Major Project 07_0145

Section 75(W) Report

Environmental Assessment

Extractive Industry

Cox Lane, Fullerton Cove

Prepared For

Buildev Properties Pty Ltd

10 June 2010

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407070_REO_008_v2.doc

Environmental Planning, Assessment and Management

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Report Title:	***Section 75W Report***
Project:	Fullerton Cove Sand Extraction Project
Client:	*Buildev Properties Pty Ltd*
Report No.:	*407070_REO_008_v2.doc*
Draft/Final:	Final

Orogen Pty Ltd and the authors responsible for the preparation and compilation of this report declare that we do not have, nor expect to have a beneficial interest in the study area of this project and will not benefit from any of the recommendations outlined in this report.

The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Document Distribution 407070_REO_008_v2.doc				
Version No.	**Copies**	**Format**	**Issued To**	**Date**
1	1	Hard Copy and CD (Post)	Howard Reed, Department of Planning	24/05/2010
2	11	Hard Copy and CD (Post)	Howard Reed, Department of Planning	10/06/2010

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Introduction

1.1 Background

On July 18 2009 the Minister approved Project Application 07/0145 for the extraction of up to 960,500 tonnes of sand from land at Cox's Lane, Fullerton Cove (hereafter referred to as the 'site'). The consent was granted subject to conditions issued by the Department of Planning as detailed in the Project Approval. A plan showing the location of the site is provided in **Figure 1.1**, while the approved extraction plan is provided in **Appendix A**.

The Preliminary Assessment (Orogen, 2007) submitted for the project identified all land within the site as being proposed for extraction. The site is described as Lot 991 DP 627179, Lot 1910 DP 557701, Lot 1 DP 1006307, Lot 3 DP 11519, Lot 1 DP 794575 and Lot 201 DP 39968, Coxs Lane, Fullerton Cove and occupies an area of 25.3 ha.

Following consideration of the project by the proponent (Buildev Properties Pty Ltd), it was determined that extraction would be confined to approximately 14.9 ha of the site, as detailed in **Appendix A**. Consequently, the Environmental Assessment (Orogen, 2009) submitted for the project excluded the northern portion of the site (hereafter referred to as the 'study area').

1.2 Proposed Modification

The proponent has identified an opportunity for additional sand extraction from the study area. The proposal seeks consent to remove sand from the study area to maximise the available resource from the site, given the demand for this material in a range of [the proponent's] projects that require construction sand.

The application to modify the consent by inclusion of the study area for extraction of sand on the site is made in accordance with the provisions of Section 75W of the *Environmental Planning and Assessment Act 1979*.

The proposed modification (as detailed below) was communicated to the Department of Planning (DoP) has in a letter dated 22 March 2010 accompanied by a modified extraction plan.

The DoP responded to this correspondence in an email dated 23 March 2010, indicating that the DoP *"considers that the matters identified in the Director-General's requirements (DGRs) issued for this project on 17 December 2007 should be addressed in the EA for the modification"*. As such, the DoP has not issued DGRs for the proposed modification.

The proponent proposes to modify the consent by the inclusion of the northern portion of the site excluded from the Project Application. Details of the area proposed for extraction are provided in **Appendix B**. This area of the site is effectively north of a line contiguous with the alignment of George St. The proposed extraction site covers an area of approximately 3.14 ha, including the acoustic/visual mounds. It is proposed to extract to a finished level 3 m AHD.

This report has been prepared to address the Director General's Environmental Assessment Requirements (DGEARS) for the project issued by the Department of Planning on 14 December 2007.

1.3 Objectives of the Proposal

The primary objective of the development will be the extraction of approximately 57 300 m^3 (95 691 t) of sand from the site. This objective is consistent with principles of Ecologically Sustainable development, in that it seeks to reuse tailings (waste) material from the previous mineral sands mine operation on the site, in order to contribute to the supply of a scarce commodity that is in high demand.

A secondary objective is to provide for visual and acoustic privacy of the surrounding rural residential areas and to undertake the extraction such that the impact on the environment is minimised. These objectives will be facilitated by:

- Compliance with the provisions of the relevant legislation and policies that relate to the proposed development, particularly: SEPP 71; SEPP 11; SEPP 33; SEPP 44; SEPP 55; the NSW Coastal Policy; *Environmental Planning and Assessment Act 1979*; *National Parks and Wildlife Act 1974*; *Protection of the Environmental Operations Act 1997*; *Water Management Act 2000*; *Coastal Protection Act 1979*; *Threatened Species Conservation Act 1995*; *Crown Lands Act 1989*; *Environment Protection and Biodiversity Conservation Act 1999*; *Commonwealth Native Title Act 1993*; and *Port Stephens Local Environmental Plan 2000.*
- The protection of areas of environmental significance, including the protection of water quality; and
- Improvement of acoustic and visual privacy for the surrounding rural residential areas through re-contouring of the site.

Project Details

2.1 Outline

The proposal is to extract approximately 57 300 m^3 (95 691 t) of sand from the site. Plans showing the existing and final proposed landform of the site are provided in **Appendix B**. It is proposed to extract sand to a graded level of 3 m AHD across the site, over an extraction area of 3.14 ha. This area includes constructed mounds for visual and acoustic impact mitigation. The visual and acoustic barriers will be constructed by re-contouring the site along the Nelson Bay Road frontage (eastern boundary) and along the site boundary where it adjoins the existing residential area in George St to the west (**Appendix B**). These barriers would provide acoustic and visual privacy for residents in the adjoining lots and provide an acoustic barrier from traffic on Nelson Bay Road.

Extraction of sand from the site would not alter the existing rural potential of the site. Following completion of the project, the site could still be used for rural purposes, with the lower elevations and flat topography of the site suitable for small scale agricultural enterprises (*eg*. grazing) or rural living.

The site is subject to an approved six (6) lot boundary adjustment (DA 16-2007-14-1) and a residential dwelling (DA 16-2007-790-1) located in the north of the site. Construction of the residential dwelling would not occur until after cessation of the sand extraction operations on the site. Enactment of the subdivision would also not occur until cessation of the extraction operations. These matters are confirmed in the Statement of Commitments for the project.

2.2 Cadastral Description

The proposed development is for an extractive industry over the following land (the study area) at Coxs Lane, Fullerton Cove:

- Lot 991 DP627179

Extraction operations are proposed over the northern portion of Lot 991, as shown in **Appendix B**.

2.3 Topography and Drainage

The existing topography of the site is detailed in **Appendix A**. A ridge running approximately north-south up to 7.0 — 7.5 m AHD is located in the central portion of the site, which slopes away steeply to the north west (8.5 °) and south west (7.5 °). The relatively steep grades in the south west of the study area are a result of bulk earthworks undertaken for construction of an access road into the site related to the approved dwelling on Lot 991. The ridge also slopes away to the Nelson Bay Road boundary, albeit at gentler grades (4.5 °) to 3 — 4 m AHD.

Drainage direction within the study area is to the northwest, with minimum levels of 1.5 m AHD reported in the Swamp Sclerophyll Forest.

2.4 Resource Availability

Details on the site history, geology and resource availability were provided in the Environmental Assessment (EA) for the project (Orogen, 2008). The study area was included in the original geotechnical investigation (RCA, 2007) and is contiguous with the remainder of the site. The resource character is therefore identical to that recorded in the remainder of the site, being formed through the deposition and re-contouring of mine tailings from the previous mineral sands mine operations on the site, as detailed in Figure 2.1 of the EA (Orogen, 2008). The volume/quantity calculations have been determined from detailed site survey and application of a maximum dry density of the sand of 1.67 t/m^3 as reported by RCA (2007).

2.5 Staging of the Extraction Operations

The purpose of staging the extraction is to ensure that the material is removed from the site in a manner that will allow the proponent to maximise the resource potential and provide for the orderly extraction and loading of sand from the site.

The proposed staging of the extraction operation in this area of the site, and subsequent amendment to staging for the remainder of the site is shown in **Figure 2.1**. The operation is proposed to move progressively around the site with the access road constructed as quarrying progresses initially from south to north.

Details regarding the staging, sand extraction process, production and operation, rehabilitation, and safety/health, are as described in the Sections 2.6 – 2.10 of the EA (Orogen, 2008).

2.6 Key Issues

The following key issues for consideration are detailed in **Section 3** of the report and accompanying appendices:

- Air Quality;
- Noise;
- Aboriginal Archaeology;
- Hydrogeology;
- Traffic;
- Ecology; and
- Community Consultation.

Impact Assessment

3.1 Air Quality

An assessment was undertaken to identify potential impacts due to emissions of dust as a result of the proposed sand extraction operations in the study area. Full details are provided in **Appendix C**.

The Air Quality Impact Assessment (AQIA) modelled a scenario that was assessed for the original EA (Scenario 2 – Holmes, 2008). This scenario assessed impacts from the extraction of 100 000 m^3 over a 12 month period from the north east portion of the site (*ie*. the study area). The modelling for this scenario predicted maximum 24-hour PM10 concentrations at the most affected residence of 5.6 $\mu g/m^3$.

This small incremental increase in 24-hour PM10 is unlikely to result in exceedances of the NSW DECCW goal of 50 $\mu g/m^3$ when considered in conjunction with cumulative impacts from other sources.

Annual average PM10 concentrations predicted for this scenario are less than 1 $\mu g/m^3$ compared to the NSW DECCW goal of 30 $\mu g/m^3$. Dust deposition levels were also predicted to be minor.

The original assessment indicated that air quality impacts associated with the sand extraction project would be minor and not expected to compromise air quality goals at any residential location. These conclusions are still valid for the proposed extension to the extraction area.

The report endorses the approach to mitigation and management outlined in the Dust Monitoring Program prepared in accordance with Condition 9 of the Project Approval (PAEHolmes, 2009), which outlined procedures for controlling and managing dust during operation of project, defined roles, responsibilities and reporting requirements and outlined the dust monitoring equipment and locations for the project.

In respect of air quality monitoring, it is noted that the monitoring proposed is still considered valid, as follows:

- One high volume air sampler (HVAS) measuring PM_{10} concentrations at the closest affected residential receptor to the site, the location depending on the stage of operations and the proximity of extraction to the residential areas to the west and southwest;
- Two dust deposition gauges measuring nuisance dust fallout at the closest affected residential receptor to the west and southwest of the site; and
- An additional dust gauge beyond the eastern boundary of the site to allow for upwind and downwind comparisons in dust levels.

It is noted that siting should be such that compliance at the closest affected residential receptors can be assessed and that the HVAS be relocated as required to reflect the stage of operation for the project. This approach is also appropriate for the proposed extended extraction area to the northeast.

3.2 Noise

An assessment of the potential noise impacts associated with the proposed expanded extraction area was undertaken. Full details are provided in **Appendix D**.

The assessment compared modelled noise generated by operations from the extension to the sand extraction activities with the L_{Aeq} 41 dB impact assessment criterion detailed in Table 1 of the existing project approval. Several scenarios were modelled to determine the received noise levels at the nearest residences.

The modelling included barrier attenuation resulting from the construction of a noise/visual bund prior to the commencement of operation. The results of the modelling indicated that at receptor sites, the predicted noise impacts comply with the noise impact assessment criterion contained in the project approval for the Fullerton Cove sand extraction project, with barrier attenuation likely to be an effective noise control.

However, in the final stages of the operation, material (forming the bund wall) will be removed from the area to the east of George Street, as is proposed for the remainder of the site. When this occurs, equipment will have line of sight with residences on George Street. Exceedances of the criterion may occur during this time, however, it is anticipated that this work will take less than one week. Mitigation measures in respect of this stage of the project noise are proposed as follows:

- Educate contractors about quieter work practices including operators not to leave plant idling when not in use;
- Selection of low noise emission plant (some plant can be 5 dB or more quieter with engineering noise controls, smaller plant items are often quieter);
- Use of 'duck quaker' style reverse beepers. This style of reverse beep is less intrusive;
- Operate behind the active extraction face for as long as possible to provide shielding; and
- Monitor noise levels during this stage of the development.

3.3 Aboriginal Archaeology

The section of the site proposed for sand extraction in this modification of consent was included in the original assessment of Aboriginal Impacts (McCardle Cultural Heritage, 2008).

The study area has been subject to a surface collection of artefacts in 2009 and is currently part of an archaeological salvage operation approved by DECCW. As such, no further investigation or assessment is required in this section of the site. Further details are provided in **Appendix E**.

3.4 Hydrogeology

3.4.1 Groundwater

As indicated in Section 2.4, the study area was included in the original geotechnical investigation (RCA, 2007) and is contiguous with the remainder of the site. As such, details regarding observed groundwater levels and flow direction reported in the hydrogeological investigation by RCA (2007) are valid for the study area.

Groundwater flow in the study area is towards the low point located in the northwest of the site. Maximum groundwater levels recorded for the site were 1.66 m AHD (RCA, 2007).

Highest predicted water table levels on the site have been calculated (RCA, 2009a), based on the February 2008 rainfall event near the site, at the request of the [then] Department of Water and Energy. This modelling, the details of which were reported by RCA (2009b), indicated a maximum head increase in response to the rainfall event of 0.2 m above the existing maximum recorded groundwater table level of 1.66 m AHD. As such, extraction to a graded base level of 3 m AHD, as detailed in the existing Project Approval, is > 1 m above the highest predicted groundwater level on the site.

3.4.2 Soil and Water Management

A revised Soil and Water Management Plan (Appendix F) has been prepared for the entire site (including the proposed additional extraction area) as part of the revised Environmental Management Strategy. The revised SWMP includes proposes the following monitoring in relation to the study area:

- Weekly inspections of erosion and sediment control infrastructure and in particular, after rainfall events;
- Weekly inspections of surface water controls (rock weirs, table drains);
- Quarterly groundwater monitoring; and
- Annual reporting.

Further details on the revised Soil and Water Management Plan are provided in Appendix F.

3.5 Traffic

Schedule 2 Conditions 5 and 7 of the Project Approval refer to the limits on the approval that relate to traffic movements:

5. Quarrying operations may take place on the site until 30 June 2016.

7. The Proponent shall not permit the dispatch of more than 20 laden trucks from the site per hour, when averaged over a working week.

With respect to traffic movements, it is advised that the additional 57 300 m^3 (95 691 t) of sand proposed to be removed from the site will be undertaken within the specified limits on time and truck movements specified above. As such, no additional assessment is required in respect of traffic impacts. Noise from haul truck movements in the study area are incorporated into the overall noise assessment referred to in **Section 3.2** and **Appendix D**.

The hours of truck operation will be in accordance with Condition 3 of Schedule 3 of the original Project Approval.

3.6 Ecology

3.6.1 Background

An assessment was undertaken to assess the potential impacts on flora and fauna associated with the proposed sand extraction operations in the study area. A detailed report is provided in **Appendix G**.

The study area was subject to previous field investigations reported by Orogen (2008b). Given the detailed nature of investigations undertaken previously on the site which were reported by Orogen (2008b), no further detailed survey was undertaken in respect of vegetation community mapping or fauna survey. As such, a field verification of the vegetation communities and fauna habitats present on site was undertaken by Orogen on 22 March 2010.

The only native vegetation community encountered in the survey was the *Leptospermum laevigatum* dune shrubland/woodland, reported as 'Vegetation Community 2' by Orogen (2008a). This was found to be in a similar condition compared to when the full botanical surveys were undertaken, as reported by Orogen (2008a).

The fauna habitats of the study area were found to have changed little since the original surveys, as reported in Orogen (2008b). No hollow-bearing trees or Koala feed trees were observed in the study area. In addition, no significant habitat features such as large hollow logs, aquatic areas, rocky outcrops or caves were observed.

3.6.2 Assessment

In total, 18 fauna species and two (2) EECs are considered as Subject Species for the study area and the assessment for significant impact (Section 5A), including two (2) additional fauna species that have been recently listed (Little Eagle, Little Lorikeet).

It is concluded from the Section 5A Assessment that the proposal is unlikely to have a significant effect on any *'Threatened species, populations or ecological communities or their habitats within the locality'*. This result is consistent with the findings reported by Orogen (2008b).

An assessment in accordance with the requirements of the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) was also undertaken. The assessment indicates that the proposed development:

- Will not have any impacts upon any matters of NES;
- Will not have any impacts upon any other matters protected by the EPBC Act; and
- Is unlikely to significantly contribute to, or increase the impact of these KTP's.

Therefore the proposal would not require referral or Commonwealth approval under the provisions of the *EPBC Act.*

The proposed modification will result in the clearing of approximately 0.92 ha of (discontinuous) dune shrubland and 2.22 ha of exotic grassland. The original proposed clearing area (excluding the exotic grassland) totalled 3.37 ha, while the combined revegetation and biodiversity offset areas totalled 4.64 ha. The additional proposed clearing area of 0.92 ha of dune shrubland provides a total clearing area (excluding the exotic grassland) on the site of 4.29 ha, which is less than the existing approved combined revegetation and biodiversity offset area of 4.64 ha.

As such, the clearing of the dune shrubland can be offset and accommodated within the existing revegetation works and Biodiversity offset areas approved in the original Project Approval and proposed planting of trees on the visual/acoustic bunds.

The vegetated areas within the site are not considered to comprise an important component of connective habitats in the locality and movement of fauna in the locality would not be compromised as a result of the proposal.

A detailed discussion of the proposal's impact on Threatened fauna was provided in the previous Flora and Fauna report (Orogen, 2008b), which concluded that the implementation of the proposed revegetation and habitat enhancement program (Orogen, 2009) would result in a near-zero net loss of habitat resources.

3.6.3 Proximity of Sand Mound to Retained Vegetation

The construction of the noise mound (**Appendix B**) adjacent to Vegetation Community 4 (analogous to the two EEC's '*Freshwater Wetlands on Coastal Floodplain of the NSW North Coast, Sydney basin and South-east Corner Bioregions'* and *'Sydney Freshwater Wetlands of the Sydney Basin Bioregion'*) and Vegetation Community 5 (analogous to the EEC *'Swamp Sclerophyll Forest on Coastal Floodplains'*) (Figure 3.1 in **Appendix G**) would function as a physical barrier to the proposed sand extraction operations (as the operations will be contained to the inside of the sand mound) and would prevent the potential for any edge effects (resulting from the extraction activities) on Vegetation Communities 4 and 5. Potential edge effects on these vegetation communities include smothering by entrained sand from the mounds, trampling of vegetation by either machinery or workers and introduction of weeds. As such, it is the extraction operations, rather than the existence of a stabilised sand mound in proximity to the vegetation communities, that has the potential to pose a threat.

It is proposed that the toe of the outer batter be located 10 m from the edge of these communities. The proximity of the toe of the mound is not in and of itself considered to have the potential to adversely affect the function or viability of these vegetation communities. Containment of the toe of the mound

with silt fencing, in addition to stabilisation of the mound to prevent wind-blown transport of sand towards the communities is sufficient to ensure that their integrity and function are not compromised by the proximity of the outer batter of the mound.

The existence of these two vegetation communities in this area of the site adjacent to the remnant (tailings) sand stockpiles left on site from the previous heavy mineral sand mining operations over 30 years ago, provides evidence that they are not adversely affected by being located adjacent to sandy environments. Vegetation Community 5 occurs naturally in both dune sand and floodplain environments. However it is the floodplain variety that is listed as an EEC, due to extensive clearing of floodplain (high soil fertility) vegetation in NSW, whereas dunal communities have remained relatively intact due to their low soil fertility.

That both these vegetation communities have survived for over 30 years virtually intact in this part of the site, following mineral sand mining operations, indicates that they are not adversely affected by being located proximal to sand dunes/mounds/stockpiles. Therefore, as it is proposed to only undertake minor re-contouring (refer to **Appendix B**) of the existing (artificially created) sand surface in proximity to the vegetation communities (to create the sand mound), the potential for impacts on the vegetation communities is very low, as the proposed changes to the adjacent land surface are minor.

This minor re-contouring does not represent a significant change to the immediate surroundings of the two vegetation communities and as such, would not adversely affect their function or viability. Siting of the mound 30 m from the vegetation communities (as opposed to the 10 m proposed here) would not in and of itself result in a lower risk of impact, as it is the extraction operations, rather than the degree of proximity of a stabilised sand mound to the vegetation communities, that has the potential to pose a threat.

Construction of the sand mound in this area of the site is predicted to not have any adverse impact on these vegetation communities, as the construction works will involve controlled minor reshaping of the existing surface to form the mound, working back towards the extraction area (away from the vegetation communities) from inside the mound. The lateral extents of the re-contouring will be controlled by the placement of marker posts in the field that delineate the furthest extent of the outer toe of the mound, field supervision of the works to ensure compliance with the marker post delineation and by the erection of sediment fencing at the toe of the mound (**Section 3.6.4**).

Therefore, machinery will not be operating within 10 m of the vegetation communities (minimal potential for trampling), while the weed management program outlined in the EA would ensure that potential for weed invasion is managed.

In addition, as detailed in the additional groundwater modelling reports provided for the project, (RCA, 2009b), there are no effects on groundwater levels as a result of the extraction being limited to 3 m AHD. The results of this modelling were acknowledged by the [then] Department of Water and Energy. The reshaping of the existing sand surface to create the mound will not affect groundwater level on the site, which is the primary control for the location of both the vegetation communities. As such, proximity of the outer toe of the batter to these groundwater dependent ecosystems is not considered to have the potential to affect the supply of groundwater to these vegetation communities, given that rates of

groundwater recharge in unconsolidated, homogenous sandy environments is uniform irrespective of topography.

It has been demonstrated that it is the sand extraction operations (inside of the mound wall), rather than the proximity of a stabilised sand mound to the vegetation communities, that has the potential to pose a threat. Given that the physical sand extraction works will be located inside the sand mounds (following mound construction), it is considered that the proximity of the toe of the outer batter of the sand mound 10 m from the edge of Vegetation Communities 4 and 5 will provide a sufficient separation distance between the extraction works and the vegetation, which would total approximately 20 m, given a 10 m mound thickness.

In summary, the proposal to locate the outer batter of the noise mound in this area of the site a minimum of 10 m from the vegetation communities is supported by the following:

- The construction of the mound in the vicinity of these vegetation communities is simply a temporary re-shaping of the site contours in this area of the site. Reference to **Appendix B** indicates that construction of the mound requires minimal change to existing surface elevations in the vicinity of these vegetation communities;
- The presence of both vegetation communities on site adjacent to the previous sand stockpiles left on the site from heavy mineral sand mining activities for over 30 years, with no apparent adverse impacts on their function or viability;
- Groundwater levels determine the viability and function of the two vegetation communities. Minor reshaping of existing surface contours to create the mound will have no adverse effect on groundwater levels on the site (which are controlled by water levels in Fullerton Cove and antecedent rainfall conditions). The minor re-contouring will also not impact on surface water flows, which are effectively non-existence on site due to the sandy nature of the soils, evidenced by the absence of surface water features. Further, the presence of the outer batter of the mound 10 m from the vegetation communities will not have any adverse effects on either surface or groundwater quality;
- Mounds and batters will be stabilised to prevent wind-blown transport of sand;
- Construction works will involve the controlled reshaping of sand on the site to form the mound, working back towards the extraction area (away from the vegetation communities) from inside the mound; and
- Extraction operations will be located on the inside of the sand mounds. Therefore the vegetation communities would be protected by the mound from works inside the extraction area.

Therefore, the physical barrier of the sand mound will prevent any potential for edge effects on these communities as a result of the sand extraction works.

Mitigation is proposed (**Section 3.6.4**) to prevent the transport of any wind-blown sand from the mounds to the areas of Vegetation Communities 4 and 5.

It is also worth noting that a shed, tennis court and access road associated with the approved dwelling in this portion of the site (DA 07-790-01) are all located within close proximity (closer than the outer toe of the proposed sand mound) to the area of the site that supports Vegetation Communities 4 and 5 (**Appendix H**). As such, the potential for any impacts and edge effects on Vegetation Communities 4 and 5 as a result of the construction of the dwelling and associated structures are assumed to have been considered by Port Stephens Council in their assessment of the dwelling DA and determined to be acceptable, as demonstrated by the approval of plans for the location of the dwelling and associated structures.

Therefore, this area of the site will be disturbed by the activities associated with construction of the dwelling. Consequently, the location of the edge of the outer batter slope of the mounds within 10 m of Vegetation Communities 4 and 5, notwithstanding the assessment reported here that such a proximity will not adversely affect these vegetation communities, is inconsequential, given the approved plans (**Appendix H**) for the dwelling and associated structures on the site.

3.6.4 Mitigation

Mitigation measures are described in full in **Appendix G** and summarised as follows:

- Pre-clearing surveys are recommended for *Diuris praecox* and *Diuris arenaria* during these species' flowering period (*ie*. September to October for *D. praecox* and August to September for *D. arenaria*);
- Checking Trees During Clearing Activity;
- Felling Trees Away from Retained Habitats;
- Erection of sediment fence along the toe of the outer batter of the sand mound adjacent to Vegetation Communities 4 and 5;
- Implementation of relevant strategies outlined in the existing Landscape Management Plan (Orogen, 2009a), including revegetation of the Dry Woodland/Shrubland areas that are located on the noise/visual mounds adjacent to Nelson Bay Road; and
- EEC Monitoring.

3.7 Community Consultation

Consultation was undertaken with residents in George St and immediate surrounding areas through a letterbox drop of information on the proposed Modification of Consent undertaken prior to lodgement with the Department of Planning. A copy of this documentation is provided in **Appendix I**. All residents in the area will be given the opportunity to comment on the application during the public exhibition period. To date, no comments have been received from residents who received a copy of the information leaflet.

No additional consultation was undertaken with the Aboriginal community as part of the Indigenous Archaeological Assessment, as the study area is located within the boundaries of the area of an archaeological salvage operation approved by DECCW.

3.8 Environmental Management Strategy

An Environmental Management Strategy (EMS) has been approved for the project (Orogen, 2009b), which incorporates details of all proposed safeguards, mitigation, monitoring and reporting measures as stipulated in the conditions of Project Approval.

The information included in the existing EMS is sufficient to address all environmental management issues for the proposed extension to the extraction area.

Project safeguards, mitigation, monitoring and reporting as described in the approved EMS will be extended to include the area of the site containing the proposed extension to the sand extraction activities. This area will be included in the execution of the EMS. As such, there is no need to amend the existing approved EMS. This approach is detailed in Section 4.1.

Statement of Commitments

4.1 Statement of Commitments

A Statement of Commitments has been prepared based on the proposed modification of the Project Approval. Details are provided in **Table 4.1**.

Table 4.1 - Statement of Commitments – MoC — Project Application 07_0145

Impacts	Mitigation Measures
Air Quality	• Monitoring proposed in approved Dust Management Program is applicable to this area of the site. • Disturb only the minimum area necessary for extraction. Reshape, topsoil and rehabilitate completed extraction areas as soon as practicable after the completion of extraction. • Maintain exposed working face in a moist condition using water carts to minimise wind-blown and traffic-generated dust. • All roads and trafficked areas will be watered as required using water trucks/carts to minimise the generation of dust. • All haul roads will have edges clearly defined with marker posts or equivalent to control their locations. • All loads leaving the site are adequately covered to prevent wind blowing dust from trucks during transit. • To prevent windblown movement of sand across the ground surface onto neighbouring properties, a solid 1.8 m high boundary fence will be erected by the proponent. This will be undertaken in consultation with the relevant landowner. • To prevent windblown movement of sand across the ground surface, a 2 m high shade cloth barrier will be erected at the crest of mounds located on the western side of the site. • Construction of mounds will not disturb the root zone of any vegetation located adjacent to the boundary with residential dwellings to the west of the site.
Soils	• Site surface drainage should be installed where required to intercept up-slope overland surface run-off flows and to restrict overland surface flows from flowing on to areas adjacent to structures. • Active extraction areas will be protected with appropriately designed and constructed silt fencing. • Following cessation of extraction from each cell, the soil should be immediately stabilised with ground cover vegetation such as fast growing sterile rye grass. • An erosion control plan will be developed in accordance with relevant guidelines prior to the commencement of construction. • All excavation and fill batter slopes will be battered at a maximum gradient of 2H:1V (temporary batters).

Table 4.1 - Statement of Commitments – MoC — Project Application 07_0145

Impacts	Mitigation Measures
Water Quality	• Areas adjacent to the low lying areas in the north-western portion of the study area will be protected from the potential for off-site surface discharge of sediment through the construction of mounds (primarily for noise and visual amenity). While the mounds will be re-vegetated, the base of the lee-side of the mounds will be screened with silt fencing, to prevent the export of material off the mounds in the event of extreme rainfall events. • Vehicles operating on site will be regularly checked and maintained to prevent the loss of oil/grease from machinery. Any repairs/maintenance and parking of machinery should be undertaken on a dedicated compacted road base pad to be constructed on the site. • A Soil and Water Management Plan (SWMP) forms part of the Environmental Management Strategy for the project. The SWMP specifically provides contingency plans for events that have the potential to contaminate the aquifer, in accordance with NSW Office of Water requirements.
Bushfire	• Precautions be undertaken to protect demountable office building on the site from risk of airborne embers that may originate from bushfires in the vicinity of the site. These include: — Demountable building to comply with Level 1 construction in accordance with AS 3959-1999.
Terrestrial Ecology	• The extent of the extraction area, including the noise/visual mounds must be accurately surveyed and marked in the field with marker pegs by a registered surveyor. • Machinery, sand and any other materials associated with the sand extraction works must not be stored or stockpiled within any areas outside the defined boundaries for the extraction area. • No machinery or other items (other than the entrance fencing) associated with the sand extraction are to be parked, driven or located within any areas outside the defined boundaries for the extraction area. • A sediment fence will be erected along the toe of the outer batter of the sand mound adjacent to Vegetation Communities 4 and 5. • Vegetation removal for each 'extraction cell' should be undertaken in a progressive manner, with no more than two cells operational (ie. one extraction, one cleared) at any one time. • Upon completing the extraction of one 'cell', the soil should be immediately stabilised with ground cover vegetation such as fast growing sterile rye grass. • Any trees to be cleared, and those within the vicinity of the tree being felled must be checked for inhabiting fauna immediately prior to felling. In particular, the crowns will need to be inspected for occupation by Koalas prior to removal. This may be undertaken by the machinery operators or site manager. • Any trees found to contain a Koala, or trees within felling distance of any tree with a Koala in the crown must not be removed until the Koala has vacated the area by its own free will. • All vegetation to be removed, particularly large trees, must be felled away from the adjoining retained vegetation.

Table 4.1 - Statement of Commitments – MoC — Project Application 07_0145

Impacts	Mitigation Measures
	• An ecological site induction notice will need to be prepared and signed by all relevant personnel involved with the clearing operations. • Extension of the approved Revegetation Plan prepared previously as a component of the Environmental Management Strategy (EMS), which outlines a revegetation program for the Dry Woodland/Shrubland. The revegetation will contain 1.92 ha of replanting along the visual/noise mound adjacent to Nelson Bay Road to offset the vegetation to be cleared for the project. • Extension of the weed management program to include the additional extraction area. Weed management to be implemented as described in the approved Revegetation Plan.
Noise	• Construction is to occur in DECCW approved hours. • No truck haulage outside of normal working hours. • Avoid compression braking in proximity of residences. • Cover loads, ensure all tailgates are secured to eliminate rattling noises. • Construction of noise mound as indicated on development plans. Western mound to be 8.5 m AHD adjacent to residence R4. Eastern mound to be 8.0 m AHD adjacent to Nelson Bay Road. • Selection of low noise emission plant. • Use of 'duck quaker' style reverse beepers. This style of reverse beep is less intrusive; • Operators not to leave plant idling when not in use. • During construction period, temporary noise barriers (erect hoarding adjacent to work areas as required). • Educate contractors about quieter work practices (this can be particularly useful with regard to limiting maximum noise levels). • Undertake liaison with local residences identified in the Noise Impact Assessment, preferably by direct contact.
Indigenous Cultural Heritage	• Aboriginal Cultural Heritage management strategies, including mitigation measures and active consultation with the relevant local Aboriginal communities will be undertaken throughout the development process. These were detailed in the approved Aboriginal Cultural Heritage Management Plan and apply to the additional area of extraction subject to the MoC application. • The persons responsible for the management of any works on site will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. • The collection of artefacts will occur prior to all works on the site and will be undertaken using a systematic pedestrian methodology. Worimi LALC and Mu-roo-ma Inc. representatives will undertake this work.

Table 4.1 - Statement of Commitments – MoC — Project Application 07_0145

Impacts	Mitigation Measures
	• Should any items of indigenous cultural heritage be uncovered during the project, work in the area would cease immediately and the area cordoned off. Representatives of the Worimi LALC/Mu-roo-ma Inc. and a NPWS representative would be contacted to provide advice regarding appropriate action. • If human remains are located during the project, all works are to halt in the immediate are to prevent any further impacts to the find or finds. The local Police and the DECC are to be notified. If the remains are found to be of Aboriginal origin and the Police consider the site not an investigation site for criminal activities, the DECC is to be contacted and notified of the situation. Works are not to resume in the designated area until approval in writing from the Police and the DECCW.
Traffic	• All project-related vehicles will access the site via Coxs Lane. • Adherence to load limits on Coxs Lane between Nelson Bay Road and the site entrance and/or this section of Coxs Lane to be upgraded in accordance with Council's specifications. • As part of the development, a truck shakedown will be required within the site boundary. • An internal haul road will be constructed as part of the development. • The layout of the main access/Coxs Lane intersection will be designed in accordance with RTA and Council requirements, taking into account the traffic flows and the speed environment. • Noise from trucks on site to be minimised through restriction on engine revs to 1500 per minute. • Sufficient parking to be provided on site for project-related traffic and visitors in accordance with relevant Council Code.
Hazards and Safety	• Storage, handling and transport of dangerous goods to be undertaken in accordance with AS1940 and AS1596 and the Australian Dangerous Goods Code.
Waste	• The site shall not receive any waste from outside the site. • All waste generated at the site shall be disposed offsite, unless a permitted by licence under the *Protection of the Environment Operations Act 1997*.
Monitoring	• An Environmental Management Strategy (EMS) has been approved for the project, which incorporates details of all proposed safeguards, mitigation, monitoring and reporting measures as stipulated in the conditions of Project Approval. • The information included in the existing EMS is sufficient to address the proposed extension to the extraction area. Project safeguards, mitigation, monitoring and reporting as described in the approved EMS will be extended to include the area of the site containing the proposed extension to the sand extraction activities. This area will be included in the execution of the EMS. As such, there is no need to amend the existing approved EMS.

Table 4.1 - Statement of Commitments – MoC — Project Application 07_0145

Impacts	Mitigation Measures
Existing Site Approvals	• Construction of the approved residential dwelling (DA 16-2007-790-1) on Lot 991 would not occur until after cessation of the sand extraction operations on the site. • Enactment of the approved subdivision on Lot 991 (DA 16-2007-14-1) would also not occur until cessation of the extraction operations.

References

Holmes Air Sciences (2008). *Air Quality Impact Assessment – Fullerton Cove Sand Extraction*. Unpublished report prepared for .Orogen Pty Ltd. 20p + Figs and Apps.

McCardle Cultural Heritage (2008). *Proposed Sand Extraction Operation at Fullerton Cove – Indigenous Archaeological Assessment*. 37 p + Annexures

Orogen Pty Ltd (2009a). *Landscape Management Plan, Major Project 07/0145, Sand Extraction, Coxs Lane, Fullerton Cove.* Unpublished report for Buildev Properties Pty Ltd. 22 p + Apps.

Orogen Pty Ltd (2009b). *Environmental Management Strategy, Major Project 07/0145, Sand Extraction, Coxs Lane, Fullerton Cove.* Unpublished report for Buildev Properties Pty Ltd. 24 p + Figs & Apps.

Orogen Pty Ltd (2008a). *Major Project 07/0145 Environmental Assessment, Extractive Industry – Coxs Lane, Fullerton Cove.* Unpublished report for Buildev Properties Pty Ltd. Vol. 1, 89 p + Figs and Apps.

Orogen Pty Ltd (2008b). *Flora and Fauna Assessment - Major Project 07/0145 Environmental Assessment, Extractive Industry – Coxs Lane, Fullerton Cove.* Unpublished report for Buildev Properties Pty Ltd. Vol. 2, 76 p + Apps.

Orogen Pty Ltd (2007). *Part 3A Preliminary Assessment Sand Extraction – George St., Fullerton Cove.* Unpublished report for Buildev Properties Pty Ltd. 16 p + Apps.

RCA Australia (2009a). *Groundwater Modelling, February 2008 Rainfall Event, Fullerton Cove*. Unpublished report prepared for Orogen Pty Ltd.

RCA Australia (2009b). *Groundwater Modelling, Fullerton Cove*. Unpublished report prepared for Orogen Pty Ltd.

RCA Australia (2007). *Geotechnical and Groundwater Investigation, Fullerton Cove.* Unpublished Report prepared for Buildev Pty Ltd. 19pp + App.

Figures

orogen

LEGEND

Subject Site

Figure 1.1 - Locality Plan

orogen

Source: Umwelt Environmental Consultants.

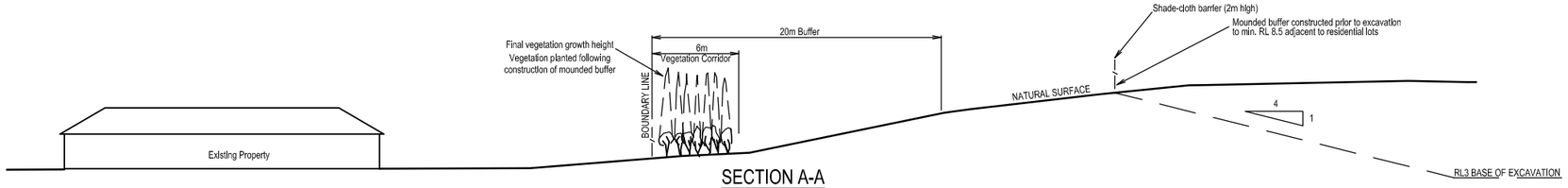
Site Boundary
Staging Plan Boundary

NOTES:
1. Map indicative only
2. Map to be printed in A4

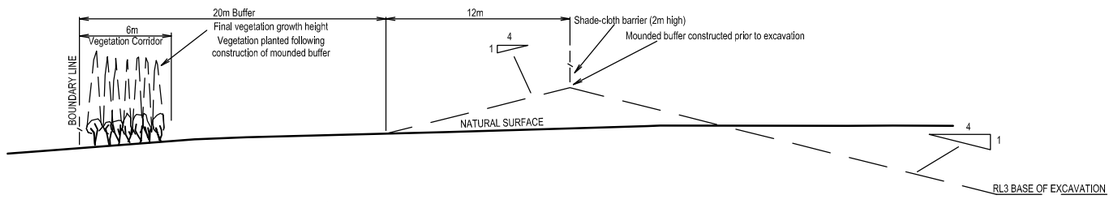
Figure 2.1 - Staging Plan

Appendix A

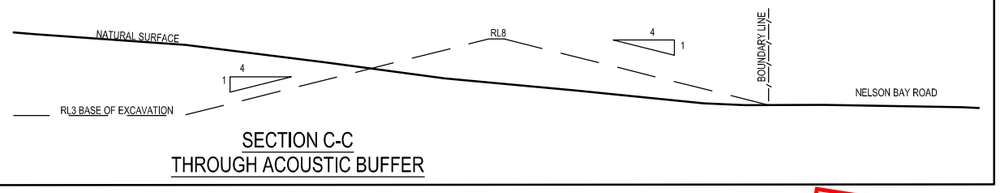
APPROVED EXTRACTION PLAN



SECTION A-A
THROUGH MOUNDED BUFFER



SECTION B-B
THROUGH MOUNDED BUFFER



SECTION C-C
THROUGH ACOUSTIC BUFFER

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SURVEYED: ___
DESIGNED: ___
DRAWN: BC
CHECKED: DE
DATUM: Australian Height Datum
CONTOUR INTERVAL: 0.5m

ISSUE DATE	REVISION
17/06/2009	K

CLIENT:

Buildev Properties
Pty Ltd. ATF
The George Street
Residential Unit trust
ABN 80017239171

PCB
PULVER COOPER & BLACKLEY PTY. LTD.
SURVEYORS
TOWNPLANNERS
CIVIL ENGINEERS
PROJECT MANAGERS

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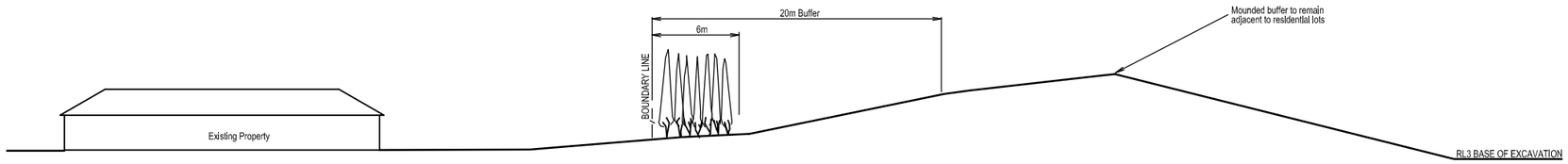
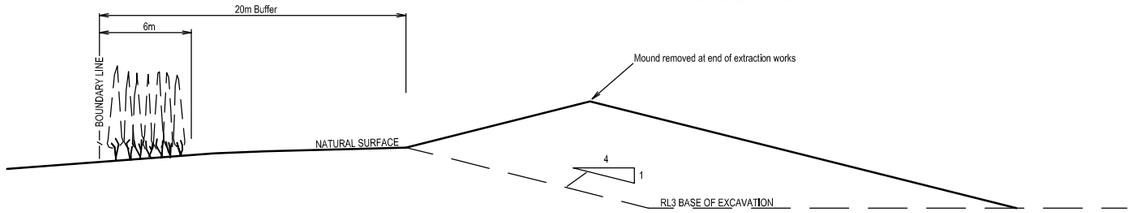
Plan of proposed excavation over subject site.

FULLERTON COVE
CONSTRUCTION
(PHASE 1)

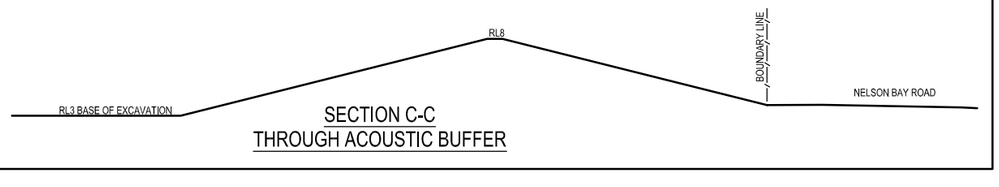
30m Vegetation Buffer
20m Private Property Buffer



SECTION A-A
ACROSS BOUNDARY



SECTION B-B
ACROSS BOUNDARY



SECTION C-C
THROUGH ACOUSTIC BUFFER

NOT FOR CONSTRUCTION

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DESIGNED: ___
DRAWN: BC
CHECKED: DE
DATUM: Australian Height Datum
CONTOUR INTERVAL: 0.5m

ISSUE DATE	REVISION
17/06/2009	K

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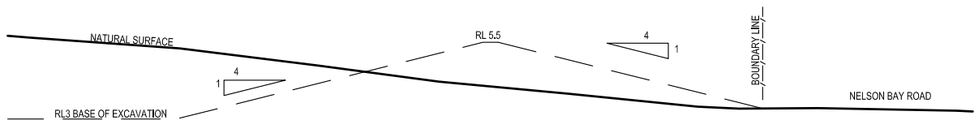
Plan of proposed excavation over subject site.

FULLERTON COVE
COMPLETION
(PHASE 2)

30m Vegetation Buffer
20m Private Property Buffer

Appendix B

EXISTING LANDFORM AND PROPOSED EXTRACTION PLAN



SECTION C-C
THROUGH ACOUSTIC BUFFER

KEY
Project Site Boundary
Limit of Earthworks Area

EARTHWORKS

PHASE 1 EXTRACTION	57, 300m³

NOT FOR CONSTRUCTION

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Horizontal Scale 1:1500

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SURVEYED: __
DESIGNED: __
DRAWN: BC
CHECKED: __
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CONTOUR INTERVAL: 0.5m

ISSUE DATE 07/05/2010
REVISION L

CLIENT:

Buildev Properties
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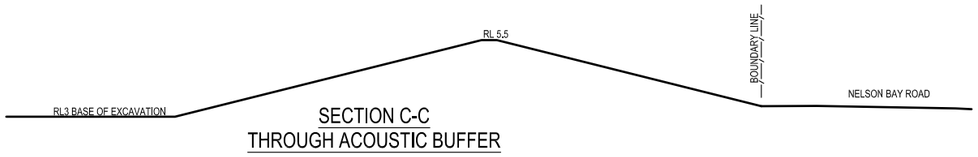
Plan of proposed excavation over Northern Area

FULLERTON COVE
CONSTRUCTION
(PHASE 1)

10m Vegetation Buffer
20m Private Property Buffer



SECTION C-C
THROUGH ACOUSTIC BUFFER

NOT FOR CONSTRUCTION

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SURVEYED: __
DESIGNED: __
DRAWN: BC
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DATUM: Australian Height Datum
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Plan of proposed excavation over Northern Area

FULLERTON COVE
COMPLETION

10m Vegetation Buffer
20m Private Property Buffer

Appendix C

AIR QUALITY IMPACT ASSESSMENT

23 March 2010

Justin Meleo
Project Director
Orogen Pty Ltd
Suite 4, 11 Manning Street
Tuncurry NSW 2428

FULLERTON COVE SAND EXTRACTION – MODIFICATION OF CONSENT

1 INTRODUCTION

On 18 July 2009, the Minister for Planning granted Project Approval to Buildev Development (NSW) Pty Limited (Buildev) to operate the Fullerton Cove Sand Extraction Project (the Project).

As part of the Environmental Assessment for the approval, PAEHolmes (formally Holmes Air Sciences) conducted an Air Quality Impact Assessment (AQIA) for the project (**Holmes, 2008**). The AQIA considered a number of scenarios involving various extraction rates and locations. The predictions presented in the AQIA indicated that the project would comply with air quality goals for all extraction scenarios.

Buildev are now considering a modification to the consent to allow an extension to the extraction area in the northeast of the site. PAEHolmes have been requested to investigate the potential air quality impacts associated with this modification.

This is achieved as follows:

- Review the location and extent of the proposed extended extraction area;
- Review the modelled source locations in the 2008 AQIA and compare to the proposed extended extraction area;
- Determine if the predictions made in the AQIA are valid for the proposed extended extraction area; and
- Provide a qualitative assessment of impacts based on the previous AQIA.

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BRISBANE

GOLD COAST

TOOWOOMBA

A PEL COMPANY

Queensland Environment Pty Ltd
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ABN: 86 127 101 642

2 OVERVIEW OF THE PROPOSAL

The Fullerton Cove Sand Extraction site is located off both Coxs Lane and George Street, Fullerton Cove, approximately 12 km north of Newcastle. The general site location and location of closest residential locations is given in **Figure 2.1**.

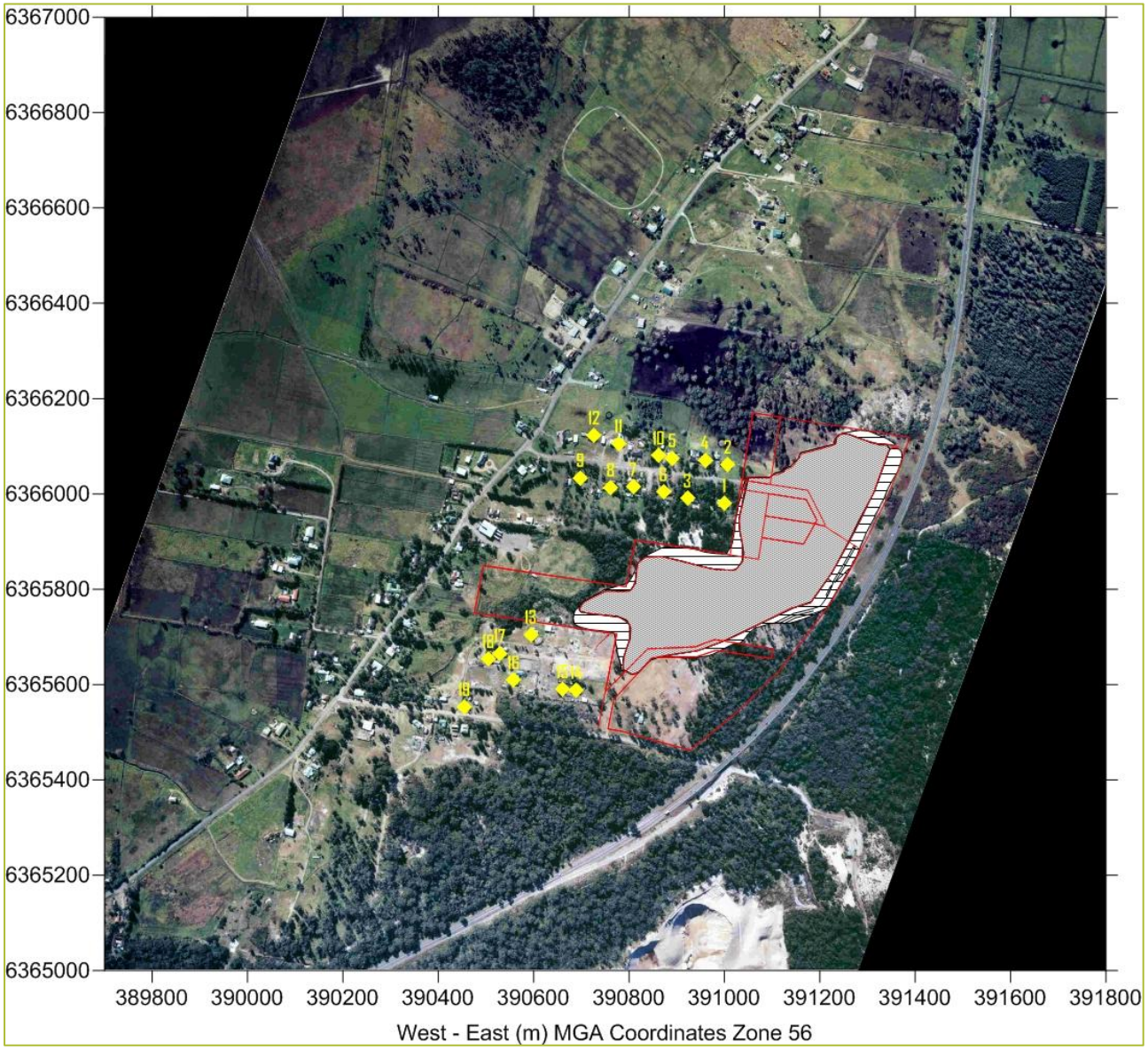


Figure 2.1: Site Location and Closest Residences

The proposed modification to extraction area is shown in **Figure 2.2**, indicating a proposed expansion into an area over the northern of the site, to the north of George Street.

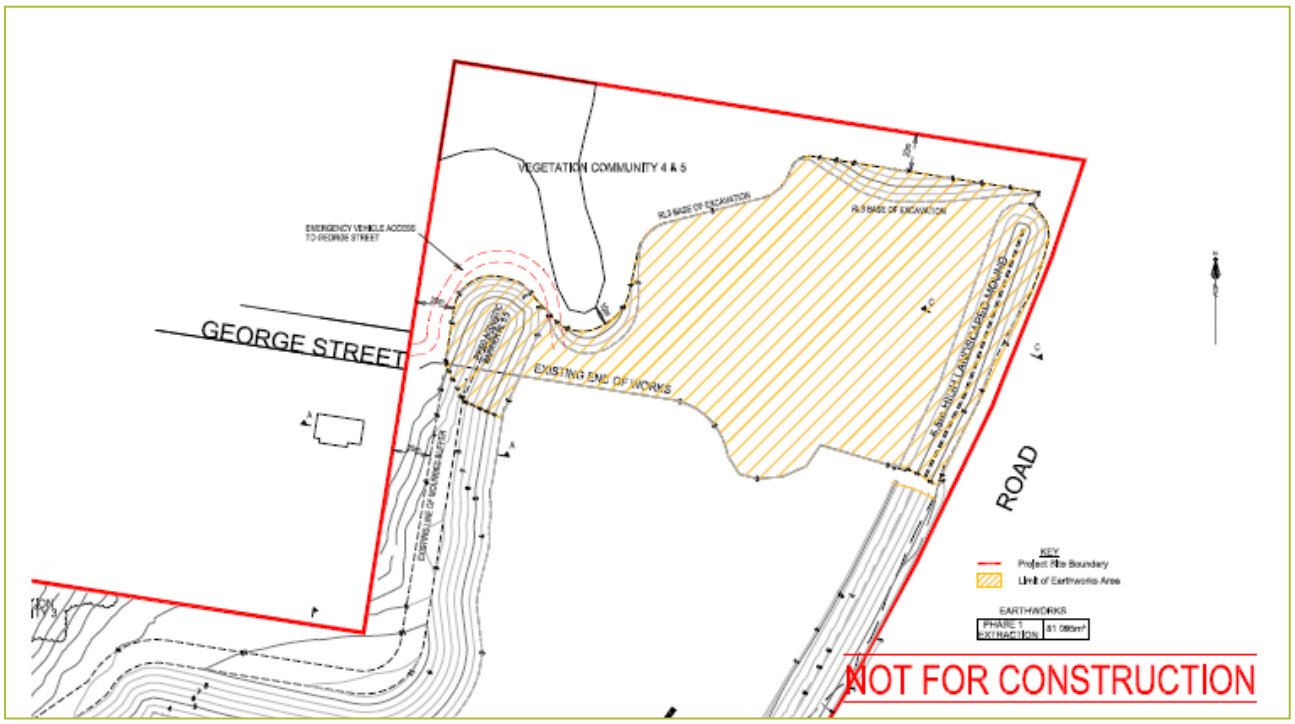


Figure 2.2: Proposed Excavation over Northern Area

3 OVERVIEW OF PREVIOUS AQIA

An Air Quality Impact Assessment for the project was conducted in accordance with the NSW Department of Environment, Climate Change and Water "*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*" (**NSW DEC, 2005**). Dispersion modelling was conducted for the project using a representative meteorological dataset from Williamtown, approximately 5 km north of the site. The assessment considered four operating scenarios, as follows:

- Scenario 1: Extraction rate of 750,000 m^3 over a 12-month period;
- Scenario 2: Extraction rate of 100,000 m^3 over a 12-month period from the northeast section of site;
- Scenario 3: Extraction rate of 100,000 m^3 over a 12-month period from the mid section of site; and
- Scenario 4: Extraction rate of 100,000 m^3 over a 12-month period from the southwest section of site.

Although the AQIA considered complete extraction of the resource (750,000 m^3) over a 12-month period (Scenario 1), the more likely scenario would be the extraction of approximately 100,000 m^3 per year over a period of up to 8 years. The following dust generating activities were modelled as dust sources:

- Bulldozers clearing vegetation;
- Excavation of sandstone;
- Front end loaders loading sand to trucks;
- Hauling of extracted sand;
- Graders on internal roads; and
- Wind erosion from exposed surfaces.

3.1 Assessment of Impacts

The AQIA modelling scenario referred to as Scenario 2 assessed the potential impacts from extraction in the northeast section of the site. The locations of the modelled sources for Scenario 2 are shown in **Figure 3.1**, showing extraction of resource in the north of the site and hauling of the resource along the boundary of the site to the exit at Coxs Lane.

Scenario 2 was modelled to reflect the worst case potential impacts of excavation in the northeast of the site and hauling of product along the full extent of the site. The modelled sources for Scenario 2 clearly align with the proposed expansion area for the modification of consent (shown in **Figure 2.2**).

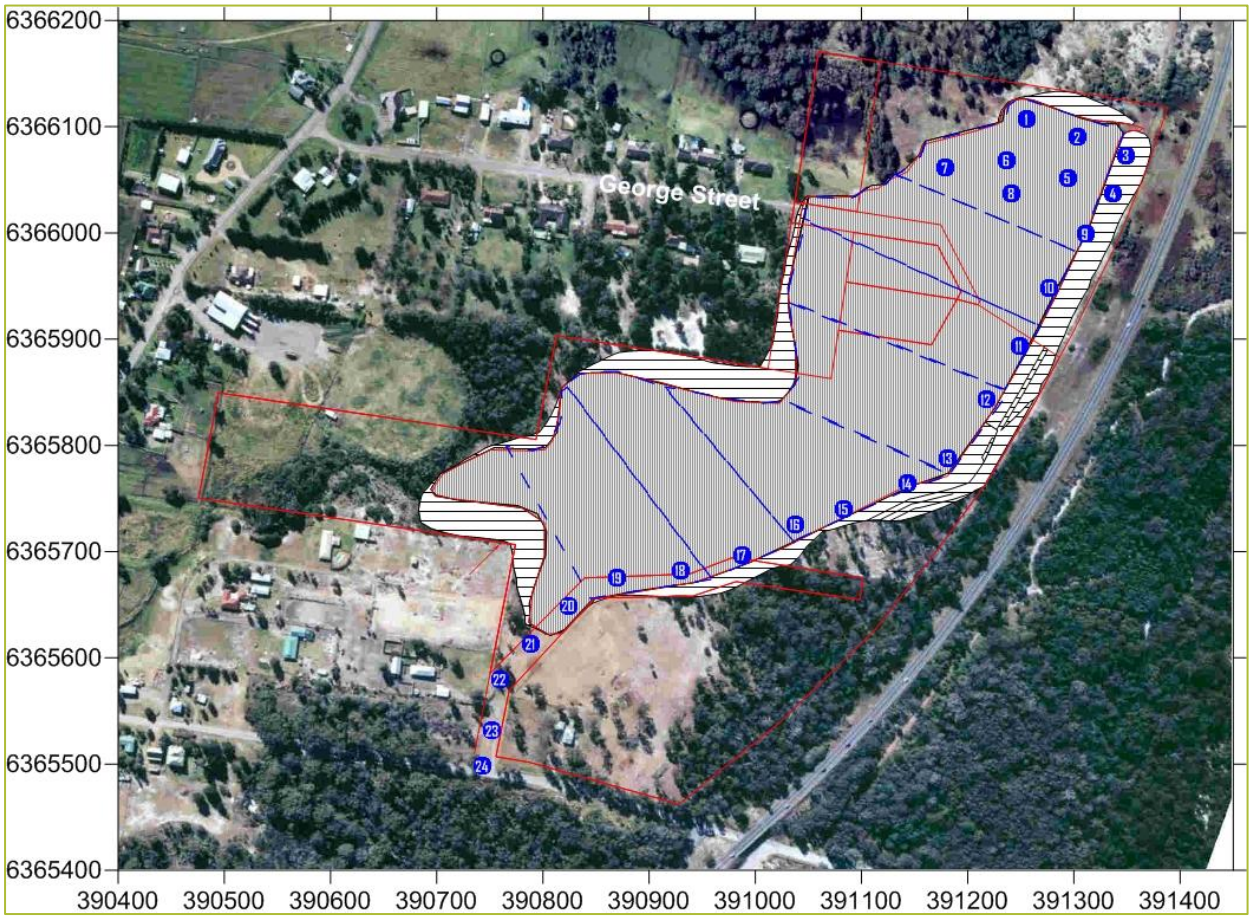


Figure 3.1: Location of Modelled Sources - Scenario 2

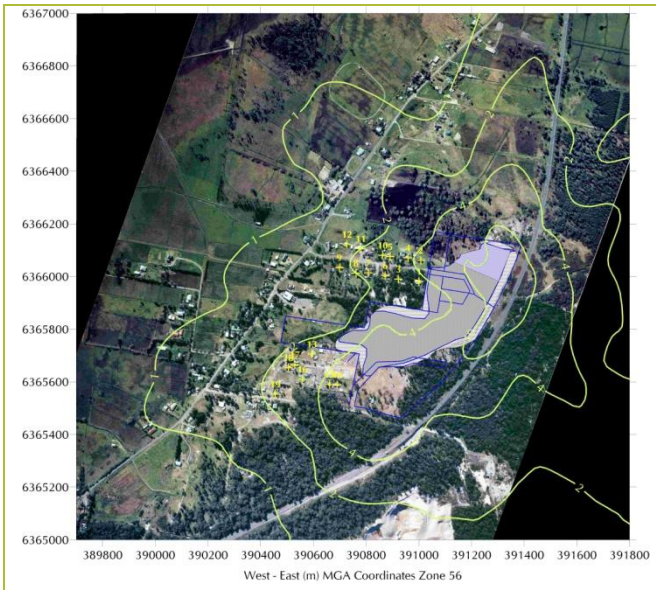
The modelling for Scenario 2 predicted maximum 24-hour PM_{10} concentrations at the most affected residence of 5.6 µg/m^3. The AQIA also demonstrates that this small incremental increase in 24-hour PM_{10} is unlikely to result in exceedances of the NSW DECCW goal of 50 µg/m^3 when considered with cumulative impacts from other sources.

Annual average PM_{10} concentrations predicted during Scenario 2 are less than 1 µg/m^3 compared to the NSW DECCW goal of 30 µg/m^3. Dust deposition levels were also predicted to be minor.

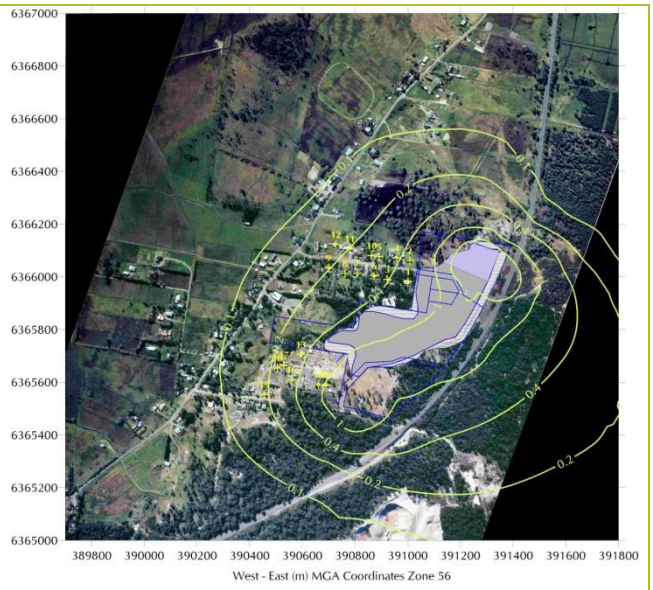
The predictions at each receptor are shown in **Table 3.1**. Contour plots of the predicted dust impacts when operations are located within the northeast area of the site are shown in **Figure 3.2**.

Table 3.1: Predicted PM_{10} and TSP concentrations and deposition levels for Scenario 2

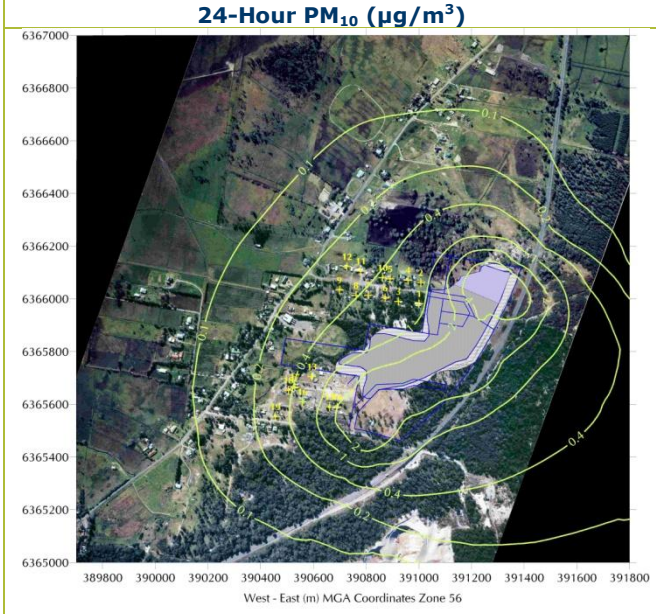
Residence ID	PM_{10} (µg/m^3)		TSP (µg/m^3)	Dust deposition (g/m^2/month)
	24-hour average	Annual average	Annual average	Annual average
	Impact assessment criteria			
	50	30	90	2
1	3.5	0.5	0.9	0.32
2	4.5	0.5	0.8	0.29
3	2.7	0.4	0.7	0.23
4	3.8	0.4	0.6	0.22
5	3.0	0.3	0.5	0.17
6	2.4	0.3	0.5	0.19
7	2.2	0.3	0.4	0.15
8	2.0	0.2	0.4	0.14
9	1.9	0.2	0.3	0.11
10	2.7	0.3	0.4	0.15
11	2.0	0.2	0.3	0.11
12	1.7	0.2	0.3	0.10
13	2.7	0.3	0.6	0.19
14	5.6	1.1	2.1	0.80
15	4.8	0.8	1.4	0.53
16	2.9	0.3	0.5	0.17
17	2.6	0.3	0.4	0.13
18	2.4	0.2	0.4	0.11
19	2.4	0.2	0.3	0.09
20	3.5	0.5	0.9	0.32
21	4.5	0.5	0.8	0.29
22	2.7	0.4	0.7	0.23
23	3.8	0.4	0.6	0.22



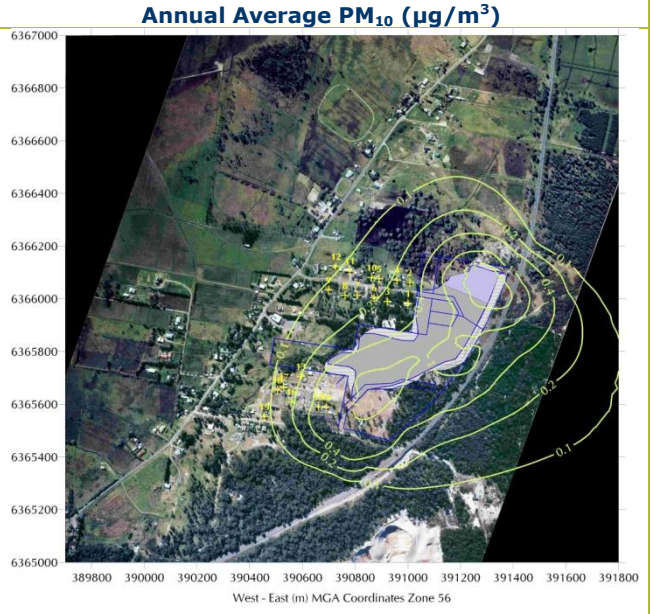
24-Hour PM_{10} ($\mu g/m^3$)



Annual Average PM_{10} ($\mu g/m^3$)



Annual Average TSP ($\mu g/m^3$)



Annual Average Dust Deposition (g/m^2/month)

Figure 3.2: Contour plots showing extent of dust impact

4 AIR QUALITY MANAGEMENT & MONITORING

PAEHolmes have developed a Dust Monitoring Program (DMP), on behalf of Buildev, in accordance with Condition 9 of the Project Approval (**PAEHolmes, 2009**). The DMP outlined procedures for controlling and managing dust during operation of project, defined roles, responsibilities and reporting requirements and outlined the dust monitoring equipment and locations for the project.

The Dust Monitoring Program has been reviewed and assessed in the context of the proposed expansion in extraction area to the north-east. The review indicates that the monitoring proposed is still considered valid, as follows:

- One high volume air sampler (HVAS) measuring PM_{10} concentrations at the closest affected residential receptor to the site, the location depending on the stage of operations and the proximity of extraction to the residential areas to the west and southwest;
- Two dust deposition gauges measuring nuisance dust fallout at the closest affected residential receptor to the west and southwest of the site; and
- An additional dust gauge beyond the eastern boundary of the site to allow for upwind and downwind comparisons in dust levels.

It is noted that siting should be such that compliance at the closest affected residential receptors can be assessed and that the HVAS is relocated to reflect the stage of operation for the project. This is also appropriate for the proposed extended extraction area to the northeast.

5 CONCLUSIONS

PAEHolmes have assessed the potential air quality impacts associated with a modification of consent for the Fullerton Cove Sand Extraction project to allow an extension to the approved extraction area.

The original air quality impact assessment for the project assessed the potential impacts from extraction in the northeast section of the site and the modelled dust sources for Scenario 2 align well with the proposed expansion area for the modification of consent.

The original assessment indicated that air quality impacts associated with the sand extraction project would be minor and not expected to compromise air quality goals at any residential location. These conclusions are still valid for the proposed extension to the extraction area.

A Dust Monitoring Program developed for the site has been reviewed is also still considered valid for the proposed extension to the extraction area.

6 REFERENCES

Holmes, 2008: "Air Quality Impact Assessment – Fullerton Cove Sand Extraction – Final", Holmes Air Sciences, 5 Febraury 2008.

NSW DEC, 2005 "Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW", August 2005

PAEHolmes, 2009 "Dust Monitoring Program – Fullerton Cove Sand Extraction Final" 16 September 2009.

Appendix D

NOISE IMPACT ASSESSMENT

Fullerton Cove Sand Extraction

Noise Assessment for Modification to Development Application

June 2010

Prepared for
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