpiling | +13.2[1] | 0 | +13.2 | 54.2 |
| Northern Residence | Composting | -13[2] | 0 | -13 | 28 |
| Western Residence | Stockpiling | +4.5 | 0 | +4.5 | 45.5 |
| Western Residence | Composting | -9 | 0 | -9 | 32 |

**The (-) sign indicate that the noise level decreases rather than increases due to a longer distance**

Based on the above it is clearly evident that the Northern residence will have the greatest impact as a result of the stockpiling activities and the Western residence will have the greatest impact due to the composting activities, depending whether we consider the reference point to be N3 or N4.

Based on our extensive experience with similar assessments and calculations including recent noise measurements of similar activities and using similar machineries, a 2.5 m high earth berm will provide an attenuation of at least 10-12dB depending of the heights of the noise source and receiver. A 4.5 m earth berm will provide an attenuation of at least 19-23 dB and a 3 m earth berm would provide an attenuation of at least 13-15 dB.

For comparison purposes we include the information related to a Spandek Zincalume sheet with a 0.42 BMT which provide a total noise transmission loss of 19 dB. This information is included in T**able 9-9**. This material has been used successfully in hundreds of applications where space is of importance. In this case we recommend the use of landscaped earth bunds to ensure that the site will keep the natural scenery/streetscape of the whole area and it is consistent with adjoining sites. Under normal circumstances and based on our extensive experience with previous applications for similar cases, an earth bund will provide much higher noise attenuation across the frequency range in addition to providing an excellent visually acceptable view. However, for conservative purposes, we assume that the 4.5 m earth bund will provide the same total noise attenuation of 19 dB as the Spantek Zincalume and the 3 m earth bund will provide attenuation of 13 dB only.

The transmission loss properties of this material has been obtained from reputable environmental consultancies and confirmed by the materials manufacturer and is shown in **Table 9-9**.

**Table 9-9: Building Component Transmission Loss Properties**

| Material | Octave Band Centre Frequency (Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **100** | **125** | **160** | **200** | **250** | **315** | **400** | **500** | **630** | **800** |
| | **1000** | **1250** | **1600** | **2000** | **2500** | **3150** | **4000** | **5000** | **STC[1]** | |
| Spandek Zincalume 0.42BMT | 12 | 13 | 13 | 15 | 14 | 15 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 21 | 20 | 25 | 23 | 24 | **19** | |

**Note:** [1] Sound Transmission Class

### 9.5.3 Noise Calculations with Noise Barriers

**Table 9-10** provides the noise levels at the closest identified receivers following the introduction of a 4.5 m high landscaped earth mound/berm at the northern, western and eastern boundaries of the site and a 3 m earth berm at the southern boundary. For conservative purposes we assume that these types of barriers provide noise attenuation of 19 dB(A) for the 4.5 m high and 13 dB(A) for the 3 m high.

**Table 9-10: Calculated Noise Levels at both Residences with Noise Barriers**

| Receiver | Highest Noise Level | Attenuation due to Noise Barrier | Total Attenuation | Resultant $L_{Aeq,15min}$ dB(A) |
|---|---|---|---|---|
| Northern Residence | 54.2 (using N3) | 19 | 19 | 35.2 |
| Northern Residence | 52.8 (using N4) | 19 | 19 | 33.8 |
| Western Residence | 45.5 (using N3) | 19 | 19 | 26.5 |
| Western Residence | 52.1 (using N4) | 13 | 13 | 39.1 |

The results in **Table 9-10** demonstrate compliance with meeting the noise limit of 41 dB(A) at the potentially sensitive receivers whether we use N3 or N4 as reference monitoring points for stockpiling or composting activities. However, we believe that the noise monitoring at these locations will demonstrate that the levels of noise generated by Epic activities is highly likely to be much lower at both residences due to all the conservative assumptions made in this assessment.

## 9.6 WORST CASE SCENARIO

Following review of all noise monitoring reports, consultation with the proponent and conducting attended noise testing, it can be concluded that the worst case scenario for noise assessment would be when the following activities are conducted at the same time:

- Excavation at the quarry is being undertaken at the surface (and up to about 2 m below the surface) of the quarry,
- Materials are being transported to one stockpiling area, and

- Other materials are being removed from the other stockpiling area and transported off site.

According to the quarry manager this scenario is very highly unlikely to occur at any time and so far has not occurred.

In any case, if this scenario was to occur, the noise criterion is not likely to be exceeded by more than 3 dB(A) $L_{Aeq,15min}$. Hence, it is recommended that the site management implement an additional noise amelioration strategy to prevent this scenario from occurring.

All other scenarios would comply with the noise criterion specified in the Consent and the EPL provided that the following are fully adhered to:

- ❖ All noise mitigation measures recommended in the initial EIS;
- ❖ All mitigation measures recommended in the noise management plan;
- ❖ All mitigation measures recommended after the third round of monitoring; and
- ❖ All mitigation measures recommended in this report.

## 9.7 RECOMMENDATIONS

Following careful consideration of all matters associated with the noise emissions from the applicant's quarry site including the stockpiling activities conducted in both areas; the western stockpiles located within the approved area and the northern stockpiles to be located within the adjacent land, the recommendations outlined below are made. These recommendations are made to ensure that all activities conducted by Epic on site, comply with the noise criterion specified in both the Development Consent and the Environment Protection Licence No12863.

1. The applicant would continue to regularly service and maintain all machinery used on site to ensure that wear and tear of any item is promptly rectified,
2. The proponent would not allow the scenario outlined in **9.6** to occur,
3. Continuous training would be provided to all employees, visitors and contractors to reduce their speed to below 20km/h to reduce both engine and exhaust noise levels,
4. All road registered vehicles would comply with current NSW noise levels specified in the POEO Act and relevant regulations,
5. Heavy vehicles idling for long periods would be avoided at any cost as this would increase the overall noise level and has the potential to increase noise impact on residents,
6. Trucks that are noticeably louder than others would be identified and their drivers would be given warning to rectify the problems,
7. Noise barriers in the form of landscaped earth berms at a height of 4.5 m to be constructed at the northern, western and eastern boundaries of the proposed stockpiling site in accordance with the recommendations included in the visual impact assessment,
8. Noise barriers in the form of landscaped earth berms at a height of 3 m to be constructed at the southern boundary of the proposed stockpiling site in accordance with the recommendations included in the visual impact assessment,
9. Noise barriers in the form of landscaped earth berms at a height of 2.5 m to be constructed along the western boundary of the proposed composting site, and

10. Despite the fact that the applicant operates only during day time, the management should consider replacing the reversing alarm beepers on all machinery with Quarck beepers rather than high tonality reverse alarm beepers provided that this change does not compromise the safety of employees and contractors.

# 10. AIR QUALITY ASSESSMENT

## 10.1 BACKGROUND

The proposed modifications include mainly the relocation of stockpiling and composting activities. Some people may consider that the proposed modifications will have the potential to increase air emissions due to the perception of people when they hear that these modifications include stockpiling and composting activities. For the remainder of this document air emissions will be referred to as dust emissions since dust is the only noticeable and measurable air emission as a result of the activities conducted on site. This assumption is based on the fact that exhaust air emissions from machinery used on site are minimal and comply with current legislation.

The original dust management plan was included in the document title: "*Air Quality (Dust) Monitoring Program – Report Number : 087623124 002 R Rev 1"* prepared by Golder & Associates Pty Limited on behalf of Epic Mining Pty Limited and dated March 2009. This report was prepared to satisfy the requirements of conditions 7 and 8 of the original development consent. Subsequently, five (5) dust monitoring points were nominated as required by the Development Consent and the EPL. However, following last year's modification (No 3), new dust monitoring points were approved by both the Department and the EPA. Refer to the approved environmental monitoring point locations included in **APPENDIX G**. The initial dust monitoring was undertaken by Golder & Associates Pty Ltd and later by VGT Pty Ltd.

The assessment has been carried out, as practically and reasonably possible in accordance with the requirements listed in the document, "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" published by the Department of Environment and Climate Change NSW (DECC NSW 2005). However, the assessment outlines the air quality assessment criteria based also on:

- The Protection of the Environment Operations Act 1997
- The Protection of the Environment Operations Regulation 2009
- Identifying potentially sensitive receptors
- Analysing potential dust generation from the proposed activities
- The appropriate control measures needed to ensure compliance

It should be noted that due to the fact that the proposed activities and the machinery used have been previously assessed hundred times by highly qualified environmental consultants, and the fact that the applicant's activities have been continuously subjected to dust monitoring for over 5 years, it was considered appropriate to utilise the air quality-related information obtained from these assessments rather than re-do the same assessments for the same activities and machinery. At the same time, it was also considered appropriate to include some calculations of the dust emissions rates so the dust emissions before and after the modifications can be compared

We will to demonstrate in this assessment that the proposed modifications have no additional impact on human health or the environment. On the contrary, they will have less potential impact. The main reasons for the expected reduction in dust emissions are:

(a) The materials to be stockpiled are the same with those previously approved and they are mainly (more than 95%) made of clay and shale. These materials are stored on site to ensure that they are fully seasoned prior to being transported off-site to the brick and tile manufacturing companies,
(b) The total quantities of stockpiled materials will be reduced from the previously approved quantities especially outside the quarry footprint,
(c) The new sites for both the composting and stockpiling activities will have landscaped earth berm (wind breaks) around most of their perimeters in addition to the planting of trees and shrubs near their boundaries.

Following tens of inspections by employees of government and non-government organisations including unannounced inspections by EPA authorised officers, it was established that the dust monitoring points are more than sufficient to cover all areas with potential dust emissions and all sensitive receivers. This extensive monitoring regime will also ensure that any dust emissions that are above the criteria, if any, will be promptly identified and the problem will be rectified.

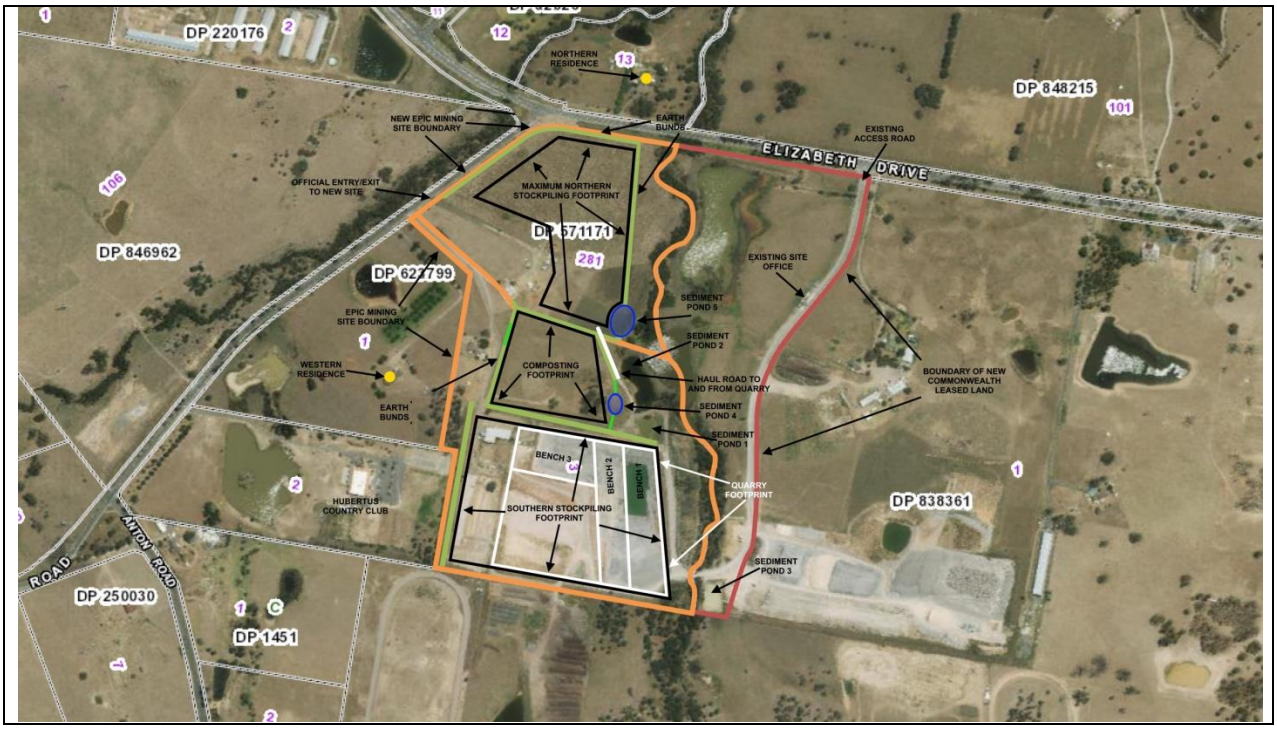
## 10.2 OPERATIONS REVIEW

### 10.2.1 Proposed Activities

The proposed activities are identical to the activities previously approved by both the Department and the EPA except the fact that the quantities of stockpiled materials will be reduced.

**Figure 10-1** shows the site layout superimposed on an aerial view to give the reader a better understanding of the existing environment of the site prior to being modified to accommodate for the stockpiling activities.

**Figure 10-1: Site Layout Superimposed on an Aerial View**




## 10.3 AIR QUALITY ASSESSMENT APPROACH

The potential for additional dust emissions from the stockpiling activities is very minimal due to the fact that the stockpiled materials are mainly clay and shale and therefore free of dust particles that can become easily airborne. These materials when left in the open tend to form a crust on the top layer. This crust prevents dust emissions while the stockpiles are inactive.

When the stockpiles become active again the management of the quarry implements all mitigations measures recommended during the preparation of the initial EIS and the in the follow-up assessments undertaken as part of the previous modifications. Hence, it was determined that the most appropriate approach to follow in our attempt of assessing the potential dust emission impact on nearby sensitive residential receptors, is outlined below:

- Review all dust monitoring results obtained in the last two full years (2014 and 2015). This review should provide sound information of the dust emission levels after the activities commenced on site including stockpiling and composting activities,
- Assess and highlight any major inconsistencies in the results and/or changes in the results,
- Establish a trend of the results and reflect any major changes in activities,
- Conduct site inspections to determine whether existing mitigations measures are effective in controlling dust emissions from the activities conducted on site with focus on stockpiling and composting activities,
- Compare the local meteorological data obtained from the closest Weather Monitoring Station with those obtained from the onsite weather monitoring station,
- Compare the results of $PM_{10}$ values obtained from the closest EPA Air Quality Monitoring Station with those obtained from the site specific monitoring,

- Compare the dust emissions for the proposed activities with those previously approved,
- Review and assess existing mitigation measures, and
- Provide recommendations on additional mitigation measures, if required.

## 10.4 AIR QUALITY CRITERIA AND GUIDELINES

### 10.4.1 Protection of Environment Operations Act 1997 (POEO Act)

The Protection of the Environment Operations Act 1997 (POEO Act) applies the following definitions relating to air pollution.

***"Air pollution"*** *means the emission into the air of any air impurity.*

*While "air impurity" includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists, odours and radioactive substances.*

The following clauses of this Act have most relevance to the site.

- **Clause 124 (Operation of Plant)**

*The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:*

*a) to maintain the plant in an efficient condition, or*
*b) to operate the plant in a proper and efficient manner.*

*Where premises is defined within the POEO Act as including:*

*(a) a building or structure, or*
*(b) land or a place (whether enclosed or built or not), or a mobile plant, vehicle, vessel or aircraft.*

- **Clause 126 (Dealing with Materials)**

*(1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.*
*(2) In this section:*

*a) deal with materials means process, handle, move, store or dispose of the materials.*
*b) materials include raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.*

- **Clause 127 Proof of causing pollution**

*To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.*

- **Clause 128 Standards of air impurities not to be exceeded**

*(1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:*
   *a) The standard of concentration and the rate, or*
   *b) The standard of concentration or the rate.*
   *c) Prescribed by the regulations in respect of any such activity or any such plant.*
*(2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.*

The subject site would be required to adhere to the above listed legislative requirements.

### 10.4.2 Department of Environment and Climate Change NSW Guidelines

The Department of Environment and Climate Change (DECC) NSW guidelines "*Approved Methods for the Modelling and Assessment of Air Pollutants (AMMAAP) in New South Wales*" (DEC NSW 2005) was used for this assessment. The DECC NSW AMMAAP aims to provide a list of statutory methods for the modelling and assessment of air pollutants from stationary sources in NSW and is referred to by the Protection of Environment Operations (Clean Air) Regulation 2002.

The ground level concentration criteria have been referenced from the DECC NSW AMMAAP. Pollutants were identified to be particulate matter and are shown in **Table 10-1** along with the averaging periods to be assessed in the dispersion modelling or calculations. The impact assessment criteria shown are based on the pollutants that could be emitted from the air emission sources on site.

**Table 10-1: Impact Assessment Criteria for $PM_{10}$ and Deposited Dust**

| Substances | Averaging Period | Impact Assessment Criteria |
|---|---|---|
| Fine Particulates ($PM_{10}$) | 24 hours<br>Annual | 50 $\mu g/m^3$<br>30 $\mu g/m^3$ |
| Deposited Dust | Annual | 2 $g/m^2$/month [a]<br>4 $g/m^2$/month [b] |

**Source:** DEC NSW (2005)

**Notes**: [a] Criteria for the maximum increase in deposited dust level.

[b] Criteria for the maximum total deposited dust level.

## 10.5 POTENTIALLY SENSITIVE RESIDENTIAL RECEPTORS

As previously stated, the site is located within a mainly rural residential area combined with some industrial and commercial activities. The activities will be well shielded from the surrounding rural residential environment by the existing built environment such as the topography of the site, the bushlands located within and in the vicinity of the site including the large trees and shrubs.

Based on the EPA's document "*NSW DEC (EPA) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales – August 2005*", the following definition of sensitive receptor is provided: "***Sensitive receptor*** *A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. ……".* However, as the site is located within a RU1 – Primary Production where a variety of activities are permitted, it was considered appropriate to pay greater attention to the location of the site relative to the rural residential dwellings only. Additional factors that were considered in this decision are the fact that no residential dwelling or any other activity occurring to the south or east of the applicant's approved and proposed sites since the Commonwealth has cleared these areas to make way for the construction of Western Sydney Airport.

In any case, based on our assessment during our inspections of the site and surrounding environment, the proposed modifications are unlikely to have any adverse impact on any sensitive residential receptor provided that the recommended mitigations measures are implemented and maintained at all times.

The closest potentially sensitive residential receptors are included in **figure 10-2** and shown in an aerial photo provided in **Figure 10-1.**

**Table 10-2: Closest Potentially Sensitive Residential Receptors**

| No | Direction | Location (m) | | | |
|---|---|---|---|---|---|
| | | Easting | Northing | Elevation | Distance to Stockpiling |
| R1 | N | 289130 | 6250069 | 60 | 134(94+40) |
| R2 | SW | 288715 | 6249558 | 68 | 257 |

## 10.6 LOCATIONS OF APPROVED DUST MONITORING POINTS

The locations of the approved dust monitoring points are included in **Table 10-3** with their eastings and northings. These locations were chosen by the environmental consultant at that time. These locations were approved by government authorities since they were considered at that time to provide sound representation of the potential impact of dust emission on the environment and human health.

**Table 10-3: Approved Dust Monitoring Points**

| LOCATION NUMBER | EASTING | NORTHING |
|---|---|---|
| **D1** | 288909 | 6249690 |
| **D2** | 289843 | 6249430 |
| **D3** | 288675 | 6248860 |
| **D4** | 289502 | 6249145 |

## 10.7 LOCATIONS OF PROPOSED DUST MONITORING POINTS

The locations of the proposed dust monitoring points are included in **Table 10-4** with their eastings and northings. These locations were chosen by the environmental consultant at that time. These locations were chosen based on the EPA's preferred approach to ensure that most possible directions (N, E, S & W) are covered whilst potentially sensitive receptors are considered in the selection. Refer to Section 18 for more details on the criteria used for selecting the locations of monitoring points.

**Table 10-4: Proposed Dust Monitoring Points**

| LOCATION NUMBER | EASTING | NORTHING |
|---|---|---|
| **D1** | 288909 | 6249690 |
| **D2** | 288810 | 6249588 |
| **D3** | 288832 | 6249940 |
| **D4** | 289205 | 6249682 |

## 10.8 EXISTING AIR QUALITY

### 10.8.1 Results of Dust Monitoring

The results of all dust monitoring conducted from January 2014 until December 2015 are presented in **APPENDIX H**.

It should be noted that the approximately three (3) years ago, the EPA requested that an additional dust deposition gauge (D6) be installed in the vicinity of the then called "Northern Residence" to provide the EPA and tenants more confidence that the applicant's activities do not cause dust emissions above the specified criteria at that location. The applicant complied with the EPA's request by monitoring dust at that location since.

**Table 10-5** below provides a summary of the deposited dust monitoring results for the period 1/01/2014-31/12/2015 and **Table 10-6** provides a summary of the $PM_{10}$ monitoring results.

**Table 10-5: Summary of Deposited Dust Monitoring Results**

| YEAR | LOCATION NUMBER | DUST (g/m$^2$/month) | | COMMENTS |
|---|---|---|---|---|
| | | HIGHEST | AVERAGE | |
| **2014** | D1 | 4.2 | 1.45 | Normal activities – Bird droppings, broken funnel, insects, dirt, dirt bikes |
| | D2 | 1.7 | 0.5 | |
| | D3 | 3.3 | 1.59 | |
| | D4 | 16.8 | 4.58 | |
| | D5 | 3.1 | 1.26 | |
| | D6 | 3.6 | 1.08 | |
| **2015** | D1 | 1.7 | 0.73 | Normal activities – Bird droppings, broken funnel, insects, dirt, dirt bikes |
| | D2 | 1.2 | 0.48 | |
| | D3 | 5.6 | 1.49 | |
| | D4 | 11.5 | 4.75 | |
| | D5 | 1.6 | 0.71 | |
| | D6 | 2.9 | 1.07 | |

**Table 10-6: Summary of $PM_{10}$ Monitoring Results**

| YEAR | LOCATION NUMBER | PM10 (µg/m$^3$) – 24 hours | | COMMENTS |
|---|---|---|---|---|
| | | HIGHEST | AVERAGE | |
| **2014** | D2 | 64 | 22.8 | Normal activities – Bird droppings, broken funnel, insects, dirt, dirt bikes |
| | D4 | 46 | 26.1 | |
| **2015** | D2 | 85 | 22.2 | Normal activities – Bird droppings, broken funnel, insects, dirt, dirt bikes |
| | D4 | 46 | 15.9 | |

## 10.8.2 Applied Mitigation Measures

Since the activities commenced on site, the management has implemented all dust control mitigation measures as recommended in the EIS and the follow-up reports by Golder & Associates Pty Ltd, and the EPA's correspondence and advice including the EPL.

The dust control mitigation measures implemented so far include the continuous use of the water truck (cart) which is a permanent feature of the site, the prompt stabilisation of all excavated areas to reduce dust emissions, the rehabilitation of areas where identified and included in the short term and long term rehabilitation of the site, the enforcement of the very low speed limit (20km/h) of vehicles travelling within the site, the continuous availability of water in the ponds for dust suppressant purposes and the management commitments in

minimising dust emissions from any activities conducted on site. It should be noted here that due to the nature and characteristics of the clay and shale materials excavated and stockpiled, dust emissions are very low.

### 10.8.3 Current Status

Based on the results of monitoring so far, dust emissions have always been in compliance with the EPA's long term impact criteria for deposited dust which is 4g/$m^2$/month except under certain circumstances (i.e. bird droppings, insects, dirt, dirt bikes, grass) that were beyond the control of the applicant. Monitoring of dust emissions has also included several real scenarios with the proposed stockpiling activities to ensure that any additional mitigation measures are implemented promptly, effectively and efficiently. So far, all monitoring tests have shown no dust emissions associated with the activities conducted on-site are above the specified criteria.

The effectiveness of the dust mitigation measures implemented on-site was confirmed first hand by representatives of the Department and the EPA during site inspections in the last 5 years. This was also confirmed on other occasions by government and non-government representatives following inspections of the site. Despite the fact that on a few occasions during the inspections, it was very windy and dry, no dust was emitted from any activities conducted on site including the stockpiles which demonstrate that the mitigation measures currently implemented on-site are more than adequate to control dust emissions. In addition to the existing dust mitigation measures, the materials characteristics being clay and shale do have a great contribution to the reduced dust emission process due to their heavy particle properties.

In addition to the abovementioned information, since the activities commenced on site only one (1) dust-related complaint was received by the EPA and following a comprehensive investigation of the complaint by both the EPA and the applicant in consultation with the complainant, it was concluded that the dust observed by the complainant was not associated with the applicant's activities.

## 10.9 SITE INSPECTIONS

### 10.9.1 Site Inspections by NICS Personnel

Two site inspections were conducted by NICS in the last 12 months; the first inspection was conducted on 24 November 2015 as part of the odour survey and the second inspection was conducted on 25 February 2016 as part of the noise testing.

Based on the observations made during both inspections, it can be concluded that the activities are conducted on site in a proper and efficient manner and that the mitigation measures implemented on site are more than adequate in managing dust emissions from all activities conducted on site. No visible dust emissions were noticed during the two inspections.

During both inspections stockpiling as well as extraction activities were conducted as per normal daily activities.

### 10.9.2 Site Inspections by Government Authorities

Tens of inspections (announced and unannounced) were conducted by authorised officers of Government Authorities including:

1. Department of Planning and Infrastructure (5 July 2011),
2. Environment Protection Authority (2010, 2 in 2011, 2 in 2012, 2 in 2013, 2014 & 2 in 2015)
3. Department of Primary Industry (2012 & 2016), and
4. Liverpool City Council (2011).

All officers provided positive feedback in relation to the fact that no dust emissions were observed during the inspections whilst the quarry was operating normally. The activities included extraction of materials from the quarry pit and stockpiling of materials in either the stockpiling areas. In addition, the officers informed the applicant that the dust mitigation measures implemented on site were adequate to control, minimise and prevent dust emissions from the site.

## 10.10 METEOROLOGY AND LOCAL AIR QUALITY

In this sub-section we present the site specific meteorological conditions obtained from the weather monitoring station installed within the applicant site and the closest Government operated weather station to demonstrate that the results obtained from both sources are very comparable. This is extremely important if and when adverse weather conditions are about to occur and in the case that a dust related complaint received. It is also important for assessing the potential impact of dust on the two sensitive receptors.

### 10.10.1 Site Specific Meteorological Conditions

A weather monitoring station was installed before activities commenced on site as recommended by the EPA and the environmental consultants at that time to ensure that the weather monitoring data obtained is more accurate, reliable and more importantly site specific rather than generic for the whole area.

Hence, meteorological conditions have been monitored by this weather monitoring station. Monitoring is being conducted on a continuous basis to ensure compliance with EPL and Development Consent conditions. Annual summaries of onsite meteorological conditions for 2014 and 2015 are included in **APPENDIX H.**

### 10.10.2 Local meteorology

The nearest known source of meteorological data is the Badgerys Creek Automatic Weather Station (AWS) operated by the Bureau of Meteorology (BoM). The AWS site is located approximately 2.2 km east south east of the proposed sites.

**Figure 10-2** shows the 2013 all-hours annual wind rose for Badgerys Creek. The annual wind climate in the area is dominated by flows from the southwest and north. To a lesser extent, winds from the east and south are also prevalent. Winds from the northwest, northeast and southeast have the lowest frequency of occurrence. Low wind speeds are most common from the southwest, while higher wind speeds, which can be associated with dust lift-off, are from the west.

It is the incidence of daytime winds that are of greatest concern with regards to the transport and dispersion of dust emissions from the proposed sites. Due to the nature of operations, the majority of dust generated at the site would be during operational hours when loading, unloading, stockpiling and vehicle movements are occurring. **Figure 10-3** shows the annual and seasonal daytime wind climate. The daytime distribution of wind directions show similar trends to the 'all hours' distribution, except during summer, when easterly winds dominate. The average wind speed is also higher during the day (1.7 m/s daytime vs. 1.4 m/s all hours). Wind erosion or dust lift-off can become significant under stronger winds (greater than 5 m/s (18 km/h)).

**Figure 10-2: Annual wind rose (all hours) – Badgerys Creek 2013**

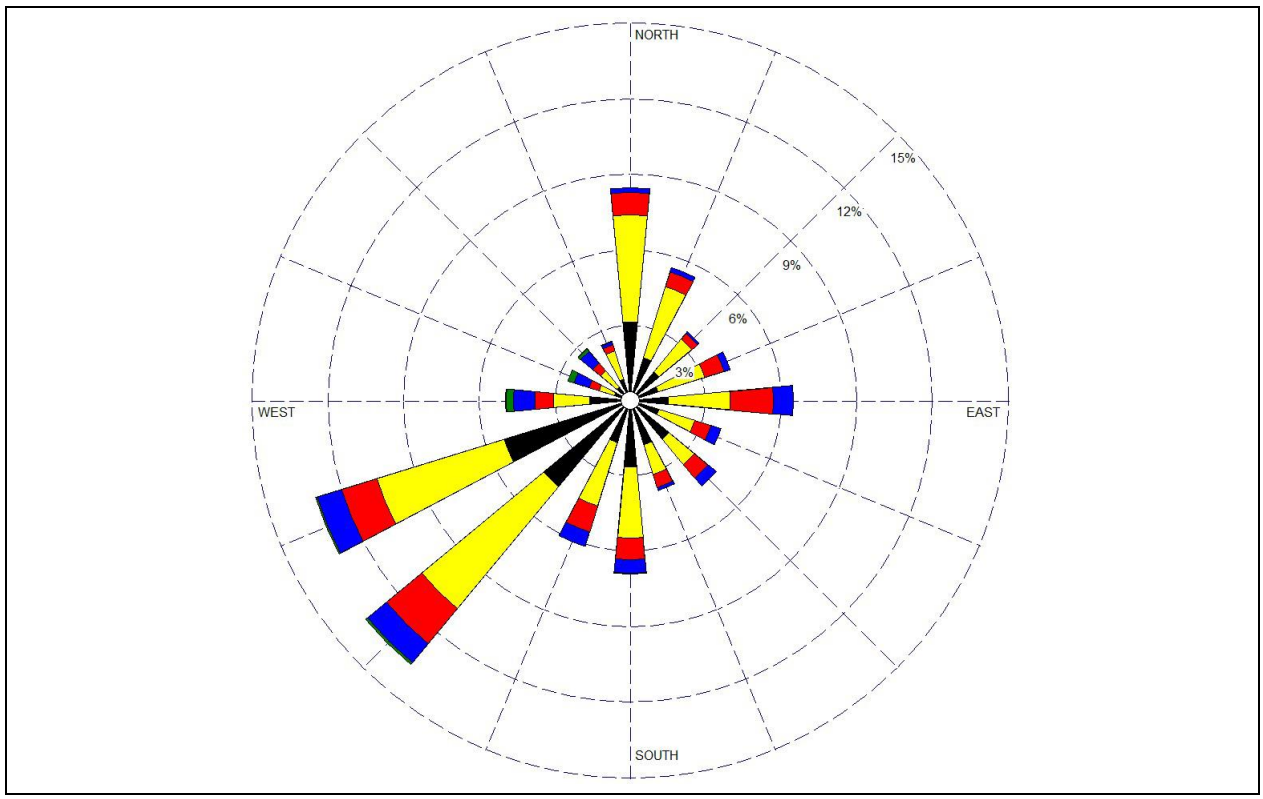
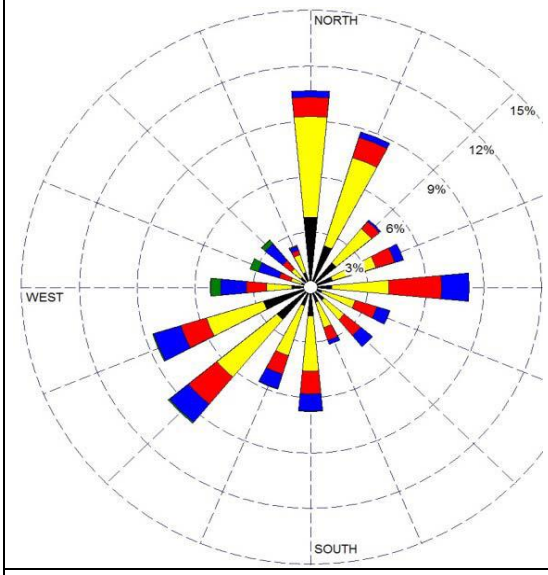
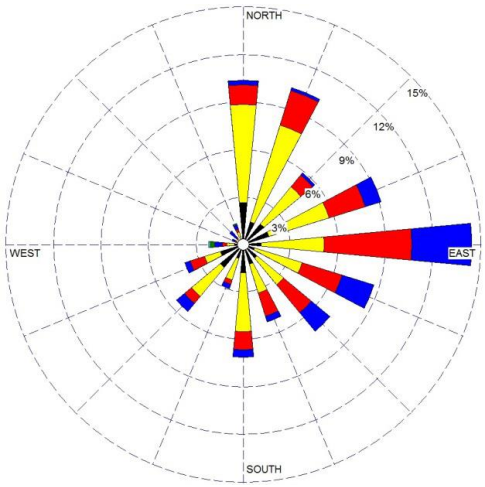
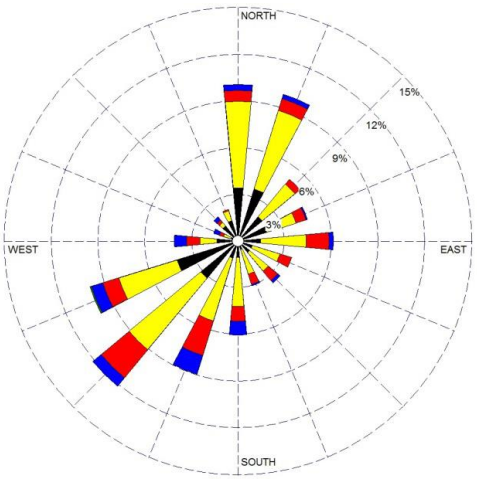
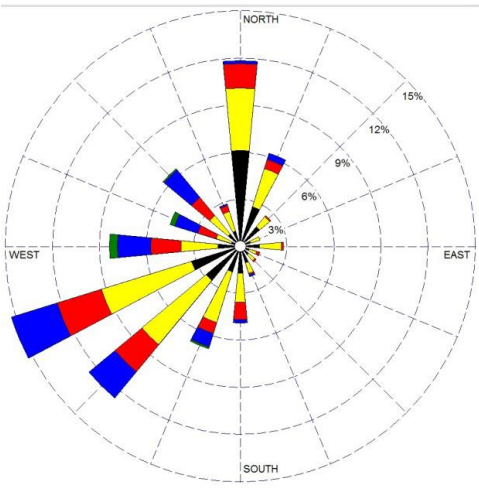
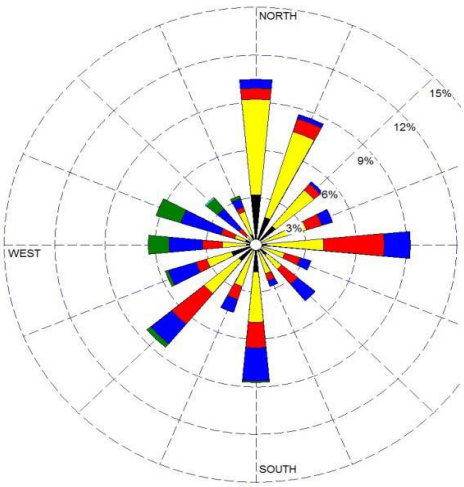


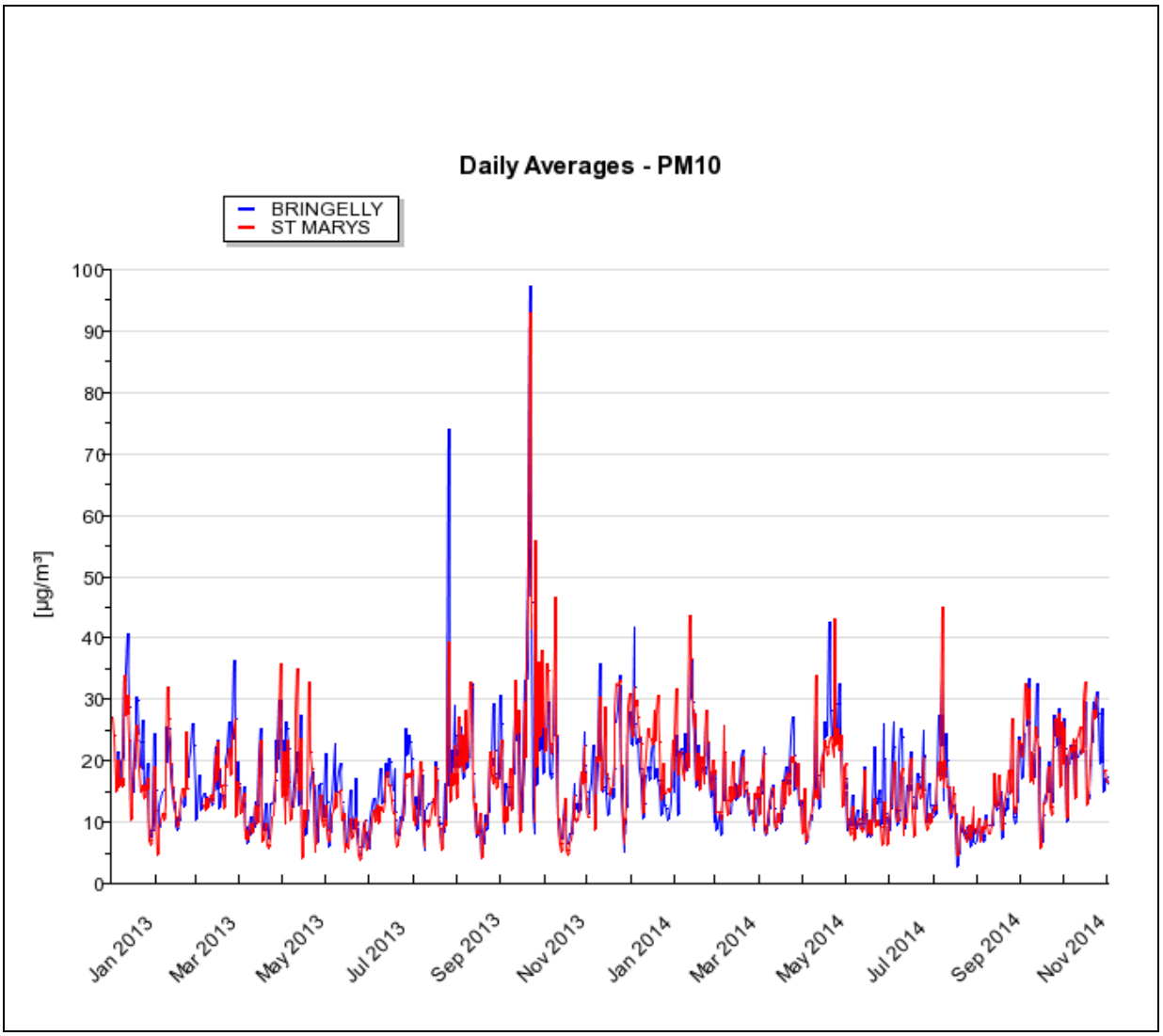
**Figure 10-3: Annual and seasonal daytime wind rose charts – Badgerys Creek 2013**

<table>
<tr><td> 
</td><td>Daytime wind roses (7am – 6pm)<br><br>WIND SPEED<br>(m/s)<br>>= 8.0<br>5.0 - 8.0<br>3.0 - 5.0<br>2.0 - 3.0<br>1.0 - 2.0<br>0.5 - 1.0<br>Calms: 5.08%</td></tr>
<tr><td>Annual</td><td></td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Summer</td><td>Autumn</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Winter</td><td>Spring</td></tr>
</table>

### 10.10.3 Local Air Quality

The closest air quality data to Luddenham is recorded in Bringelly (approximately 5.8 km south east of the site) and St Marys (approximately 7 km north east of the site). A summary of dust monitoring data recorded at these two sites is provided in **Figure 10-4**.

**Figure 10-4: Daily PM10 concentrations (Source: NSW OEH)**




Apart from a few spikes (likely due to regional air quality events, such as bush fires or dust storms), the $PM_{10}$ 24-hour averages in the region typically range from 15 – 35 µg/m3, well below the recommended concentration of 50 µg/m3 (DECC *Approved Methods*).

Furthermore, local air quality parameters of the subject region are unavailable, thus $PM_{10}$ background concentration data was sourced from the values listed in the DEC NSW Quarterly Monitoring Reports for the Bringelly monitoring station (DEC NSW 2007A, DEC NSW 2007B, DEC NSW 2007C, DEC NSW 2007D). The Bringelly monitoring station is the closest to the

subject site at Luddenham and has been referred to in terms of using background $PM_{10}$ data in the assessment. **Table 10-7** includes a summary of the background $PM_{10}$ data for 2007.

**Table 10-7: Existing Background $PM_{10}$ Data (Ramsay Rd, Bringelly NSW, 2007)**

| $PM_{10}$ | Value Recorded Within Each Month ($\mu g/m^3$) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | | | | | | | | | | | | Av. |
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 24-Hr Maximum | 50 | 32 | 32 | 34 | 48 | 19 | 28 | 26 | 29 | 45 | 34 | 28 | 34 |
| All-Hour Monthly Av | 30 | 21 | 20 | 19 | 20 | 10 | 13 | 14 | 17 | 25 | 16 | 17 | 19 |

**Source:** DEC NSW (2007A), DEC NSW (2007B), DEC NSW (2007C), DEC NSW (2007D)

The referenced 24-hour background data featured in **Table 10-7** above are maximum values recorded from the DEC/OEH Bringelly monitoring station. The background data for $PM_{10}$ at Bringelly may be considered as an acceptable conservative substitute for $PM_{10}$ in Luddenham due to the use of maximum $PM_{10}$ values and the relatively close proximity to the applicant's sites.

Dust deposition background data were also unavailable and so a conservative value of 2 $g/m^2$/month was used.

## 10.11 ASSESSMENT OF AIR QUALITY IMPACTS

It is proposed that the quantity of materials to be stockpiled within the new proposed site would be reduced by approximately 20% from the quantity previously approved within the Commonwealth land. Furthermore, the proposed sites will have wind breaks in the form of landscaped earth berms as well as trees and shrubs to assist in preventing dust from leaving the site. These additional measures were not installed at the previously approved site.

The site will effectively be operated for approximately 5 days per week for 45 weeks per year when excluding Public Holidays and shut down time for service and maintenance purposes especially during the Christmas/ New Year period and Easter break.

Based on our extensive experience with similar activities and the potential for air emissions (mainly dust) from such activities and their relatively small scale, we are confident that the air emissions will not migrate outside the boundaries of the site provided that the mitigation measures recommended for the noise assessment, visual assessment and others that are recommended in this document are fully implemented on site.

### 10.11.1 Odour

Due to the nature of the virgin materials stockpiled on site which is of a non-putrescible nature, and the dry nature of the storage activities, odours are not expected to be present on site. This was confirmed during the inspections conducted by NICS personnel, in particular the odour

survey that was undertaken on 24 November 2015. More details associated with the comprehensive odour survey are included in Section 19.

### 10.11.2 Potential Air Emission Sources

The following list shows the potential air emission sources that have been identified from examining the proposed site operations and activities:

- Vehicle and machinery exhaust gas emissions (negligible);
- Vehicle Travel;
- Wind Erosion from Stockpiles;
- Loading and Unloading;
- Excavation;

However, as previously stated due to the nature and characteristics of the clay and shale materials excavated and stockpiled, the potential for dust emissions is minimal.

Vehicle and other machinery exhaust gas emissions are considered negligible especially due to the fact that most of these items are relatively new and do comply with both current NSW emission requirements and relevant Australian Design Rules. Despite the fact that these emissions are negligible, no change in these emissions is expected since no additional machinery will be used in the proposed new sites.

Wheel-generated dust emissions from vehicle travel within the site are expected to occur during operation. By comparing the haul roads of the previously approved stockpiling and composting locations with the proposed new locations, there appears to be very minimal change to the distance travelled which might give a negligible increase to the wheel-generated dust emissions

Low level dust emissions from stockpiles are also expected to be released due to wind erosion. Inspection of the wind roses and wind speed figures suggest that this would need to be considered in the assessment.

Loading, unloading and material handling activities may have the potential to generate low levels of dust emissions due to the nature of the materials being handled on site. These have been considered in the assessment.

Dust emissions from the excavation activities are expected. Proposed dust mitigation controls for these processes were included in the air assessment.

The potential for exposure to dust emissions is dependent on the intensity of site activities (i.e. the amount of dust generated), duration and frequency of the operations in any given locality and the relative location of nearby sensitive receptors.

Except for the negligible dust generated from haul trucks on the fully sealed access road, the majority of dust-generating activities will occur within the approved and proposed sites. The nearest residential sensitive receptor is at least 134 m (94+40) from the nearest dust

generating activity within these sites. Typically, a high proportion of the coarse particulate matter emissions are deposited within 300 to 500 m of the dust generating activity, if dust mitigation measures are not fully implemented at the dust generating source.

Analysis of local meteorological data shows that the prevailing winds are from the southwest and north, with easterly winds a feature during the summer months. These prevailing weather conditions are favourable since the most sensitive residential receptors are located north and south west of the proposed stockpiling site.

### 10.11.3 Air Emission Factors

Despite the fact that most dust generating activities remain unchanged as a result of the proposed modifications, it was considered appropriate to develop site-specific air emission factors using relevant and appropriate methodologies from various references. These air emission factors were then used to create the site-specific emission rates which could be used at a later stage, if required due to further changes in the applicant's activities or expansion of the activities within the approved and proposed locations. Calculation methodologies and figures are provided as follows.

#### 10.11.3.1 Vehicle Travel Emissions

"Dust Emissions" written by F.W. Parrett (Parrett 1992) contains a methodology of calculating dust emission rates from vehicle travel on unpaved roads based on the parameters of the fraction of particles suspended, silt content, average vehicle speed and number of rainy days per year. Compared to generic emission factors, the referenced equation focuses on developing a site-specific emission factor based on site-specific conditions and properties, shown as Equation 10-1.

Equation 10-1: $$E = 0.81PS\left(\frac{V}{30}\right)\left(\frac{365-R}{365}\right)\left(\frac{T}{4}\right)$$

Where

*E* = emission factor in g/vehicle mile
*P* = constant wherein a value 0.32 is used for gravel roads (applicable to the subject site)
*S* = silt content in %
*V* = average vehicle speed in miles per hour
*R* = number of days per year with rainfall of more than 0.01 inches
*T* = number of tyres

The calculated vehicle travel emission factors are listed in **Table 10-8**. These emission factors represent uncontrolled emissions.
S = 5
V = 20km/h or 12.43 Miles/h
R = 68.6 days (1995-2016 data)

T = 16 as an average (trailer & dog and rigid truck)

**Table 10-8: Developed Emission Factors from "Dust Emissions" by F.W. Parrett**

| Activity | $PM_{10}$ Emission Factor | Units | $PM_{10}$ Emission Factor | Units |
|---|---|---|---|---|
| Travel of Trucks | 1.744 | g/vehicle mile | 1.063 | g/vehicle km |
| Travel of Staff Vehicles* | 0.0 | g/vehicle mile | 0.0 | g/vehicle km |

**Source:** Parrett (1992)

*Note that Staff travelling is very limited and mostly on sealed access roads

### 10.11.3.2 Loading and Unloading Emissions

Emissions from loading, unloading and material handling were estimated based on methodology listed in the National Pollutant Inventory (NPI) guidelines "*Emission Estimation Technique Manual (EETM) for Mining*" (NPI DEH 2001). The referenced equation focuses on developing a site-specific emission factor based on the site-specific conditions and properties, shown as Equation 10-2.

Equation 10-2: $$E = k0.0016\left(\frac{U}{2.2}\right)^{1.3}\left(\frac{M}{2}\right)^{-1.4}$$

Where

*E* = emission factor in kg/tonne
*k* = 0.74 for particles less than 30 micrometres
0.35 for particles less than 10 micrometres
*U* = mean wind speed in m/s
*M* = material moisture content in %

The calculated emission factor is for uncontrolled emissions and is listed in **Table 10-9.**
K = 0.35
U = 3.7 (Badgerys Creek AWS)
M = 10

**Table 10-9: Adopted Emission Factors from NPI EETM Guidelines**

| Activity | $PM_{10}$ Emission Factor | Units |
|---|---|---|
| Loading, Unloading and Handling of Materials | 0.00016 | kg/tonne |
| | 0.16 | g/tonne |

**Source:** NPI DEH (2001)

### 10.11.3.3 Wind Erosion Emissions from Stockpiles

Emissions from active stockpiling due to wind erosion were based on default values listed in the National Pollutant Inventory (NPI) guidelines "*Emission Estimation Technique Manual (EETM) for Mining*" (NPI DEH December 2001) (Section 1.1.17) . These values were recommended to

be used since they reflect Australian conditions rather than using formulas for overseas conditions. The value for PM10 is 0.2 kg/ha/hr or 200 g/ha/hr.

### 10.11.4 Excavation Emissions

**Table 10-10** shows the emissions from excavations, which are based on the methodology listed in the National Pollutant Inventory (NPI) guidelines "*Emission Estimation Technique Manual (EETM) for Mining*" (NPI DEH December 2001). The referenced equations focus on developing a site-specific emission factors based on the site-specific conditions and properties, shown as Equation10-3.

Equation10-3: $$E_w = k(0.0016)\frac{(U/2.2)^{1.3}}{(M/2)^{1.4}}$$

Where

$E_w$ = Emission factor using a front end loader or an Excavator in kg/tonne
$k$ = 0.74 for particles less than 30 micrometres aerodynamic diameter
0.35 for particles less than 10 micrometres aerodynamic diameter
$U$ = Mean wind speed in m/s
$M$ = Moisture content in %

**Table 10-10: Adopted Emission Factors from NPI EETM Guidelines**

| Activity | $PM_{10}$ Emission Factor | Units |
|---|---|---|
| Excavator/ Front End Loader | 0.000116 | kg/tonne |
| | 0.116 | g/tonne |

**Source:** NPI DEH (2001)

#### 10.11.4.1 Air Emissions Inventory

**Table 10-11** shows the list of estimated site-specific air emission rates and the corresponding references used to calculate each emission rate. These were derived by multiplying the referenced emission factors with the amount of units for each proposed activity (e.g. vehicle travel emission rates were derived by multiplying the emission factor with the proposed speed of the vehicle and dividing by 3600 to convert hours to seconds).

**Table 10-11: Air Assessment Emission Rates without Mitigation Measures**

| Emission Sources | Emission Rates (g/s) | Reference Source for the Emission Factor Used in Air Assessment |
|---|---|---|
| | $PM_{10}$ | |
| Vehicle Travel Emissions<br>• Truck Travel<br>• Staff Vehicle Travel | <br>0.0096<br>0.0 | Parrett (1992) |
| Loading and Unloading | 0.395 | NPI DEH (2001) |
| Wind Erosion Emissions From Stockpiles | 2 | Parrett (1992) |
| Excavation | 0.0028 | NPI DEH (2001) |

The above calculations are based on excavation, loading or unloading of approximately 200,000 tonnes per year for 45 weeks and 5 days per week (total of approximately50 working hours per week). Stockpiling area is approximately 6 ha.

## 10.11.5 Air Assessment and Discussion

### 10.11.5.1 Air Quality Controls

**Based on the analysis provided in the previous table (Table 10-11), it appears that the potential impacts ($PM_{10}$) will mostly be attributed to wind erosion emissions (mainly stockpiling activities) since all other emissions together are very negligible compared to the emissions from the stockpiling alone.**

The NPI guidelines "*Emission Estimation Technique Manual (EETM) for Mining*" (NPI DEH 2001) lists a number of air emission controls that may be relevant for use on the subject site. The following emission controls (included in **Table 10-12**) were referenced from the document in order to achieve compliance in dust impacts at the potentially sensitive receptors.

**Table 10-12: Emission Reduction Controls Referenced from NPI Guidelines**

| Control | Activity Applicable To | Emission Reduction |
|---|---|---|
| Water sprays | Stockpile Storage | 70% |
| Naturally high moisture content | Stockpile Storage | 50% |
| Wind breaks (barriers) | Stockpile Storage | 30% |

**Source:** NPI DEH (2001)

Managing air pollution at the source through best management practices is a key factor to the successful operation of the proposal.

It is therefore recommended that the site manager monitors daily weather forecast and conditions to be fully aware of any sudden changes to the weather conditions. These updates should contain warnings of the onset of strong winds. In the event of such warning, the

manager could then take steps to ensure that exposed areas that could reasonably be subjected to wind erosion are consolidated by the timely application of water sprays.

Based on the above generic mitigation measures and by applying the general emission reduction controls included in **Table 10-12**, the reduction controls, which are referenced from the NPI guidelines "*Emission Estimation Technique Manual (EETM) for Mining*" (NPI DEH December 2001), included in **Table 10-13** were applied to the air emissions.

**Table 10-13: Dust Suppression Control Factors**

| Control Method | Reduction |
|---|---|
| Water sprays on haul roads (vehicle travelling) | 70% |
| Water sprays in Loading and Unloading Activities | 70% |
| Water sprays on Stockpiling Activities | 70% |
| Wind breaks (barriers) around most of the perimeter of the site including the stockpiling areas | 30% |

**Table 10-14** presents the emission rates of the activities following the application of all recommended mitigation measures.

**Table 10-14: Air Assessment Emission Rates with Mitigation Measures**

| Emission Sources | Emission Rates (g/s) | Reference Source for the Emission Factor Used in Air Assessment |
|---|---|---|
| | $PM_{10}$ | |
| Vehicle Travel Emissions<br>• Truck Travel<br>• Staff Vehicle Travel | 0.00288 | Parrett (1992) |
| Loading, Unloading and Material Handling | 0.08295 | NPI DEH (2001) |
| Wind Erosion Emissions From Stockpiles | 0.42 | Parrett (1992) |
| Excavation | 0.00084 | NPI DEH (2001) |

Based on the above calculated emission rates, it is clearly evident these values are extremely low compared with similar activities and for similar machinery. These low values are mainly attributed to the following reasons:

1. The activities are very limited compared with similar quarries despite the fact that the site will be open for nearly 50-55 hours per week for an approximate total of 45 weeks per year.
2. The relatively new machinery proposed to be used on site will assist in reducing the emission of dust even further especially while travelling,
3. The site layout plays an important role in reducing travelling distances for both staff and haulage,
4. The low speed limit of 20km/h has a great impact on reducing dust emissions from vehicles travelling within the site,

5. The construction of a 4.5 m high landscaped earth berm /barrier (wind break) at the northern, western and eastern sides of the site and a 3 m barrier (wind break) along most of the southern side,
6. The implementation of dust suppression measures including wind breaks (barriers and plantations), water sprays, cart and hoses at all activities undertaken on site.

**Based on the above findings and the fact that all activities will remain the same apart from the stockpiling activities which will be reduced by approximately 21%, it is clearly evident that the total dust emissions from the activities undertaken by the applicant will be reduced when compared with the dust emissions from the previously approved activities at the previously approved sites. The dust emissions from the previously approved composting and stockpiling activities as well as quarrying did comply with the relevant NSW criteria without the need to install wind breaks (barriers and plantation). These emissions will be reduced by 21% before the introduction of the wind breaks. This means that the proposed relocation of stockpiling and composting will have dust emission reduction that is greater than 21%. Compliance with the NSW dust criteria will be achieved comfortably.**

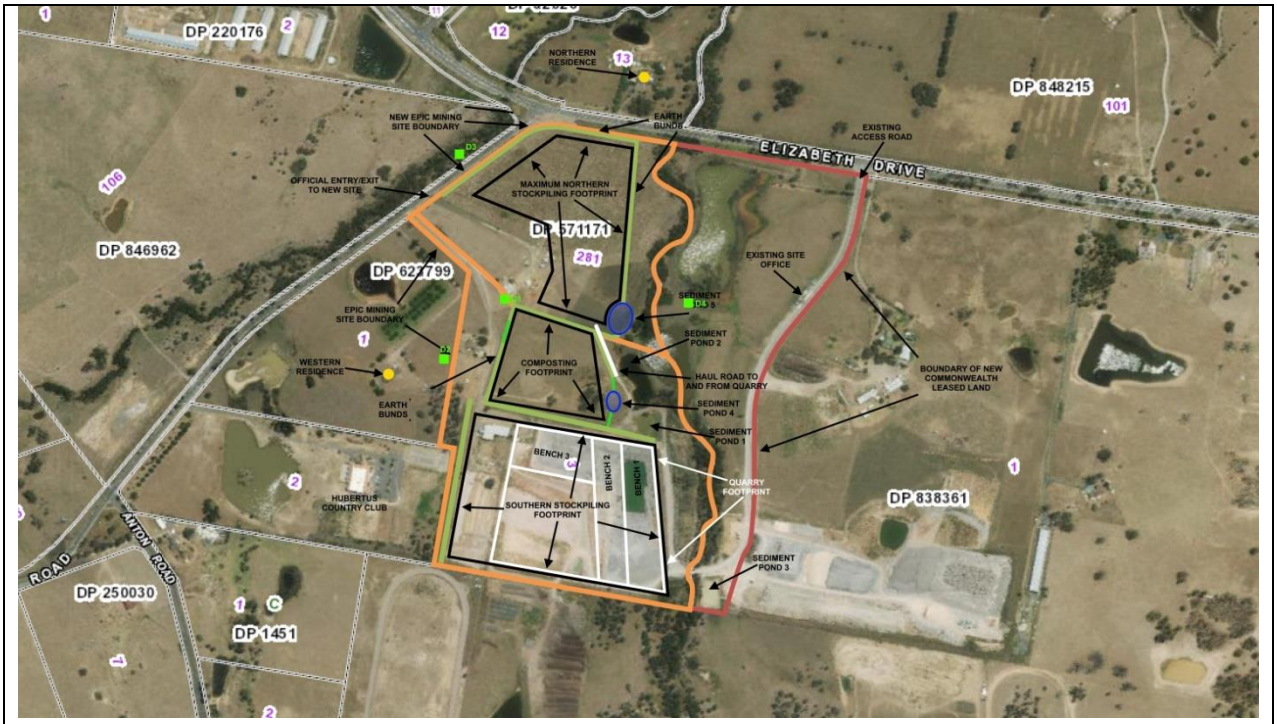
## 10.12 RECOMMENDATIONS

Despite the fact that based on the very low values of dust generated from the proposed activities, it is anticipated that the no dust will be noticed or observed outside the boundaries of the site, it is recommended that the dust deposition monitoring program previously implemented be continued. However, the program should be re-evaluated after two (2) years to determine whether the existing program is of value and needs to continue at the same frequency and locations. This monitoring program should include deposited dust (dust gauge) as well as $PM_{10}$ (high volume sampler) to ensure that any exceedances of the NSW criteria could be identified and appropriate action would be taken to prevent recurrence of these exceedances. The deposited dust should be monitored continuously on a monthly basis and the $PM_{10}$ on a quarterly basis.

Due to the change in stockpiling and composting locations, it is also recommended that dust monitoring points be re-located to ensure that dust emissions from the applicant's activities are captured in the dust monitoring program. These locations are shown in **Figure 10-5** which have been chosen based on the receptors that are likely to be the most affected by dust impacts, if any.

Monitoring at these locations would be new and next to residences. Contribution from other sources of dust would need to be recorded during placement and retrieval of the dust gauges sampling bottles. Analysis of weather data would be useful in assisting the reviewer to understand more fully the effectiveness of the dust mitigation measures.

**Figure 10-5: Proposed locations of dust monitoring points**




## 10.13 EXISTING MITIGATION MEASURES ADEQUACY

Based on the information provided in the previous Sections, we believe that the existing dust mitigation measures are adequate to ensure compliance with statutory requirements since the applicant is already in full compliance with these requirements unless there are external factors that influence the results such as bird droppings.

It is, though, of utmost importance for the continued viability of the project and to avoid the potential of any regulatory actions by regulatory authorities that all previously recommended dust mitigation measures whether they were included in the environmental management plan or other follow-up reports be adhered to at all times.

## 10.14 PROPOSED MITIGATION MEASURES

Based on the outcomes of the assessment, observations made during the site inspections by Government and non-Government employees and the results of monitoring in the last three (3) years, and under normal circumstances no additional dust mitigation measures would be required. However, to avoid any exceedances of the dust criteria even under the worst case scenario, we recommend that the applicant considers the additional mitigation measures outlined below. It should be noted that most of these mitigation measures are already implemented on site.This is derived from the fact that the management of the quarry has always been very proactive in its environmental obligations since the quarrying activities commenced on site.

1. Construction and maintenance of landscaped earth berms (wind breaks/noise barriers) around most the sites' perimeters including planting of trees and shrubs as recommended in the Visual Impact Assessment.
2. Ensure that the 4.5 m high landscaped earth berms/barriers (wind breaks) are installed and maintained on the northern, eastern and western sides of the site. These barriers are very effective wind breakers to prevent dust generated from the site activities from leaving the site. In addition, the 3 m high similar landscaped earth berm (wind break) proposed for most of the southern side should assist in preventing the dust generated on site from leaving the site.
3. Retain existing vegetation where possible or re-vegetate cleared areas with fast growing species for rapid coverage to temporarily or permanently stabilise the soil.
4. If certain stockpiles are to remain on site for an extended period of time, the management should consider the use of covers to assist in reducing wind erosion and generation of dust from these stockpiles, if the expected crust does not form quickly enough on the stockpiled materials surface.
5. Since there is only one entry/exit point to the site, the management should control on-site traffic by designating specific routes for haulage. Vehicle speeds within the site should be kept to below 20 km/hr.
6. All loaded trucks should be covered while entering and/or leaving the site.
7. Material spillage on roads and pathways should be cleaned up immediately.
8. Using water sprays and water carts to wet down haul roads. Sealed roads at access and egress points will be watered-down regularly to minimise the re-suspension of dust on sealed roads.
9. Watering material prior to it being loaded for haulage, where appropriate.
10. Ceasing activities during periods of adverse weather conditions that are caused by very dry and windy conditions especially high south westerly or north easterly winds when there are visible dust emissions moving off-site, until adequate control measures are implemented or conditions improve. Wind erosion can become significant at wind speeds above 5 m/s.
11. Readiness of all employees on-site through regular training sessions to address any potential for excessive dust emissions when severe adverse weather conditions are encountered or predicted;
12. More frequent water spraying on days where adverse weather conditions are present; and
13. More accelerated rehabilitation work to be conducted on selected areas, if determined to be necessary.

## 10.15 CONCLUSION

Based on the above information it can be concluded and confirmed that the proposed modifications will have no additional impact on the environment or human health from a dust generation perspective. On the contrary, the dust emissions will be reduced for the reasons stated above. The dust mitigation measures already implemented on site and those recommended will ensure that any potential of increased dust emissions from the modifications will be prevented or at least greatly minimised promptly in an efficient and

effective manner. The heavy clay/shale particles nature of the stockpiled materials provides ease of compaction and minimal dust generation.

In addition, we believe that the dust mitigation measures (including staff training) are capable of managing any dust generation situation that may arise in future as a result of the proposed modifications and under any weather condition.

Based on our extensive experience with similar assessments for similar activities and the fact that air emissions will be reduced and the additional mitigation measures recommended in the vicinity of the proposed site, we believe that the proposed activities' dust emissions will comply very easily with the NSW criteria and thus computer modelling is not warranted as it would simply confirm our conclusion.

# 11. TRANSPORT

## 11.1 GENERAL

Despite the fact that no changes to the number of vehicle movements are proposed since no changes to the production rate is proposed as part of this modification, it was considered appropriate to consider possible improvement to the current traffic arrangements within the site as a result of relocating both the composting and stockpiling activities from the Commonwealth leased land into an adjacent site for the stockpiling and the northern portion of the applicant's approved site for the composting.

Furthermore and for completeness purposes only, we have included information associated with the overall traffic management on site as it evolved over the past 5 years.

## 11.2 EXISTING ENVIRONMENT

The site legal address is 275 Adams Road, Luddenham. During the preparation for the EIS it was determined by all stakeholders including government authorities that the best approach to reduce traffic impact including traffic noise on nearby residential properties is to develop and implement a road transport protocol which would include the construction of a new access road to the Quarry via Elizabeth Drive. The road transport protocol was prepared and implemented for the site. The roadway off Elizabeth Drive internal of the site has been properly created and vehicles gain safe access to the site from Elizabeth Drive via a slip lane.

The access road also incorporates a weighbridge and site office to ensure that access is continuously monitored by the quarry management at all times during normal operations. This access road has already been properly established in accordance with the protocol. The specific number of trucks entering and leaving the site varies depending of the demand for the clay and shale. Due to the small number of truck movements, it is anticipated that these movements have none to minimal impact on the traffic in the vicinity of the site including Elizabeth Drive.

At a nominal 32 tonnes per vehicle, approximately 20 vehicles will be required per day for the transport of raw materials, which equates to approximately 40 vehicle movements over a daily ten hour period.

Haulage vehicles will travel east from the site along Elizabeth Drive and return to the site travelling west along Elizabeth Drive. No haulage vehicles may enter or leave the site between 6 pm and 7am at any day.

## 11.3 NEW ENVIRONMENT (STOCKPILING ACTIVITIES)

Based on the information provided by the quarry management which is based on the records kept on a daily basis, the number of vehicles entering and leaving the site has not exceeded the number of vehicle movements prior to the stockpiling activities commencing on the site. This number is still below what was used to undertake the traffic and transport impact assessment during the preparation of the initial EIS.

## 11.4 POTENTIAL ADDITIONAL IMPACTS

No additional impacts were noticeable due to the stockpiling activities provided that all vehicles used in the stockpiling activities were in compliance with current NSW legislation in respect to exhaust gas emissions and noise levels.

There is no expected significant change to the road transport protocol or anticipated vehicle trips with the proposed modification works. The transport protocol related specifically to the removal of clay product and is based on a typical operation on-site. The proposed stockpiling of product on-site does not add to the total number of truck movements on-site or off-site as the remnant excavated material will be reused on-site.

## 11.5 IMPLEMENTED MITIGATION MEASURES

All mitigation measures associated with the traffic and transport management as recommended in the EIS and other studies conducted during the planning stage, have been implemented with all required works. Following careful review of the information obtained from the proponent, the EIS, the road transport protocol, a comprehensive site inspection and the outcome of the independent environmental audit, we are confident that the mitigation measures implemented on site are sufficient to eliminate any potential impact due to the traffic associated with the composting and stockpiling activities.

## 11.6 PROPOSED NEW STOCKPILING LOCATION POTENTIAL IMPLICATIONS

We believe that the proposed new location for stockpiling would have a positive rather than negative impact on the traffic management within the areas under the management of the applicant since there will be car parking spaces dedicated for its employees whereby they can enter the site from the new address' dedicated driveway at 285 Adams Road, Luddenham. They would park their vehicle and walk down to the active stockpiling working area to drive the heavy machinery as per usual. However, the heavy machinery will only use the haul road to travel between the quarry and the proposed stockpiling area. This split between the routes of light vehicles and heavy vehicle road users is extremely important to assist in minimising the risk of traffic conflict which on occasions may cause unexpected accidents. Furthermore, the number of vehicle movements will not change by moving the stockpiling from the current location to the new location. In any case, the maximum number of light vehicles (employees only) using the driveway at 285 Adams Road will not exceed 4 at any working day.

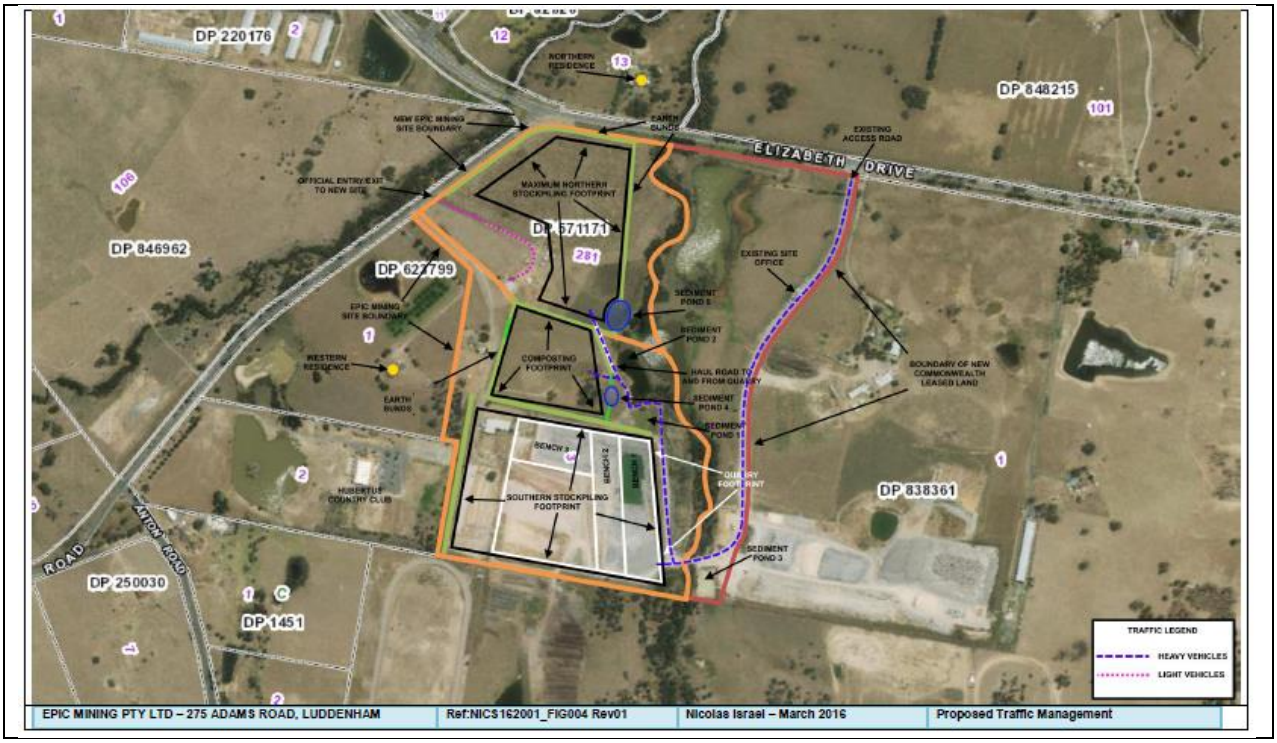
**Figure 11-1** shows the proposed traffic flow of light (employees) and heavy vehicles to and from the proposed new stockpiling area. These proposed traffic arrangement should be implemented in both the construction and operation stages.

## 11.7 PROPOSED NEW COMPOSTING LOCATION POTENTIAL IMPLICATIONS

Similarly, the proposed new location for composting activities would have positive rather than negative impact on traffic management for the same reasons outlined in Section 11.6 above.

**Figure 11-1** shows the proposed traffic flow of light and heavy vehicles to and from the proposed new composting area. These proposed traffic arrangement should be implemented in both the construction and operation stages.

**Figure 11-1: Proposed Traffic Management for Light and Heavy Vehicles within the Site**




## 11.8 PROPOSED MITIGATION MEASURES

Based on the information provided in Section 11.4 above, no additional mitigation measures are proposed apart from management directions to employees associated with the stockpiling activities to use the new light vehicle route and car park located within the new site at 285 Adams Road, Luddenham.

It should also be noted that the speed limit of 20km/h will continue to be implemented within the site. This speed limit will apply to all vehicles travelling within the areas under the control of the applicant.

In summary:

- All light vehicles will enter the site via the main entry/exit driveway of Adams Road by making a left turn (approximately 90$^{o}$) if they are heading south and a right turn (approximately 90$^{o}$) if they are heading north,

- All vehicles would continue towards the car park to park their vehicles before commencing work
- All heavy vehicles will enter the site via the access road of Elizabeth drive. Some vehicles will stop at the stockpiling area within the quarry footprint, others will continue along the haul road to reach either the composting area or the new stockpiling area.
- Generally, all visitors should initially stop and report to the site office. Depending of the purpose of their journey and the size of their vehicle, they will be given instructions by the site manager on the way to proceed.
- All light vehicles will leave the site in a forward direction via the entry/exit driveway for and then by making either a right turn into Adams Road heading north or a left turn into Adams Road heading south.
- All heavy vehicles will leave the stockpiling and composting sites in a forward direction travelling along the dedicated haul road until they reach the sealed access road which they follow until they connect with Elizabeth Drive.

## 11.9 CONCLUSION

Based on the observations made during the site inspections, the proposed site layout the information presented above and the proposed activities on site, we believe that the proposed modifications would have positive rather than negative impact on most aspects associated with the traffic and transport conditions within and in the vicinity of the site. We are also confident that the proposed traffic arrangements are sufficient and efficient in protecting the Health & Safety of employees and contractors without compromising the day to day operations of the site.

# 12. PUBLIC SAFETY

The proposed new sites for stockpiling and composting activities are well segregated and fenced to prevent any unauthorised entry by the general public in addition to the fact that the there are no retail sales for the materials extracted and stockpiled on site.

Furthermore, all aspects associated with the application of SEPP 33 – Hazardous and Offensive Development have been addressed in the Risk Assessment Section (Section 4) as well as the Statutory Context Section (Section 3) of this document. Below is some additional information associated with the management of small quantities of chemicals that are likely to be stored and handled on site.

## 12.1 CHEMICALS

### 12.1.1 Background

Based on the information supplied by the applicant there are only small quantities of chemicals to be kept on site. They are all kept in a secure and safe place and stored in accordance with current NSW statutory requirements and codes of practice.

The following chemicals are stored on site:

- Small quantities of household cleaning chemicals;
- Small quantities of herbicides;
- Small quantities of insecticides;
- Small quantities of oil & grease for use in the workshop; and
- Small quantities of diesel to refuel quarry machinery. (These are stored within a double skinned and self bunded steel tank which complies with the relevant environmental guidelines and Workcover requirements)

### 12.1.2 Potential Environmental Impacts

It can be confirmed with confidence that there is no adverse impact on human health or the environment as a result of storing and handling of chemicals on site mainly due to the fact that most of these chemicals are not considered hazardous or have the potential for any risk associated with their handling. In addition, only small quantities are kept on site.

This conclusion was confirmed during site inspections by government authorities, environmental consultants and the independent environmental auditor.

The proposed modifications do not alter the status of the mitigation measures implemented on site to ensure that these chemicals have no potential harm to human health and the environment.

Therefore, no additional mitigation measures are required.

# 13. RESOURCE

We understand that at this stage the sites proposed for stockpiling and composting activities will be used for the intended proposed purpose only, no other resources will be investigated or assessed at this stage. However, if the applicant wishes to investigate other options for the use of site resources, formal relevant assessments will be required.

# 14. WASTE MANAGEMENT

## 14.1 GENERAL

It is clear that waste management is a priority for the applicant to ensure that all wastes generated on site especially in the active working areas are collected promptly and where appropriate classified appropriately in accordance with current EPA waste classification guidelines.

There are several locations where wastes are likely to be generated during normal operations on-site as outlined below.

1. Waste is generated at the site office and personnel amenities near the weighbridge. These wastes are three types:

   - Food scraps and other domestic waste
   - Recyclable materials such as aluminium cans, plastic containers, papers and cardboard
   - Sewerage and other human wastes from the toilets and shower

2. Waste is generated at the site's workshop where all vehicles/equipment are serviced and maintained – this waste is stored in dedicated bins and transported off-site by a licensed transporter.

3. Waste is also generated at the working site by employees

In addition to the above wastes generated on site, the applicant imports relatively small quantities of EPA approved and exempted organic garden/dry mulch wastes for re-using on-site. Some of this waste material is used directly in the rehabilitation of excavated areas including the Vegetated Riparian Zone. Some of this waste material is also used in landscaping activities, earth bunds and mounds within the site after it has been subjected to a composting process. This aspect is addressed in greater details in the Composting Section (19) of the EAR.

## 14.2 WASTE MANAGEMENT PLAN

Waste management on site was included in a comprehensive Waste Management Plan which was prepared as part of complying with the original Development Consent. This plan was approved by the Department at that time. Notwithstanding the above, we consider it appropriate to include some additional information that it is considered relevant to both the construction and operation stages of the proposed modification.

Thus, the additional details for the Waste Management Plan cover the two (2) stages; the construction and operational stages. Furthermore, and to support the waste management plan, we considered it appropriate rather than completing some standard forms, detailed information

is necessary to demonstrate the applicants' dedication to waste management and to show the locations of dedicated waste bins.

### 14.2.1 Waste Management Plan for the Construction Stage

Since no demolition will be necessary during the construction stage, a waste management plan for demolition will not be required.

The construction will include the removal and clearing of grass from the areas where tree planting/landscaping, noise barriers (earth berms), diversion drains, sediment pond, haul road and site preparation for the stockpiling and composting activities are proposed. The waste will mainly be grass clippings and some clean soil. This waste will be reused on site at different locations as fill material but mainly as part of the noise barriers (earth berms).

As part of this modification application, there are no buildings or similar structures to be constructed. Hence, it is anticipated that no waste is likely to be generated during the construction stage. However, if any waste is generated by any contractors engaged to undertake any work during the construction stage, they will be required to remove this waste off site as part of the contractual arrangements.

### 14.2.2 Waste Management Plan for the Operational Stage

Since the site is mainly used for the receiving and storing of excavated clay and shale from the adjacent site and finished products for their intended purposes (oil, grease, toilet paper, office items), it is clearly evident that waste management is one of the applicants' top priorities to ensure that materials received are not mixed with waste generated from their employees during normal activities. The waste generated on site is separated into domestic putrescible, domestic non-putrescible and possibly industrial non-putrescible waste.

The domestic putrescible waste is mainly made up of very small quantities of food scraps, tissues, etc.… This waste is placed in a separate bin and collected by the weekly Council (or contractor) garbage collection run.

The domestic non-putrescible waste is mainly made up of office left-overs, papers, cardboard boxes, empty tissue boxes, empty aluminium cans, plastic bottles, glass jars, etc. These will be placed in the recyclable bins to be collected by weekly (or fortnightly) Council (or contractor) recyclable collection runs.

The industrial solid waste is generated from the packaging of products stored and used on site and other by-products from the use of certain products such as potentially oil contaminated cardboard boxes, dirty rags, plastics, empty containers, etc.….. The solid waste is to be placed in a dedicated mini skip which is collected and replaced by a licensed waste transporter on a monthly basis.

Since all major machinery servicing and maintenance are undertaken by professional mechanical companies, it is anticipated that only small quantities of industrial liquid waste mainly machinery related waste such as sump oil and grease will be generated on site. This waste will be stored in a specially dedicated tank and collected regularly by a licensed waste transporter.

Other than the above waste, no other waste materials will be generated on site that may require transporting directly to licensed landfills due to the fact that all materials received on site are considered to be finished products and no further processing is required.

Due to the fact that the site is not connected to Council's sewer, the amenities of the site are and will continue to be serviced by the existing septic tank due to the nature and location of the site. The septic tank will be emptied by an appropriately licensed company on a regular basis.

Furthermore, due to the nature of the proposed activities being 100% dry, no wastewater will be generated.

Based on the applicant's excellent environmental performance, including waste management, in the past 5 years, we are confident that the proposed re-location of stockpiling and composting activities will not change the applicant's waste management approach or its employees' culture.

***The proposed modifications do not have any impact on the generation, storage or disposal of wastes associated with the activities conducted on-site.***

# 15. VISUAL IMPACT ASSESSMENT

## 15.1 BACKGROUND

The Department has recently approved the stockpiling activities as part of development consent modification No 3. Since the stockpiles within the Commonwealth land will be removed, there is no need to reproduce the visual impact assessment that was previously undertaken for these stockpiles. However, the visual impact assessment that was undertaken for the stockpiles located within the applicant's approved site (they were called Western stockpiles in the modification No 3 EAR) is reproduced in here for completeness.

Furthermore, visual impact assessment for the quarrying activities were included in the initial EIS as well as a summary was reproduced in the EAR for modification 3. We believe that there is no need for this to be reproduced again.

Due to the fact that normal operations will be limited to between the hours of 0700 and 1800 hours on Monday to Friday, and that maintenance of plant and equipment may be conducted during normal hours of operation and on Saturday from 0700 to 1300 hours, there is no requirement for any lighting to be installed at any location within the existing and proposed sites.

Refer to the proposed site layout included in **Figure NICS162001_FIG001 Rev01** for an illustration of all relevant features within the approved and proposed sites.

A comprehensive Visual Analysis for the proposed stockpiles was conducted by experienced environmental consultants. This analysis and the outcomes are reproduced below. Illustrations of the visual analysis for the stockpiles within the applicant's approved site and the proposed stockpiles are also included in **APPENDIX J**.

## 15.2 METHODOLOGY

In relation to the visual impact of any activity/structure on the surrounding environment, an acceptable method of assessing impact is to use the so called "*scale of impact*" which is done by percentage visibility and categorised as per **Table 15-1** below.

**Table 15-1: Scale of Visual Impact**

| Scale of Visual Impact | Percentage of Visibility |
|---|---|
| None | no visibility |
| Very low | 10% |
| Low | 25% |
| Moderate | 50% |
| High | 75% |
| Extreme | 100% |

The best approach in this site specific case is to assess the visual impact at various locations from various directions and from different properties. These views should also be internal and external to the approved area since the existing stockpiles are located within the approved area. For the proposed stockpiles, only external views will be considered as an accurate location of each stockpile is still unknown.

## 15.3 EXISTING STOCKPILES (WITHIN APPROVED AREA)

### 15.3.1 Activities

The activities on site include the extraction of clay and shale from the quarry, stockpiling the extracted materials at two different locations where several stockpiles are established to separate materials by colours and uses. The stockpiled materials are left in these stockpiles for seasoning and then they are transported to brick and tile manufacturing facilities.

### 15.3.2 Context

The stockpiles of extracted clay and shale are within the approved land of Lot 3 DP 629799, Luddenham (275 Adams Road, Luddenham). The land is approximately 19 hectares and was shown in previous figures of this document. These stockpiles are also shown in the visual analysis figure included in **APPENDIX J**. The site is traversed by Oaky Creek from south to north. Commonwealth Land is located to the east and south, and a large parcel of it, specifically of Lot 1 DP 838361 is leased by the applicant for the temporary storage of extracted clay and shale for seasoning purposes only. Most of the leased land will be handed back to the Commonwealth as soon as the applicant's activities cease and the land is rehabilitated in accordance with the contract between the applicant and the Commonwealth.

The site proposed for the new stockpiling activities is located to the north of the applicant site in addition to some privately owned properties to the west. The Hubertus club is located at the western side of the site.

### 15.3.3 External Views

1. The stockpile is not visible from Elizabeth Drive due to the topography of the area and the noise barrier (earth berms) installed in the northern side of the quarry footprint.
2. The stockpile is not visible from Adams Road due to the topography of the area and the noise barrier (earth berm) installed north and west of the quarry footprint.
3. The stockpile is barely visible from the southern adjoining properties due to the topography of the area.
4. The stockpile is slightly visible from the eastern adjoining properties due to the topography of the area.

Hence, the external visibility impact is low.

### 15.3.4 Internal Views

1. The stockpile is visible from within the quarry footprint.
2. The stockpile is barely visible from the northern section of the site due to the topography of the area and the noise barrier (earth berm) installed on site.
3. The stockpile is barely visible from the southern section of the site due to the topography of the area and the additional noise barriers (earth berms) installed on site.
4. The stockpile is slightly visible from the eastern section of the site due to the topography of the area and the shielding provided by the large trees and bushes located along Oaky Creek.
5. The stockpile is not visible from the western section of the site due to the noise barrier (earth berm) installed on the site.

Hence, the internal visibility impact is low.

### 15.3.5 Recommendations

The visual external impact is low to none so no mitigation measures are necessary in regard to the external views. The visual impact from eastern adjoining properties is low to none from some areas and moderate to low from others. The only mitigation measures necessary in this case is continuation of the maintenance of trees along Oaky tree and the Riparian zone.

Notwithstanding the above, it is recommended that some sporadic plantings of indigenous trees at strategic locations as indicated in the relevant drawing included in **APPENDIX J** will assist further in minimising the visual impact from all directions.

## 15.4 PROPOSED STOCKPILES (WITHIN 2470 ELIZABETH DRIVE, LUDDENHAM)

### 15.4.1 Background

The proposed stockpiling site was visually assessed on 10 February 2016 from key points including public roads, private properties and internal views from the applicant's site as well as Commonwealth leased land. The analysis has been divided into external views from outside Commonwealth leased land, the proposed site and the applicant site, and internal views from leased areas on Commonwealth land. Recommendations to mitigate adverse aesthetic impacts are proposed. Photo 1 (refer to **Figure NICS162001_FIG003 Rev01** and **APPENDIX J**) to see all relevant photos) provides the baseline extreme view used as an analytical standard.

In this case, it was considered appropriate to undertake the visual analysis from at least eight (8) locations (N-NE-E-SE-S-SW-W-NW) to ensure that the whole site including its features are covered in this assessment. In addition, it was considered appropriate to include the coordinate, elevation and distances to the site of all points where visual analysis (and photos) was undertaken to provide the reviewer with a better understanding of the accurate locations of these points. **Table 15-2** includes all above mentioned data. Furthermore, the meteorological conditions were obtained by using a portable digital weather station. The weather was sunny

and hot with temperatures at 30-31$^{o}$C, relative humidity at 43% barometric pressure at 1023 mb and wind coming from NW at 2km/h.

### 15.4.2 Context

The stockpile of extracted clay and shale will be placed within the dedicated footprint within 2470 Elizabeth Drive, Luddenham. The site is dissected to the north by Elizabeth Drive. To the west there is Adams Road as shown on the aerial map. The applicant is carrying out extractive industry processes in the property immediately to the south of the proposed stockpiled area. To the east there is Oaky Creek where a bushland is clearly visible along most sections of Oaky Creek.

### 15.4.3 Description

The stockpiles will be located approximately 40m south of Elizabeth Drive at number 2470. The area will comprise several stockpiles of clay-shale running east-west totalling approximately 5.5ha on average. The accurate locations of the stockpiles will be determined by the Quarry Operations Manager to ensure that the use of the proposed site is maximised with minimal potential impact on human health and the environment having regard to the safety of the applicant's employees.

### 15.4.4 External Views

Interrupted distant views of the proposed stockpile area are available from Elizabeth Drive and Adams Road, as shown in Photos 1, 2, 7 & 8. The impact visibility is moderate. Most other external views are obscured by the natural topography and/or bushlands within the vegetated riparian zone along Oaky Creek as shown on the plan and in Photos 3 & 4. The impact is low.

The visual impacts from the north and south west are moderate. All others are moderate to low and none

### 15.4.5 Internal Views

The immediate views from the internal areas (the applicant site and part of Commonwealth leased land) are shown in Photos 3, 4, 5 & 6. Photo 5 represents the extreme visual aspect of the proposed stockpiling area. This view is only available from the applicant's site directly south of the proposed site; Existing vegetation makes the impact from the access road to be low.

Photo 3 is taken from east of the proposed stockpiling area. There is no residence and no road located for over 1000 metres further east. The impact from the east of the site looking west is very low to none.

**Table 15-2** includes accurate locations of points where the visual assessment related photos were taken. The table includes also the points' geographical coordinates and their distances to the closest stockpiling footprint.

**Table 15-2: Accurate Locations of Points where Photos Were Taken**

| Photo No | Direction | Location (m) | | | | Comments |
|---|---|---|---|---|---|---|
| | | Easting | Northing | Elevation | Distance | |
| **0** | Site (Middle) | 288979 | 6249826 | 65 | 0 | |
| **1** | N | 289086 | 6250008 | 61 | 47 | Distance to closest section of maximum stockpiling footprint |
| **2** | NE | 289541 | 6249947 | 65 | 437 | Distance to closest section of maximum stockpiling footprint |
| **3** | E | 289416 | 6249728 | 63 | 310 | Distance to closest section of maximum stockpiling footprint |
| **4** | SE | 289310 | 6249435 | 63 | 311 | Distance to closest section of maximum stockpiling footprint |
| **5** | S | 289009 | 6249514 | 65 | 150 | Distance to closest section of maximum stockpiling footprint |
| **6** | SW | 2888863 | 6249606 | 71 | 133 | Distance to closest section of maximum stockpiling footprint |
| **7** | W | 288821 | 6249918 | 64 | 97 | Distance to closest section of maximum stockpiling footprint |
| **8** | NW | 288939 | 6250033 | 60 | 76 | Distance to closest section of maximum stockpiling footprint |

### 15.4.6 Recommendations

The visual external impact is moderate so mitigation measures are necessary with regard to these aspects. The visual impact from leased Commonwealth land is Low to none east of the proposed stockpiling area and moderate directly north of the proposed site. To reduce the external visual impact and to also maintain the natural streetscape with the adjacent property east of the site, it is recommended that clump plantings of 6 to 10 indigenous trees along the northern boundary with Elizabeth Drive and scattered clump plantings to the west be undertaken to mitigate these visual impacts. In addition to the above and to reduce the impact to low or none, it is recommended that earth berms be constructed along the northern, western and part of the southern boundaries of the site as shown in **Figure 15-2 (REF: NICS162001_FIG004 Rev01)**. The earth berms must be at least 4.5 m high to assist the existing topography of the area in mitigating the visual impact. For the northern and eastern earth berms, they must be located between the proposed indigenous trees and the stockpiling

footprint. All earth berms must be stabilised by the use of appropriate grass. It is recommended but not necessary that some native bushes or shrubs be also planted on these earth berms to simulate the natural environment in the adjacent properties.

The feasibility of implementing these recommendations is dependent on the acceptability of these plantings under any future plans for the proposed stockpiling site.

## 15.5 CONCLUSION

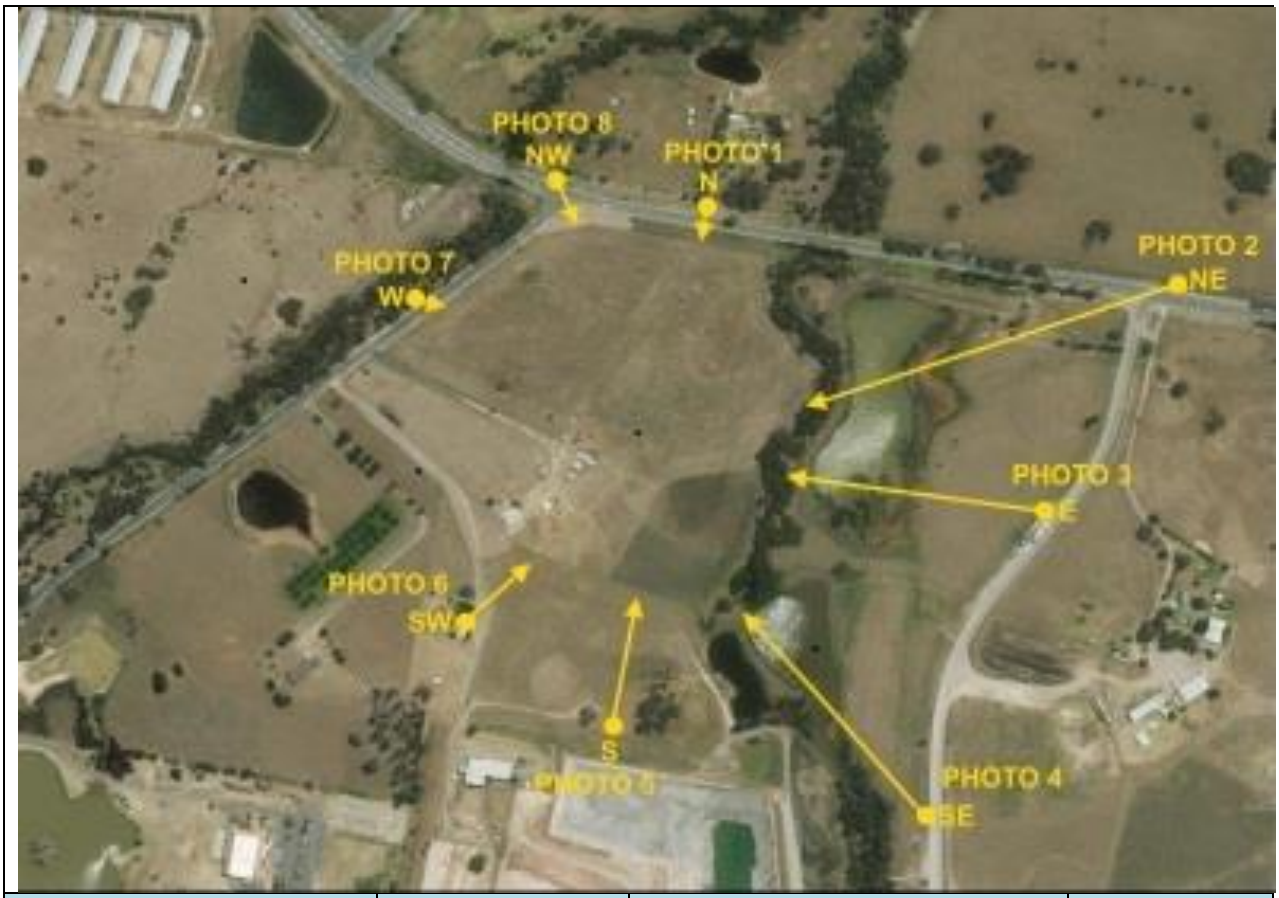
Based on the above information, it can be concluded that the proposed modifications will have very low to none visual impact on residents or people standing in a public place provided that the recommendations outlined above are implemented by the applicant.

**Figure 15-1** shows all photos taken from 8 different locations as part of the Visual Impact Assessment. **Figure 15-2** shows the locations and directions where the 8 photos were taken. **Figure 15-3** shows the locations of proposed tree plantings and landscaped earth berms/mounds to ensure that the visual impact is reduced to very low..

**Figure 15-1: Photos of Site from 8 Different Locations**

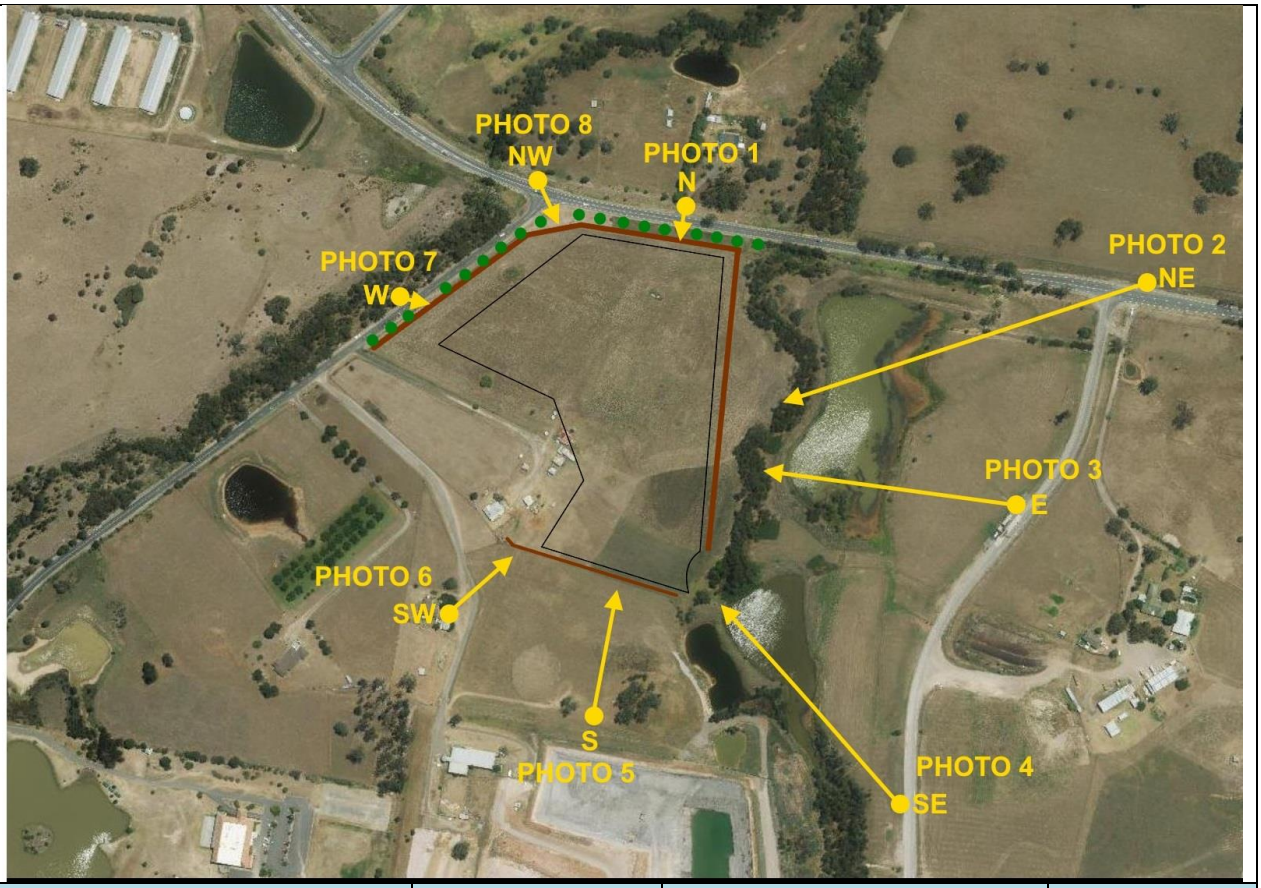

| | | | |
|---|---|---|---|
| **Epic Mining Pty Ltd – 275 Adams Road, Luddenham** | **Proposed Site Layout** | **Ref:NICS162001_FIG003 Rev01** | **Nicolas Israel – 15 March 2016** |

**Figure 15-2: Visual Assessment Photos' Accurate Locations and Directions**




| | | | |
|---|---|---|---|
| **Epic Mining Pty Ltd – 275 Adams Road, Luddenham** | **Photo Locations & Directions** | **Ref:NICS162001_FIG004 Rev02** | **Nicolas Israel – 19 July 2016** |

**Figure 15-3: Locations of Proposed Tree Plantings and Landscaped Earth Berms**




| | | | |
|---|---|---|---|
| **Epic Mining Pty Ltd – 275 Adams Road, Luddenham** | **Proposed Site Layout** | **Ref:NICS162001_FIG011 Rev01** | **Nicolas Israel – 19 July 2016** |
| **Tree Plantings** | | **Earth Berms** | |

# 16. REHABILITATION

The rehabilitation issue is of great importance to all stakeholders since tens of mines have been left as they are without a proper closure plans or rehabilitation of the site. Rehabilitation has two aspects associated with it: the first is rehabilitation during the normal active life of the mine and rehabilitation after the completion of mining activities.

In relation to the Luddenham quarry, it has been operating for about five (5) years and it has an approval to operate until 31 December 2024 which is more than 8 years from now. Based on the current production and market demand, the quarry is highly likely to stay active until 2024.
During the preparation of the EIS and shortly after, a rehabilitation plan was prepared and implemented on site to ensure that areas that are disturbed due to different reasons are rehabilitated regularly. In addition, several areas were identified as being of poor aesthetic and environmental quality especially adjacent to Oaky Creek. The plan targeted these areas as well. The applicant continues to implement the recommended strategies and programs to rehabilitate these areas.

It is well known that mines normally close when their resources are exhausted. However, in some circumstances mines could close for other reasons such as financial viability of the mine, technical implications, work health & safety aspects, environmental, regulatory, geological. Based on discussions with the applicant, the quarry is unlikely to close before the 2024 timeframe.

When the closure time is approaching a mine closure plan will be developed in consultation with the relevant stakeholders. This closure plan will be put in place and implemented progressively to ensure that all required planning and environmental measures and procedures are fully implemented on site.

At this stage, there is more than adequate time for the mine closure plan to be prepared and implemented, if required. However, we understand that the applicant is considering several options in relation to the use of the void when all resources are extracted. Another important factor in this case is the construction and operation of the Western Sydney Airport in the adjacent land.

Rehabilitation of the previously approved composting site was completed in accordance with the contractual arrangements and in consultation with the Commonwealth since the land is part of the Western Sydney Airport footprint. Relevant employees of the Commonwealth were very satisfied with the rehabilitation completed by Epic. The Commonwealth has specific rehabilitation requirements consistent with their instructions. Similarly, the rehabilitation of the approved stockpiling area will be completed to the same standards required by the Commonwealth. In addition, any plans for the future use including rehabilitation works will have to be consistent with the future use of the site in a consistent manner with an Airport.

In conclusion, due to the extensive experience (over 20 years) of the applicant's Operations Manager with similar activities, in particular the last 5-6 years of stockpiling and composting activities within the adjacent Commonwealth land, we are confident that the land will be

restored to better than its original condition when this project is completed. This was recently demonstrated when the previously used composting site was restored by the applicant and handed back to the Commonwealth.

# 17. ENVIRONMENTAL MONITORING & REPORTING REQUIREMENTS

The applicant has been so far complying with all monitoring and reporting requirements included in all statutory instruments.

## 17.1 BACKGROUND

The applicant is seeking to vary the frequency of environmental monitoring (and reporting) in the Development Consent (and the Environment Protection Licence No 12863 (EPL)) to reflect quarry operations which are 6-8 months per year and to implement the provisions of the EPL which included that "*the monitoring will be reviewed by the EPA in consultation with the licensee (applicant) after 12 months of normal operations*". This condition was included in the EPL when it was first issued by the EPA in 2009.

Following extensive consultation with and advice from the EPA, the applicant prepared and submitted a comprehensive supporting report to assist the EPA in its assessment of the application to vary the EPL so as to reduce the frequency of monitoring without compromising the integrity of the EPL and compliance with environmental legislation. It should be noted that the frequency of monitoring was recommended by the EPA following continuance compliance with all criteria specified in the EPA for more than three (3) years.

The proposed variations are very consistent with EPA current policies, guidelines and strategies to reduce the cost of additional monitoring that has no environmental benefits and replace the monitoring with environmental improvement programs, rehabilitation plans and the like. It will be demonstrated in this report that no adverse environmental impacts of any aspect, associated with the activities currently conducted on site, will occur as a result of this proposed variation. Also, no changes to existing normal quarry activities will eventuate as a result of the proposed variation since these are of administrative nature rather than operational.

The applicant is simply seeking to vary the monitoring and reporting frequency to release some funds for environmental improvement programs and other related works on site.

In making the subject application for modifications, the applicant has consulted the EPA as well as the Department. In summary, both the Department and the EPA have concluded that the advantages of the proposed modification outweigh the disadvantages by far having regard to the viability of the quarry, socio-economic and environmental implications and the potential for minimal environmental impacts, if any, associated with the modification. Such is based on the activities being conducted on site, the environmental monitoring performed by the applicant and Government Authorities, the studies undertaken so far by several environmental experts, the minimal extent of neighbour complaints, the minimal adverse environmental impacts arising from the operation and the fact that the deeper excavation goes into the ground the potential for impacts is reduced.

Furthermore, based on the noise testing undertaken by suitably qualified acoustic consultants for over 20 rounds over a 5-year period, the activities undertaken by the applicant has always complied with the noise criterion specified by the Department.

## 17.2 CURRENT ENVIRONMENTAL MONITORING AND REPORTING REQUIREMENTS

The Air Quality Impact Assessment criteria are included in condition 1 of Schedule 4 of the Consent. They include Total Suspended Particulate (TSP) matter, Particulate matter <10µm ($PM_{10}$) and deposited dust.

The Development Consent includes comprehensive monitoring requirements. However, the requirement subject to this specific proposed modification is included in condition 15 under the Noise Monitoring Section of Schedule 4 – Environmental Performance of the current Development Consent. This condition states: *"The applicant shall prepare noise compliance assessments of the operations at the site, within 3 months of the commencement of operations, and at intervals of 3 months thereafter, unless otherwise agreed by the Secretary and the EPA. The assessment shall be carried out by a suitably qualified and experienced acoustical consultant, approved by the Secretary, and submitted to the EPA and the Department."*

## 17.3 PROPOSED ENVIRONMENTAL MONITORING AND REPORTING REQUIREMENTS

It is proposed that the condition be modified to the following requirement: "*The applicant shall prepare noise compliance assessments of the operations at the site, within 3 months of the commencement of operations, and at intervals of 3 months thereafter, unless otherwise agreed by the Secretary and the EPA. The assessment shall be carried out by a suitably qualified and experienced acoustical consultant, approved by the Secretary, and submitted to the EPA and the Department****. Following the first 12 months of monitoring, the monitoring shall be conducted on a yearly basis, unless otherwise directed by the Secretary".***

Due to changes in NSW Air Quality Assessment requirements in the last 5-6 years TSP is no longer required to be included in the assessment since the EPA itself no longer monitors for TSP in its Air Quality Monitoring Stations across NSW. It is, therefore, proposed to remove the TSP from the consent.

## 17.4 CONCLUSION

These proposed modifications are of an administrative nature which is considered to be minor in the context of the overall Development Consent and effectively assists in facilitating the implementation of additional environmental improvement plans and rehabilitation programs on-site.

Overall these proposed modifications are reasonable, justifiable, practical, desirable and feasible without altering the intent of the Development Consent.

The purpose of the development and development consent remains as originally submitted – a quarry operation for the extraction of clay and shale.

# 18. ENVIRONMENTAL MONITORING AND DISCHARGE POINTS

Following several site inspections by EPA officers and environmental consultants, and reviewing of environmental monitoring results, both parties advised that it is necessary to review the locations of some of these points to ensure that they reflect the impacts from the activities conducted by the applicant only rather than from other activities that are not associated with the applicant. Furthermore, due to the construction and future operation of Western Sydney Airport in the adjacent Commonwealth land east and south of the applicant's site where most monitoring points are located, it is advisable that these points be located elsewhere.

Due to the closure of most road located south and east of the quarry by the Commonwealth as part of the construction of Western Sydney Airport, the applicant recently received an approval from the Department to temporarily modify its environmental monitoring requirements at the points located south and east of the quarry. Refer to **APPENDIX M** for a copy of the Department's approval letter. Furthermore, the relocation of stockpiling and composting activities means that the previously approved points may no longer be representative of all activities undertaken by the applicant. Hence, the applicant considers it appropriate to nominate new locations for environmental monitoring in accordance with current industry's best practice and more importantly EPA's requirements.

## 18.1 PROPOSED MODIFICATIONS

The applicant is seeking from the Department a modification to relocate some of the environmental discharge and monitoring points based on the following reasons:

- Several inspections by officers of the EPA revealed that some of these environmental discharge and monitoring points may not accurately reflect the potential environmental impacts of the activities conducted by the applicant and recommended that these locations be reconsidered;
- Several inspections of Environmental Consultants revealed that some of these environmental discharge and monitoring points reflected a greater contribution to the environmental impacts from external activities not associated with the applicant activities;
- Review of the results of all monitoring conducted for over five (5) years revealed that various external activities in particular some seasonal events made a greater contribution to the results of the monitoring than the activities conducted by the applicant;
- The construction of Western Sydney Airport is proceeding at a very fast pace. Almost all tenants within the airport footprint have been removed and most access roads have already been closed. This means that there are no residences to the south of the applicant's approved site or to the east of the access road for several kilometres. This also means that the applicant will have no access to any location south and east of its approved site as of May 2016.

- The dust monitoring at the Hubertus Country Club is greatly affected by exhaust car emissions and dust generated from the traffic in the car park especially on certain days or whenever special events are held at the club; and
- The noise monitoring at the Hubertus Country Club is greatly affected by traffic noise from cars entering, idling and leaving the car park in addition to noise from club customers.

**APPENDIX G** includes maps showing the approved and proposed Environmental Discharge and Monitoring Points. In addition, **Table 18-1** includes detailed description and accurate locations of approved environmental monitoring points whilst **Table 18-2** includes detailed description and accurate locations of proposed environmental monitoring points. Similarly **Figure 18-1** shows the locations of approved environmental monitoring points whilst **Figure 18-2** shows locations of proposed environmental monitoring points.

The proposed monitoring points for water and groundwater remain the same as the previously approved points as they are still representative of the relevant activities undertaken by the applicant.

The proposed monitoring points for dust and noise have been chosen in a manner that is consistent with current EPA requirements and best industry practices. The chosen locations have been based on the following criteria:

1. Since there are only two (2) potentially sensitive receivers, noise and dust monitoring must be undertaken in close proximity or at the direction of these receivers to enable proper assessment of potential impact on these receivers,
2. Most directions (North, East, South and West) must be accommodated, when possible,
3. Other potentially sensitive habitats, if any should be considered,
4. Nearby properties that are not under the control of the applicant should also be considered,
5. Security of the monitoring equipment for long-term monitoring,
6. Safety of the persons undertaken the attended monitoring,
7. The acceptance of adjacent property owners and/or potentially sensitive receivers for such monitoring to be undertaken with consideration to their privacy.

Therefore, it is recommended that the Department considers approving this modification.

**Table 18-1: Epic Mining - Approved Environmental Monitoring Points**

| POINT ID | DESCRIPTION | EASTING | NORTHING |
|---|---|---|---|
| D1 | Dust Monitoring Point 1 | 288909 | 6249690 |
| D2 | Dust Monitoring Point 2 | 289843 | 6249430 |
| D3 | Dust Monitoring Point 3 | 288675 | 6248860 |
| D4 | Dust Monitoring Point 4 | 289502 | 6249145 |
| | | | |
| N1 | Noise Monitoring Point 1 | 288909 | 6249690 |
| N2 | Noise Monitoring Point 2 | 289843 | 6249430 |
| N3 | Noise Monitoring Point 3 | 288950 | 6248930 |
| N4 | Noise Monitoring Point 4 | 289547 | 6248773 |
| | | | |
| WS1 | Water Sampling Point 1 | 289160 | 6249975 |
| WS2 | Water Sampling Point 2 | 289200 | 6249110 |
| | | | |
| WMS1 | Weather Monitoring Station 1 | 289410 | 6249615 |
| | | | |
| BMS1 | Groundwater Monitoring Bore 1 | 288860 | 6249240 |
| BMS2 | Groundwater Monitoring Bore 2 | 289197 | 6249323 |
| BMS3 | Groundwater Monitoring Bore 3 | 289193 | 6249376 |

**Figure 18-1: Map Showing Approved Environmental Monitoring Points**

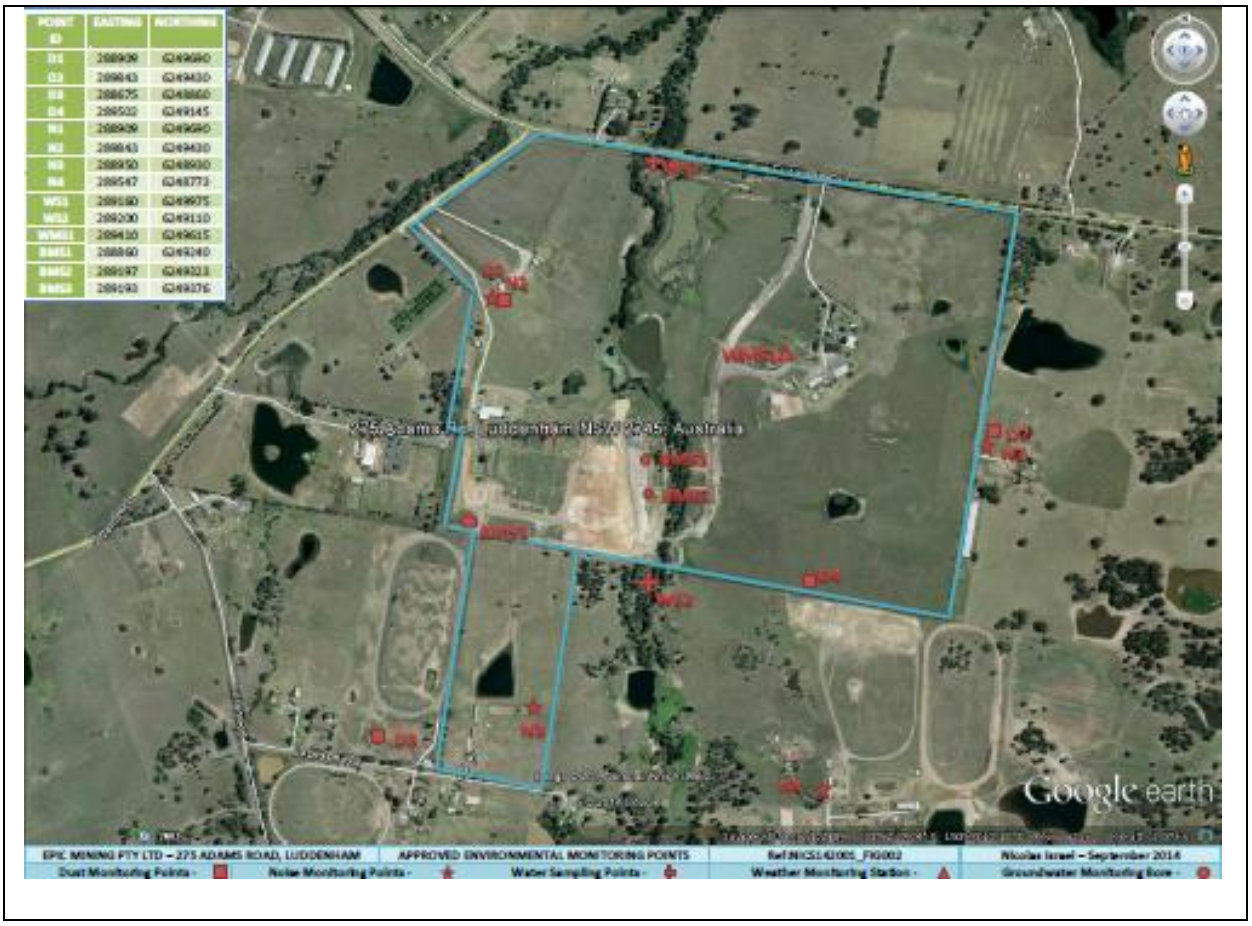


**Table 18-2 - Epic Mining - Proposed Environmental Monitoring Points**

| POINT ID | DESCRIPTION | EASTING | NORTHING |
|---|---|---|---|
| D1 | Dust Monitoring Point 1 | 288909 | 6249690 |
| D2 | Dust Monitoring Point 2 | 288810 | 6249588 |
| D3 | Dust Monitoring Point 3 | 288832 | 6249940 |
| D4 | Dust Monitoring Point 4 | 289205 | 6249682 |
| | | | |
| N1 | Noise Monitoring Point 1 | 288909 | 6249690 |
| N2 | Noise Monitoring Point 2 | 288810 | 6249588 |
| N3 | Noise Monitoring Point 3 | 289137 | 6250048 |
| N4 | Noise Monitoring Point 4 | 289205 | 6249682 |
| | | | |
| WS1 | Water Sampling Point 1 | 289160 | 6249975 |
| WS2 | Water Sampling Point 2 | 289200 | 6249110 |
| | | | |
| WMS1 | Weather Monitoring Station 1 | 289386 | 6249718 |
| | | | |
| BMS1 | Groundwater Monitoring Bore 1 | 288860 | 6249240 |
| BMS2 | Groundwater Monitoring Bore 2 | 289197 | 6249323 |
| BMS3 | Groundwater Monitoring Bore 3 | 289193 | 6249376 |

**Figure 18-2: Map Showing Proposed Environmental Monitoring Points**

## 18.2 CONCLUSION

The conclusions for this proposed modification are very similar to the conclusions included in the previous Section “Environmental Monitoring and Reporting Requirements” since they fall in the same category of environmental requirements except the fact that this is not only of an administrative nature but rather it also includes changing the physical locations of some monitoring points.

# 19. COMPOSTING ACTIVITIES

The main objectives of this section are to provide detailed information about the composting activities, environmental impact assessment and any potential positive or negative impacts as a result of these activities being undertaken in the proposed location. We will demonstrate that the proposed location will reduce even further the minimal potential impact of the composting activities on human health and the environment. It is suggested that this section be reviewed in conjunction with the proposed site layout to give the reviewer a better understanding of all factors that are common between the locations of both stockpiling and composting.

## 19.1 BACKGROUND

Since both the Department of Planning and Environment (Department), and the NSW Environment Protection Authority (EPA) had previously approved the small scale non-commercial composting activities, and the fact that these activities are being conducted for the sole use of the finished products within the approved premises of The applicant, there had been no reason for these activities not to continue in the same manner. **It is of utmost importance to note that The applicant uses only garden organics/dry mulch for composting. No other materials are used in the composting process and certainly no putrescible materials have been used in the currently approved location or will be used in the proposed location.**

The Department of Planning and Environment approved a modification of development consent DA 315-7-2003 for a clay shale quarry, access road and service facility area on 13 May 2015 (MOD 3). The modified development consent approves a range of matters including revised numbers and locations of monitoring points, the frequency of monitoring and reporting requirements, composting activities and approval to stockpile excavated materials.

It is noted that the Department had previously requested that a comprehensive assessment of the potential impacts of the composting activities on human health and the environment be included in the Environmental Assessment Report supporting the modification No 3 application. The applicant had supplied the requested assessment which was accepted, at that time, by both the Department and the EPA (as part of the consultation and notification process).

Following several communications with the EPA including assessment reports as part of a Pollution Study & Reduction Program, and advice from the Department, we believe that the EPA is now convinced that the Department has approved the composting activities up to 5,000 tonnes per year to be conducted at the applicant site as part of modification No 3.

Notwithstanding the above it was considered appropriate to again include a comprehensive assessment of the composting activities at the proposed location. This decision was based on several aspects including recent changes to environmental legislation and the fact that composting activities will be moved from the Commonwealth leased land into the applicant's approved land for various reasons including the proposed construction of Western Sydney Airport which includes a part of the applicant's leased Commonwealth land. The proposed location was selected for justified reasons that are based mainly on environmental grounds as

outlined in this Section. We believe that the applicant will have a much better control and management of stormwater, leachate and dust since a dedicated stormwater (and leachate) collection system including a pond will be installed as part of the new location.

A small scale non-commercial composting activity was conducted on an adjacent land which is leased by the applicant from the Commonwealth. This land does not have any residential premises and that is the reason for it being used for the sole purpose of composting. The composting activity is not for commercial purposes but rather for in-house use only as part of the site rehabilitation plan including the riparian zone. These activities were approved by both the EPA and the Department previously. No other approvals were required mainly due to the fact that the scale of these activities was well below the threshold under both the POEO Act 1997 and the Environmental Planning and Assessment Act 1979. An assessment of these activities has been undertaken and it is included in this Section. Based on this assessment this activity will have no adverse impact on human health or the environment.

Composting is the transformation of raw organic materials into biologically stable humus rich substances for growing plants (T. Halbach, University of Minnesota). The organic materials are decomposed by microorganisms such as bacteria and fungi, and invertebrates such as worms by utilising the carbon and nitrogen content as an energy source with oxygen and water. This process results in the production of carbon dioxide, heat, water and nutrient rich compost.

In normal composting facilities the finished products are garden mixes and top dressing mixes that are applied to the surface of a lawn, turf or field to improve the quality of the soil and promote good growth. These types of mixes compact well and contain materials such as paper & cardboard, leaf mulch, ground tree waste, wood chips, saw dust and shavings, duck litter and mushroom compost. Initially, the finished product was only one which was formulated by composting experts from a reputable company which specialises in waste recycling and resource recovery activities such as this. Hence, the finished product is made to the applicant's specific requirements, for specific locations and to suit particular types of plants being managed by the applicant within the area under its control. Later on it was determined that it is best if only raw mulch is used in the composting process provided that it is conducted in a professional manner, it will satisfy the requirements of all areas within the applicant's management and control. The raw mulch has been used on its own for approximately three (3) years.

Some information included in this Section was extracted from documents prepared by other consultants for the applicant composting activities such as the document titled: "*REHABILITATION ACTION AGENDA – The applicant Mining Pty Ltd – Site Rehabilitation and Environmental Management Procedures*" dated March 2011 and prepared for the applicant by the Centre for Organics and Resource Enterprises.

The objectives of this activity are listed below:

1. To recycle materials normally sent to landfills;
2. To produce a soil conditioner that is specifically designed for the soil found within the the applicant Mining site;

3. To assist the rehabilitation program by having continuous supply of soil conditioner to ensure full compliance with the approved rehabilitation plan;
4. To reduce the excessive cost of using commercially produced composted materials in such large quantities that are required to cover the whole site especially the areas that are subject to the rehabilitation plan and Vegetated Riparian Zone. This will free up some funds to be used for other environmental management programs on site;
5. To assist in complying with the approved vegetation and landscaping plan by having continuous supply of a soil conditioner that is specifically designed for the site's soil;
6. To assist in stabilising certain existing structures on site such as earth berms including noise barriers by accelerating the growth of grass and plants; and
7. To assist in the acceleration of the growth of grass in several areas such as diversion drains, swales, and small earth berms that are used to assist in the surface water management.

The Company currently conducting these activities in collaboration with the applicant is Soilco Pty Ltd which is a very reputable Company and specialises in the manufacturing of composting materials and soil conditioners.

Soilco has a comprehensive "Quality Policy" that aims at providing the best quality of services and products in the composting and soil conditioners industry.

## 19.2 SUBJECT LAND

### 19.2.1 Approved Premises

The subject site is located in Luddenham, approximately 25 kilometres southwest of the city of Parramatta, in the Parish of Bringelly, County of Cumberland and in the Liverpool Local Government Area. The subject site consists of two Lots; Lot 1 in DP 838361 (Part of) and Lot 3 in DP 623799. The total area incorporating the two lots is approximately 71 hectares. The proposed clay-shale quarry is located on Lot 3 which is relatively flat, sloping gently from the southwest to the northeast within the upper parts of Oaky Creek catchment.

Oaky Creek forms the boundary between Lots 1 and 3 and is an ephemeral drainage which only flows following significant rainfall events in the upper part of the catchment. An off-line dam is located in the north-western corner of Lot 1 and a smaller storage occurs on the southern end. An off-line dam is located in the northeast part of Lot 3.

The majority of Lot 3 is cleared land with a mixture of working sheds, horse yards and property roads. Small clusters of remnant vegetation occur along the eastern Oaky Creek boundary, adjacent to the off-line dam in the northeast corner and in the horse yards on the western boundary. There are also several mature native and exotic trees scattered across the site. Surrounding properties are modified rural, consisting of grazing, poultry farms, glass house and igloo crops and some dwellings.

The site is also known to use its access from Elizabeth Drive as its office address to facilitate finding the site by all stakeholders including clients, Government Authorities' representatives and the community. **Figure 19-1** includes an aerial view of the site taken in July 2015.

### 19.2.2 Approved Location of Composting Activities

Following extensive consultation with relevant Authorities including the EPA and the Department, and the Department's recent approval of the Development Consent modification No 3 which included the composting activities, it was confirmed that the composting activities would be undertaken at the Commonwealth land leased by The applicant and located to the south of The applicant's original premises. **Figure 19-2** shows a closer view of the currently approved location of the composting activities. **Figure 19-3** shows the currently approved and proposed locations of the composting activities. However, due to the fact that the EPA did not accept the modification 3 as approved by the Department to have included composting activities up to 5,000 tonnes per year, it directed The applicant to cease receiving any materials from offsite for composting purposes. Hence, The applicant ceased receiving any materials for composting purposes in August 2015. All composting activities of materials already stored on site were completed in December 2015 and all composted materials are being used until depleted.

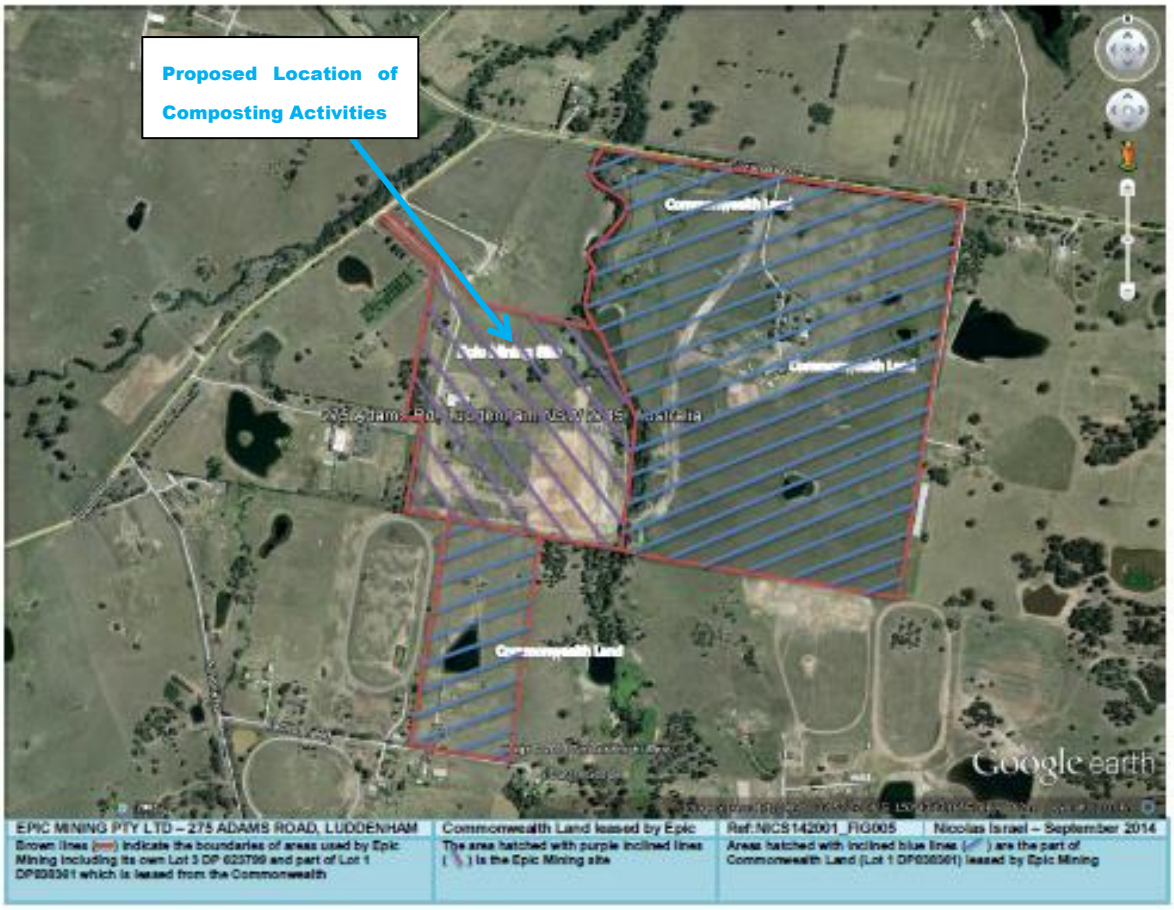
### 19.2.3 Proposed Location of Composting Activities

Recently, The applicant management has determined that it would be more appropriate to relocate the composting activities due to several internal and external pressures, as well as environmental reasons. This decision was made following consultation between the applicant management, its business partners, the Commonwealth, the Department and the EPA.

**Figure 19-1: Aerial View of the approved location of Composting Activities - 31/07/2015**


**Figure 19-2: Closer View of the approved Location of Composting Activities within the Commonwealth Land – November 2015**


**Figure 19-3: Current and Proposed Locations of Composting Activities within the Applicant's Approved Site**


Proposed Location of Composting Activities
Google earth
EPIC MINING PTY LTD – 275 ADAMS ROAD, LUDDENHAM
Brown lines indicate the boundaries of areas used by Epic Mining including its own Lot 3 DP 623799 and part of Lot 1 DP808361 which is leased from the Commonwealth
Commonwealth Land leased by Epic
The area hatched with purple inclined lines is the Epic Mining site
Ref: NICS142001_FIG005
Nicolas Israel – September 2014
Areas hatched with inclined blue lines are the part of Commonwealth Land (Lot 1 DP808361) leased by Epic Mining

## 19.3 STATUTORY REQUIREMENTS

The key NSW statutory requirements that pertain to the environmental management of the site are addressed in details in **Section 3**. Only composting related requirements are addressed in this section. These statutory requirements are divided into two categories; Planning and Environmental.

It is important for the applicant's staff and contractors to be aware of the legislative and regulatory requirements related to the composting activities and their corresponding responsibilities.

### 19.3.1 Planning

Clause 13 of Schedule 3 of the *Environmental Planning and Assessment Regulation, 2000* could have applied to these activities. However, due to the small scale of the activities, intended use of the finished product, the location of the activities and the topography of the area where the activities are conducted, the Department of Planning and Infrastructure had determined that clause 13 does not apply provided that the scale remains below the threshold, the intended use remains the same (not for commercial purposes but rather for in-house use only as part of the rehabilitation program and the vegetation and landscape plan). Hence, no modification of the Consent was required.

Clause 13 of Schedule 3 of the Environmental Planning and Assessment Regulation 2000 defines Composting facilities or works as being:

***"13 Composting facilities or works***

*Composting facilities or works (being works involving the controlled aerobic or anaerobic biological conversion of organic material into stable cured humus-like products, including bioconversion, biodigestion and vermiculture):*

*(a) that process more than 5,000 tonnes per year of organic materials, or*

*(b) that are located:*

*(i) in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area, or*

*(ii) in an area of high watertable, highly permeable soils, acid sulphate, sodic or saline soils, or*

*(iii) within a drinking water catchment, or*

*(iv) within a catchment of an estuary where the entrance to the sea is intermittently open, or*

*(v) on a floodplain, or*

*(vi) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the*

*neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic. "*

#### 19.3.1.1 Development Consent – Modification No 3

The Development Consent DA No. 315-7-7003 was issued to Badger Mining Pty Ltd by the Department of Planning and Environment (Department)) on 23 May 2004 to undertake the following activities:

*"The development and operation of a clay/shale quarry on Lot 3, DP 623 799 and the construction and use of an access road and service facilities on Lot 1, DP 838 361."* In addition, this Consent was modified several times previously and it includes stockpiling of extracted materials and composting as well as other relevant activities which were part of Modifications No1, 2 and 3.

### 19.3.2 Environmental

This section includes only environmental requirements specifically for the composting activities since other Sections of this document include greater details of all environmental requirements for the activities conducted by the applicant under previous and current environmental legislation.

Under NSW environmental legislation, two (2) statutory instruments are considered to be relevant for the current activities; the Protection of the Environment Operations Act 1997 (POEO Act), the Protection of the Environment Operations Regulation 2009 (POEO Regulation 2009). The following sub-sections include the requirements under these two statutory instruments.

#### 19.3.2.1 Protection of the Environment Operations Act 1997 & Protection of the Environment Operations (General) Regulation 2009

The Protection of the Environment Operations Act 1997 (POEO Act) establishes the NSW environmental regulatory framework and includes a licensing requirement for certain activities.

The Protection of the Environment Operations (General) Regulation 2009 (POEO Regulation) includes provisions for licensing and notices fees, Load Based Licensing requirements and fees, National Pollutant Inventory requirements, etc.…

Schedule 1 of the POEO Act contains a list of activities that are classified as scheduled activities and other activities that require an environment protection licence. However, Schedule 2 of the POEO Act also provides powers for making waste regulations that range from the operation of waste facilities, the transport of waste, the handling, use, storage, resource recovery, re-use and disposal of waste, and monitoring and reporting by waste facilities and transporters.

The activities conducted by the applicant are considered premises-based activities under the provisions of the POEO Act.

In preparing this report and particularly this Section, relevant Sections of NSW environmental legislation (i.e. POEO Act) were used to illustrate that the applicant would continue to undertake its activities in a proper, effective and efficient manner to ensure full compliance with statutory requirements.

In addition to the environmental provisions included in this Section, the Raw Mulch Resource Recovery Exemption 2008 allowed for Garden Organics to be applied to land without pasteurization. This meant that there was no requirement for composting to be included as a scheduled activity. This was changed in June 2014.

#### 19.3.2.2 Current Environmental Provisions

Current environmental provisions for composting activities are outlined below.

***"12 Composting***

*(1) This clause applies to* ***"composting"****, meaning the aerobic or anaerobic biological conversion of organics into humus-like products:*

*(a) by methods such as bioconversion, biodigestion or vermiculture, or*

*(b) by size reduction of organics by shredding, chipping, mulching or grinding.*

*(2) The activity to which this clause applies is declared to be a scheduled activity if:*

*(a) where it takes place inside the regulated area, or takes place outside the regulated area but receives organics from inside the regulated area (whether or not it also receives organics from outside the regulated area):*

*(i) it has on site at any time more than 200 tonnes of organics received from off site, or*

*(ii) it receives from off-site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics, or*

*(b) where it takes place outside the regulated area and does not receive organics from inside the regulated area:*

*(i) it has on site at any time more than 2,000 tonnes of organics received from off site, or*

*(ii) it receives from off-site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics.*

*(3) For the purposes of this clause, 1 cubic metre of organics is taken to weigh 0.5 tonnes."*

#### 19.3.2.3 Relevant Definitions under the POEO Act 1997

**Compost:** stable, pasteurised organics resulting from the controlled microbiological transformation of organics.
**Compost pad:** the prepared area upon which composting takes place.
**Composting:** the process of aerobic conversion (under controlled conditions) of organics by micro-organisms, yielding cured soil conditioners, compost or humus.
**Composting and related organics processing:** for the purpose of these guidelines* means the production of composts, soil conditioners, mulches and other products by processes including composting, mulching, digestion and fermentation.
*(Environmental Guidelines – Composting and Related Organics Processing Facilities)

It should be noted that the Pasteurised Garden Organics Resource Recovery Exemption (PGORRE) which was introduced on 6 June 2014 required that garden organics be pasteurised (this means that this requirements is no longer included in the Raw Mulch Resource Recovery Exemption). The PGORRE was amended again on 24 November 2014 by introducing relevant Resource Recovery Order for the processor and Resource Recovery Exemption for the consumer.

#### 19.3.2.4 Licensed Activities

The activities currently undertaken by the applicant were classified as scheduled activities under the Protection of the Environment Operations Act 1997 being Extractive Activities – Other Land-Based Extraction which are included in the Environment Protection Licence No 12863 (EPL). The applicant will continue to undertake the same activities. In addition, the EPA modified the applicant's EPL several times before including on 17 November 2015 when it included two (2) additional scheduled activities that were considered by the EPA relevant for the ancillary activities undertaken on site. These premises-based activities are listed in **Table 19-1.**

**Table 19-1: Licensed Activities**

| Scheduled Activity | Fee Based Activity | Scale |
|---|---|---|
| Extractive Activities | Other Land-Based Extraction | >100000-500000 T obtained |
| Waste Disposal (application to land) | Waste disposal by application to land | Any annual capacity |
| Waste Storage | Waste storage – other types of waste | >0 T stored |

A full description of the activities currently conducted by the applicant is included in **Section 1** of this document.

Despite the fact that the composting activities undertaken by the applicant have been addressed on several occasions through different reports submitted to Government authorities, it was considered appropriate to include again detailed information associated with these activities in this report to ensure that the reviewer has a clearer picture of these activities in one report only rather than referring to several documents to obtain that information.

## 19.4 MATERIALS QUALITY

The main materials used in this activity are organic materials collected from kerbside drop-offs and are sourced separately from several resource recovery management centres by Soilco.

All materials to be delivered are inspected prior to transport and delivery. Inspections are also undertaken once the material is stockpiled at the management centre. The materials are stockpiled at the management centres and then are processed into the material to be transported off-site. Processing includes shredding, initial stabilisation and potentially screening depending on the grading required. However, changes to the environmental legislation now require that the materials be composted rather than only shredded and screened to an agreed particle size.

The Raw Mulch Resource Recovery Order does not apply if the materials brought to site are Garden Organics. For the Raw Mulch Resource Recovery Order and Exemption to apply, the materials must be timber waste and/or single source leaf mulch. Any composting of such materials triggers the Pasteurised Garden Organics Resource Recovery Order and Exemption 2014.

As part of this phase of the process, the processor takes all feasible and reasonable steps to ensure that the following materials are not supplied in the Materials in concentrations higher than these specified in the Pasteurised Garden Organics Resource Recovery Order 2014:

- plastic items;
- putrescible household, domestic and commercial waste;
- ferrous metals;
- hazardous waste;
- painted timber;
- CCA treated timber;
- all asbestos;
- any foreign material greater than 100mm in diameter; and
- any other non-green waste material.

Contamination is to be less than 0.5% by dry weight (for glass, metal and rigid plastics) and less than 0.05% by dry weight (for light, flexible or film plastics), for each delivery and will be generally in accordance with the contamination levels as specified in AS4454.

The processor conducts inspections of the materials prior to transport and delivery to the applicant's site. Inspections are also conducted by the applicant and Soilco personnel immediately upon receipt on site. Additional random inspections are conducted once the materials are stockpiled to ensure that no unwanted materials have gone through the first round of inspections.

The processor is required to rectify any non-conformance within 28 days of notification either by providing resources to remove the contamination or totally remove the materials from the site.

It has been agreed with the processor that the oldest pre-processed raw mulch materials will be delivered first to assist in avoiding delays in the processing of the materials.

## 19.5 DELIVERIES

Raw mulch materials must be unloaded on site by the processor under the applicant's direction in an orderly manner. Materials are to be unloaded from the trucks in rows. The site manager will determine the best orientation for rows, taking any contours into consideration. All trucks must empty their loads at the furthest end of row formation by unloading two truckloads side by side, then adding other loads end to end to form long rows.

The materials supplied must comply with the requirements of the Pasteurised Garden Organics Resource Recovery Order 2014, Protection of the Environment Operations (Waste) Regulation, 2014 as well as AS4454.

The materials supplied should also be processed in accordance with the requirements of the Pasteurised Garden Organics Resource Recovery Order 2014.

## 19.6 PROCESS

According to advice from experts in the composting industry and government officials who have been administering similar activities for tens of years, the processes outlined below are considered to be the most efficient and effective processes with the least potential impacts on human health and the environment provided that certain mitigation measures and amelioration strategies are implemented on site. A Process Flow Chart is included in **Figure19-4**.

Composting of this nature is aerobic decomposition. The Environmental Guidelines – Composting and Related Organics Processing Facilities (NSW EPA) provides a Table listing classes of materials that could be used in composting activities. According to the guidelines, *"the higher the class of material used in the compost, the more likely it is that there will be environmental impacts if the operation is undertaken outdoors."* The materials used in the composting process at the applicant's site fall mainly under Class 1 which is the lowest class of material.

It is noted that Soilco's process control system regulates the production of its finished products containing source separated organics. The process control system ensures that best management practices are adopted and all measures are taken to minimise risks. By following these procedures, products of consistently high quality can be produced. The composting process eliminates plant propagules, plant and animal pathogens, phytotoxicity and nutrient problems.

The EPA's Pasteurised Garden Organics Order 2014 applies to this product. Soilco's process control ensures that the General Conditions of the Order are met prior to the product being

applied to land. Below is a list of best management practices that both Soilco and the applicant have implemented on site.

- Ensure that garden organics supplied under this order are pasteurised as a minimum,
- Implement an inspection process that pasteurised garden organics do not contain asbestos, engineered wood products and preservative treated or coated wood residues,
- Should not mechanically size reduce pasteurised garden organics as a way of managing physical contamination,
- Ensure that pasteurised garden organics are ready for land application,
- Ensure that the pasteurised garden organics have met the physical contaminant requirements.

**Figure 19-4: Flow Chart of the Applicant's Small Scale Non-Commercial Composting Activities**

## 19.7 MATERIALS TRANSPORTATION AND CONTROL

The materials transportation from the source to the applicant's site includes a load quality control system to ensure that the materials processed are 100% the same received at the quarry site. This system includes weighing all loads on an authorised weighbridge at the source.

The loads are also weighed at the weighbridge located at the entry point of the applicant's site. The applicant management keeps the following documentation and reconciles all loads at the end of each month:

- Date of the deliveries;
- Delivery vehicle identification including make, model, registration and company;
- Dockets from both weighbridges; and
- Source/s of materials.

This information is stored on a computer to ensure that it is available for all parties involved on request and, if required, Government authorities. This information will assist in planning ahead for requesting additional materials to ensure continuous supply of composted materials for the rehabilitation areas.

Due to the fact that the site is a quarry with all associated activities, the applicant management has determined that all drivers entering the site to deliver materials associated with the composting activities must follow the following procedures:

- They must be inducted onto to the applicant's site;
- They will be advised of the place to unload the materials on the applicant's site prior to leaving the loading depot;
- They must follow the truck route advised by the applicant as indicated on the route map provided;
- They must unload the product in the place designated by the applicant;
- In the event that these procedures cannot be complied with, they must contact the site Manager Sam Tarabori on 02 4774 9334 or 0410 411 998; and
- They must comply with all the applicant and Employer Company Occupational Health & Safety requirements.

## 19.8 RECEIVAL OF MATERIALS

The delivery driver of incoming materials and the quarry operations manager (Sam Tarabori or another person nominated by the applicant's management) inspect the materials to ensure that it complies with the grade and quality as agreed and it is free of contamination. If the materials do not comply with the agreed quality, the inspectors will report it to the source company and will forward a Non Compliance Report (NCR) to the appropriate persons. Any non-conforming materials are either rejected immediately and sent back to the source or segregated from all other materials and marked as such until an agreed solution is reached between the involved parties.

## 19.9 BATCHING

The Quarry Operations Manager ensures that there is sufficient receiving space for the incoming materials (based on agreed volumes) and the appropriate signage is provided for truck drivers.

## 19.10 RAW MATERIALS STOCKPILING

Upon receiving the raw materials, the drivers are given direction to the unloading area where raw materials will be stockpiled separately so they are not blended or mixed incorrectly. This is for storage only not composting.

## 19.11 COMPOSTING STOCKPILES

Raw materials and finished products would normally have an approximate height of 3-3.5 metres and a maximum width of 5 metres. There is no limit on the length of the stockpile as long as it does not extend beyond the area dedicated for composting activities to ensure that all pollution control measures implemented on site continue to be effective and efficient in minimising potential adverse impact on the environment and human health.

However, in relation to the composting stockpiles, only one stockpile is formed at a time to ensure continuity and correct ageing. The base width is two (2) metres and the height is one and half (1.5) metre for all windrows which are the same since they are generated by the same windrow machine. The only difference between the windrows is the length of each one which has no limit as long as it does not extend beyond the area dedicated for composting activities to ensure that all pollution control measures implemented on site continue to be effective and efficient in minimising potential adverse impact on the environment and human health. In addition, each stockpile is identified by a number or a location on a map. This should occur within one week of the product arriving on-site.

## 19.12 STOCKPILE CONTROL AND MANAGEMENT

The applicant's management controls the composting stockpiles to prevent weed proliferation, minimise dust emissions and odour generation, and to mitigate fire risk. The applicant's management monitors the piles to ensure high quality outcomes and maintenance of the product quality in the stockpiles. The applicant turns the stockpiles three times during an eight-week period. Turning is also conducted in the case that significant weed species emerge. Turning does not mean moving all of the material, but merely pushing the one side onto the other so the outside of the pile becomes the inside. Due to the fact that the composting activities are segregated from the remainder of the other activities on site, none of the heavy machinery has the potential to drive over the stockpiles.

Stockpile temperatures are monitored periodically by either Soilco or the applicant to ensure they reach temperatures appropriate to prevent weeds emerging in the long-term during use but do not reach near combustible levels.

## 19.13 QUALITY CONTROL AND TESTING

The process control system ensures that the best environmental management practices are adopted and all measures are taken to minimise any potential risks. Depending on the desired use (as input to a soil or as a mulch or compost), the materials will be tested for compliance with relevant parameters. Australian Standard AS-4454 is the standard for composts, soil conditioners and mulches. Final soil mixes (if the product is blended with other soil materials) may be tested to Australian Standard AS-4419.

## 19.14 DISPOSAL OF UNWANTED MATERIALS

Throughout the process any non-organic unsuitable materials removed from the stockpiles are stockpiled in a separate and contained area, and is disposed by the appropriate means or recycled if considered suitable.

## 19.15 FINISHED PRODUCTS AND THEIR USE ON SITE

Only one finished product is obtained from the composting activities. This product is a soil conditioner that is designed and made specifically for the applicant's site.

The use of this product is limited to the areas within the control and management of the applicant. These areas are:

- The areas being rehabilitated as part of the rehabilitation plan
- The Vegetated Riparian Zone
- The bund walls
- The earth berms
- Diversion drains
- Other areas that are part of the vegetation and landscaping plan

Some of the areas where the finished product is used are shown in the photos included in **Figure 19-5.**

**Figure 19-5: Photos of Areas where the Composted Finished Product is used**

Photo 1: Finished product used on the earth berms

Photo 2: The Riparian Zone

Photo 3: The Riparian Zone at a later stage

Photo 4: The Riparian Zone at a later stage

Photo 5: Finished product used on the bund wall around most of the quarry perimeter

## 19.16 ENVIRONMENTAL ASPECTS

Below is an assessment of most environmental aspects as outlined in the EPA's "*Environmental Guidelines – Composting and Related Organics Processing Facilities"*.

### 19.16.1 Dust

Dust emissions resulting from material storage, handling and transfer can be expected if appropriate dust mitigation measures are not implemented. The majority of material stockpiles are of a damp nature and would not release high quantities of dust during heavy winds. Dust suppression on internal roadways would be addressed by wetting down the roads during hot or dry weather using the water cart on site in accordance with the site's dust management plan.

In addition, the organic mulch being brought to the site can assist in managing existing dust. However, in supplying the material, several areas of the site are likely to be a source of dust generation and the dust management controls outlined below are implemented on site so that dust does not cause pollution of waters or becomes a nuisance.

Plant and equipment on site that generate dust includes excavators, front-end loaders and trucks. Dust generated by these sources and activities is currently controlled by:

- A site speed limit of under 20 kph;
- All activities that have the potential to generate dust under specific weather conditions will be limited to minimise the generation of dust;
- Using the in-house water truck (cart) to suppress dust, as required; and
- Ensuring all trucks entering or leaving the premises have secure and covered loads.

These dust mitigation measures are implemented in the same manner for all activities undertaken on the applicant's site including composting.

### 19.16.2 Odour

Based on our experience, this is one of the critical potential issues as certain raw materials are clearly odorous. However, under normal circumstances Category 1 organics such as garden materials, wood and fibrous materials generally do not generate odours to such an extent as to become offensive especially when the activities are conducted in such efficient and effective manner, very well controlled in all aspects and are far away from sensitive receptors. Although there is no history of odour complaints, there is potential for this to occur in some sites. We believe that due to the application of the best management practices on this site, and the type of materials used and produced, the likelihood of this occurring is minimal. This has so far proved to be effective since no odour-related complaints have been received by the applicant or the authorities since the composting activities commenced on site.

Being able to confine potentially low scale odorous raw materials to an area free of weather effects is difficult on some sites but not on this site especially with the help of earth berms, the

topography of the area and the implementation of mitigation measures to the raw material stockpiles which will provide greater latitude for these materials to be used, rather than being disposed of to landfills.

Organic mulch supplied for the applicant's program has a very high coarse material content. This provides significant aeration and consequently minimises the likelihood of creating the anaerobic conditions that can cause odour. In the event that the material presents a risk of causing odours, existing operational procedures for the site include the best odour control methods, such as:

- Excessively wet material that is highly odorous will be noted and brought to an aerobic state as quickly as possible; a dry amendment may also be added.
- Stockpiles with high nitrogenous material content may be made smaller to avoid excessive heat build-up.
- Where possible, any agitation of the stockpiles, such as turning for weed and fire management, will be scheduled when the wind is moderate, steady and blowing away from sensitive receptors.

Reporting procedures shall ensure that adequate warning is given to the site manager if the organic materials could present an odour risk. This allows best practice management of the material and ensures minimisation of potential odours. Agitation of the stockpiles during turning may result in peak odour emissions for the operation. Where possible, these activities will be scheduled when the wind is moderate, steady and away from sensitive receptors.

As previously stated, the process is a 100% dry process without the introduction of any heat or water and the fact that only dry mulch/garden organics, which is a non-putrescible material used in the process, odours are unlikely to be generated during the composting process provided that the complete process is followed by the operator. This was clearly evident during the site inspections undertaken by EPA officers on more than one occasion.

It is understood from the applicant that a screening procedure is undertaken on each non-finished product load entering the site and prior to being unloaded at the location dedicated for composting to check for materials that are not permitted to be received on site including odorous materials and in particular putrescible materials. This procedure is strictly adhered to and is supervised by the site manager. This procedure assists in reducing the potential for odour generation on site.

Furthermore, the implementation of best management practices has contributed significantly to reducing potential odour emissions. These practices include the following:

- The adoption of mechanical aeration and regular turning practices to maintain aerobic conditions in the windrows;
- The turning (and wetting) of windrows is closely monitored and optimised in the first few weeks of the composting stage as it is known that oxygen demand and heat generation is high during this period, increasing the likelihood of anaerobic pockets and adverse odour emissions;

- Management of hardstand, runoff drains, filter strips, sedimentation ponds through avoidance of anaerobic conditions;
- Prompt removal and disposal of non-organic contaminants; and
- Ongoing and simultaneous recording of complaints about odours, activities on site, weather conditions and feedstock quantity and quality.

In any case, we have determined that it is appropriate that we undertake a comprehensive odour survey in accordance with current EPA and the industry's best practices. The objective of the odour survey was to determine whether the composting activities undertaken by the applicant cause ***"Offensive Odour"*** as defined in the POEO Act 1997.

An odour survey was undertaken in the early morning of 24 November 2015. **Table 19-2** includes the meteorological conditions that were obtained mainly from a portable weather station which was placed near the main entrance to the composting site. Wind speed and wind direction were obtained from the Bureau of Meteorology in the early morning (and after the completion of the survey). The wind direction was also observed during the site inspection since it is extremely important for the environmental assessments such as an odour survey.

**Table 19-2: Meteorological Conditions on 24 November 2015**

| | |
|---|---|
| **General** | Sunny – fine – clear sky |
| **Temperature ($^{o}$C)** | 21.4 |
| **Relative Humidity (%)** | 71 |
| **Barometric Pressure (mbar)** | 1015 |
| **Wind Speed (Km/h)** | 7 |
| **Wind Direction** | Mostly NNE |

Our odour survey commenced further away from and upwind of the composting site in accordance with EPA's best practices. We then moved closer and closer to the composting site until we entered the site. We confirmed that no odour related to the activities conducted on site was detected outside or at the boundaries of the site. When we approached the active working area where windrows were located, we again were unable to detect any odours until we were within 1-2 metres from the material stockpiles where we detected a mild earthy odour which is typical of the materials stored on site. This odour when considered in accordance with current EPA policies/guidelines and the POEO Act 1997 is not considered to be ***"Offensive Odour".***

It is noted that due to the decision for the construction of Sydney's Second Airport at Badgerys Creek, the Commonwealth has already removed all tenants from the airport footprint. This means that there are no people working or residing for a long distance away from the applicant's site including the composting site, except one residence which is located at approximately 405 m to the northwest of the approved composting site.

Despite the fact that no odour was detected at or outside the boundaries of the site, and the considerable distance from the site to nearby residents, we considered it appropriate to visit the

residential areas to ensure that there was a complete odour survey covering rural, commercial and residential areas. We confirm that we were unable to detect any odours associated with the applicant's composting activities at any residential area.

In addition to the whole perimeter of the site at and just outside its boundaries, the odour survey also included the following nearby streets/locations:

- Resident to the north west of the composting site
- Most of Jackson Road
- Ferndale Road
- Longleys Road
- Elizabeth Drive from Kemps Creek to Luddenham
- Adams Road
- Anton Road
- Luddenham Road
- Hubertus Country Club

**As previously advised on more than one occasion, The applicant activities including composting had not resulted in any odour-related complaints received by the applicant, Liverpool Council, the Department or the EPA.**

### 19.16.3 Leachate and Stormwater

We believe that Category 1 organics such as garden materials, wood and fibrous materials generally form leachates only when additional water (including rainfall) is introduced. Furthermore, stockpiles of raw organics and processed organics may have the potential to pollute waters, because leachate may be generated when the stockpiled organics contain excessive moisture (for example, when too much rain falls on to the organics or if stockpiled organics are not sufficiently aerated or turned).

We understand that the raw materials brought to the site do not have excess water and the run-off is due to contact with rain, rather than leachate being self-generated by the stockpiles. Therefore, contaminated leachate is highly unlikely to be generated by the site operations and the risk of contamination of groundwater would be minimal due to several other reasons such the fact that groundwater is more than 61 m below ground level and composting activities are undertaken above ground on a well compacted impervious compost pad .

In addition, the location of the stockpiles and the open air blending, mixing and composting operations readily enables sediment controls to be designed into the site in convenient and effective locations. In this case, the area located downstream of the composting area is designed in a way that will contain any surface water run-off from the composting area. Any excess water (now called leachate) is diverted via specially designed diversion drains and earth mounds to a leachate/stormwater collection pond as it was previously discussed and agreed with the EPA in its recent communications to ensure that this potentially contaminated water is well managed and re-used only in the composting area unless it is treated appropriately. This water will be tested on a regular basis to determine the extent of its contamination so as to

ensure that it is treated if considered necessary, prior to being used on site as part of the overall Site Water Management system and the ***"****Nil Water Discharge"* policy implemented by the applicant. Based on the previous five (5) years of composting these materials by the applicant, it is very evident that only a small quantity of leachate was generated after very heavy rainfall. This leachate was diverted to the sump pit as requested by the Department. Testing of the water in the sump pit did not show any high levels of contaminants simply due to the fact that the materials used in the composting area are mainly clean dry garden organics/mulch.

Under normal weather conditions, the stockpiles of organic mulch generally absorb any rainwater. Under these conditions it is expected that no stormwater run-off will occur. However, if under severe adverse weather conditions, stormwater runoff occurs, the area used for the storage of the organic mulch materials is within the contained and controlled water management system which will divert runoff to the proposed collection pond. Any stormwater runoff from outside the composting footprint will be diverted away from the composting footprint.

As previously stated, the proposed location of the composting activities is extremely convenient for good reasons, including the management of stormwater runoff, dust management and noise management due to the topography of that site, and existing and proposed structures (i.e. earth mounds, diversion drains, landscaping, etc...). As part of the overall management of stormwater-related issues derived from the composting activities, the applicant will implement a strategy to prevent stormwater run-on from the areas located upstream of the composting footprint by constructing diversion drains and earth mounds around the upstream perimeter of that site. This strategy has been previously proven to be extremely successful in preventing any stormwater generated upstream of the composting site from entering the composting site which would most likely increase the quantity of potentially contaminated water (leachate) that would need to be captured and potentially treated. We believe that this strategy is of extreme importance to all composting activities to ensure that clean water is diverted away from potentially non-clean areas. In this case, the clean stormwater is diverted away from the composting site and directed to other clean areas to either enter the existing site stormwater management system (sedimentation pond 2) or follow the natural flow of water as it has been occurring on site for hundreds and possibly thousands of years.

In addition to the upstream and downstream diversion drains, earth mounds and all other mitigation measures implemented at the composting site, the following measures will also be adopted by the applicant to ensure that stormwater run-off is effectively captured:

- Stockpile formation will be carried out in a manner that reduces run-off in the event of severe adverse weather conditions; and
- The moisture content of the stockpiled material will be kept at the lower end of the required scale so that in the event of heavy rainfall high level of absorption will take place.

More information associated with the water management within the composting area is included in the water section (**Section 6**) of this document including the proposed earth mounds, diversion drains and design of the sediment pond.

### 19.16.4 Noise Amenity

Due to the fact that no additional high noise generating plant or equipment will be used in this process, it is anticipated that no additional noticeable or measurable noise will be generated as a result of this activity. Hence, offensive noise is not considered to be a factor in these activities. Potential sources of noise are from delivery vehicles and stockpile turning equipment only.

The low number of truck movements for the delivery of the organic mulch materials is not considered to have any additional impact on the cumulative noise level emanating from the site.

The existing traffic management plan that the applicant has implemented already includes provisions for truck movements.

In addition, the proposed location of composting activities is well shielded from other adjoining residential receptors except for the western residence where it is likely to be slightly visible. The noise levels are and will continue to be well below the criteria specified in the Development Consent and the EPL. Despite these facts, we believe that it is appropriate that suitably designed and landscaped earth mounds be installed as shown on the site layout to minimise the potential visual impact from both the composting and stockpiling activities on the western residence. These earth mounds will also be used to divert clean water from the areas located upslope of the composting activities to reduce the quantities of surface water run-on which will otherwise result in increasing the quantities of leachate to be managed.

A noise assessment was undertaken as part of the assessment required by the Department and was included in the EAR supporting the modification No 3 application. The noise assessment included noise from the composting activities as well as all other activities undertaken by the applicant. In addition and based on the noise monitoring (including monitoring of noise from the composting activities) undertaken by the applicant for the last five (5) years no exceedances of the noise criteria specified by the EPA and the Department were recorded. Reference should be made to the noise section of this document for confirmation of noise monitoring results.

In summary, there will be no increase in noise levels due to conducting the composting activities at the proposed location since all activities that have been assessed for noise impact will remain the same. On the contrary, we believe that due to the topography of the proposed location including the 5 m high earth mound located at the southern end of this portion of the site and the proposed additional 3.5 m high earth mounds at most of the western and northern sides of the composting area, the noise impact will be reduced even further. Compliance with the existing noise criteria will be confirmed when regular noise monitoring will be undertaken as part of the noise monitoring requirements imposed by both the Department and EPA.

Further details on the noise assessment are included in **Section 9**.

### 19.16.5 Fire

There are no buildings near the composting area. Hence, fire protection requirements under the Building Code of Australia (BCA) are not required for this area.

Fire risk is very low in this case due to the fact that the area is segregated from public access and there are no potential heat generation or potential chemical reactions as part of the process.

*Fire at composting and related organics processing facilities can attract public and industry concern about the perceived risks of composting activities, threaten damage and loss of equipment, and present potential dangers to workers and firefighters (Rynk, 2000)*.

Possible causes of fires at composting and related organics processing facilities include:

- Spontaneous combustion (see below for further information)
- Sparks from work activities such as welding
- Lightning strikes
- Cigarettes
- Build-up of particulate matter near engine manifolds and exhaust pipes of processing equipment
- Bushfires
- Arson.

*The conditions for spontaneous combustion (such as large piles, limited air flow and time for temperature to build up) are usually more prevalent within large, undisturbed piles containing raw feedstock, curing compost or finished compost rather than in active composting systems (Rynk 2000).*

As previously stated, the applicant and Soilco will be, as they have always been in the past, monitoring the composing activities in relation to most aspects including the potential for fires. However, certain natural disasters (i.e. lightning, bushfires) are beyond their controls.

### 19.16.6 Waste

The facility uses waste as a raw material. This waste is organic in nature and would otherwise be sent to landfill. Waste generated from the processes on site would consist of minor quantities of inert waste from the packaging materials and some office waste.

All waste is appropriately classified in accordance with the NSW EPA *Waste Classification Guidelines*. The composting activities at the proposed location are expected to generate negligible quantities of waste that cannot be re-used on site. Hence, the risk associated with waste generation from the composting activities is minimal. Further details on waste generation and management are provided in **Section 14**.

### 19.16.7 Visual Amenity

The composting area is well segregated from all other activities conducted by the applicant. The siting of these activities was chosen to provide minimum visual impact, if any, on the surrounding environment.

The area is not visible from any residential receptors or public place due to the reasons outlined below. The only exception to this is the low visibility of the composting site from the western resident. As previously stated, this resident was approached on at least five (5) occasions as part of the community consultation process and she did not have any concerns or wished to participate in any aspects associated with the applicant's activities. It was noted that no formal or informal complaints were ever received from this residents.

- The topography of the area;
- Trees and shrubs that surround the area;
- Earth mounds/berms;
- Maintaining lowest practically possible height of stockpiles; and
- The excellent management of all aspects associated with these activities by both the applicant and Soilco managements.

This has so far provided an excellent and healthy relationship with the adjoining residential receptors.

### 19.16.8 Traffic Impact

This activity is unlikely to generate a significant number of truck movements. Truck movements would be under 5 per week. They follow current approved traffic route from and to the site in accordance with the approved traffic and transport management plan.

More details on traffic management are included in **Section11.**

## 19.17 CONCLUSION AND RECOMMENDATIONS

The non-commercial composting activities conducted by the applicant within the Commonwealth leased land were below the threshold to require licensing under the POEO Act 1997. This was confirmed by the EPA in a letter dated 22 July 2011. The letter states: *"If the waste received at the site does not exceed threshold limits outlined in the Protection of the Environment operations Act 1997 ("POEO Act"), an Environment Protection Licence ("EPL") would not be required for waste related activities only. As you are aware, current activities (Extractive activities – other land-based extraction) at the site are the subject of EPL number 12863. Hence any additional activities that require licensing will be incorporated into this EPL."*

In addition, the activities are below the threshold that requires any changes to the existing Development Consent. This determination was confirmed by the Department in an email dated

18 January 2012. The email states: *"Re the green waste I confirm my telephone response to you of 30 November that the importation of green waste used in rehabilitation is covered by the terms of your existing consent. That is, if green waste is imported for other purposes (such as landfill or making compost for sale), then it will require a modification to your existing consent. Providing all green waste imported is used in site rehabilitation, or other activities not requiring consent (such as may be the case for soil supplementation or landscaping), then I do not see a consent modification is required."*

**At this stage, the quantity of composting materials received and processed at the proposed location will remain unchanged.**

The composting activities have been conducted in accordance with the EPA's guidelines and advice from expert consultants in the area of composting. The activities have been conducted in an area that is segregated from all other activities conducted on site including quarrying and transporting of materials as well as rehabilitation work. The area was surrounded by earth berms and the topography of the area makes it an ideal location for this type of activity with minimal potential for any adverse impact on human health or the environment.

In addition, the benefits to recycle these materials will save great space in our near-exhausted landfills.

The proponent has implemented several effective mitigation measures and amelioration strategies to ensure that any potential adverse environmental impact is minimised. Based on the inspections conducted by highly qualified and experienced environmental consultants and EPA officers, it was confirmed that the applicant has applied all feasible and reasonable measures to minimise any potential adverse impact on human health and the environment.

Inspections by officers from Government and non-Government organisations confirmed that the non-commercial composting activities are conducted by the applicant in accordance with best management practices. The equipment used in these activities is operated in a proper and efficient manner, and they are maintained in a proper and efficient condition.

It should be noted that no complaints have been received by the applicant or any Government department regarding the composting activities conducted on site. I believe that this is a very good indication that the composting activities have no adverse impact on human health or the environment.

Similarly, the applicant is intending to implement all previously proven mitigation measures and amelioration strategies including all environmental controls at the proposed new location. In addition, more mitigation measures are proposed for the new location to reduce even further the potential risk of harm to human health or the environment. These additional mitigation measures include diversion drains, earth mound, surface water collection pond and others as outlined above.

Based on the assessments of the potential impacts of the composting activities on human health and the environment including the site inspections and odour survey undertaken by a

highly experienced and qualified environmental consultants, we believe that this report demonstrates that the composting activities will have minimal potential impact on human health and the environment, provided that the proposed mitigation measures and those previously implemented are maintained.

# 20. CONSULTATION

## 20.1 GENERAL

Consultation with government departments and the local community plays an important role in ensuring all potential environmental impacts are evaluated. The consultation process provides the opportunity to identify and prioritise issues. Key aspects identified through both the government and community consultation process are addressed in varying degrees throughout this report.

The three (3) items listed are considered to be extremely important in the consultation process for most proposals included this one:

- Liaison with all relevant local, state and federal government authorities regarding the proposed development and requirements of the report;
- Consultation with all stakeholders including community and industry in the vicinity of the subject site; and
- Compilation of issues of concern raised and outcomes of any meetings undertaken during the consultation process.

## 20.2 GOVERNMENT CONSULTATION

The applicant undertakes consultation on a regular basis with key local, state and federal Government agencies as specified in the development consent prior to commencing works on-site and after work has commenced on-site. The key agencies that the applicant has previously consulted include:

- The Department of Planning and Environment (Department);
- The Office of Environment and Heritage (OEH);
- The NSW Environment Protection Authority (EPA);
- The NSW Roads and Maritime Services (RMS);
- Department of Primary Industries – Water (DPI-Water);
- Liverpool City Council;
- NSW Police;
- NSW Ambulance Services; and
- NSW Rural Fire Services.

In relation to this modification application, the applicant has consulted the following agencies:

- The Department of Planning and Environment (Department);
- The NSW Environment Protection Authority (EPA);
- Department of Primary Industries – Water (DPI-Water);
- Liverpool City Council;
- NSW Rural Fire Services.

## 20.3 COMMUNITY CONSULTATION

Community consultation was conducted on a regular basis in a formal manner according to the requirements of schedule 5 of the Development Consent. During these formal regular meetings, no concerns were raised by any community member about the activities conducted on site. In addition, as part of the formal meetings conducted at the beginning of the development and when meetings were held on site, a site inspection was conducted by all attendees including Government Authorities' representatives.

Minutes of these meetings were also circulated to all parties involved to confirm that all issues raised, if any, were addressed by the management of the applicant promptly and in a very professional manner.

In addition, the applicant regularly engages with adjoining landowners and has in the past received no substantiated complaints in relation to any activities conducted on site including excavation, transporting, rehabilitation, composting and stockpiling.

As part of this EA process, a program of targeted land owner consultation involving face to face meetings and discussions with potentially impacted landholders who reside within close proximity of the subject site boundaries and other interested parties, has been undertaken. No objections have arisen from adjoining property owners or from interested parties.

It was suggested that informal consultations continue to be undertaken between the applicant and nearby landowners to provide the opportunity for landowners to raise any concerns they may have in future.

## 20.4 INTERNAL CONSULTATION

The site management has already established simple yet effective communication/consultation channels for an effective implementation of the overall environmental management system. Typical methods of communication that may suit the size of the operation include meetings and notice boards and the use of tool box sessions which are highly effective. Currently, site management upholds an existing environmental management plan (EMP), and are also utilising verbal communication as the most effective method, given the size of the site and its operations.

So far, the management has received only positive feedback from its employees and contractors about the overall environmental management on site.

## 20.5 CONCLUSION

It is concluded that the proponent has conducted community meetings in accordance with the development consent conditions in the first 12 months. However, due to the lack of interest

shown by the community representatives at that time, it was determined that the best approach to continue on with the community consultation is to visit and meet with all neighbouring properties owners and tenants. This approach continues to be implemented and was found to be effective in informing the community of any changes to the activities conducted on site and any potential impact on human health or the environment.

As part of the last modification (No 3), condition8 of Schedule 5 required the applicant to establish and operate a Community Consultative Committee in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committee for Mining Projects (Department of Planning, 2007) (CCC Guidelines).*

The applicant attempted to establish the CCC in accordance with the *"CCC Guideline)* but was unsuccessful in doing so due to the lack of interest from the community and the limited number of residential premises in the vicinity of the quarry. The applicant submitted a request to the Department for approval to use an alternative program/protocol for community consultation. The Department has considered the proposed alternative program of community consultation, involving informal consultation on a regular basis. The proposal was generally accepted, with some changes in consideration of the Department's Guidelines. It was considered that the entity of the Luddenham Quarry CCC should be retained, for identification and reporting purposes. Refer to **APPENDIX M** for a copy of the Department's approval letter.

Thus, the Luddenham Quarry CCC should be established under the following terms:

1. Individual consultation by Epic Mining with the occupants of residences most likely to be affected by dust and noise, as identified in Schedule 4, conditions 7 and 19, respectively, which include the "northern" residence in the EIS, and the most-affected residences in Jackson Road, Ferndale Road and adjoining landowners to the east of the site;
2. Consultation with a representative number of potentially impacted stakeholders, including residents and operators of commercial facilities within the suburbs of Luddenham and Kemps Creek;
3. Consultation with a representative of Liverpool Council;
4. Completion of the first round of consultation, as set out in points 1-3 above by 30 September 2015, thence twice annually;
5. Preparation of a Consultation Report within 28 days of completion of consultation, including issues raised and actions to be taken, as would otherwise be required in the preparation of Minutes of meeting; and
6. Submission of Consultation Reports to the Department and placement of Consultation Reports on Epic Mining's website within 2 weeks of the completion of each report, once established in accordance with Schedule 5, condition 12.

**The applicant suggests that the Development Consent be modified to allow the applicant to continue implementing the alternative program/method already approved by the Department.**

# 21. HOURS OF OPERATIONS

Current hours of operations are included in both the Development Consent and the Environment Protection Licence. The hours are:

- Normal activities including haulage, vehicles entering and leaving the premises and extraction activities may be conducted **Monday to Friday from 0700 to 1800 hours**.
- Maintenance of plant and equipment may be conducted during normal hours of operation and on **Saturday from 0700 to 1300 hours**.
- **Sunday and Public Holiday – no activities**.

These approved and strictly enforced hours of operation will not change as a result of the proposed modification (introduction of the stockpiling activities).

# 22. JUSTIFICATION OF THE MODIFICATIONS

## 22.1 BACKGROUND

A description of the need for and objectives of the modifications and a justification of the carrying out of the modifications in the manner proposed is provided below in addition to an evaluation against Section 79C requirements. The discussion is provided having regard to the biophysical, economic and social considerations, the principles of Ecologically Sustainable Development (ESD), the consistency of the modifications with the objectives of the EP&A Act, the existing Development Consent, land zoning and the consequences of not carrying out the modifications.

## 22.2 SECTION 79C EVALUATION

Based on discussions with relevant Government Departments, it was considered appropriate to include an evaluation of the proposed modification against Section 79C of the Environmental Planning and Assessment Act 1979 to ensure that all matters required to be considered by the Department are fully addressed in this EAR. In this instance, it was determined that the most practical manner to undertake the evaluation is by tabulation as shown in **Table 22-1**.

*"(1) Matters for consideration—general*
*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:"*

**Table 22-1: Section 79C Evaluation**

| Matters For Consideration | Comments |
|---|---|
| *(1)(a)(i) any environmental planning instrument* | The relevant Environmental Planning Instruments are included in this Section<br>The modification satisfies the requirements of the EPIs<br>The modification is permitted in this land zone<br>The modification satisfies the aims and objectives of relevant EPIs<br>The modification complies with all relevant development standards included in the EPIs<br>Several additional matters that were considered relevant in the EPIs have been addressed in this EAR<br><br>The modification is permissible in the context of the governing planning instruments and warrants approval given that the intent and purpose of the development consent remains the same. The quantity of extracted material will not exceed the approved 300 000 tonnes annual limit as per the condition of consent.<br><br>The onerous nature of the other consent conditions and compliance requirements ensures that all the necessary |

| | |
|---|---|
| | safeguards are in place to protect the ecology, residential amenity and the environment. |
| *(1)(a)(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved),* | We are unaware of any proposed EPI or draft EPI that may apply for this modification |
| *(1)(a)(iii) any development control plan* | Yes, LDCP 2008 is the relevant DCP<br>The proposed modification is consistent with LDCP 2008<br>The objectives of the LDCP 2008 are provided in this Section.<br>The proposed modification is consistent with the objectives of the LDCP 2008.<br>The proposed modification complies with all relevant development standards included in the LDCP 2008.<br>The proposed modification does require formal notification and consultation, however, we will accept the Department's advice on this matter<br>All relevant additional or special provisions for the proposed modification have been addressed in this EAR. |
| *(1)(a)(iiia) any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F* | None |
| *(1)(a)(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph)* | Clause 92 associated with the NSW Coastal Policy 1997 is not applicable to the proposed modification<br>Clauses 93, 94 & 94A associated with Fire Safety and Temporary Structures aspects are better be determined by the Department, if considered relevant |
| *(1)(a)(v) any coastal zone management plan (within the meaning of the Coastal Protection Act 1979)* | Not applicable |
| *(1)(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality* | The site is located within a mainly rural environment as stated in the site description section of this EAR rather than in an area of a particular scenic quality or natural landscape richness. The only potentially sensitive environment is Oaky Creek and the adjacent bushland which will be protected by the applicant in accordance with DPI – Water requirements. Consideration has been given to these requirements which are related to a Vegetated Riparian Zone if a development is likely to encroach to within 40 m of the waterway (Oaky Creek).<br>The modification has been assessed against all potential environmentally related matters and found to be of none to very low impact on both the natural and built environment due to the |

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| | minimal work required. On the contrary, we believe that the modification will make a positive impact on the natural environment by restoring some areas of the site to their original natural status, mainly adjacent to public roads.<br>The modification has no adverse impact on the neighbouring properties but rather, it may have a positive impact especially visually by planting native trees and shrubs.<br>The proposed modification is consistent and compatible with adjacent properties in the same land use zone RU1<br>The proposed modification will have no adverse impact on views or vistas.<br>Access to the site is via Adams Road and an access road/driveway as outlined above.<br>The proposed modification is unlikely to generate any additional traffic movements since there will be no change to current production or activities.<br>The modification will have no impact on the public infrastructure since it contained within an area that will be segregated from any public area.<br>There are no adverse impacts on existing utilities in the area.<br>The soil quality will not be adversely changed in any way by the modification but rather, the soil quality will be improved due to the use of good quality soils and other materials in all areas.<br>The proposed modification is unlikely to have any adverse impact on the local or regional air quality due to its intended end use and previous air quality monitoring for over 5 years.<br>As outlined above, the proposed modification has no adverse impact on the existing flora and fauna due to its nature, intended use and location.<br>Waste generated on site will be minimal and mainly of domestic nature, however, the applicant will make available relevant waste bins for domestic as well as industrial waste just in case any waste could not be placed in the bin dedicated for domestic waste only.<br>Natural ventilation and lighting will be promoted at all times to conserve energy and energy saving light bulbs will be used in the shed.<br>The proposed modification is unlikely to generate any offensive noise (as defined in the Protection of the Environment Operations Act 1997) that could be audible outside the boundaries of the site.<br>The proposed modification will comply with the noise criteria specified in the Development Consent at the potentially sensitive receivers. The proposed modification will be located within a site with a fence around its perimeter and another fence around the shed and the shed will be securely locked to prevent access by unauthorised people or being the subject of vandalism.<br>There are no issues associated with economic benefits of the development and we have already committed to using local businesses for all our purchases and daily activities to ensure that |

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| | the local economy is receiving the benefits from the development. All employees will be encouraged to use local businesses for their everyday consumables.<br>In conclusion, we believe that the proposed modification is likely to have positive rather than negative impacts on the environment and the community. |
| *(1)(c) the suitability of the site for the development* | The site is suitable for the development as outlined in this EAR in addition to the fact that the location, space allocated and nature of the development make it consistent with the objectives of the land zoning.<br><br>The approved quarry area is of a sufficient size to ensure that stockpiling and composting can effectively occur without disrupting extraction works and are suitably distant from the riparian zone and creek bed.<br><br>The staging of extraction works is consistent with typical extraction operations and ensures stockpiling can be facilitated.<br>The proposed amendments to the consent will greatly assist in the day to day quarry operation and the extraction of high grade clay over an anticipated time frame as established by the Department of Planning and Infrastructure. |
| *(1)(d) any submissions made in accordance with this Act or the regulations* | We are unaware of any submissions made and we will be providing responses to any submissions received during the consultation stage |
| *(1)(e) the public interest* | No adverse matters relating to the public interest arise from the modifications.<br><br>The quarry operations on-site have been operating in the public interest as it provides employment opportunities on-site and via associated industries.<br><br>The quarry also produces valuable clay and shale of a high quality. The quality of clay likely to be extracted from the site is in short supply in the Sydney Metropolitan area and the continued extraction of the clay from the site over the life of the quarry can ensure the demand is met.<br><br>The local community have been consulted on more than 20 occasions as part of the Department's Community Consultative requirements. So far we have had only positive feedbacks and full endorsement of the quarry operation. |
| *(1)(f) Substantially the Same Development* | The proposed modification is substantially the same as the development previously approved by the Department (consent authority) |

## 22.3 NEED FOR AND OBJECTIVES OF THE PROPOSED MODIFICATIONS

The modifications would facilitate the continuity of employment for the existing quarry workforce, providing job security for existing employees and contractors, and to continue to stimulate demand in the local and regional economy.

Based on several assessments conducted for the extraction of clay and shale, it was found that there is a real shortage of light firing shale within the Sydney Basin. At this stage, there is no other producer of such materials in this area to supply the brick manufacturing companies.

The modifications would include the implementation of mitigation measures, and management (including performance monitoring), to minimise potential impacts on the environment and human health.

The Socio-Economic Assessment which was undertaken as part of the original EIS and the EAR submitted with the last modification (EAR) indicates that the continuation of current activities including stockpiling would result in great contributions to regional and NSW output, and business turnover and household income.

It is expected that an incremental net benefit would eventuate as a result of the implementation of the modifications. This net benefit for all stakeholders is net from costs associated with potential environmental impacts and management measures for the modifications.

## 22.4 JUSTIFICATIONS FOR PROPOSED MODIFICATIONS

The reasons for the changes proposed to the operation will be incorporated in details in the *'Epic Mining Mine Operation Plan'*. A summary of the reasons for the proposed re-locations of both stockpiling and composting activities is outlined below and the proposed works are necessary given the following:

- The original EIS described the operation of the quarry as a *'shovel and truck activity'*. This means that excavated materials will be transported via a conveyor to the truck loading area and taken off-site to cater for the 'then' perceived demand for the product within the brick manufacturing industry. This was based on the assumption that the brickworks had the capacity to store materials on their sites and that all the extracted materials were of a high grade with no overburden. This resulted in the need to stockpile materials on an adjacent site which was leased from the Commonwealth;

- Stockpiling is a necessary process enabling the scouring and fretting of the raw extracted material. Stockpiling also enables greater flexibility to provide the correct clay-shale mixes and allows for the removal of unwanted shale-sandstone materials within a controlled environment. Each extracted individual kiln fired coloured raw material will be isolated as its own stockpile;

- The practice to convey materials directly to brick manufacturers is no longer acceptable to the buyers for several reasons including the fact that the building/construction industry's demand fluctuates greatly depending on factors that are outside the scope of this report. One of the main reasons is that the brick companies purchasing the raw products extracted from the quarry no longer have the capacity to stockpile materials within their own sites. The brick companies' land is being consumed for re-development consistent with initiatives to develop sites along the M7 corridor and South West Growth Centre;

- The existing benching and extraction detail approved under the development consent in terms of the direction of benching/staging was also not consistent with natural contours, raw material geology, surface water collection measures and best standard industry practices. The existing redirection of benching responds to site circumstances and the proposed changes to the operation reflect current industry practice and operational requirements;

- The previous modification (No3) approval of both stockpiling and composting activities as well as other minor changes provided the applicant with incentive to continue with its excellent environmental performance which resulted in zero (0) substantiated complaint from the community and other stakeholders;

- The proposed modifications will result in reduction of stockpiled materials in the proposed new site as well as the total stockpiled materials whilst there is no change in the quantity of materials stored within the quarry footprint;

- The proposed modifications will help in ensuring the financial viability of the applicant by freeing funds to assist in implementing any additional environmental mitigation measures, if and when required. It will save the applicant several thousands of dollars for reduced land leased from Commonwealth;

- The construction of Western Sydney Airport with Lot 1 DP 838361 which surrounds the applicant's site from both east and south sides is being fast tracked to ensure compliance with the timeframes specified by the Commonwealth. All tenants within this land have been removed and most nearby roads are being closed to prevent entry to this land from most directions. This means that the applicant will no longer be able to use the previously leased land to stockpile its extracted materials on the previously approved land. Similar scenario applies to the composting activities which were undertaken in a small area of the leased Commonwealth land. This activity has been temporarily suspended until approval of the new location is granted for the proposed new location;

- Since the commencement of normal operations at the site, there have not been any

incidents associated with environmental aspects such as water, air or waste;

- Some of the proposed modifications are of administrative nature only and will not require any physical work to be conducted on site;

- The proposed activities are exactly the same as the activities previously approved by the Department;

- None of the proposed modifications will generate any additional activities on site but rather they are being relocated from one area to another; and

- Communication with several employees of the Department and EPA revealed that the proposed modifications are reasonable and justifiable under the current planning and environmental legislation, policies and guidelines.

In terms of undertaking a quantitative and qualitative assessment of the modifications, we make the following observations:

- The proposed quarry operation (being the principal component of the consent), remains unaltered and the proposed amendments do not introduce new environmental considerations – **qualitative consideration**. The modifications maintain the same excavation quantities, hours of operation, haulage etc.

- The proposal will maintain an appropriate level of 'green' space and landscaping to beautify the development and assist in achieving reasonable levels of privacy, screening and acoustic protection. The southern stockpiles will be contained within the approved quarry footprint only. The proposed northern stockpiles within the adjacent land (285 Adams Road, Luddenham) have been previously subjected to comprehensive environmental assessments, noise and dust monitoring for over five (5) years. Similarly for the composting activities which have been subjected to more than one comprehensive environmental assessment. Notwithstanding the above, relevant environmental assessments have been outlined in this report. The outcomes of these assessments are very encouraging and conclude that the potential impacts to the environment or human health are none to minimal and for some aspects positive rather than negative. – **Quantitative consideration**.

- The proposed design amendments are fully contained within the site and do not affect neighbour amenity – **quantitative consideration**. The western properties include the gun club and a dwelling. The gun club is suitably protected in terms of acoustic measures with the construction of a 6m high bund wall along its eastern boundary running parallel with the applicant's noise barrier/bund wall. The adjoining dwelling called the western residence on Lot 1 DP 623799 (265 Adams Road, Luddenham) is sited well away from the common boundary. Similarly for the northern residence located at 2111 Elizabeth Drive, Luddenham which is located approximately 94 m from the boundary (and more than 140 m from any proposed activity) of the proposed stockpiling site on the opposite (northern) side of the very busy Elizabeth Drive. The proposed mitigation measures which include several earth berms (noise barriers, wind breaks for dust and visual attenuation measures) will ensure

that the amenity of adjoining properties or potentially sensitive receptors/receivers will remain unaffected.

- Since the commencement of normal operations at the site, no complaints have been received by the applicant or any Government Authority (i.e. the Department, EPA, Council) in relation to any of its activities and particularly any aspects of environmental nature except one dust complaint that was received by the EPA about 5 years ago. However, when the applicant and the EPA investigated the complaint in consultation with the complainant, it was determined that the dust emission complaint could not be substantiated and was not associated with the applicant's activities on the site – **quantitative consideration**.

- The existing acoustic bund walls have been appropriately constructed from clay taken from the surface of the quarry area. The clay has assisted in the compaction of the bund walls and in the minimisation of dust generation. Also the surfacing of the bund walls with grass has assisted in the binding of the bund and in achieving a natural appearance of the bund walls. The constructed bund walls around the perimeter of the approved quarry area will effectively screen the stockpiles from view and shield adjoining properties from noise. Similarly, all proposed earth berms (bund walls) will be constructed in the same manner and landscape appropriately as recommended in the environmental including visual assessments - **qualitative consideration.**

### 22.4.1 Ecologically Sustainable Development Considerations

As part of the reasons and justifications for the proposed modifications, it is considered appropriate to address the Ecologically Sustainable Development Principles. These considerations are outlined below.

The concept of sustainable development came to prominence at the World Commission on Environment and Development (1987), in the report entitled *Our Common Future*, which defined sustainable development as:

*Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

For the purposes of this EAR, the relevant definition of ecologically sustainable development (ESD) is that in section 6(2) of the *Protection of the Environment Administration Act, 1991*, which is the definition adopted by the EP&A Act. This definition states:

*Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:*

> *(a) the precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*
> *In the application of the precautionary principle, public and private decisions should be guided by:*

*(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*

*(ii) an assessment of the risk-weighted consequences of various options.*

*(b) inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

*(c) conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

*(d) improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services, such as:*

*(i) polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*

*(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*

*(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

Project design, planning and assessment have been carried out applying the principles of ESD, through:

- incorporation of environmental considerations and the results of the impact assessments in decision-making processes;
- adoption of high standards for environmental and occupational health and safety performance;
- assessment of potential greenhouse gas emissions, where and if relevant, associated with the proposed modifications;
- consultation with relevant stakeholders including Federal, State and Local Governments, and local businesses and community; and
- optimisation of the economic benefits to the community arising from the proposed modifications.

Assessment of potential long-term impacts of the proposed modifications was carried out during the preparation of this EAR on visual aspects, surface water, biodiversity (flora and fauna), air quality, noise, Aboriginal cultural heritage, socio-economics and more.

The design of the proposed modifications, and proposed mitigation measures to minimise environmental impacts, takes into account biophysical considerations, including the principles of ESD as defined in section 6(2) of the *Protection of the Environment Administration Act, 1991*.

### 3.4.3 Consideration of the Proposed Modifications against the Objects of the EP&A Act

Section 5 of the EP&A Act describes the objects of the EP&A Act as follows:

*(a) to encourage:*

*(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals,*

*water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*

*(ii) the promotion and co-ordination of the orderly and economic use and development of land,*

*(iii) the protection, provision and co-ordination of communication and utility services,*

*(iv) the provision of land for public purposes,*

*(v) the provision and co-ordination of community services and facilities, and*

*(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*

*(vii) ecologically sustainable development, and*

*(viii) the provision and maintenance of affordable housing, and*

*(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and*

*(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.*

The proposed modifications are considered to be generally consistent with the objects of the EP&A Act, because they:

- incorporate measures for the management and conservation of natural resources including water and natural areas, development of the Sydney shale and clay resources, and control measures to minimise potential amenity impacts associated with surface activities in the vicinity of the quarry;
- include the economic use and development of land, while maintaining key existing land uses including primary production uses on surrounding Commonwealth and privately-owned land;
- would support the ongoing provision of community services and facilities through royalties, tax revenues and contributions;
- incorporate a range of measures for the protection of the environment, including the protection of biodiversity values;
- incorporate relevant ESD considerations;
- are part of a State Significant Project that would be determined by the Minister for Planning, however feedback and consultation with Local, State and Federal Government agencies has been undertaken where relevant; and
- involve public consultation though the EA consultation program, which would be ongoing following the Department's assessment of the proposed modifications in accordance with the requirements of the EP&A Act.

As such, it is considered that the modifications would result in positive rather than negative environmental consequences in comparison to the currently approved activities and their locations.

# 23. CONCLUDING REMARKS

Based on the outcomes of the environmental assessments conducted during the preparation of this report, the results of environmental monitoring being conducted in the last five (5) years, the highly commended environmental performance of the applicant, the very encouraging feedback received from Government and non-Government Organisations and the positive comments received from the community at large, the following concluding remarks are made:

1. The proposed modifications include mainly re-locating the stockpiling and composting activities which are approved activities. The stockpiling activities will be moved from the leased Commonwealth land to an adjacent site north of the applicant's already approved site and the composting activities will be moved to a northern portion of the applicant's already approved site;

2. The proposed modifications are minor in the context of the overall development consent and effectively assist in facilitating standard quarrying operation works on-site and stockpiling of materials on an adjacent site to give a space for the construction of the Western Sydney Airport;

3. The area that was used by the applicant for the composting activities was rehabilitated to better than original conditions and was recently returned back to the Commonwealth. Due to the excellent site preparation, relatively clean and dry materials used in the composting activities, there was no adverse impact on human health or the environment as a result of the composting activities. Comments received from the Commonwealth in relation to this site were extremely pleasant and encouraging. This demonstrate the excellent environmental performance of the applicant in undertaking these activities;

4. Overall the proposed modifications are practical, desirable and feasible without altering the nature of the development consent;

5. The intent of the development consent remains as approved – a quarry operation for the extraction of clay and shale, stockpiling of materials, composting and other related activities;

6. The proposed modifications are permissible pursuant to the provisions of SREP No 9. The stockpiling activities are permissible within the proposed new site under current land zoning;

7. Given the minor nature of the proposed works, the application is consistent with the provisions of section 75W of the EP&A Act 1979;

8. The environmental, socio-economic, visual, risk assessments, where relevant, undertaken in relation to both the approved area and proposed stockpiling and composting sites demonstrate that the potential impacts are none to minimal and for some aspects positive rather than negative;

9. It is anticipated that no significant adverse impacts arise as a result of the proposed

modifications and the development as modified remains substantially the same;

10. The proposed modifications are consistent and in-line with Ecologically Sustainable Development;

11. From a streetscape perspective the stockpiling will not be obvious being effectively screened from view by the earth berms/bund walls, and the trees already established on the site and around the approved quarry area. The proposal will be inconsequential when viewed from the streets. The actual quarry area is a considerable distance from Elizabeth Drive and Adams Road ensuring the use is not visible to passing traffic. Furthermore, the proposed locations for stockpiling and composting activities will include similar arrangements to ensure that these activities will have minimal visual impact on adjoining properties. Photos taken from various locations within and outside the boundaries of the site confirm the above and have been attached;

12. Noise, water and dust monitoring is in place and the proposed modifications will be subject to continuing monitoring in accordance with the Development Consent and the EPL #12863;

13. The applicant has taken the opportunity to review the site surface water management in respect of changes to the proposed stockpiling and composting sites. The proposed design changes to water management are appropriate and rectify any anomalies that may have existed in previous water management arrangements. This is considered to be an improvement on the previous plan;

14. Once the available quarry footprint achieves its full excavated size, the stockpiling of raw materials will be conducted at some 30 meters below the existing landform and will be completely eliminated from visual and noise considerations;

15. The proposed changes to the Luddenham Community Consultative Committee are already approved by the Department and the applicant is simply seeking the formalisation of the approved program/method;

16. The proposed changes to the locations of environmental monitoring points have been previously discussed with both the Department and the EPA. In principal approval was given mainly due to the fact that the existing locations no longer represent the potential impacts from the applicant's activities including the proposed relocation of certain activities; and

17. The proposed changes to the Air Assessment Parameters were previously discussed with both the Department and EPA. The EPA has already removed these requirements from the EPL and the Department has agreed in principal on the changes.

The Department's assistance is therefore sought to modifying relevant conditions of the Development Consent to reflect the proposed modifications as outlined in this report.

# 24. RESPONSIBILITY

The Operations Manager is responsible for the implementation and maintenance of all relevant management plans throughout the relevant activities conducted on site. The Operations Manager may delegate the responsibility to other staff members who are appropriately trained to implement and maintain these management plans. The Operations Manager is also responsible for managing the day-to-day operations on site.

The current Operations Manager's details are:

Samuel Tarabori
Ph: 4774 9334
Mobile: 0410 411 998
Email: samuelt@epicmining.com.au
Address 1: 275 Adams Road, Luddenham NSW 2745, or
Address 2: 2420 Elizabeth Drive, Badgerys Creek NSW 2555

The names of the delegated employees, if any nominated by the Operations Manager, should be included in the relevant sections of the management plans, when updated.

The applicant's management will need to ensure that those coming onto the site have understood the relevance and objectives of all management plans relevant to their specific jobs and will carry out their activities in accordance with the requirements of these relevant management plans and the approved consent conditions, where relevant.

Having the full commitment of the applicant's management and staff, contractors and their staff is imperative for the high level of success intended from the use of these plans within the applicant's site.

# 25. TRAINING

The applicant's management recognises that training and awareness should be treated as an integral part of the implementation of the consent requirements and relevant management plans.

The applicant's management would provide appropriate and additional training to the Operations Manager, if it is considered necessary, as it will all depend on his previous experiences with similar duties. The training would include the implementation and maintenance of the consent requirements and relevant management plans to ensure that the Operations Manager is competent and confident in carrying out the duties and responsibilities associated with these requirements.

In addition, the training would include a session on undertaking prompt action to manage pollution incidents or potential pollution related matters in the case that a feedback was provided, an enquiry was made or a complaint was received. The prompt action is required to ensure that any potential impact to human health or the environment is minimised.

It is essential that the site management thoroughly understand the contents of the consent and be competent in the applicable legislation, and the environmental aspects and impacts of all operations and procedures.

Therefore, site management will determine the level of competency necessary for staff and contractors coming to site to ensure their environmental objectives and statutory responsibilities are met.

Training will need to be assessed on a periodic basis for staff while contractors would be assessed on a job-by-job basis. All relevant procedures should be discussed until a level of understanding has been reached and a degree of competency has been demonstrated by the staff member or contractor involved to the site operator's satisfaction.

Shortfalls could be addressed by specific on-site training. Updates and reviews should also be conducted in the case of complaints or after any changes in the consent conditions requirements, in particular, a change in site management, procedures, site operations or legislation.

# 26. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for undertaken environmental assessments and the preparation of Environmental Assessment Reports (EAR). No guarantees are either expressed or implied.

This EAR has been prepared solely for the use of Epic Mining Pty Limited (Epic), as per our agreement for providing environmental services. Only Epic is entitled to rely upon the information provided in this EAR within the scope of work described in this EAR. Otherwise, no responsibility is accepted for the use of any part of the EAR by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this EAR, no warranty is given, nor liability accepted (except what is otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Epic for the purposes of preparing this EAR.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

# 27. REFERENCES

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2. Environmental Planning & Assessment Act 1979
3. EIS titled "*Proposed Clay/Shale Extraction Operation – Lot 3 – 275 Adams Road Luddenham"*, dated May 2003, and prepared by Douglas Nicolaisen & Associates Pty Ltd (DNA)
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6. Modification Application DA 315-7-2003 MOD 3 and the accompanying Environmental Assessment titled "*Environmental Assessment Report for The applicant Mining Pty Ltd: 275 Adams Road, Luddenham, NSW"*, prepared by Benbow Environmental Pty Ltd and dated November 2014 relating to temporary stockpiling, composting, extraction sequencing and other activities
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# APPENDICES

**APPENDIX A – Modified Consolidated Development Consent No 315-7-2003**
**MOD 3 Final Notice of Modification**
**MOD 3 Assessment Report**

## APPENDIX B - Environment Protection Licence No 12863

**APPENDIX C - Approved Site Layout**
**Proposed Site Layout**

## APPENDIX D – Topographical Site Survey for the Proposed Stockpiling Site

## APPENDIX E – Epic Site and Commonwealth Land Relationship
## Commonwealth Land Leased by Epic Mining

**APPENDIX F – Previous Site Surface Water Management Plan**
**Proposed Site Surface Water Management Plan**
**Previous Schematic Site Surface Water & Town Water Management**
**Proposed Schematic Site Surface Water & Town Water Management**

**APPENDIX G – Map of Approved Environmental Monitoring & Discharge Points**
**Map of Proposed Environmental Monitoring & Discharge Points**

## APPENDIX H – Recent Environmental and Weather Monitoring Results

**APPENDIX I – Flora & Fauna Report by Lesryk Environmental Pty Ltd**

**APPENDIX J - Visual Analysis for the Approved Site**
**Visual Analysis for the Proposed Stockpiling Site**

**APPENDIX K – Traffic Management Plan**

## APPENDIX L – Surface Water Calculations and Sizing of Sediment Ponds

## APPENDIX M – Recent Department's Letters of Approval

## APPENDIX N – Most Recent Letter to Deerubbin Local Aboriginal Council

## APPENDIX O – Credentials of Authors'