Annex G

Planning Certificates

PLANNING CERTIFICATE

The City of Newcastle

Section 149, Environmental Planning and Assessment Act 1979

To: D Wood
53 Bonville Ave
THORNTON NSW 2322

Certificate No: 162312
Fees Paid: $133.00
Receipt No(s): 3392820

Your Reference:

Date of Issue: 30/03/2012

The Land: LOT: 12 DP: 625053
158 MAITLAND ROAD SANDGATE 2304

Advice provided on this Certificate:

Advice under section 149(2): see items 1 – 17
Additional advice under section 149 (5): see Items 18 – 27

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone Council's **Customer Enquiry Centre** on (02) 4974 2030, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the Council's development policies for the general area, contact Council's **Customer Enquiry Centre**.

All information provided is correct as at 30/03/2012. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

The City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Enquiry Centre
Ground floor,
282 King Street
Newcastle NSW 2300

Phone: (02) 4974 2030
Facsimile: (02) 4974 2001

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

PART 1:

ADVICE PROVIDED UNDER SECTION 149(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 149(2). These notes shall be taken as being advice provided under section 149(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 4 - Development Without Consent and Miscellaneous Exempt and Complying Development

State Environmental Planning Policy No. 6 - Number of Storeys in a Building

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 30 - Intensive Agriculture

State Environmental Planning Policy No. 32 - Urban Consolidation (Redevelopment of Urban Land)

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 62 - Sustainable Aquaculture

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 71 - Coastal Protection

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (Major Development) 2005

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

State Environmental Planning Policy (Temporary Structures and Places of Public Entertainment) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Affordable Rental Housing) 2009

Newcastle Local Environmental Plan 2003

Draft Newcastle Local Environmental Plan 2011

Newcastle Development Control Plan 2005

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2003

Zoning: The LEP identifies the land as being within the following zone(s):

4(b) Port and Industry Zone

Note: Refer to www.newcastle.nsw.gov.au or www.legislation.nsw.gov.au web site for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in the LEP:

Zone 4(b) Port and Industry Zone

- **Manner shown on zoning map**

  Land in this zone is edged heavy black and marked "4(b)" or coloured brown on the zoning map.

- **Zone objectives**

  (a) To accommodate port, industrial, maritime industrial, and bulk storage activities which by their nature or the scale of their operations require separation from residential areas and other sensitive land uses.

  (b) To require that development of land within 750 metres from the high-water mark of the shores of the Port of Newcastle, capable of docking ocean-going vessels, is used for purposes that:
  (i) require a waterfront location that provides direct access to deep water, or
  (ii) depend upon water-borne transport of raw materials or finished products, or
  (iii) have a functional relationship that necessitates proximity to the activities described above.

  (c) To facilitate sustainable development through the application of industrial ecology.

  (d) To provide for other development which will not significantly detract from the operation of large scale industries or port-related activities, that is primarily intended to provide services to persons employed in such industries and activities.

- **Development without consent**

  Except as otherwise provided by this plan, the following do not require consent:

  (a) exempt development identified in clause 10,

  (b) utility undertakings described in Schedule 4 when carried out by a public authority,

  (c) anything specified in section 4B (3) of the Act,

  (d) development below high water mark for purposes related to the operation of the Port of Newcastle by the Newcastle Port Authority,

  (e) environmental protection works,

  (f) emergency bush fire hazard reduction work or fire fighting acts,

  (g) managed bush fire hazard reduction work on land other than excluded land.

- **Development only with consent**

  Any development not identified in, development without consent or prohibited development.

- **Prohibited development**

  Development for the purpose of:
  agriculture
  bed and breakfast accommodation
  boarding houses
  bulky goods retail outlets
  camping grounds or caravan parks
  cemeteries
  child care centres
  commercial offices
  dwellings or dwelling-houses (other than those used in conjunction with industry and situated on the same land as the industry)
  eco-tourism facilities
  educational establishments
  exhibition homes

exhibition villages
hazardous industries
hazardous storage establishments
hospitals
hotels
institutions
intensive agriculture
local shops
motels
natural water-based aquaculture
offensive industries
offensive storage establishments
places of assembly
places of worship
pond-based aquaculture
recreation areas
roadside stalls
serviced apartments
shops
urban housing

NOTE: The above advice relates only to restrictions that apply by virtue of the zones indicated. The LEP includes additional provisions that require development consent for particular types of development, or in particular circumstances, irrespective of zoning.

Minimum land dimensions for erection of a dwelling-house: The LEP does not contain any development standards relating to minimum land dimensions for the erection of a dwelling-house.

Critical habitat: The LEP does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the LEP.

Heritage items: There are no heritage items listed in the LEP situated on the land.

Draft Newcastle Local Environmental Plan 2011

Zoning: The Draft LEP contains amending provisions that have the effect of altering the current zoning of the land. If the draft amendment were to be approved, the land would be within the following zone(s):

IN3 Heavy Industrial Zone

Zone IN3 Heavy Industrial Zone

- **Objectives of zone**
  - To provide suitable areas for those industries that need to be separated from other land uses.
  - To encourage employment opportunities.
  - To minimise any adverse effect of heavy industry on other land uses.
- **Permitted without consent**

  Building identification sign; Business identification sign; Environmental protection works.
- **Permitted with consent**

  Aquaculture; Boat launching ramps; Boat repair facilities; Car parks; Drainage; Depots; Earthworks; Extractive industries; Flood mitigation works; Freight transport facilities; Hazardous industries; Hazardous storage establishments; Heavy industries; Helipad; Industries; Jetties; Kiosks; Light industries; Liquid fuel depots; Marinas; Mining; Moorings; Neighbourhood shops; Offensive industries; Offensive storage establishments; Passenger transport facilities; Port facilities; Recreation areas (indoor); Roads; Service stations; Sewerage systems; Sex services premises; Signage; Take away food and drink premises; Transport depots; Truck depots; Vehicle

body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Water supply systems; Wholesale supplies.

- **Prohibited**

  Bulky goods premises; Industrial retail outlets; Natural water based aquaculture; Rural industries; Vehicle sales or hire premises; Any other development not specified in, permitted without consent or permitted with consent.

Minimum land dimensions for erection of a dwelling-house: The Draft LEP does not contain any development standards relating to minimum land dimensions for the erection of a dwelling-house.

Critical habitat: The Draft LEP does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the Draft LEP.

Heritage items: The Draft LEP does not identify any heritage item on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(c) & (d) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP). There are other requirements under the Codes SEPP that must also be satisfied to be considered as complying development. Clauses 1.17 and 1.18 of the Codes SEPP identify the general requirements to be classified as complying development.*

General Housing Code

Complying development under the General Housing Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

Specific land exemptions being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Rural Housing Code

Complying development under the Rural Housing Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m. Unless complying development is carried out on the part of the lot to which clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 does not apply.

Specific land exemptions being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2. Unless complying development is carried out on the part of the lot to which clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 does not apply.

Housing Alterations Code

Complying development under the Housing Alterations Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

General Development Code

Complying development under the General Development Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

General Commercial and Industrial Code

Complying development under the General Commercial and Industrial Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

Subdivision Code

Complying development under the Subdivision Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

Demolition Code

Complying development under the Demolition Code may NOT be carried out on this land. The land is affected by:

General land exemptions being land that is an environmentally sensitive area, being land to which State Environmental Planning Policy No 14-Coastal Wetlands applies and land within 100m.

4. Coastal Protection Act 1979

The land IS AFFECTED by the operation of sections 38 or 39 of the Coastal Protection Act 1979.

4A. Certain information relating to beaches and coasts

The land IS NOT AFFECTED by an order under Part 4D of the Coastal Protection Act 1979 in relation to emergency coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

The Council HAS NOT been notified under section 55X of the Coastal Protection Act 1979 that emergency coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land).

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Mine Subsidence Compensation Act 1961

The land IS NOT within a proclaimed Mine Subsidence District under the Mine Subsidence Compensation Act 1961.

NOTE: The above advice is provided to the extent that Council has been notified by the Mine Subsidence Board. For up-to-date details, contact the Mine Subsidence Board, 117 Bull Street, Newcastle West. Ph (02) 49084300.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by any road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Earthquake: The Council has adopted standards for earthquake resistant construction in a Local Approvals Policy titled "Building Materials & Practices Structural Quality Policy" (dated 11 July 1995). This document may be inspected or purchased at Council's Customer Enquiry Centre.

Potential acid sulphate soils: Works carried out on the land must be undertaken in accordance with the LEP.

Bush fire: Under the LEP, the consent authority shall not grant consent to development on bush fire prone land unless the consent authority is satisfied with the measures proposed to be taken with respect to the development to protect persons, property and the environment from danger that may arise from a bush fire.

Land Contamination: Council's information currently indicates that the property may be affected by land contamination. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to the Newcastle Development Control Plan 2005, which may be inspected or purchased at Council's Customer Enquiry Centre.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. The Council considers the likelihood of natural and man-made risks when determining development applications under section 79C of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in the Council either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

Council's information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Development of flood prone land is controlled by Element 4.3 of the Newcastle Development Control Plan 2005. The Newcastle Development Control Plan 2005 provides restrictions or imposes conditions with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings.

The Newcastle Development Control Plan 2005 may be inspected or purchased at Council's Customer Enquiry Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through Council's Customer Enquiry Centre on (02) 4974 2050

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 27 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 94A Development Contributions Plan 2009 - Updated March 2011:

The Plan specifies section 94A contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on Council's website or may be inspected or purchased at Council's Customer Enquiry Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995.

10. Biobanking agreements

The land IS NOT land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates.

11. Bush fire prone land

The land, either in whole or in part IS bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Council HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which the Council is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure

The land IS NOT AFFECTED by a valid site compatibility certificate (of which the Council is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which the Council is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

Note. The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997.

The land to which the certificate relates is the subject of an ongoing maintenance order(s) within the meaning of the Contaminated Land Management Act 1997.

You can contact Council's Compliance Services Unit on (02) 49742525 to obtain further information. NOTE: Contamination information that relates to the land that is not required to be disclosed under section 59(2) Contaminated Land Management Act 1997, may be provided under a section 149(5) certificate.

PART 2:

ADVICE PROVIDED UNDER SECTION 149(5)

ATTENTION: Section 149(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 149(5).

18. Outstanding Notices and Orders issued by Council.

Council records indicate that this premises IS NOT AFFECTED by an outstanding notice or order (excluding the notices or orders mentioned in the note below).

NOTE: The Council has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which the Council is unaware.

NOTE: This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979, the Local Government Act 1993 or the Swimming Pool Act 1992. To obtain advice regarding these matters, you should lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Enquiry Centre on (02) 4974 2030.

19. Further consent requirements under the LEP.

The following provisions of the Newcastle Local Environmental Plan 2003 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Development that does not require consent: Clause 13 provides that, except as otherwise provided by this plan, the following do not require development consent:

(a) exempt development identified in clause 10,

(b) utility undertakings described in Schedule 4 when carried out by a public authority,

(c) anything specified in section 4B (3) of the Act,

(d) development below high water mark for purposes related to the operation of the Port of Newcastle by the Newcastle Port Authority,

(e) environmental protection works,

(f) emergency bush fire hazard reduction work or fire fighting acts,

(g) managed bush fire hazard reduction work on land other than excluded land.

Development that requires consent: Clause 14 provides that, except as otherwise provided by this plan, the following may be carried out only with development consent:

(a) a use of land,

(b) the subdivision of land,

(c) the erection of a building,

(d) the carrying out of a work, including:

(i) the excavation, filling or dredging of land, and

(ii) the disposal of waste,

(e) the removal or pruning of a tree or the clearing of native vegetation,

(f) the injuring or poisoning of a tree,

(g) the demolition or removal of a building, work, relic or place in whole or in part,

(h) works involving a heritage item or within a heritage conservation area involving the alteration of a building, work or relic by making structural or non-structural changes to the detail, fabric, finish or appearance of its exterior, except changes resulting from any maintenance necessary for its ongoing protective care which would not adversely affect any heritage significance it may have,

(i) altering a heritage item by making structural or non-structural changes to the detail, fabric, finish or appearance of its interior, except changes resulting from any maintenance necessary for its ongoing protective care which would not adversely affect any heritage significance it may have,

(j) disturbing or excavating a place of Aboriginal heritage significance or an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved or destroyed,

(k) the moving to another location of a building or relic,

(l) the display of an advertising sign,

(m) the carrying out of a utility undertaking described in Schedule 4 otherwise than by a public authority.

Development that is prohibited: Clause 15 provides that, except as otherwise provided by this plan, the following development is prohibited:

(a) development for the purpose of hazardous industries, hazardous storage establishments, offensive industries or offensive storage establishments,

(b) the carrying out of particular land uses within a zone if nominated as prohibited development in the zone *(refer to Item 2 of this Certificate)*.

Existing uses: 'Existing uses' (as defined in section 106 of the Environmental Planning and Assessment Act 1979) may in specified circumstances, be enlarged, expanded, intensified, altered, extended, rebuilt or changed with development consent. See Part 5 of the Environmental Planning and Assessment Regulation 2000. These provisions are deemed by section 108(2) of the Act to be incorporated in the Newcastle Local Environmental Plan 2003.

NOTE: There are other provisions within the Newcastle Local Environmental Plan 2003 that affect the carrying out of development. If you propose to carry out development on the land, you should consider the need to obtain further professional advice regarding the full effect of the Newcastle Local Environment Plan 2003 and other environmental planning instruments.

20. Suspension of covenants.

Under the LEP, any covenant, agreement or like instrument, which is contrary to development that is permitted and for which consent has been granted under the Plan, does not apply to the extent to which the covenant, agreement or instrument would prevent or restrict the development from being undertaken in accordance with the consent.

NOTE: Covenants that burden neighbouring land (and which benefit the subject land) may also have been suspended. In determining a development application, the Council is not required to take into consideration whether the proposed development would comply with any applicable covenant. The Council holds no records on the existence of covenants, nor does it carry out a title search when assessing applications. The enforcement of covenants is a private matter between covenantees.

21. Unexhibited proposed environmental planning instruments.

The land IS NOT AFFECTED by a resolution of the Council to endorse a planning proposal which has yet to have a gateway determination pursuant to section 56(2) of the Act.

22. Draft development control plans.

The following draft development control plan/s APPLY to the land. The draft plan/s has been exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

Draft Newcastle Development Control Plan 2011

23. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that Council has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

24. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that Council has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust.

25. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that Council has been notified by the Department of the Environment, Heritage, Water and the Arts. For up-to-date details, contact the Department of the Environment, Heritage, Water and the Arts, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

26. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

27. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Newcastle Urban Strategy

The Newcastle Urban Strategy was adopted by the Council on 11 March 1998. The contents of the Strategy will be taken into account when the Council determines development applications.

Note: The Strategy is available for purchase from Council's Customer Enquiry Centre.

Contaminated land information

Council is in possession of contaminated land information relating to this property. Appendix A contains a list of this information. You can contact Council's Compliance Services Unit on 02 4974 2525 to arrange to view any documents listed.

Issued without alterations or additions, 30/03/12

for:
PHIL PEARCE
GENERAL MANAGER

Contaminated Land Information	ECM Number

Council is in possession of the following contaminated land document(s) which relate to the land. Persons relying on the certificate are advised to examine and consider the contents of each document:

1. Report: ERA Environmental Services Pty. Ltd. October 1994, Plan of Management for the Toll Bulk Services Site Sandgate, prepared for North Mining Ltd.	DW 132096
2. Report: Enviromet, January 1993, Soil Sampling and Analysis of the Toll Bulk Services Site at Sandgate for Peko Wallsend Operations L td	DW 132095
3. Report: Enviromet, April 1992, Soil Sampling and Analysis of the Toll Bulk Services Site at Sandgate for Peko Wallsend Operations Ltd.	DW 132094

The following potentially contaminating activity(s) has been observed to be carried out on the land:

1. above ground fuel storage	DW 3573793
2. above ground and underground fuel storage	

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Annex H

EPBC Act Protected Matters Report

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

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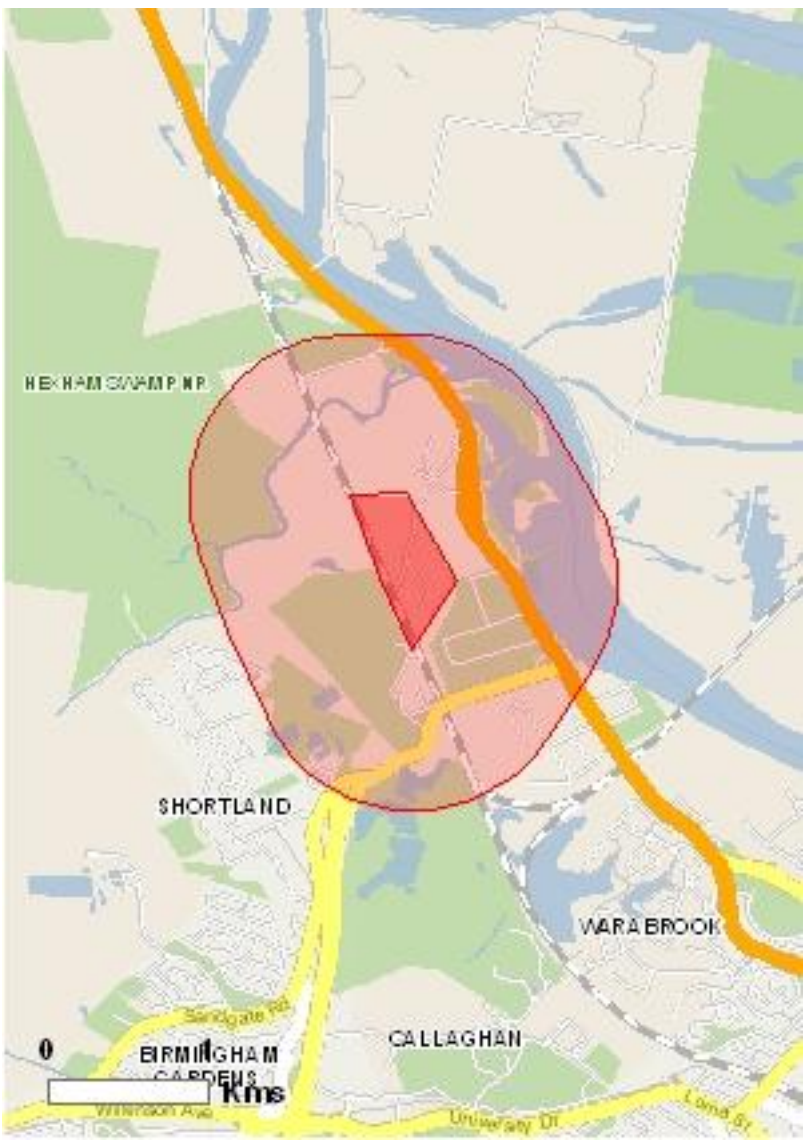


Coordinates

Buffer: 1.0Km

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	19
Migratory Species:	40

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	44
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	1
State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	15
Nationally Important Wetlands:	2

Details

Matters of National Environmental Significance

Wetlands of International Significance (RAMSAR)	[Resource Information]
Name	Proximity
Hunter estuary wetlands	Within Ramsar site

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Anthochaera phrygia		
Regent Honeyeater [82338]	Endangered	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat likely to occur within area
Sternula nereis nereis Fairy Tern (Australian) [82950]	Vulnerable	Species or species habitat may occur within area
FROGS		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
MAMMALS		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANTS		
Allocasuarina defungens Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat may occur within area
Tetratheca juncea Black-eyed Susan [21407]	Vulnerable	Species or species habitat likely to occur within area
REPTILES		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba		
Great Egret, White Egret [59541]		Breeding likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Breeding likely to occur within area
Migratory Marine Species		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Lamna nasus		
Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Breeding may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Breeding likely to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Breeding may occur within area
Xanthomyza phrygia		
Regent Honeyeater [430]	Endangered*	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Roosting known to occur within area

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Breeding likely to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]		Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Roosting known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Roosting known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur

Name	Threatened	Type of Presence within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Roosting known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding likely to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]		Roosting known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Roosting known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area

Name	Threatened	Type of Presence
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Roosting known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Breeding may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding likely to occur within area
Numenius madagascariensis Eastern Curlew [847]		Roosting known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Breeding may occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Name	Threatened	Type of Presence
Xenus cinereus		
Terek Sandpiper [59300]		Roosting known to occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Hunter Estuary Wetlands	NSW	Registered

State and Territory Reserves [Resource Information]

Name	State
Hunter Wetlands	NSW

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Frogs		
Bufo marinus		
Cane Toad [1772]		Species or species habitat likely to occur within area
Mammals		
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Alternanthera philoxeroides		
Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus asparagoides		
Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana		
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera		
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana		
Broom [67538]		Species or species habitat may occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum		
African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Pinus radiata		
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate		
Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtiji		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Kooragang Nature Reserve	NSW
Shortland Wetlands Centre	NSW

Coordinates

-32.86575 151.69962,-32.86114 151.69794,-32.86114 151.69794,-32.86103 151.70118,-32.86601 151.70407,-32.86997 151.70152,-32.86575 151.69962

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

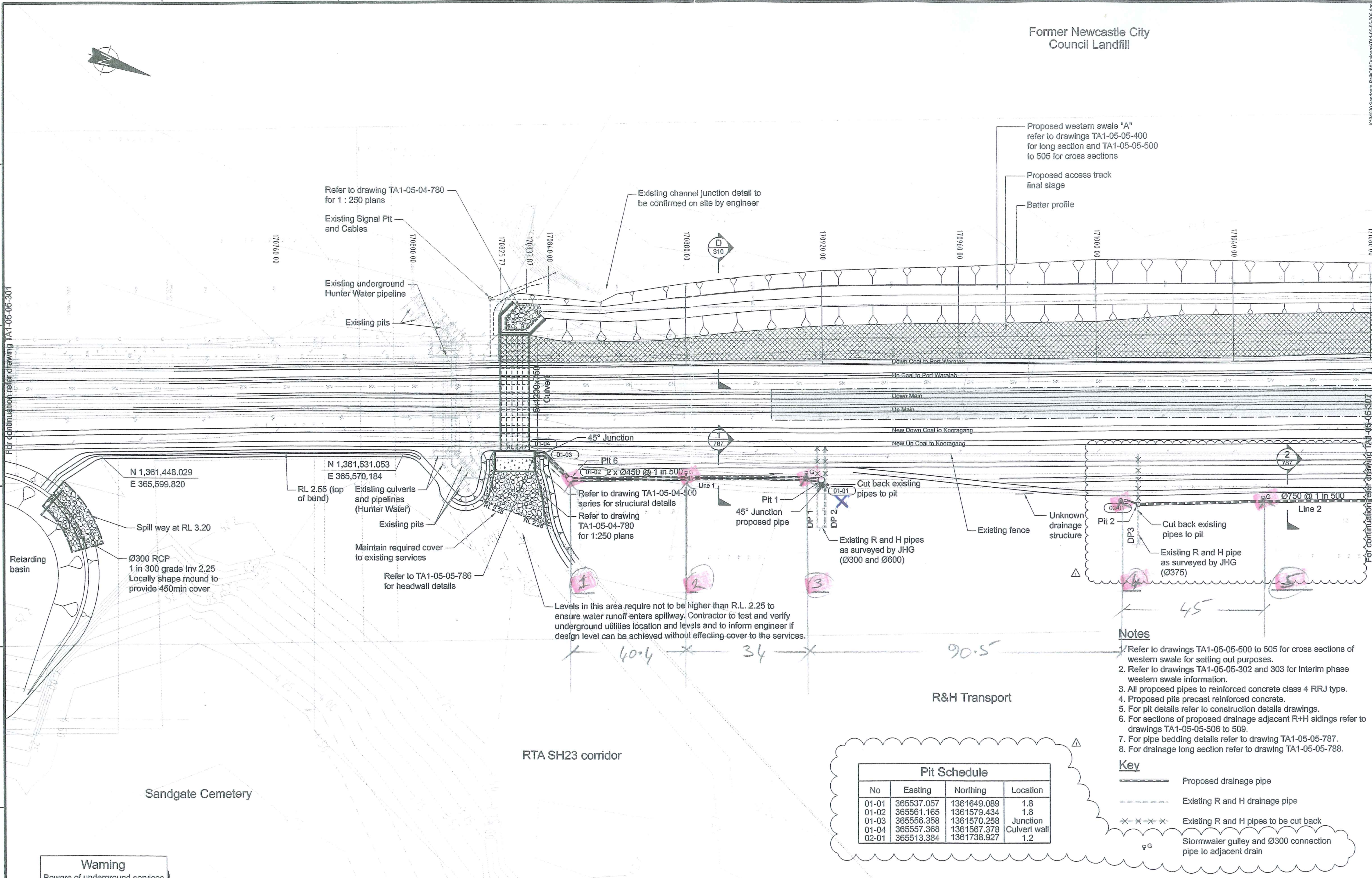
The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of Sustainability, Environment, Water, Population and Communities
GPO Box 787

Annex I

Site Drainage Survey



Notes

1. Refer to drawings TA1-05-05-500 to 505 for cross sections of western swale for setting out purposes.
2. Refer to drawings TA1-05-05-302 and 303 for interim phase western swale information.
3. All proposed pipes to reinforced concrete class 4 RRJ type.
4. Proposed pits precast reinforced concrete.
5. For pit details refer to construction details drawings.
6. For sections of proposed drainage adjacent R+H sidings refer to drawings TA1-05-05-506 to 509.
7. For pipe bedding details refer to drawing TA1-05-05-787.
8. For drainage long section refer to drawing TA1-05-05-788.

Key

- Proposed drainage pipe
- Existing R and H drainage pipe
- Existing R and H pipes to be cut back
- Stormwater gulley and Ø300 connection pipe to adjacent drain

Pit Schedule

No	Easting	Northing	Location
01-01	365537.057	1361649.089	1.8
01-02	365561.165	1361579.434	1.8
01-03	365556.358	1361570.258	Junction
01-04	365557.368	1361567.378	Culvert wall
02-01	365513.384	1361738.927	1.2

Warning
Beware of underground services
The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

1:500 10 8 6 4 2 0 10 20 30 40 50 m

Rev	Date	Revision Description	Drwn	App	I.S
I	01/08/06	R & H Drainage Underground System Relocated / Concrete Channel now Shotcrete	MI	MM	
H	07/07/06	Updated to take into account verifier's comments	BJK	MM	
G	08/06/06	Uderground Drainage Pipe Relocated and Concrete Channel Added	MI	MM	
F	05/05/06	Drainage Trench and Pits revised	CPL	MM	
E	21/04/06	Crossing A Outlet Structure Revised R+H Drainage Updated	MI	MM	
D	07/03/06	Updated to take into account Verifiers comments	MI	MM	
C	31/01/06	Updated to take into account Verifiers Comments	MI	MM	
B	18/12/05	Crossing A 'on hold' cloud removed	MI	MM	

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Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

ARUP 84620

Scale at A1 1:500 Date 15/11/05
Designed JRV
Drawn MI
Checked MM
RAH Certified

ARTC Australian Rail Track Corporation Ltd

John Holland

Sandgate Rail Grade Separation
Proposed Drainage Layout (with Final Phase Western Swale) - Sheet 1 of 2

B C D E F G H I

TA1-05-05-306

Sheet No.

Drawing Status CONSTRUCTION

Former Newcastle City Council Landfill

Proposed final western swale "A" refer to drawings TA1-05-05-400 for long section and TA1-05-05-500 to 505 for cross sections

Proposed access track final stage

Batter profile

Bund to be constructed to prevent swale discharging to channel heading to leachate pond, detail to be confirmed by engineer on site

End of swale to be extended and shaped on site as directed by engineer to suit existing swamp water levels. Area denoted by cloud will need to be cleared first to establish correct tie-in levels

Tie swale into existing levels at swamp

For continuation refer drawing TA1-05-05-308

171040 00 | 171080 00 | 171120 00 | 171160 00 | 171200 00 | 171240 00 | 171280 00 | 171305 75 | 171311 75 | 171320 00 | 171340 93 | 171360 00 | 171400 00

Down Coal to Port Waratah
Up Coal to Port Waratah
Down Main
Up Main
New Down Coal to Kooragang
New Up Coal to Kooragang

R&H Sidings
R&H Sidings
R&H Sidings

Start of open swale
Overflow pipe headwall 02-04
Pit 5 02-05
Ø750 @ 1 in 120

Fall
Ø750 @ 1 in 500
Line 2
02-02
Ø750 @ 1 in 500 02-03
Pit 3
Pit 4
Fall on Existing ground
Fall
Fall on Existing ground
Ø750 @ 1 in 120
Line 2
02-06
Pit 7

Rip rap protection to base and sides of swale around bend (refer to drawing TA1-05-05-780 for typical rip rap details).

Reinstate open drain swale (Refer to drawings TA1-05-05-506 to 509 for details)

Rip Rap protection to base and sides of swale

N 1362067.182
E 365373.158
(Centreline coordinate)

03-02
3
787
03-01
New Ø300 pipe extension to be concrete encased

DP 7
Extend existing Ø300 pipe to proposed channel and install pipe through wall of channel at IL0.35

Existing R and H pipe as surveyed by JHG (Ø300)

For continuation refer drawing TA1-05-05-307

60-20

DP 4
DP 5
DP 6

Cut back existing pipe to pit
Cut back existing pipes to pit

Existing R and H pipes as surveyed by JHG (Ø300)
Existing R and H pipes as surveyed by JHG (2 x Ø300)

Stormwater gulley pit with heavy duty open grating on lid to be constructed at low spot. (Contractor to confirm low spot by level survey on site) Invert level of outgoing 300mm pipe -0.26m

5 | 6 | 7 | 8 | 9 | 10

39.8 | 35 | 24.6 | 29.7 | 24.6

R&H Transport

Notes

1. Refer to drawings TA1-05-05-500 to 505 for cross sections of western swale for setting out purposes.
2. Refer to drawings TA1-05-05-302 and 303 for interim phase western swale information.
3. All proposed pipes to reinforced concrete class 4 RRJ type.
4. Proposed pits precast reinforced concrete.
5. For pit details refer to construction details drawings.
6. For sections of proposed drainage adjacent R+H sidings refer to drawings TA1-05-05-506 to 509.
7. For pipe bedding details refer to drawing TA1-05-05-787.
8. For drainage long section refer to drawing TA1-05-05-788.

Key

- Proposed drainage pipe
- Existing R and H drainage pipe
- Existing R and H pipes to be cut back
- Stormwater gulley and Ø300 connection pipe to adjacent drain

Pit Schedule

No	Easting	Northing	Pit Ø
02-02	365481.660	1361826.196	1.2
02-03	365479.542	1361832.164	1.8
02-04	365428.150	1361932.906	1.2
02-05	365425.736	1361934.055	Headwall
02-06	365446.968	1361923.946	1.8
03-01	365377.275	1362080.630	DP7
03-02	365368.314	1362077.488	Channel

Warning
Beware of underground services
The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown.

1:500 0 10 20 30 40 50 m
10 8 6 4 2

Rev	Date	Revision Description	Drwn	App	I.S
H	31/07/06	R & H Drainage Underground System Relocated / Concrete Channel now Shotcrete	MI	MM	
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E	05/05/06	Drainage Trench and Pits Revised	CPL	MM	
D	21/04/06	Crossing A Outlet Structure Revised. R & H Drainage Updated	MI	MM	
C	07/03/06	Updated to take into account Verifiers Comments	MI	MM	
B	31/01/06	Updated to take into account Verifiers Comments	MI	MM	
A	12/12/05	Construction Issue	MI	MM	

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ARUP 84620

ARTC Australian Rail Track Corporation Ltd

John Holland

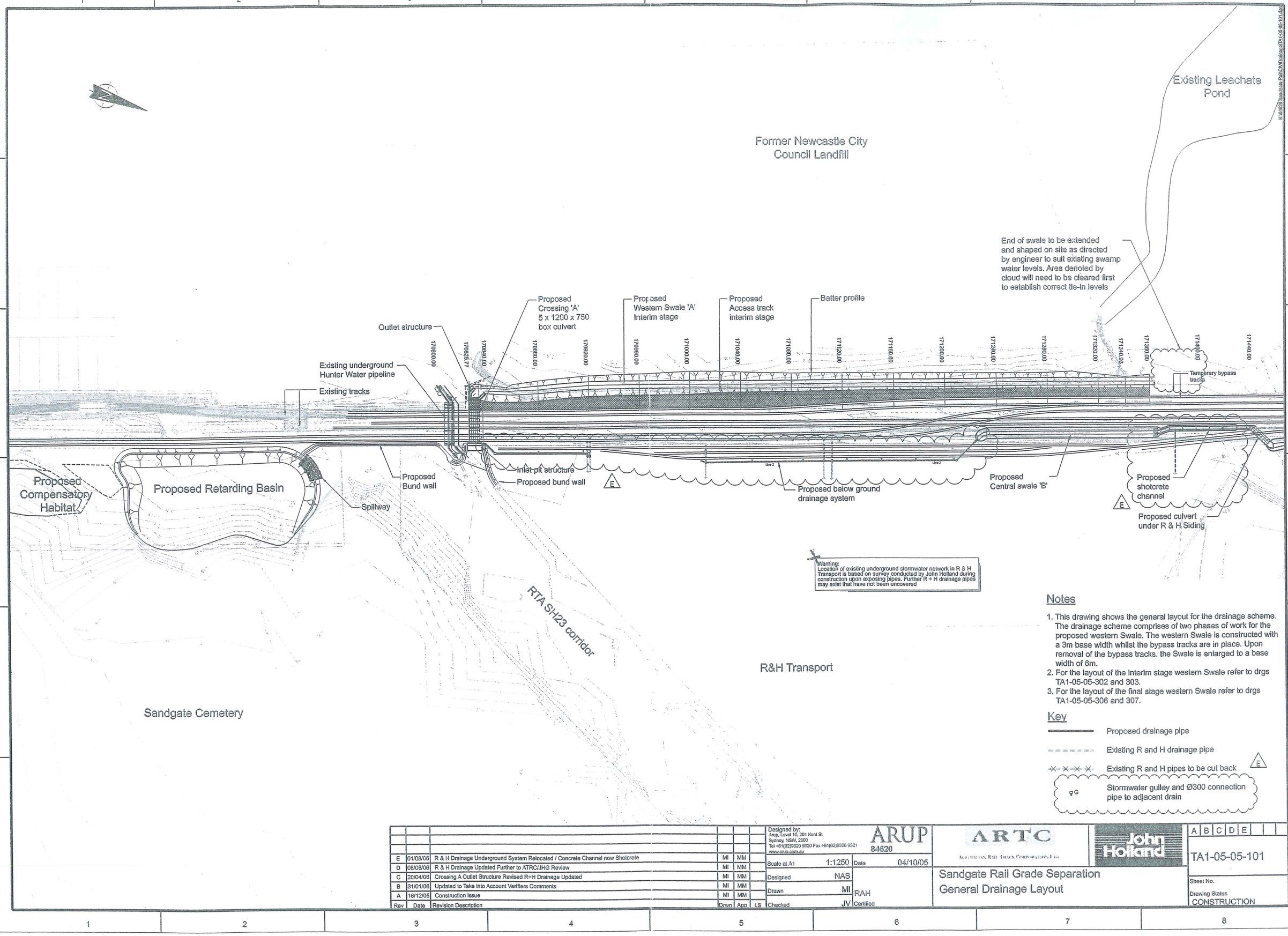
Scale at A1	1:500	Date	15/11/05
Designed	JRV		
Drawn	MI	RAH	
Checked	MM	Certified	

Sandgate Rail Grade Separation
Proposed Drainage Layout (with Final Phase Western Swale) - Sheet 2 of 2

TA1-05-05-307

Sheet No.

Drawing Status
CONSTRUCTION



Warning:
Location of existing underground stormwater network in R & H Transport is based on survey conducted by John Holland during construction upon exposing pipes. Further R + H drainage pipes may exist that have not been uncovered

Notes

1. This drawing shows the general layout for the drainage scheme. The drainage scheme comprises of two phases of work for the proposed western Swale. The western Swale is constructed with a 3m base width whilst the bypass tracks are in place. Upon removal of the bypass tracks. the Swale is enlarged to a base width of 6m.
2. For the layout of the interim stage western Swale refer to drgs TA1-05-05-302 and 303.
3. For the layout of the final stage western Swale refer to drgs TA1-05-05-306 and 307.

Key

- Proposed drainage pipe
- Existing R and H drainage pipe
- Existing R and H pipes to be cut back (E)
- SG Stormwater gulley and Ø300 connection pipe to adjacent drain

Rev	Date	Revision Description	Drwn	App	I.S
E	01/08/06	R & H Drainage Underground System Relocated / Concrete Channel now Shotcrete	MI	MM	
D	09/06/06	R & H Drainage Updated Further to ATRC/JHG Review	MI	MM	
C	20/04/06	Crossing A Outlet Structure Revised R+H Drainage Updated	MI	MM	
B	31/01/06	Updated to Take into Account Verifiers Comments	MI	MM	
A	16/12/05	Construction Issue	MI	MM	

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ARUP 84620

ARTC Australian Rail Track Corporation Ltd

John Holland

Scale at A1	1:1250	Date	04/10/05
Designed	NAS		
Drawn	MI	RAH	
Checked	JV	Certified	

Sandgate Rail Grade Separation
General Drainage Layout

A B C D E

TA1-05-05-101

Sheet No.

Drawing Status
CONSTRUCTION

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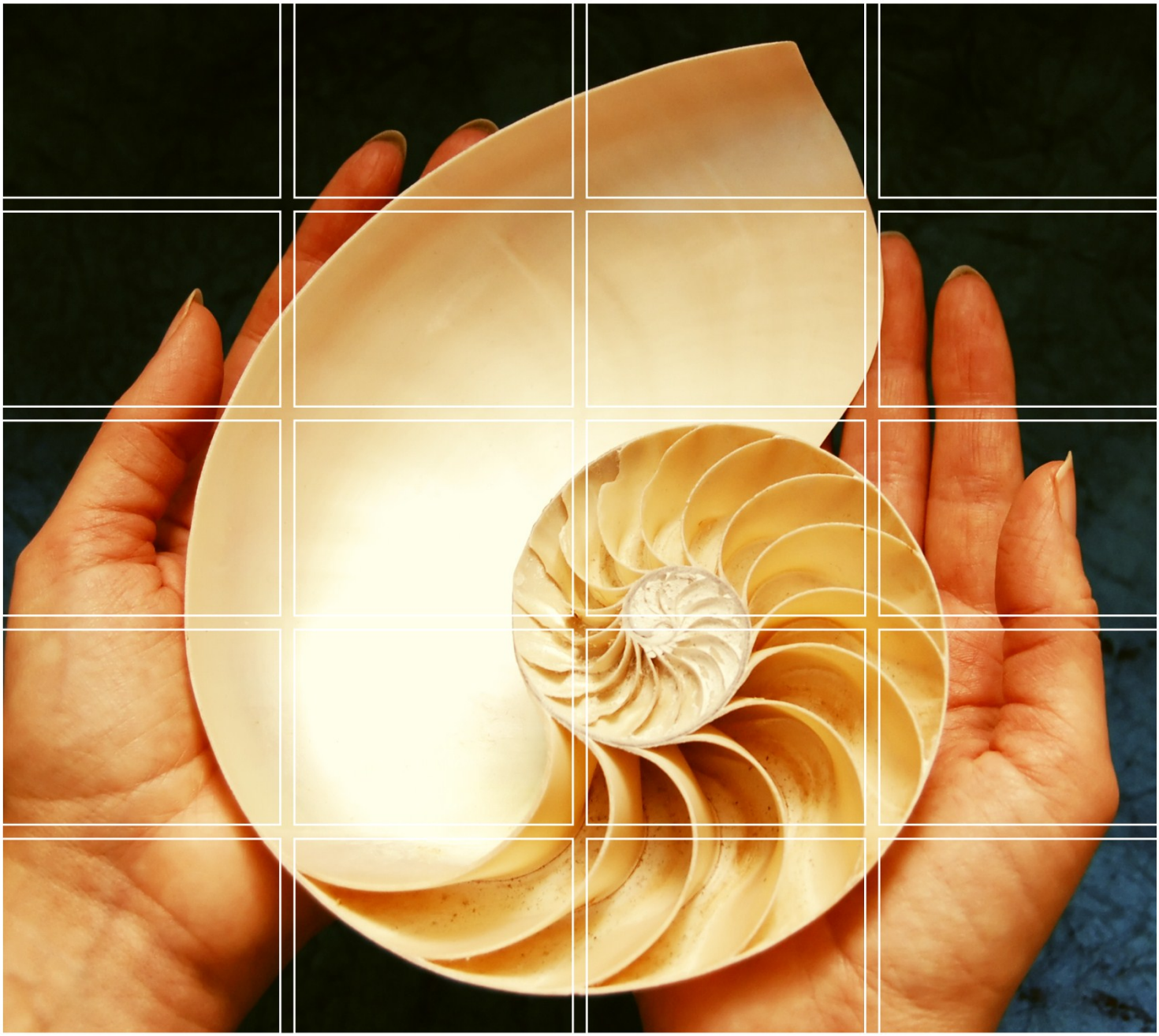

Lot 12 Old Maitland Road Sandgate NSW 2304

Targeted Phase II Environmental Site Assessment

Crawfords Freightlines Pty Ltd

July 2012

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Targeted Phase II Environmental Site Assessment

Crawfords Freightlines Pty Ltd

July 2012

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Signed:	
Date:	*3 July, 2012*
Approved by:	*Will Ellis*
Position:	Partner
Signed:	
Date:	*3 July, 2012*

Environmental Resources Management Australia Pty Ltd Quality System

FINAL REPORT

Crawfords Freightlines Pty Ltd

Targeted Phase II Environmental Site Assessment Lot 12 Old Maitland Road, Sandgate NSW

FINAL

June 2012

Reference: 0143175PhIIESA_FINAL

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EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Crawfords Freightlines Pty Ltd (Crawfords) to undertake a Targeted Phase II Environmental Site Assessment (ESA) of a parcel of land located at 158 Old Maitland Road, Sandgate NSW (the subject site), formally identified as Lot 12 in Deposited Plan (DP) 625053. The site is currently owned by Sierra Sun Pty Limited, with portions of the site either currently or historically leased to third parties for land-use under the current zoning (4(b) Port and Industry Zone). This Targeted ESA is required to address the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement (EIS) for an Ammonium Nitrate Distribution and Storage Facility to continue operations at the site.

The specific objective of this Targeted Phase II ESA was to assess the current status of contaminants in soils and groundwater beneath the site that is potentially associated with Crawfords Freightlines current and historic activities and provide an understanding as to the suitability of the site for its current land use as well as provide a baseline for future comparison.

To meet the project objective, ERM undertook an intrusive investigation that incorporated findings of the previously completed Phase I ESA to target specific areas of concern.

The results of the investigation indicated that:

- *elevated concentrations ammonia and nitrogen in soil were encountered in areas of current and historic ammonium nitrate handling and storage. PAHs and metals were encountered in the fill material on site and are considered likely to be related to filling activities and not Crawfords Freightlines current or historic operations on the site; and*

- *elevated concentrations of ammonia and nitrogen were encountered in groundwater in areas of current and historic ammonium nitrate handling and storage. Minor dissolved metal exceedances were reported in three monitoring wells across the site, the source is thought to be associated with leachate derived from the imported fill material or potentially representative of regional background conditions.*

Soil contamination appears to be limited to fill materials on the site and is likely to be directly related to the blast furnace slag observed. This is not considered to represent a significant issue in isolation nor is it considered to affect the site's continued industrial use.

Elevated concentrations of Ammonia (as N) in groundwater are considered to be significant and warrant notification of the site under Section 60 of the Contaminated Land Management Act.

At this stage it is not considered that these elevated concentrations pose a risk to human health as it is highly unlikely that the groundwater is impacting on a drinking water source, however given the close proximity to surface water it is recommended that site practices are reviewed to minimise spillage of ammonium nitrate on the site and a programme of yearly groundwater monitoring should be implemented across the site to assess ammonia and nitrogen concentrations and the effect of improvements on the management of ammonium nitrate on the site.

1 INTRODUCTION

1.1 GENERAL

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by Crawfords Freightlines Pty Ltd (Crawfords) to undertake a Targeted Phase II Environmental Site Assessment (ESA) of a parcel of land located at 158 Old Maitland Road, Sandgate NSW (the subject site), formally identified as Lot 12 in Deposited Plan (DP) 625053.

This Targeted ESA is required to address the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement (EIS) for an Ammonium Nitrate Distribution and Storage Facility to continue operations at the site.

The site is currently owned by Sierra Sun Pty Limited, with portions of the site either currently or historically leased to third parties for land-use under the current zoning (4(b) Port and Industry Zone). This investigation refers to the parcel of land within Lot 12 DP625053 currently leased to Crawfords Frieghtlines as identified in *Figure 2*.

A Site Locality Map and a Site Layout Plan is presented as *Figure 1* and *Figure 2*, respectively.

1.2 OBJECTIVES

The overarching objective of the Targeted Phase II ESA completed by ERM was to identify and provide an assessment of potential liabilities in relation to key environmental issues resulting from current and historic on-site operations.

The Targeted Phase II ESA reported herein has been based upon findings from the previously completed 'Phase I' ESA (*Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012). The specific objectives of this Targeted Phase II ESA were to:

- to assess the current nature of contaminants in soils and groundwater beneath the site that maybe potentially associated with Crawfords Freightlines current and historic activities on the site only; and
- provide an understanding as to the suitability of the site for its current land use and provide a baseline for future comparison of environmental issues. From these findings, recommendations on any follow-up investigation or remedial works can be made.

1.3 SCOPE OF WORK

To achieve the project objectives the following scope of work was completed:

- review of ERM Report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate, Lot 12 DP 625053* issued in April 2012;
- underground service/cable clearance of drilling locations with the assistance of a professional service locator prior to the commencement of intrusive works;
- excavation of 14 soil bores using a combination of hand auger (Non-Destructive Drilling (NDD)) and mechanical drilling to a maximum depth of five metres below ground surface (m bgs);
- logging of lithologies by an experienced ERM field scientist at the time of drilling with soil samples collected at various depth intervals within the fill material and natural soils encountered;
- submission of up to three (3) soil samples from each borehole to Australian Laboratory Services (ALS), an environmental laboratory accredited by the National Association of Testing Authorities (NATA), for analysis based on evidence of potential contamination encountered (visual, olfactory or Photo Ionisation Detector (PID) screening results) and previous investigation findings;
- conversion of five soil bores to permanent groundwater monitoring wells;
- collection of groundwater samples from newly installed monitoring wells following well development and stabilisation of field parameters;
- surveying of newly installed monitoring wells by a registered surveyor to Australian Height Datum (AHD) and Map Grid of Australia (MGA); and
- compilation of Targeted ESA report to enable conclusions to be drawn regarding the nature and extent of contamination to soil and groundwater.

1.4 LIMITATIONS ON THE USE OF THIS REPORT

The findings of this report are based on the scope of work outlined in the applicable sections of this report. ERM performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental profession. No warranties express or implied, are made.

Subject to the scope of work, ERM's assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not evaluate structural conditions of any buildings on the subject property, nor any other issues. Although normal standards of professional practice have been applied, the absence of any identified

hazardous or toxic materials on the subject property should not be interpreted as a guarantee that such materials do not exist on the site.

This assessment is based on site inspection conducted by ERM personnel, sampling and analyses described in the report, and information provided by the property owner or other people with knowledge of site conditions. All conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved with the project and, while normal checking of the accuracy of data has been conducted, ERM assumes no responsibility or liability for errors in data obtained from regulatory agencies or any other external sources, nor from occurrences outside the scope of this project.

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2 BACKGROUND

2.1 SITE DESCRIPTION

The subject site is located at 158 Old Maitland Road, Sandgate NSW approximately 11km west of Newcastle's CBD and falls under the jurisdiction of Newcastle City Council. A plan showing the location of the site is presented as *Figure 1*.

The site occupies a total area of 87,700 m^2, of which, 3,197 m^2 is currently leased by Scafflink Australia and 8,940 m^2, being Shed "A" and Shed "B". Shed "A" and Shed "B" have been previously leased by Impact Fertilisers as a storage facility for general fertiliser. The remaining area is leased to Crawfords Freightlines for the primary purpose of ammonium nitrate storage and distribution. Subsidiary storage products include aluminium, timber and heavy mining plant.

The site appears to have received large volumes of imported fill to raise, level and stabilise the ground surface conditions prior to and during construction of the facility.

A comprehensive site description can be found within ERM report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012.

2.2 SITE HISTORY

Over time, sections of the site have been leased to third parties for a range of commercial/industrial uses other than storage of ammonium nitrate. A detailed review of the site history is provided within ERM Report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012.

2.3 REVIEW OF HISTORICAL INVESTIGATIONS

According to the planning certificate provided by Newcastle City Council, Section 149 (2) and (5) of the Environmental Planning and Assessment Act 1979, three previous environmental investigations have been completed for the site and are listed below:

- *Plan of Management for the Toll Bulk Services Site Sandgate, prepared for North Mining Ltd, ERA Environmental Services Pty. Ltd (October 1994)*;
- *Soil Sampling and Analysis of the Toll Bulk Services Site at Sandgate for Peko Wallsend Operations Ltd., Enviromet (January 1993)*; and

- *Soil Sampling and Analysis of the Toll Bulk Services Site at Sandgate for Peko Wallsend Operations Ltd., Enviromet (April 1992).*

The abovementioned reports are available for viewing at the Newcastle City Council administration centre however due to the age, only limited information was considered reliable and relevant for use in this report.

2.4 ENVIRONMENTAL SETTING

2.4.1 Surrounding Land Uses

Land use surrounding the site is summarised below:

North: A portion of land owned by Sierra Sun Pty Limited which currently stores stockpiled magnetite, formally identified as Lot 22 in DP 627724. Beyond this parcel of land is Sibelco Australia (Industrial) approximately 200m north of the subject site.

Northeast: Located immediately to the northeast is swamp/wetland currently occupied by the 2HD Broadcasters transmission tower. At the time of the ESA, the majority of this area was covered by standing water.

West: Immediately west of the site is the Great Northern Railway followed by Newcastle Golf Practice Centre, a former Newcastle Council Landfill site commonly known as Astra Street Landfill, Shortland.

Southeast: Directly to the southeast is the Shortland to Sandgate Bypass under construction. Sandgate Cemetery is directly adjacent approximately 100 metres from the site.

The location and general layout of the surrounding land-use practices is presented in *Figure 2.*

2.4.2 Potentially Sensitive Surrounding Land Use

Beyond the site boundaries, potentially sensitive receptors include the surrounding wetland area located immediately adjacent to the northeast and west. These standing water bodies are considered tributaries to the surrounding swamp/wetland area.

2.4.3 Topography

The site and the immediate surrounding industrial area is located within the low lying Hexham Swamp soil landscape and according to the *Beresfield* 1:25,000 topographic map (9232-3N, 2001); elevation of the site is less than 10m AHD.

2.4.4 Hydrology

The site is located within the Hexham Swamp soil landscape and is surrounded by standing water bodies directly to the northeast and west, and is considered a tributary of the surrounding swamp area. The Southern Channel of the Hunter River located approximately 700m to the northeast and Ironbark Creek located approximately 400m to the west. Both Rivers experience tidal fluctuations and are used for limited boating and recreational activities.

For the site in general, the surface has been reshaped over time with the use of fill, to provide a relatively level and trafficable site. Surface water and runoff is directed towards the drainage network to the west of the site.

2.4.5 Geology

Regional Geology

Based on the *Newcastle 1:100 000 Geological Sheet 9232* (1995), the site is located on both Hexham Swamp (hs) and Disturbed Terrain (xx) soil landscapes of primarily fill material underlain by quaternary estuarine/lacustrine sediments; silts and clays.

Site Geology

The specific geology beneath the site, based on interpretation of soil bore log data obtained during this investigation consisted of surface coverings (asphalt, gravel and topsoil) underlain by fill materials to an approximate depth of 2.0 m bgl. This material is described as a highly compacted mixture of silt, clay and gravel, with localised areas of slag and concrete with a maximum reported thickness of 2.1m bgl.

Directly beneath the surface coverings, the geology comprised of black and dark grey clay generally to 2.5m bgl followed by clayey sand with occasional shell fragments to borehole completion.

Soil borelogs are provided within *Annex C*.

2.4.6 Hydrogeology

Given the broad estuarine plain of the site and surrounds, site hydrogeology is considered complex as the wetland maintains a permanent watertable which is generally less than 1m below the ground surface and rises to the surface during wet seasons (*Soil Landscapes of the Newcastle 1:100 000 Geological Sheet 9232* (1995)).

For the site in general, the surface has been reshaped over time with the use of fill material, to provide a relatively level and trafficable area. Groundwater is understood to exist as a shallow unconfined water zone within the fill material and estuarine sediments at depths between 1-3m bgl. The hydraulic gradient across the site is inferred to be towards Ironbark Creek, approximately 400m to the west - northwest.

3 DATA QUALITY OBJECTIVES

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the objectives outlined herein. The DQOs were selected with reference to relevant guidelines published by the NSW Environment Protection Authority (EPA), Australian and New Zealand Environment and Conservation Council (ANZECC) and National Environment Protection Council (NEPC), which define minimum data requirements and quality control procedures.

The DQOs were prepared in line with the DQO process outlined in NSW Department of Environment and Conservation (DEC) (2006) *Guidelines for the NSW Site Auditor Scheme - 2nd Edition*. The seven-step DQO approach identified in NSW DEC (2006) is described in the following sections.

3.1 OBJECTIVE

The overall objective of Targeted Phase II ESA is to provide an assessment of potential liabilities in relation to key environmental issues resulting from current and historic on-site operations, such that potentially significant environmental liabilities are identified.

This investigation is obligatory as part of NSW Planning and Infrastructure's delivery to address the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Impact Statement (EIS) for the Ammonium Nitrate Distribution and Storage Facility to continue operations at the site.

3.2 DECISION

The principal decision to be made with respect to the investigation is to determine whether contamination exists as a result of Crawfords Freightlines current and historic operations at the site.

Factors to be considered in achieving this objective include the following:

- selection of applicable soil and groundwater quality criteria based upon the current land use;
- identification of appropriate sampling locations and sampling densities;
- identification of contaminants of potential concern (COPCs); and
- definition of the nature and extent of contamination.

3.3 *INPUTS*

The inputs required to make the above decisions are as follows:

- historical and current land use/s;
- observations and findings from ERM report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012;
- direct measurement of environmental variables including soil type, olfactory observations, staining, water strike and groundwater level;
- laboratory measurements of soil and groundwater samples for one or more of the COPCs;
- field and laboratory quality assurance/quality control data (please refer to *Section 8*); and
- the relevant soil and water quality screening criteria.

3.4 *STUDY BOUNDARIES*

The investigation was limited spatially to the Crawfords Freightlines leased area within Lot 12 in DP 625053 as defined on *Figure 2.*

Potential issues which may present limitations to the delivery of the Phase II ESA works can be summarised as follows:

- location of underground/overground services or infrastructure; and
- location of buildings or highly trafficked areas.

3.5 *DECISION RULE*

Assessment Criteria

Appropriate assessment criteria for screening of the soil and groundwater data will be adopted with consideration of Australian guidelines and the most recent Australian risk assessment guidance. A detailed review of assessment criteria is presented within *Section 7.1*.

3.6 LIMITS ON DECISION ERRORS

The acceptable limits on decision errors to be applied during the review of the results will be based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness (PARCC) in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999, *Schedule B (3) - Guidelines on Laboratory Analysis.*

The potential for significant decision errors are to be minimised by:

- completing a robust Quality Assurance/Quality Control (QA/QC) assessment of the validation data and application of the probability that 95% of data will satisfy the DQIs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect;

- assessing whether appropriate sampling and analytical density for the purposes of targeted environmental characterisation (nature and extent of impact); and

- ensuring the screening criteria set for the works is appropriate for the proposed use of the site.

The potential for significant decision errors are to be minimised by completing a robust QA/QC program and by completing an investigation program that has an appropriate sampling and analytical density for the purposes of the assessment works and that the representative sampling is undertaken.

3.7 SAMPLING DESIGN

The sampling guidelines for this investigation were developed based on a Phase I desktop review, review of existing data and a review of NSW Environment Protection Authority (EPA) (1997) *Guidelines for Consultants Reporting on Contaminated Sites*. When data gathered during this assessment indicated that the objectives were not being met, the sampling design (including sampling pattern, type of samples and analytes) was adjusted accordingly.

4 INVESTIGATION METHODOLOGY

4.1 SOIL BORE INVESTIGATION

Fourteen soil bores were advanced in accordance with ERM Standard Operating Procedures (SOPs) using the following general methodology:

- all locations were cleared for the presence of underground services by Hunter Smith Management Pty Ltd, a specialist service location subcontractor, using a Cable Avoidance Tool (CAT) and Ground Penetrating Radar (GPR);
- soil bores were initially cored to penetrate either asphalt/concrete hardstand, if present;
- soil bores were manually cleared for the presence of potential underground services using a hand auger. Where possible, boreholes were cleared to a minimum depth of 1.3m bgl in accordance with ERM's Global Sub-surface Clearance Policy;
- a Geoprobe drilling rig, operated by Rockwell Drilling Services, was mobilised to the site and advanced the soil bores to the target depths using a combination of 50mm diameter hydraulic push tube and 100mm solid flight augers. The specific drilling techniques utilised at each borehole and monitoring well are presented in the borelogs provided in *Annex C*;
- soil samples were collected in accordance with techniques described in Australian Standard AS4482.2 to maintain the representativeness and integrity of the samples. All samples were either collected from the outside of the augers during hand augering or directly from the push tube core;
- representative soil samples were collected from each soil bore and test pit at significant soil horizons and/or evidence of contamination;
- each soil bore was logged by an experienced scientist to record the following information: soil type, colour, grain size, sorting, angularity, inclusions, moisture condition, structure, defects, staining and odour in general accordance with ASTM D2488-00 and ASTM D2487-06; and
- to minimise cross contamination between sampling locations, non-disposable down-hole drilling equipment was decontaminated prior to the commencement of drilling and between drilling locations.

Borehole locations are presented on *Figure 2*. The borehole and monitoring well location rationale is detailed in *Annex G*.

4.1.1 Field Screening

A duplicate of each soil sample submitted to the laboratory was screened on site for the presence of volatile contaminants using visual and olfactory methods and using a calibrated PID fitted with a -10.6 eV lamp. The PID was calibrated at the beginning of each working day using isobutylene gas at a concentration of 100ppm, with calibration certificates attached in *Annex B*. PID screening results are presented within the borelogs in *Annex C*.

For PID screening, duplicate soil samples were placed in snap lock bags immediately after collection and sealed. The soil was crumbled within the bag to promote volatilisation and then left to sit for several minutes prior to obtaining a reading. A reading was taken by punching a small hole in the bag, placing the tip of the PID into the bag, sealing with the fingers and recording the maximum concentration observed. Where the presence of VOCs or other impact was suspected, additional laboratory analysis was typically undertaken to quantify the concentrations of contaminants present.

4.1.2 Soil Sampling Protocol

Soil samples were collected for laboratory analysis at selected locations based on visual and olfactory evidence of the following:

- multiple layers of fill material;
- changes in the soil profile; and
- evidence of contamination.

Pre-treated laboratory supplied sample containers were filled, where practical, to minimise headspace, before being sealed and appropriately labelled. Labels included the following information:

- sample identification number and depth;
- ERM project number;
- date of collection; and
- sampler.

Sample jars were sealed and immediately placed in an insulated cooler, on ice, and stored to minimise potential loss or degradation. Samples were shipped under chain of custody documentation to ALS Environmental Pty Ltd (ALS).

4.2 GROUNDWATER MONITORING WELL INVESTIGATION AND GROUNDWATER SAMPLING

Five of the fourteen boreholes were specifically drilled for the installation of monitoring wells. All monitoring wells were installed in accordance with ERM Standard Operating Procedures (SOPs) using the following general methodology.

4.2.1 *Monitoring Well Construction*

All monitoring wells were installed in accordance with the procedures described below:

- wells were constructed of 50mm diameter, threaded factory slotted screen (0.4 mm slots) and blank unplasticised Polyvinyl Chloride (uPVC) well materials. The wells were screened within groundwater bearing strata and were constructed, where practicable, to allow the ingress of any phase separated hydrocarbon (PSH) which may be present. The wells were generally screened over approximately 3.0m from 0.5m above the water strike (where possible), based on field observations;

- following drilling, the well casing and screen were inserted into the borehole. Washed and graded filter sand was then poured into the annulus between the well screen and borehole wall, ensuring that the sand covered the entire screened level and extended approximately 0.5 metres above the top of the well screen;

- bentonite pellets were then inserted above the sand to an approximate thickness of 0.5m and hydrated to effectively seal off the well from surface water or perched / shallow groundwater inflows; and

- each well was surface sealed with concrete and either a monument/stand pipe or heavy duty road box mounted flush with the ground surface. The well casing was sealed with air-tight, plastic, lockable well caps.

Following well installation, each well was developed by pumping at least 10 well volumes (where possible) of groundwater to remove fine materials or contaminants potentially introduced during drilling. Wells were considered developed when either a minimum of 10 well volumes were removed or if the well was purged dry prior to this. Where insufficient well volumes were obtained due to low recharge, all attempts were made to remove fines and construction material by purging the well over several events to allow for recharge.

Monitoring well construction details are presented on the borehole logs in *Annex C*.

4.2.2 *Groundwater Purging and Sampling Protocol*

Groundwater purging and sampling was carried out on 14 May 2012. Prior to purging, all wells were dipped to accurately gauge the depth of groundwater across the site. Wells were purged using a peristaltic pump, under low flow sampling techniques to facilitate collection of samples representative of surrounding aquifer conditions. The wells were purged until sufficient water had been removed to obtain stabilised readings of pH, conductivity, redox potential, temperature and dissolved oxygen, using a water quality meter. Groundwater samples were then collected using equipment dedicated to each soil bore to eliminate the potential for cross-contamination between sample locations.

During sample collection and equipment decontamination, disposable nitrile gloves were used to prevent dermal contact with dissolved COPCs. The following order of sampling was adopted:

- samples to be analysed for volatile compounds were placed into 40mL vials, ensuring no headspace is left in the vial;
- samples to be analysed for semi-volatile compounds were placed in 250ml solvent washed amber bottles;
- samples to be analysed for metals were filtered through disposable stericups containing 0.45 micron filters and placed in 60ml plastic bottles washed in "clean room" conditions and preserved with laboratory grade nitric acid; and
- samples to be analysed for ammonia and nitrogen (total oxidised) were placed into 200 millilitre plastic bottles preserved with laboratory grade sulphuric acid.

Sample jars were sealed and immediately placed in a cooler on ice to minimise degradation of organic compounds. Samples were shipped under chain of custody documentation to ALS, a NATA accredited analytical laboratory.

4.2.3 *Survey*

All groundwater monitoring wells were surveyed to Australian Height Datum (AHD) for elevation and Map Grid of Australia (MGA) coordinates by Parker Scanlon Pty Ltd. The elevation of the highest point of the top of the uPVC casing was measured to allow for appropriate groundwater elevation calculations and accurate groundwater flow direction interpretations.

The survey report is attached as *Annex F*.

5 LABORATORY ANALYSIS

Laboratories used for the investigations are NATA accredited for the analytical methods required. The primary laboratory used for soil and groundwater analysis was ALS (NATA registration number: 13542 (Sydney)).

The analytical methods used by each laboratory are provided in the laboratory certificates in *Annex F*.

5.1 SOIL LABORATORY ANALYSIS

Soil samples, including QC samples, were analysed by ALS.

Soil samples were analysed for a range of the following COCs:

- Ammonia;
- Nitrogen (total oxidised) including nitrate and nitrite;
- TRH ;
- BTEX;
- Metals – As, Hg, Cd, Cr, Cu, Pb, Ni and Zn;
- PAHs;
- Phenols;
- Polychlorinated biphenyls (PCBs), organo-phosphate pestices(OPPs) and organo-chlorine(OCPs);
- Acid Sulphate Soil Screen; and
- Asbestos.

The number of soils analysed for each is summarised in *Table 5.1* below.

Table 5.1 Number of Soils Samples Analysed

Analysis Type	No. Primary Samples	No. Duplicate Samples
Ammonia	23	3 Intra-laboratory Duplicates
Nitrogen (total oxidised)	23	3 Intra-laboratory Duplicates
TRH	6	1 Intra-laboratory Duplicate
BTEX	6	1 Intra-laboratory Duplicate
Metals	5	No duplicates
PAHs and Phenols	5	No duplicates
PCBs, OPs and OCs	4	No duplicates
Acid Sulphate Soil Screen	7	No duplicates
Asbestos	2	No duplicates

5.2 GROUNDWATER LABORATORY ANALYSIS

Groundwater samples, including QC samples, were analysed by ALS.

Groundwater samples were analysed for a range of the following COCs:

- Ammonia;
- Nitrogen (total oxidised) including nitrate and nitrite;
- TRH;
- BTEX;
- Dissolved metals - As, Hg, Cd, Cr, Cu, Pb, Ni and Zn;
- PAHs;
- Phenols; and
- PCBs, OPPs and OCPs.

The number of groundwater samples analysed is summarised in *Table 5.2* below.

Table 5.2 Number of Groundwater Samples Analysed

Analysis Type	No. Primary Samples	No. Duplicate Samples
Ammonia	5	1 Intra-laboratory Duplicates
Nitrogen (total oxidised)	5	1 Intra-laboratory Duplicates
TRH	5	1 Intra-laboratory Duplicates
BTEX	5	1 Intra-laboratory Duplicates
Metals	5	1 Intra-laboratory Duplicates
PAHs and Phenols	5	1 Intra-laboratory Duplicates
PCBs, OPs and OCs	5	1 Intra-laboratory Duplicates

6 FIELD RESULTS

6.1 FIELD LITHOLOGY DESCRIPTIONS

The following is a generalised summary of the soil and geology of the subsurface based on the field work completed. Detailed borelogs are included in *Annex C*.

Table 6.1 Lithology Encountered On Site

Lithological Unit	Description	Depth (mbgl)
Asphalt		~0 – 0.1
Fill	Sandy Silty Gravel, grey, dry – damp, loose, fine grained – coarse gravel, poorly sorted, sub-rounded – sub-angular. Highly compacted fill material.	~0.1 – 2.0
Clay	Dark grey – black, moist, very soft, non-plastic, homogenous.	~2.0 – 2.5
Clayey Sand	Grey, moist – saturated, dense, fine grained, well sorted.	~2.5 – 5.0

6.1.1 *Groundwater Monitoring*

The field parameters and observations made during groundwater monitoring have been compiled and are provided within *Groundwater – Well Sampling Data Forms* of *Annex B*.

6.2 HYDROGEOLOGY

The groundwater levels measured on site during groundwater monitoring are presented in *Table 3*. During drilling, groundwater was encountered between 0.5 – 2.2m bgs, however it was difficult to obtain an accurate water strike. Generally, it was noted to have been between sandy lenses within the fill and estuarine units. Once wells were installed, the water levels across the site stabilised to between 1.0 to 2.3m bgs.

It was found that the groundwater flows generally according to the site's topography, toward the west in the direction of the adjacent standing water body and Ironbark Creek to the northwest.

7 LABORATORY RESULTS

7.1 SCREENING CRITERIA USED FOR ASSESSMENT OF SOIL AND GROUNDWATER RESULTS

As presented in *Tables 5a* to *10*, the soil and groundwater assessment criteria used to evaluate the results in this investigation considered the current commercial/industrial land use of the site.

Potential sensitive receptors within the vicinity of the site have been identified as on- and off-site commercial works. There are no registered groundwater bores within a one kilometre radius of the site, as identified in ERM report, *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012.

The screening assessment assumed no future groundwater use, potable or non-potable, since groundwater would not likely be used for drinking water given its natural background quality (eg, brackish, high TDS concentrations) and likely low yields.

The Tier 1 screening criteria applied to the soil data is as follows:

- Cooperative Research Centre for Contaminant Assessment and Remediation of the Environment (CRC CARE) Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater (Friebel and Nadebaum 2011);
- NEPM (1999) - Assessment of Site Contamination, Schedule B (1) - Guideline on the Investigation Levels for Soil and Groundwater, Soil Health Investigation Levels for commercial/industrial land (HIL F); and
- New South Wales Environmental Protection Agency (NSW EPA), Contaminated Sites Guidelines for Assessing Service Station Sites – Threshold Concentrations for Sensitive Land Use (Protection of Human Health).

The Tier 1 screening criteria applied to groundwater data is as follows:

- CRC CARE Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater (Friebel and Nadebaum 2011); and
- ANZECC/ARMCANZ, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (ANZECC 2000).

7.2 SOIL RESULTS

As discussed in *Section 5.1*, a total of 23 soil samples were analysed from the 14 soil bores locations across the investigation area with analytical results and comparisons to the adopted screening criteria presented in *Tables 5a* to *7*. Laboratory acid sulphate soil field screening results including chain of custody documentation are presented within the certified laboratory reports supplied in *Annex E*.

A summary of reported concentrations of ammonia as N, nitrate (as N), nitrite (as N) and nitrogen (total oxidised) are presented in *Figure 5*, with specific locations of exceedances of the adopted screening criteria presented below:

- BH07_0.4 for arsenic (Ecological screening criteria);
- BH10_0.4 for lead and zinc (Ecological screening criteria);
- MW01_0.5 for lead (HIL F);
- MW01_0.5 for lead, arsenic, cadmium, copper, mercury, nickel and zinc (Ecological screening criteria);
- BH08_1.2 for arsenic (Ecological screening criteria);
- BH04_0.1 for benzo(a)pyrene, benzo(a)anthracene, chrysene, dizenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and sum of PAHs (HIL F); and
- MW03_0.15 for benzo(a)pyrene, benzo(a)anthracene, dizenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and sum of PAHs (HIL F).

Acid sulphate soil analysis indicates that potential acid sulphate soils (PASS) exist in-situ.

7.3 GROUNDWATER RESULTS

Data from five groundwater monitoring wells were used in this assessment with analytical results and comparisons to the adopted screening criteria presented in *Tables 8* to *10*. Groundwater samples were submitted to ALS with chain of custody documentation and certified analytical laboratory reports supplied in *Annex F*.

A summary of reported concentrations of ammonia as N, nitrate (as N), nitrite (as N) and nitrogen (total oxidised) is presented in *Figure 6*, with specific locations of exceedances of the adopted screening criteria presented below:

- MW02 for Ammonia as N (Ecological screening criteria);
- MW03 for Ammonia as N (Ecological screening criteria);
- MW04 for Ammonia as N (Ecological screening criteria);
- MW01 for cadmium (Human health screening criteria);
- MW01 for copper and zinc (Ecological screening criteria);
- MW03 for zinc (Ecological screening criteria);
- MW05 for arsenic (Human Health screening criteria);
- MW05 for copper and zinc (Ecological screening criteria); and
- MW04 for benzo(a)pyrene (Human Health screening criteria).

8 QUALITY ASSURANCE AND QUALITY CONTROL

8.1 FIELD QUALITY CONTROL RESULTS

To ensure that soil and groundwater analytical results are representative of actual field conditions, the accuracy and precision of laboratory QC results are measured by percentage recovery and relative percentage difference (RPD), respectively. The following quality control (QC) sampling procedures were followed and results included in *Annex E*:

- equipment blanks (or rinsate blanks): comprising of deionised water collected from either the sampling tool during drilling or the interface probe during groundwater sampling following decontamination to ensure the quality of decontamination procedures and to avoid cross contamination between sample points. Rinsate blanks were reported as non-detect with the exception of either Ammonia as N, Nitrate (as N) or Nitrogen (Total Oxidised) in R_070512_01, R080512_01 and R140512_01 (*Table 14*). These exceptions were at or near the LOR for their respective analytes and are therefore not considered significant. As such, systematic cross contamination between sampling locations is not considered to be an issue and does not affect the integrity of the data set or findings of this assessment;

- RPDs generated between the field duplicate samples and the primary samples for groundwater reported one result outside the acceptable range (*Table 12*). Field duplicate samples for soil reported seven instances where results exceeded the acceptable range *(Table 11).* Generally, the results indicate good laboratory precision. The recorded out-of-range RPD values for soil are likely a result of the highly heterogeneous nature of the fill material on site and are not considered significant. Soil samples within the fill material were not homogenised prior to splitting to minimise loss of volatile analytes;

- trip blanks: trip blanks were provided by the laboratory to accompany the samples to monitor potential ingress of volatiles into a sample during transport. There were no positive results for the trip blanks, therefore no evidence for ingress of volatiles during transport (*Tables 13* and *14)*; and

- trip spikes: trip spikes were provided by the laboratory to accompany the samples to avoid loss of volatiles during transport. Trip spikes were within acceptance criteria, providing evidence that no unacceptable analyte loss or gain had occurred (refer to laboratory certificates located in *Annex E*).

Samples were collected, handled and transported in accordance with ERM's standard operating procedures.

In summary, ERM considers that the field QC results are acceptable for the purposes of this investigation.

8.2 *LABORATORY QUALITY CONTROL*

Laboratory QC analytical results are summarised below:

- percentage recovery results for matrix spikes, matrix spike duplicates, laboratory control samples and surrogates were within the acceptable range defined by the laboratory; and

- laboratory internal standards, calibration blanks and mid-range calibration have been performed within acceptable limits defined by the laboratory.

In summary, ERM considers that the laboratory QC results are acceptable for the purposes of this investigation. Laboratory validation documentation is included in *Annex E*.

9 DISCUSSION

9.1 IDENTIFIED SOIL CONTAMINATION

A summary of the laboratory analysis completed on samples collected from the 14 investigation locations advanced during this ESA is provided in *Section 7.2*. A summary for all analytical soil results, including total number of samples analysed for each constituent, total number of detections, total number of screening criteria exceedances, and maximum concentrations reported, is supplied within *Tables 5a* to *7*, with results illustrated in *Figure 5*.

Ammonia (as N) and Nitrogen (Total Oxidised)

There are currently no published guidelines for ammonia and nitrogen in soils however, maximum reported concentrations of ammonia (as N) were reported within the fill material of BH10 (130mg/kg), located within the area on the mechanic workshop and MW02 (110mg/kg), located within the area of a reported historical release as a result of Impact Fertilizer's operations.

Concentrations of Nitrogen (Total Oxidised) was reported above the laboratory LOR in all sampling locations on site with the exception of one isolated location (BH05), located within the timber storage yard. The highest reported concentrations were noted to be within the current ammonium nitrate storage and handling yard south of Shed 'B', being MW02 (510mg/kg) and MW04 (108mg/kg).

Petroleum Hydrocarbons and Polycyclic Aromatic Hydrocarbons

The analytical data indicates that soil contamination relating to petroleum hydrocarbon sources, as defined by concentrations exceeding commercial screening criteria are limited to the fill materials likely used to raise the site above standing water level during construction.

Exceedances of the adopted commercial screening criteria were reported for benzo(a)pyrene, benzo(a)anthracene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and sum of PAHs in MW03 and BH04, and chrysene in BH04, both investigation locations are located in the north of the site. Following interpretation of field observations and laboratory data, the fill material used to raise the site in the north during construction is indicative of slag material.

Metals

Exceedances of the adopted commercial screening criteria were reported for lead (1970mg/kg) in MW01 at a depth of 0.5m bgs. Concentrations exceeding the adopted ecological screening criteria were reported for lead, arsenic, cadmium, copper, mercury, nickel and zinc in isolated locations within the imported fill materials on site.

Other COPCs

Concentrations of PCBs, OPPs and OCPs were reported below the laboratory LOR in all samples analysed.

Asbestos was suspected within boreholes of two locations during field works however laboratory analysis reported non detect.

9.2 *IDENTIFIED GROUNDWATER CONTAMINATION*

A summary of the laboratory analysis completed on groundwater samples collected from the five monitoring wells sampled as part of this ESA is provided in *Section 7.3*. A summary for all analytical groundwater results, including total number of samples analysed for each constituent, total number of detections, total number of screening criteria exceedances, and maximum concentrations reported, is supplied within *Tables 9* and *10*, with results illustrated in *Figure 6*.

Ammonia (as N) and Nitrogen (Total Oxidised)

Analytical groundwater concentrations for Ammonia (as N) were consistently encountered at all locations across the site above the LOR. Elevated concentrations of ammonia, exceeding the screening criteria were reported for MW02 (16,400µg/L), MW03 (1,280µg/L) and MW04 (4,620µg/L) located within areas of current and historic ammonium nitrate storage areas. Following findings from ERM report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW* issued in April 2012, MW02 was installed to target reported historical spills associated with the former Impact Fertiliser's operations in Shed 'B'.

Petroleum Hydrocarbons and Polycyclic Aromatic Hydrocarbons

Exceedances of the adopted human health screening criteria were reported for benzo(a)pyrene in MW04 with a concentration of 0.5µg/L which is at the laboratory LOR.

Analytical results for TRH, BTEX and PAHs (sum of) have been reported below the adopted human health or ecological screening criteria in all monitoring wells sampled on site.

Metals

Dissolved concentrations of either arsenic, cadmium, copper or zinc above the adopted screening criteria have been reported in monitoring wells, MW01, MW03 and MW05 across the site. Due to distribution of heavy metals, the source is thought to be associated with leachate derived from the imported fill material or potentially representative of regional background conditions.

Other COPCs

Concentrations of PCBs, OPPs and OCPs were reported below the laboratory LOR in all samples analysed.

10 CONCLUSIONS

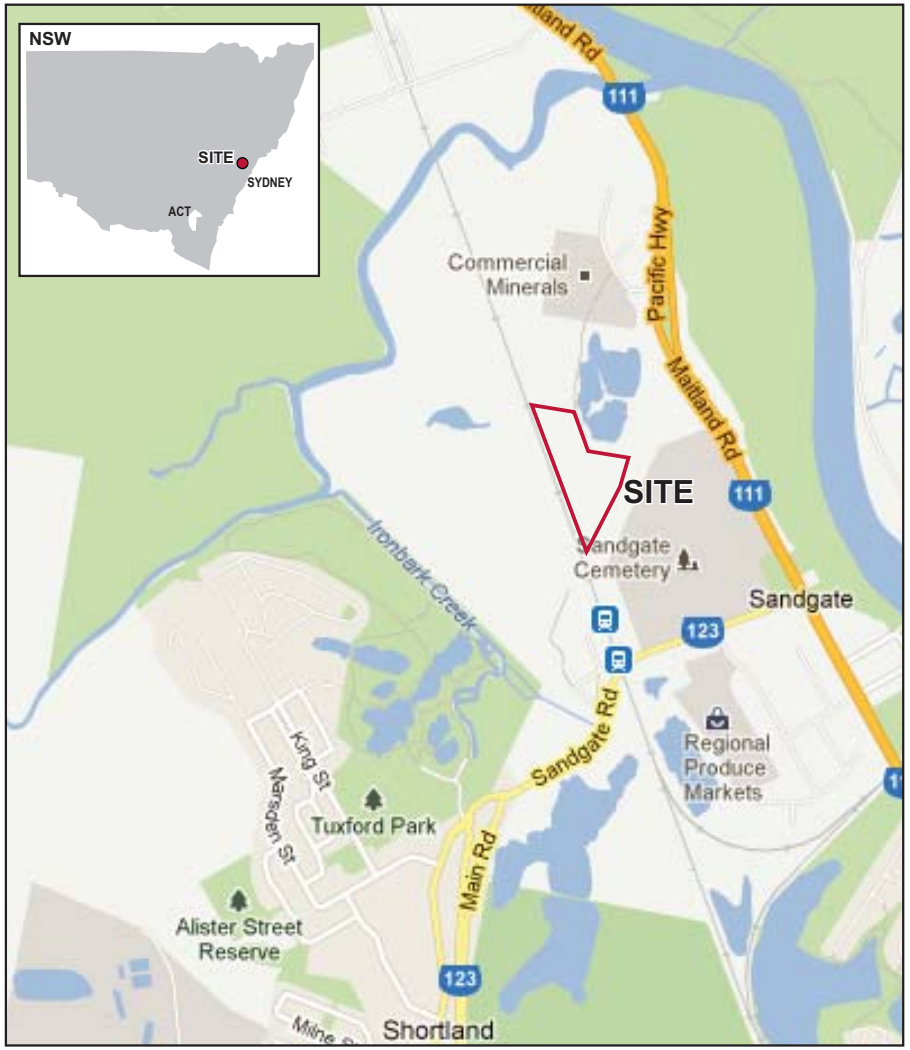
Based on the results of the Targeted ESA, it is considered that the overall objectives of the scope of work have been met, and a better understanding of the nature and extent of contamination has been established. In conclusion, the completed works have confirmed the following:

- a relatively consistent soil profile was identified across the investigation area, consisting of up to 2m of fill material underlain by sands and clay;
- groundwater beneath the site was observed to be present as a shallow unconfined water zone within the fill material and estuarine sediments at depths between 1.0 – 2.3m bgs;
- Acid sulphate soil analysis indicates that potential acid sulphate soils (PASS) exist in-situ. Further analysis and management of soils at the site is required if excavation of natural estuarine sediments is to occur;
- soil results indicated elevated concentrations and commercial screening level exceedances, with conclusions drawn on the nature and extent of soil contamination as follows:
    - elevated ammonia and nitrogen concentrations are present in areas of current and/or historical ammonium nitrate handling and storage;
    - elevated concentrations of PAHs and metals are present within the fill material and are more prominent in the north of the site. This is likely a result of imported filling material used to raise the site during construction and is not considered to be related to Crawfords Freightlines current or historic operations.
- groundwater results indicated elevated concentrations and screening level exceedances, with conclusions drawn on the nature and extent of contamination of groundwater as follows:
    - elevated concentrations of ammonia above the adopted screening criteria and nitrogen are present in areas of current and/or historical ammonium nitrate handling and storage; and
    - dissolved metals concentrations above the adopted screening criteria have been reported in three monitoring wells across the site. Due to distribution of heavy metals, the source is thought to be associated with leachate derived from the imported fill material or potentially representative of regional background conditions and is not considered to be related to Crawfords Freightlines current or historic operations.

Soil contamination appears to be limited to fill materials on the site and is likely to be directly related to the blast furnace slag observed. This is not considered to represent a significant issue in isolation nor is it considered to affect the site's continued industrial use.

Elevated concentrations of Ammonia (as N) in groundwater are considered to be significant and warrant notification of the site under Section 60 of the Contaminated Land Management Act. At this stage it is not considered that these elevated concentrations pose a risk to human health as it is highly unlikely that the groundwater is impacting on a drinking water source, however given the close proximity to surface water it is recommended that site practices are reviewed to minimise spillage of ammonium nitrate on the site and a programme of yearly groundwater monitoring should be implemented across the site to assess ammonia and nitrogen concentrations and the effect of improvements on the management of ammonium nitrate on the site.

Figures



Legend

Site Boundary

N

Source:

© 2010 Google Earth, © 2010 Google Maps

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Drawing No:	0143175h_PHII_ESA_C001_R0.cdr		
Date:	24/05/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: DW	

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

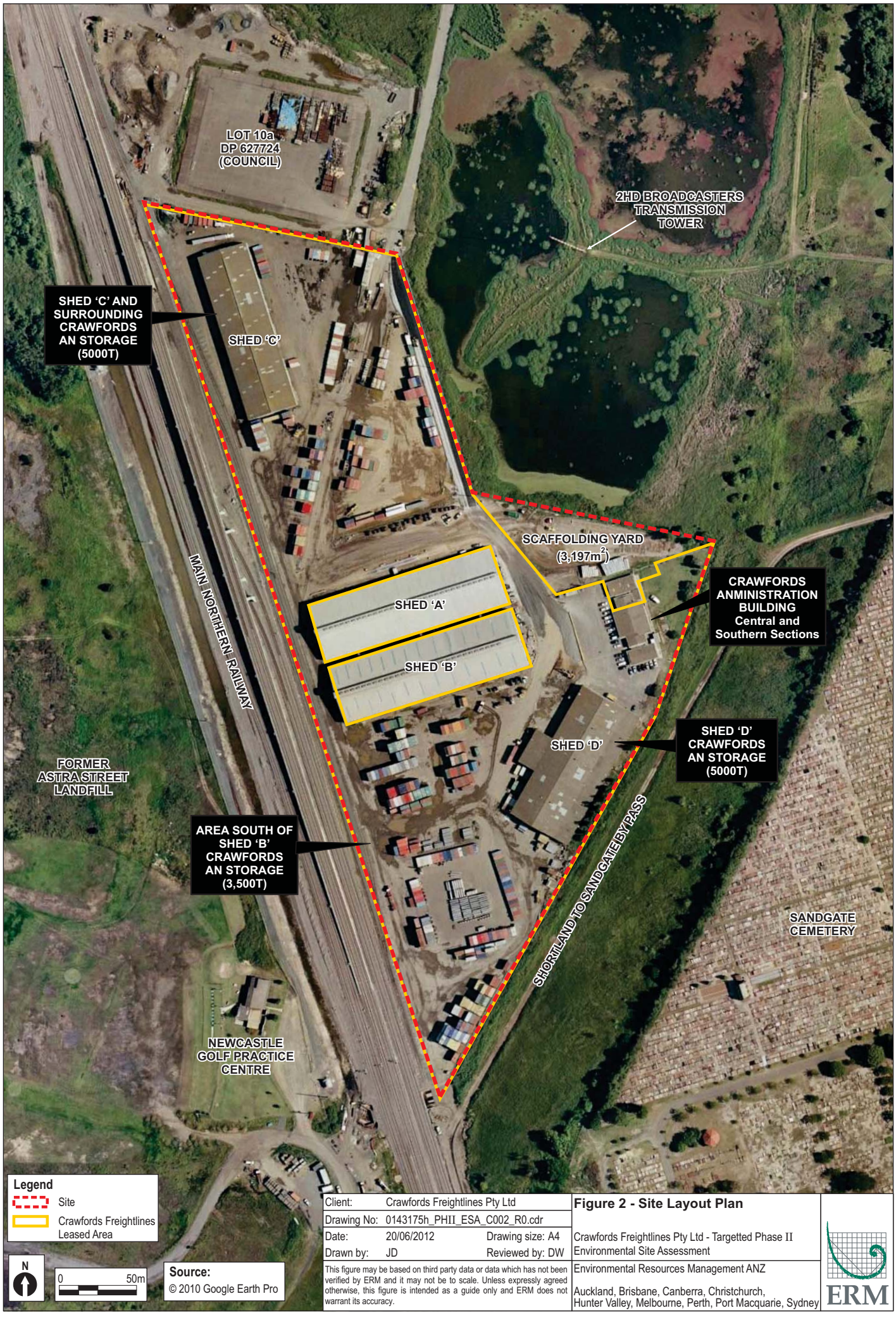
Figure 1 - Site Locality Plan

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

Environmental Resources Management ANZ

Auckland, Brisbane, Canberra, Christchurch, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

ERM



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Date:	20/06/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: DW	

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 2 - Site Layout Plan

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

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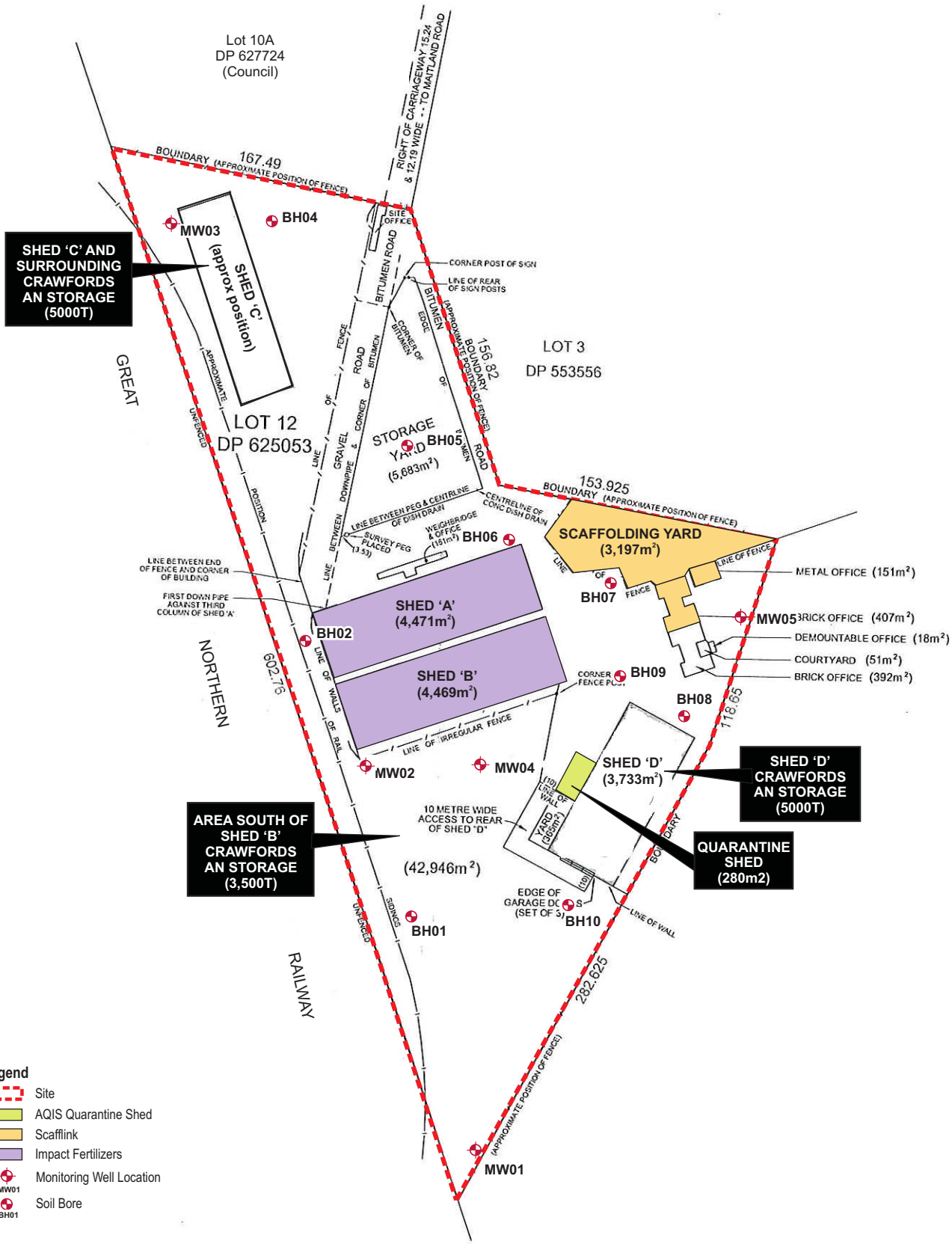

Legend

- Site
- AQIS Quarantine Shed
- Scafflink
- Impact Fertilizers
- MW01 Monitoring Well Location
- BH01 Soil Bore

Notes:

1. This plan should not be used for critical design dimensions.

N

0 50m

Source:
Harper Somers O'Sullivan
Ref 24353

Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_PHII_ESA_C003_R0.cdr		
Date:	30/05/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: DW	

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 3 - Site Features Plan

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

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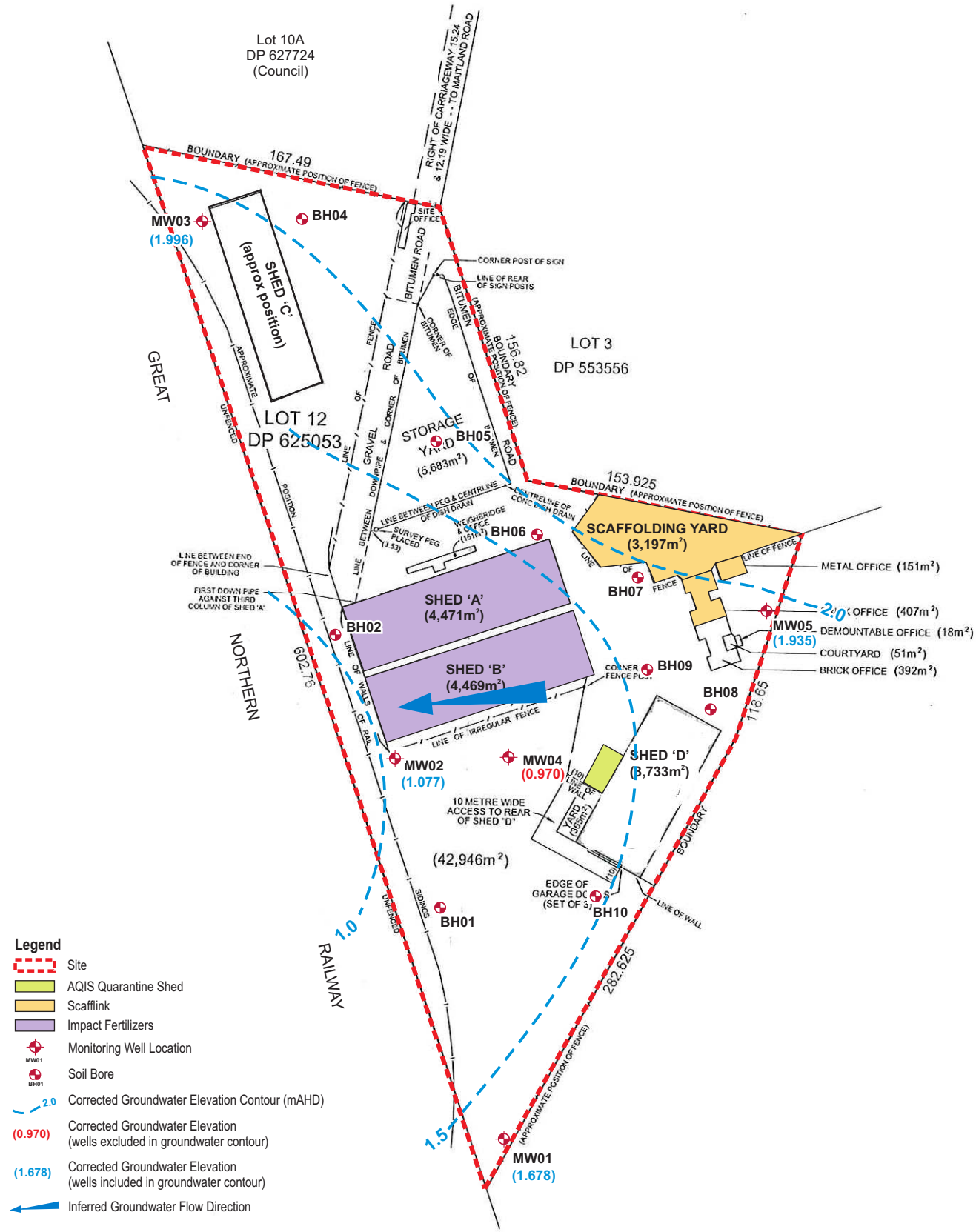

Legend

- Site
- AQIS Quarantine Shed
- Scafflink
- Impact Fertilizers
- MW01 — Monitoring Well Location
- BH01 — Soil Bore
- 2.0 — Corrected Groundwater Elevation Contour (mAHD)
- (0.970) — Corrected Groundwater Elevation (wells excluded in groundwater contour)
- (1.678) — Corrected Groundwater Elevation (wells included in groundwater contour)
- Inferred Groundwater Flow Direction

Notes:

1. This plan should not be used for critical design dimensions.

N

0 50m

Source:
Harper Somers O'Sullivan
Ref 24353

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Drawn by:	JD	Reviewed by: DW	

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Figure 4 - Hydrogeological Information

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

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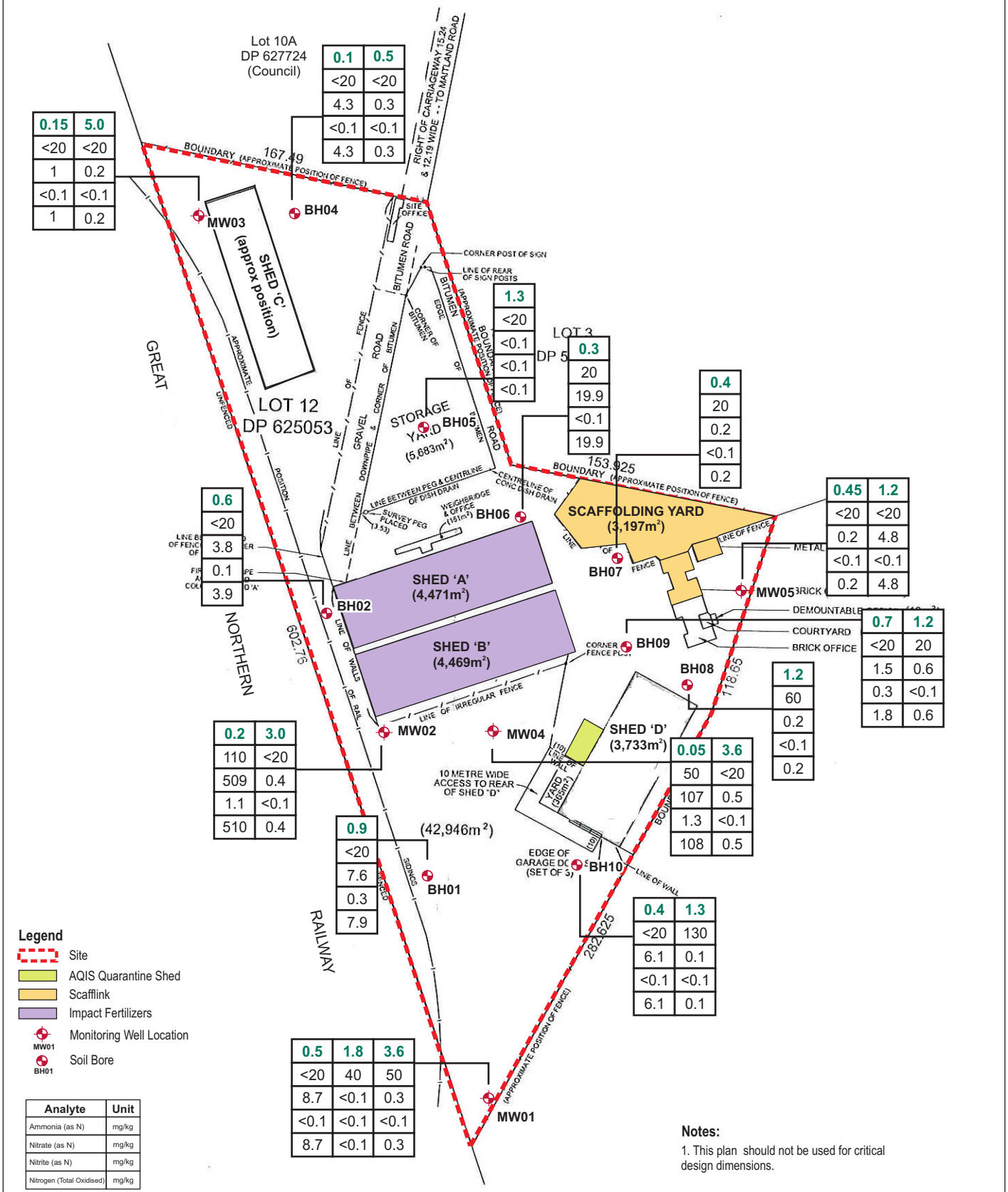

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This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 5 - Soil Analytical Results

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

Environmental Resources Management ANZ

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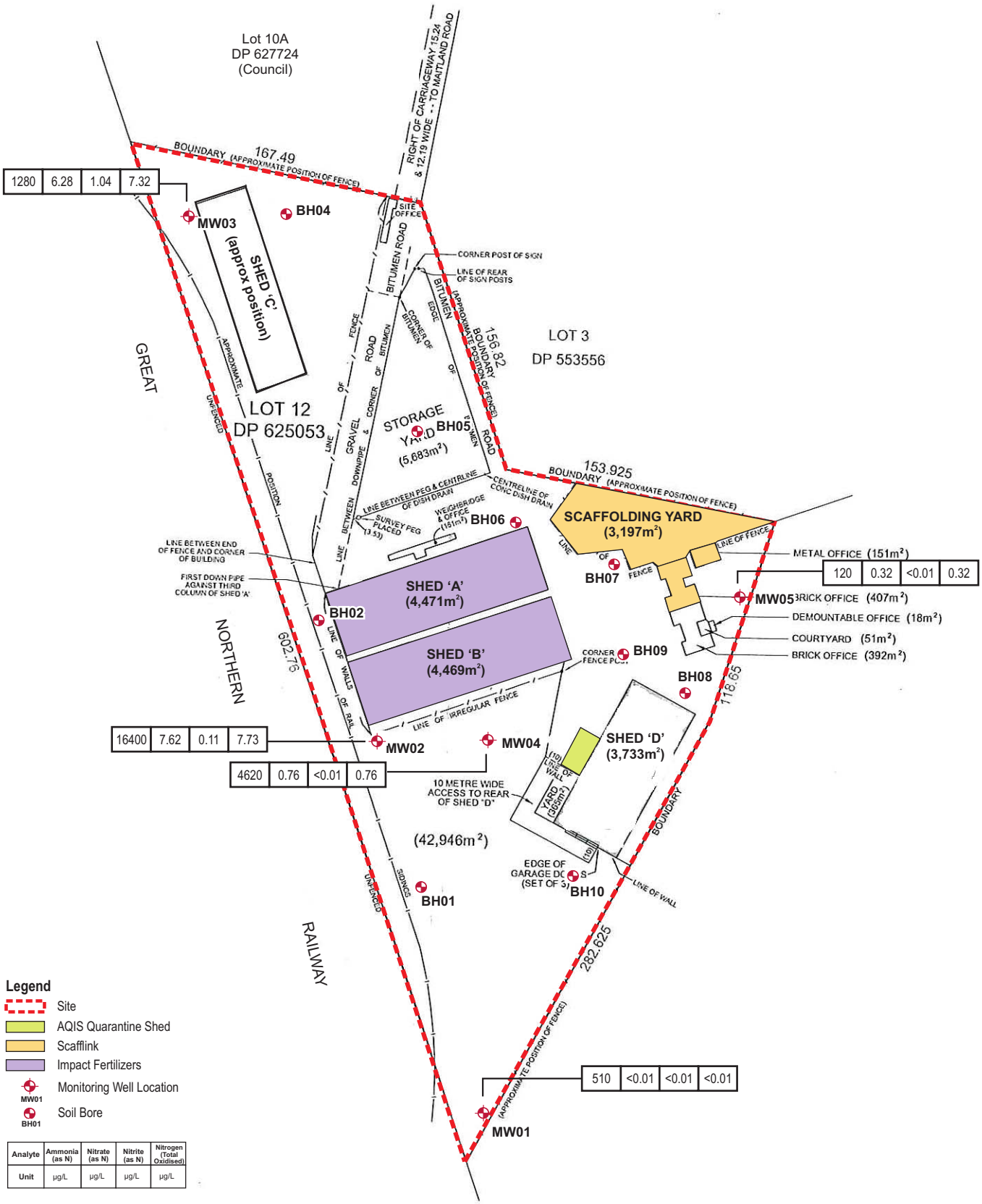
ERM



Notes:

1. This plan should not be used for critical design dimensions.

Source:
Harper Somers O'Sullivan
Ref 24353

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Drawing No:	0143175h_PHII_ESA_C006_R0.cdr		
Date:	07/06/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: DW	

Figure 6 - Groundwater Analytical Results

Crawfords Freightlines Pty Ltd - Targetted Phase II Environmental Site Assessment

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ERM

Tables

	Site Information
Site Identification	Crawfords Freightliners
Site Location	Sandgate NSW, 2304
Latitude/Longitude	NA
Property Description	Lot 12 in DP 625053
Site Area (m^2)	Approximately 49,735m^2
Site Elevation (m AHD)	< 10m AHD
Ownership of Site	Sierra Sun Pty Ltd
Current Zoning	(4(b) Port and Industry Zone
Notes:	
Source of Information:	ERM Report *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW*

Date	Site Activity	Site Personnel	Summary
7/05/2012 - 8/05/2012	Installation of soil bores and conversion to monitoring wells	Drew Wood and Matthew Crow	Installation of 14 soil bores across the investigation area and conversion to groundwater monitoring wells
14-May-12	Groundwater Monitoring Event (GME)	Rose Pascoe	Groundwater monitoring event of five monitoring wells located within the investigation area

Well ID	Gauging Date	Event	TOC Elevation (mAHD)	Ground Surface Elevation (mAHD)	Total Measured Depth (mbTOC)	Depth to Water (mbTOC)	Corrected Water Elevation (mAHD)	Well Condition/Comments
MW01	14/May/12	Pre	3.410	2.75	4.290	1.732	1.678	No odour
MW02	14/May/12	Pre	1.790	1.85	4.004	0.713	1.077	No odour
MW03	14/May/12	Pre	2.060	2.2	4.743	0.064	1.996	
MW04	14/May/12	Pre	1.880	2	3.985	0.91	0.970	No odour
MW05	14/May/12	Pre	2.98	2.23	3.632	1.045	1.935	No odour

Notes:

mAHD metres Australian Height Datum
mbTOC metres below top of casing
m metres

Well ID	Purge Date	Event	DO (mg/L)	EC (µScm-¹)	pH	Eh (mV)	TEMP (°C)	TDS (mg/L)	Comments
MW01	14/May/12	Post	0.45	489	7.57	-99.10	19.90	268.73	Clear, no odour
MW02	14/May/12	Post	0.48	37710	6.60	-57.80	20.50	20740.50	Clear, no odour
MW03	14/May/12	Post	0.54	5670	5.79	48.60	20.60	3118.50	Clear, no odour
MW04	14/May/12	Post	0.39	49837	6.33	-80.20	21.00	27410.35	Clear, no odour
MW05	14/May/12	Post	0.24	598	6.26	-68.90	17.10	328.90	Clear, no odour

Notes:

MW	Monitoring Well
Pre	Pre Purging
Post	Post Purging
DO	Dissolved Oxygen
mg/L	milligrams per litre
EC	Electrical Conductivity
μScm^{-1}	microsiemens per centimetre
Eh	Redox
mV	millivolts
TDS	Total Dissolved Solids
L	Litres
HC	Hydrocarbon

Equipment: Interface probe (Solinist - 122)
Water quality meter (10M 100 284)

Operator: Rose Pascoe

						TPH							BTEX						Lead	Metals								PAH/Phenols
						TRH C6 - C9	TRH C6 - C10	TRH C6 - C10 less BTEX (F1)	TRH C10 - C14	TRH C10 - C16	TRH C15 - C28	TRH C16 - C34	TRH C29 - C36	TRH C34 - C40	TRH C10 - C36 (Sum of total)	TRH C10 - C40 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Lead	Arsenic	Cadmium	Chromium (III+VI)	Copper	Mercury	Nickel	Zinc	Naphthalene
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						10	10	10	50	50	100	100	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.5	5	5	1	2	5	0.1	2	5	0.5
CRC Care HSL-D (Commercial/Industrial) Sand 0-<1m							**260**			**NL**							**3**					**230**								
Ecological Soil Screening Criteria																		*1.4* [#1]	*3.1* [#1]			*14* [#1]	*600* [#1]	*20* [#1]	*3* [#1]		*100* [#1]	*1* [#1]	*60* [#1]	*200* [#1]	
Human Health Screening Assessment Criteria (HIL F)																	[#1]	130 [#1]	50 [#1]			25 [#1]	1500 [#1]	500 [#1]	100 [#1]		5000 [#1]	75 [#1]	3000 [#1]	35000 [#1]	
NEPM 1999 HIL E																							1500		100		5000	75	3000	35,000	
Field ID	**Sample Depth**	**SDG**	**Sample Code**	**Location Code**	**Sampled Date**																										
BH04_0.1	0.1	ES1211396	ES1211396036	BH04	8/05/2012	<10	<10	<10	<50	150	19600	20900	4270	3780	23900 [#3]	24800	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]									13 - 17.3
D_070512_01	0.15	ES1211396	ES1211396010	MW03	7/05/2012	<10	<10	<10	<50	80	4260	4640	680	390	4940 - 4965 [#3]	5110	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]									9
MW03_0.15	0.15	ES1211396	ES1211396007	MW03	7/05/2012	<10	<10	<10	<50	70	3670	3990	580	330	4250 - 4275 [#3]	4390	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]	9	<5	<1	5	6	<0.1	<2	44	6 - 10.2
BH07_0.4	0.4	ES1211396	ES1211396024	BH07	8/05/2012	<10	<10	<10	<50	<50	<100	<100	<100	<100	<50 [#4]	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]	35	*21*	<1	6	21	<0.1	12	62	<1
BH10_0.4	0.4	ES1211396	ES1211396033	BH10	8/05/2012	<10	<10	<10	<50	90	3090	3760	1260	1030	4350 - 4375 [#3]	4880	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]	416	16	2	15	37	<0.1	9	*284*	<0.5
MW01_0.5	0.5	ES1211396	ES1211396001	MW01	7/05/2012	<10	<10	<10	<50	<50	160	220	<100	<100	160 - 235 [#3]	220	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]	*1970*	*30*	*13*	73	*669*	*2.8*	*72*	*4300*	<0.5
Statistical Summary																															
Number of Results						6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	6
Number of Detects						0	0	0	0	4	5	5	4	4	5	5	0	0	0	0	0	0	4	3	2	4	4	1	3	4	3
Minimum Concentration						<10	<10	<10	<50	<50	<100	<100	<100	<100	<50	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	9	<5	<1	5	6	<0.1	<2	44	<0.5
Minimum Detect						ND	ND	ND	ND	70	160	220	580	330	160	220	ND	ND	ND	ND	ND	ND	9	16	2	5	6	2.8	9	44	6
Maximum Concentration						<10	<10	<10	<50	150	19,600	20,900	4270	3780	23,900	24,800	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	1970	30	13	73	669	2.8	72	4300	17.3
Maximum Detect						ND	ND	ND	ND	150	19,600	20,900	4270	3780	23,900	24,800	ND	ND	ND	ND	ND	ND	1970	30	13	73	669	2.8	72	4300	17.3
Average Concentration						5	5	5	25	73	5138	5593	1148	938	6283	6571	0.1	0.25	0.25	0.25	0.25	0.25	608	17	4	25	183	0.74	24	1173	5.5
Median Concentration						5	5	5	25	75	3380	3875	630	360	4312.5	4635	0.1	0.25	0.25	0.25	0.25	0.25	225.5	18.5	1.25	10.5	29	0.05	10.5	173	4.3
Standard Deviation						0	0	0	0	47	7307	7755	1595	1438	8901	9222	0	0	0	0	0	0	927	11	6	32	324	1.4	33	2088	6.2
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	1	1	1	2	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0	1	1	1	2	0

Comments

#1 FALSE

#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.

#3 ESDAT Combined with Non-Detect Multiplier of 0.5.

#4 ESDAT Combined.

						TPH							BTEX						Lead	Metals							PAH/Phenols
						TRH C6 - C9	TRH C6 - C10	TRH C6 - C10 less BTEX (F1)	TRH C10 - C14	TRH C10 - C16	TRH C15 - C28	TRH C16 - C34	TRH C29 - C36	TRH C34 - C40	TRH C10 - C36 (Sum of total)	TRH C10 - C40 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Lead	Arsenic	Cadmium	Chromium (III+VI)	Copper	Mercury	Nickel	Zinc	Naphthalene
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						10	10	10	50	50	100	100	100	100	50	50	0.2	0.5	0.5	0.5	0.5	0.5	5	5	1	2	5	0.1	2	5	0.5
CRC Care HSL-D (Commercial/Industrial) Sand 1-<2m						**370**				**NL**							**3**	**NL**	**NL**			**NL**								**NL**
Ecological Soil Screening Criteria																		*1.4* [#1]	*3.1* [#1]			*14* [#1]	*600* [#1]	*20* [#1]	*3* [#1]		*100* [#1]	*1* [#1]	*60* [#1]	*200* [#1]	
Human Health Screening Assessment Criteria (HIL F)																	1 [#1]	130 [#1]	50 [#1]			25 [#1]	1500 [#1]	500 [#1]	100 [#1]		5000 [#1]	75 [#1]	3000 [#1]	35000 [#1]	
NEPM 1999 HIL F																							1500		100		5000	75	3000	35,000	
Field ID	**Sample Depth**	**SDG**	**Sample Code**	**Location Code**	**Sampled Date**																									
BH08_1.2	1.2	ES1211396	ES1211396018	BH08	8/05/2012	<10	<10	<10	80	150	1230	1390	300	<100	1610 [#3]	1540	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5 [#4]	26	20	<1	<2	9	0.1	3	58	<1 - 1.2
Statistical Summary																															
Number of Results						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Number of Detects						0	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1
Minimum Concentration						<10	<10	<10	80	150	1230	1390	300	<100	1610	1540	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	26	20	<1	<2	9	0.1	3	58	1
Minimum Detect						ND	ND	ND	80	150	1230	1390	300	ND	1610	1540	ND	ND	ND	ND	ND	ND	26	20	ND	ND	9	0.1	3	58	ND
Maximum Concentration						<10	<10	<10	80	150	1230	1390	300	<100	1610	1540	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	26	20	<1	<2	9	0.1	3	58	1.2
Maximum Detect						ND	ND	ND	80	150	1230	1390	300	ND	1610	1540	ND	ND	ND	ND	ND	ND	26	20	ND	ND	9	0.1	3	58	1.2
Average Concentration																															
Median Concentration						5	5	5	80	150	1230	1390	300	50	1610	1540	0.1	0.25	0.25	0.25	0.25	0.25	26	20	0.5	1	9	0.1	3	58	0.85
Standard Deviation																															
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Comments

#1 FALSE

#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.

#3 ESDAT Combined with Non-Detect Multiplier of 0.5.

#4 ESDAT Combined.

Table 6 - Soil Analytical Results - PAHs and Phenols
Crawfords Freightlines
Targeted Phase II ESA - 0143175

						PAH/Phenols																			
						Sum of polycyclic aromatic hydrocarbons	2,4-dimethylphenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4-chloro-3-methylphenol	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Phenol	Pyrene
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Human Health Screening Assessment Criteria (HIL F)						100[#2]	12000[#1]	31000[#1]		3100[#1]		33000[#1]		170000[#1]	2.1[#1]	5[#2]				210[#1]	0.21[#1]	22000[#1]	22000[#1]	2.1[#1]		42500[#2]	17000[#1]
Field ID	**Sample Depth**	**SDG**	**Sample Code**	**Location Code**	**Sampled Date**																						
BH04_0.1	0.1	ES1211396	ES1211396036	BH04	8/05/2012	**6400**	<8	<8	<8	<16	<8	58.6	<8	226	**493**	**210**	406	97.7	135	**420**	**30.1**	1810	20.7	**100**	1010	<8	1370
BH08_1.2	1.2	ES1211396	ES1211396018	BH08	8/05/2012	3.7	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1.4	<0.5	0.5
BH10_0.4	0.4	ES1211396	ES1211396033	BH10	8/05/2012	0.6	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
MW01_0.5	0.5	ES1211396	ES1211396001	MW01	7/05/2012	8.9	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	1.1	0.8	1.3	0.6	<0.5	1	<0.5	2.2	<0.5	<0.5	<0.5	<0.5	1.9
MW03_0.15	0.15	ES1211396	ES1211396007	MW03	7/05/2012	**920**	<4	<4	<4	<8	<4	9.1	<4	40.6	**67.7**	**33.5**	57.3	19.2	20.9	63.6	**4.6**	239	<4	**17.3**	154	<4	183
Statistical Summary																											
Number of Results						5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects						5	0	0	0	0	0	2	0	2	3	3	3	3	2	3	2	4	1	2	3	0	5
Minimum Concentration						0.6	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Minimum Detect						0.6	ND	ND	ND	ND	ND	9.1	ND	40.6	1.1	0.8	1.3	0.6	20.9	1	4.6	0.6	20.7	17.3	1.4	ND	0.5
Maximum Concentration						6400	<8	<8	<8	<16	<8	58.6	<8	226	493	210	406	97.7	135	420	30.1	1810	20.7	100	1010	<8	1370
Maximum Detect						6400	ND	ND	ND	ND	ND	58.6	ND	226	493	210	406	97.7	135	420	30.1	1810	20.7	100	1010	ND	1370
Average Concentration						1467	1.4	1.4	1.4	2.7	1.4	14	1.4	53	112	49	93	24	31	97	7.1	410	4.7	24	233	1.4	311
Median Concentration						8.9	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.25	1.1	0.8	1.3	0.6	0.25	1	0.25	2.2	0.25	0.25	1.4	0.25	1.9
Standard Deviation						2786	1.7	1.7	1.7	3.3	1.7	25	1.7	98	215	91	177	42	59	183	13	789	9	43	439	1.7	597
Number of Guideline Exceedances						2	0	0	0	0	0	0	0	0	2	2	0	0	0	1	5	0	0	2	0	0	0
Number of Guideline Exceedances(Detects Only)						2	0	0	0	0	0	0	0	0	2	2	0	0	0	1	2	0	0	2	0	0	0

Comments
#1 USEPA regional screening level for an industrial landuse
#2 NEPM 1999 HIL F

		Halogenated Benzenes	Halogenated Phenols						Inorganics					OCs																					
		Hexachlorobenzene	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	Ammonia as N	Moisture	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.5	0.5	0.5	0.5	0.5	2	20	1	0.1	0.1	0.1	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.2		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2
Ecological Soil Screening Criteria																																			
Human Health Screening Assessment Criteria (HIL F)																	*50* [#1]							*1000* [#1]										
NEPM 1999 HIL F																	50							1000									50		
Field ID	**Sample Depth**	**SDG**	**Sample Code**	**Location Code**	**Sampled Date**																														
BH01_0.9	0.9	ES1211396	ES1211396032	BH01	8/05/2012							<20	11	7.6	0.3	7.9																				
BH02_0.6	0.6	ES1211396	ES1211396030	BH02	8/05/2012							<20	6.9	3.8	0.1	3.9																				
BH04_0.1	0.1	ES1211396	ES1211396036	BH04	8/05/2012		<8	<8	<8	<8	<8	<16	<20	5	4.3	<0.1	4.3																				
BH04_0.5_	0.5	ES1211396	ES1211396037	BH04	8/05/2012							<20	19.4	0.3	<0.1	0.3																				
BH05_1.3	1.3	ES1211396	ES1211396029	BH05	8/05/2012							<20	17.5	<0.1	<0.1	<0.1																				
BH06_0.3	0.3	ES1211396	ES1211396027	BH06	8/05/2012							20	7.4	19.9	<0.1	19.9																				
BH07_0.4	0.4	ES1211396	ES1211396024	BH07	8/05/2012	<0.05						20	24.6	0.2	<0.1	0.2	<0.05	<0.05	<0.05	<0.1 [#4]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3 [#2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH08_1.2	1.2	ES1211396	ES1211396018	BH08	8/05/2012	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<2	60	21	0.2	<0.1	0.2	<0.05	<0.05	<0.05	<0.1 [#4]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3 [#2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH09_0.7	0.7	ES1211396	ES1211396022	BH09	8/05/2012							<20	16.7	1.5	0.3	1.8																				
BH09_1.2	1.2	ES1211396	ES1211396023	BH09	8/05/2012							20	19.3	0.6	<0.1	0.6																				
BH10_0.4	0.4	ES1211396	ES1211396033	BH10	8/05/2012	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<20	17	6.1	<0.1	6.1	<0.05	<0.05	<0.05	<0.1 [#4]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3 [#2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
BH10_1.3	1.3	ES1211396	ES1211396034	BH10	8/05/2012							130	18.9	0.1	<0.1	0.1																				
D_070512_01	0.15	ES1211396	ES1211396010	MW03	7/05/2012							<20	9.3	0.9	<0.1	0.9																				
D_080512_01	0.05	ES1211396	ES1211396019	MW04	8/05/2012							50	11.6	326	5.6	332																				
D_080512_02	0.4	ES1211396	ES1211396035	BH10	8/05/2012							<20	18.2	1.7	<0.1	1.7																				
MW01_0.5	0.5	ES1211396	ES1211396001	MW01	7/05/2012		<0.5	<0.5	<0.5	<0.5	<0.5	<2	<20	7.7	8.7	<0.1	8.7																				
MW01_1.8	1.8	ES1211396	ES1211396002	MW01	7/05/2012							40	16.9	<0.1	<0.1	<0.1																				
MW01_3.6	3.6	ES1211396	ES1211396003	MW01	7/05/2012							50	23.4	0.3	<0.1	0.3																				
MW02_0.2	0.2	ES1211396	ES1211396004	MW02	7/05/2012							110	6	509	1.1	510																				
MW02_1.0	1	ES1211396	ES1211396005	MW02	7/05/2012																															
MW02_3.0	3	ES1211396	ES1211396006	MW02	7/05/2012							<20	22.5	0.4	<0.1	0.4																				
MW03_0.15	0.15	ES1211396	ES1211396007	MW03	7/05/2012	<0.25	<4	<4	<4	<4	<4	<8	<20	<1	1	<0.1	1	<0.25	<0.25	<0.25	<0.5 [#4]	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2	<0.7 [#2]	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2
MW03_5.0	5	ES1211396	ES1211396009	MW03	7/05/2012							<20	27.1	0.2	<0.1	0.2																				
MW04_0.05	0.05	ES1211396	ES1211396014	MW04	8/05/2012							50	18.4	107	1.3	108																				
MW04_3.6	3.6	ES1211396	ES1211396016	MW04	8/05/2012							<20	24.1	0.5	<0.1	0.5																				
MW05_0.45	0.45	ES1211396	ES1211396011	MW05	7/05/2012							<20	25.1	0.2	<0.1	0.2																				
MW05_1.2	1.2	ES1211396	ES1211396012	MW05	7/05/2012							<20	25.1	4.8	<0.1	4.8																				
Statistical Summary																																			
Number of Results		4	5	5	5	5	5	5	26	26	26	26	26	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Number of Detects		0	0	0	0	0	0	0	10	25	24	6	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration		<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<20	<1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	20	5	0.1	0.1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration		<0.25	<8	<8	<8	<8	<8	<16	130	27.1	509	5.6	510	<0.25	<0.25	<0.25	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2	<0.7	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	130	27.1	509	5.6	510	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.05	1.4	1.4	1.4	1.4	1.4	3	27	16	39	0.37	39	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1
Median Concentration		0.025	0.25	0.25	0.25	0.25	0.25	1	10	17.85	0.95	0.05	0.95	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.1	0.15	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.1
Standard Deviation		0.05	1.7	1.7	1.7	1.7	1.7	3.1	32	7.4	116	1.1	117	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0
Number of Guideline Exceedances		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments
#1 FALSE
#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#3 ESDAT Combined with Non-Detect Multiplier of 0.5.
#4 ESDAT Combined.

									OPs										Pesticides				PCBs	Asbestos
									Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Prothiofos	Demeton-S-methyl	Fenamiphos	Parathion	Pirimphos-ethyl	PCBs (Sum of total)	Asbestos Detected (Y/N)
									mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	y/n
EQL									0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.2	0.05	0.05	0.05	0.2	0.05	0.1	
Ecological Soil Screening Criteria																													
Human Health Screening Assessment Criteria (HIL F)																												*50* [#1]	
NEPM 1999 HIL F																												50	
Field ID	**Sample Depth**	**SDG**	**Sample Code**	**Location Code**	**Sampled Date**																								
BH01_0.9	0.9	ES1211396	ES1211396032	BH01	8/05/2012																								
BH02_0.6	0.6	ES1211396	ES1211396030	BH02	8/05/2012																								
BH04_0.1	0.1	ES1211396	ES1211396036	BH04	8/05/2012																								
BH04_0.5_	0.5	ES1211396	ES1211396037	BH04	8/05/2012																								
BH05_1.3	1.3	ES1211396	ES1211396029	BH05	8/05/2012																								
BH06_0.3	0.3	ES1211396	ES1211396027	BH06	8/05/2012																								
BH07_0.4	0.4	ES1211396	ES1211396024	BH07	8/05/2012	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.1	No
BH08_1.2	1.2	ES1211396	ES1211396018	BH08	8/05/2012	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.1	
BH09_0.7	0.7	ES1211396	ES1211396022	BH09	8/05/2012																								
BH09_1.2	1.2	ES1211396	ES1211396023	BH09	8/05/2012																								
BH10_0.4	0.4	ES1211396	ES1211396033	BH10	8/05/2012	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.1	
BH10_1.3	1.3	ES1211396	ES1211396034	BH10	8/05/2012																								
D_070512_01	0.15	ES1211396	ES1211396010	MW03	7/05/2012																								
D_080512_01	0.05	ES1211396	ES1211396019	MW04	8/05/2012																								
D_080512_02	0.4	ES1211396	ES1211396035	BH10	8/05/2012																								
MW01_0.5	0.5	ES1211396	ES1211396001	MW01	7/05/2012																								
MW01_1.8	1.8	ES1211396	ES1211396002	MW01	7/05/2012																								
MW01_3.6	3.6	ES1211396	ES1211396003	MW01	7/05/2012																								
MW02_0.2	0.2	ES1211396	ES1211396004	MW02	7/05/2012																								
MW02_1.0	1	ES1211396	ES1211396005	MW02	7/05/2012																								No
MW02_3.0	3	ES1211396	ES1211396006	MW02	7/05/2012																								
MW03_0.15	0.15	ES1211396	ES1211396007	MW03	7/05/2012	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2	<0.3	<0.25	<0.25	<0.25	<0.2	<0.25	<0.2	
MW03_5.0	5	ES1211396	ES1211396009	MW03	7/05/2012																								
MW04_0.05	0.05	ES1211396	ES1211396014	MW04	8/05/2012																								
MW04_3.6	3.6	ES1211396	ES1211396016	MW04	8/05/2012																								
MW05_0.45	0.45	ES1211396	ES1211396011	MW05	7/05/2012																								
MW05_1.2	1.2	ES1211396	ES1211396012	MW05	7/05/2012																								
Statistical Summary																													
Number of Results						4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
Number of Detects						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.1	NA
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Maximum Concentration						<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.2	<0.3	<0.25	<0.25	<0.25	<0.2	<0.25	<0.2	NA
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Average Concentration						0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.11	0.05	0.05	0.05	0.1	0.05	0.063	NA
Median Concentration						0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.1	0.1	0.025	0.025	0.025	0.1	0.025	0.05	NA
Standard Deviation						0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0	0.025	0.05	0.05	0.05	0	0.05	0.025	NA
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

#1 FALSE

#2 ESDAT Combined. Some Analytes are missing from this Combined Compound.

#3 ESDAT Combined with Non-Detect Multiplier of 0.5.

#4 ESDAT Combined.

Table 8 - Groundwater Analytical Results - TRH, BTEX, Metals and Naphthalene
Crawfords Freightlines
Targeted Phase II ESA - 0143175

						TPH								BTEX						Lead	Metals								PAH/Phenols
						TRH C6 - C9	TRH C6 - C10	TRH C6 - C10 less BTEX (F1)	TRH C10 - C14	TRH C10 - C16	TRH C15 - C28	TRH C16 - C34	TRH C29 - C36	TRH C34 - C40	TRH C10 - C36 (Sum of total)	TRH C10 - C40 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Lead (Filtered)	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Naphthalene
						µg/L	mg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL						20	0.02	0.02	50	0.1	100	0.1	50	0.1	50	100	1	2	2	2	2	2	0.001	0.001	0.0001	0.001	0.001	0.0001	0.001	0.005	1
Ecological Screening Criteria - Fresh Water (NSW)																	*950*				*350*		*0.0034*	*0.024*	*0.0002*		*0.0014*	*0.0006*	*0.011*	*0.008*	*16*
Ecological Screening Criteria - Marine Water (NSW)																	700						0.0044		0.0055		0.0013	0.0004	0.07	0.015	70
Human Health Screening Criteria (NSW)																	1	800	300			600	0.01	0.007	0.002		2	0.001	0.02		
Sample Code	**Field ID**	**SDG**	**Location Code**	**Sampled Date**																											
ES1211770001	MW01	ES1211770	MW01	14/05/2012		<20	<0.02	<0.02	<50	<0.1	<100	<0.1	<50	<0.1	<50[#2]	<100	<1	<2	<2	<2	<2	<2[#2]	<0.001	<0.001	*0.0118*	<0.001	*0.008*	<0.0001	0.002	*0.678*	<1
ES1211770002	MW02	ES1211770	MW02	14/05/2012		<20	<0.02	<0.02	<50	<0.1	260	0.24	<50	<0.1	260 - 310[#1]	240	<1	<2	<2	<2	<2	<2[#2]	<0.01	<0.01	<0.001	<0.01	<0.02	<0.0001	<0.01	<0.05	<1
ES1211770003	MW03	ES1211770	MW03	14/05/2012		<20	<0.02	<0.02	<50	<0.1	380	0.34	<50	<0.1	380 - 430[#1]	340	<1	<2	<2	<2	<2	<2[#2]	<0.001	0.002	0.0001	<0.001	<0.001	<0.0001	0.009	*0.019*	<1
ES1211770004	MW04	ES1211770	MW04	14/05/2012		<20	<0.02	<0.02	<50	<0.1	<100	<0.1	<50	<0.1	<50[#2]	<100	<1	<2	<2	<2	<2	<2[#2]	<0.01	<0.01	<0.001	<0.01	<0.02	<0.0001	<0.01	<0.05	<1
ES1211770005	MW05	ES1211770	MW05	14/05/2012		<20	<0.02	<0.02	<50	<0.1	370	0.38	<50	<0.1	370 - 420[#1]	380	<1	<2	<2	<2	<2	<2[#2]	<0.001	*0.04*	<0.0001	<0.001	*0.003*	<0.0001	0.004	*0.19*	<1
ES1211770006	D_140512_01	ES1211770	MW04	14/05/2012		<20	<0.02	<0.02	<50	<0.1	<100	<0.1	<50	<0.1	<50[#2]	<100	<1	<2	<2	<2	<2	<2[#2]	<0.01	<0.01	<0.001	<0.01	<0.02	<0.0001	<0.01	<0.05	<1
Statistical Summary																															
Number of Results						6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects						0	0	0	0	0	3	3	0	0	3	3	0	0	0	0	0	0	0	2	2	0	2	0	3	3	0
Minimum Concentration						<20	<0.02	<0.02	<50	<0.1	<100	<0.1	<50	<0.1	<50	<100	<1	<2	<2	<2	<2	<2	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.0001	0.002	0.019	<1
Minimum Detect						ND	ND	ND	ND	ND	260	0.24	ND	ND	260	240	ND	ND	ND	ND	ND	ND	ND	0.002	0.0001	ND	0.003	ND	0.002	0.019	ND
Maximum Concentration						<20	<0.02	<0.02	<50	<0.1	380	0.38	<50	<0.1	430	380	<1	<2	<2	<2	<2	<2	<0.01	0.04	0.0118	<0.01	<0.02	<0.0001	<0.01	0.678	<1
Maximum Detect						ND	ND	ND	ND	ND	380	0.38	ND	ND	430	380	ND	ND	ND	ND	ND	ND	ND	0.04	0.0118	ND	0.008	ND	0.009	0.678	ND
Average Concentration						10	0.01	0.01	25	0.05	193	0.19	25	0.05	193	185	0.5	1	1	1	1	1	0.0028	0.0096	0.0022	0.0028	0.0069	0.00005	0.005	0.16	0.5
Median Concentration						10	0.01	0.01	25	0.05	155	0.145	25	0.05	155	145	0.5	1	1	1	1	1	0.00275	0.005	0.0005	0.00275	0.009	0.00005	0.005	0.025	0.5
Standard Deviation						0	0	0	0	0	163	0.15	0	0	189	155	0	0	0	0	0	0	0.0025	0.015	0.0047	0.0025	0.0042	0	0.0023	0.26	0
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	4	0	5	0	0	6	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	3	0

Comments
#1 ESDAT Combined with Non-Detect Multiplier of 0.5.
#2 ESDAT Combined.

	PAH/Phenols																						
	Sum of polycyclic aromatic hydrocarbons	**2,4-dimethylphenol**	**2-methylphenol**	**2-nitrophenol**	**3-&4-methylphenol**	**4-chloro-3-methylphenol**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benz(a)anthracene**	**Benzo(a) pyrene**	**Benzo(b)fluoranthene**	**Benzo(g,h,i)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenz(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-c,d)pyrene**	**Phenanthrene**	**Phenol**	**Pyrene**
	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.0005	1	1	1	2	1	1	1	1	1	0.5	1	1	1	1	1	1	1	1	1	1	1
Ecological Screening Criteria - Fresh Water (NSW)																					**320**	
Ecological Screening Criteria - Marine Water (NSW)																					*400*	
Human Health Screening Criteria (NSW)											0.01											
Sample Code **Field ID** **SDG** **Location Code** **Sampled Date**																						
ES1211770001 MW01 ES1211770 MW01 14/05/2012	<0.0005	<1	<1	<1	<2	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ES1211770002 MW02 ES1211770 MW02 14/05/2012	0.0015	<1	<1	<1	<2	<1	1.5	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ES1211770003 MW03 ES1211770 MW03 14/05/2012	0.0456	<1	<1	<1	<2	<1	7.5	<1	3.1	<1	<0.5	<1	<1	<1	<1	<1	7.6	3.5	<1	18.1	<1	5.8
ES1211770004 MW04 ES1211770 MW04 14/05/2012	0.005	<1	1	<1	<2	<1	<1	<1	<1	<1	0.5	<1	<1	<1	<1	<1	1.6	<1	<1	1.5	<1	1.4
ES1211770005 MW05 ES1211770 MW05 14/05/2012	0.0034	<1	1.5	<1	2.6	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	1.2	<1	<1	1.2	<1	1
ES1211770006 D_140512_01 ES1211770 MW04 14/05/2012	0.0045	<1	<1	<1	<2	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	1.6	<1	<1	1.5	<1	1.4
Statistical Summary																						
Number of Results	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects	5	0	2	0	1	0	2	0	1	0	1	0	0	0	0	0	4	1	0	4	0	4
Minimum Concentration	<0.0005	<1	<1	<1	<2	<1	<1	<1	<1	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Minimum Detect	0.0015	ND	1	ND	2.6	ND	1.5	ND	3.1	ND	0.5	ND	ND	ND	ND	ND	1.2	3.5	ND	1.2	ND	1
Maximum Concentration	0.0456	<1	1.5	<1	2.6	<1	7.5	<1	3.1	<1	0.5	<1	<1	<1	<1	<1	7.6	3.5	<1	18.1	<1	5.8
Maximum Detect	0.0456	ND	1.5	ND	2.6	ND	7.5	ND	3.1	ND	0.5	ND	ND	ND	ND	ND	7.6	3.5	ND	18.1	ND	5.8
Average Concentration	0.01	0.5	0.75	0.5	1.3	0.5	1.8	0.5	0.93	0.5	0.29	0.5	0.5	0.5	0.5	0.5	2.2	1	0.5	3.9	0.5	1.8
Median Concentration	0.00395	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.25	0.5	0.5	0.5	0.5	0.5	1.4	0.5	0.5	1.35	0.5	1.2
Standard Deviation	0.018	0	0.42	0	0.65	0	2.8	0	1.1	0	0.1	0	0	0	0	0	2.7	1.2	0	7	0	2
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

Comments

#1 ESDAT Combined with Non-Detect Multiplier of 0.5.

#2 ESDAT Combined.

Table 10 - Groundwater Analytical Results - OCs, OPs, PCBs, Pesticides and Inorganics
Crawfords Freightlines
Targeted Phase II ESA - 0143175

		Halogenated Benzenes	Halogenated Phenols						Inorganics				OCs																						
		Hexachlorobenzene	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised)	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.5	1	1	1	1	1	2	10	0.01	0.01	0.01	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	2		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2
Ecological Screening Criteria - Fresh Water (NSW)									**900**	**700**																									
Ecological Screening Criteria - Marine Water (NSW)									900																										
Human Health Screening Criteria (NSW)																																			
Sample Code	**Field ID**	**SDG**	**Location Code**	**Sampled Date**																																
ES1211770001	MW01	ES1211770	MW01	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	510	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
ES1211770002	MW02	ES1211770	MW02	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	**16400**	7.62	0.11	7.73	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
ES1211770003	MW03	ES1211770	MW03	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	**1280**	6.28	1.04	7.32	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
ES1211770004	MW04	ES1211770	MW04	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	**4620**	0.76	<0.01	0.76	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
ES1211770005	MW05	ES1211770	MW05	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	120	0.32	<0.01	0.32	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
ES1211770006	D_140512_01	ES1211770	MW04	14/05/2012	<0.5	<1	<1	<1	<1	<1	<2	**12300**	0.75	0.01	0.76	<0.5	<0.5	<0.5	<1[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3[#2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Statistical Summary																																			
Number of Results		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects		0	0	0	0	0	0	0	6	5	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration		<0.5	<1	<1	<1	<1	<1	<2	120	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	120	0.32	0.01	0.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration		<0.5	<1	<1	<1	<1	<1	<2	16,400	7.62	1.04	7.73	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	16,400	7.62	1.04	7.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.25	0.5	0.5	0.5	0.5	0.5	1	5872	2.6	0.2	2.8	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.25	0.25	1	1.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1
Median Concentration		0.25	0.5	0.5	0.5	0.5	0.5	1	2950	0.755	0.0075	0.76	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.25	0.25	1	1.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1
Standard Deviation		0	0	0	0	0	0	0	6880	3.4	0.42	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances		0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)		0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments
#1 ESDAT Combined with Non-Detect Multiplier of 0.5.
#2 ESDAT Combined.

					OPs														Pesticides				PCBs
					Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Prothiofos	Demeton-S-methyl	Fenamiphos	Parathion	Pirimphos-ethyl	PCBs (Sum of total)
					µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL					0.5	0.5	0.5	0.5	0.5	0.0005	0.5	0.5	0.5	0.5	0.5	0.5	2	2	0.5	0.5	0.5	2	0.5	1
Ecological Screening Criteria - Fresh Water (NSW)																								
Ecological Screening Criteria - Marine Water (NSW)																								
Human Health Screening Criteria (NSW)																								
Sample Code	**Field ID**	**SDG**	**Location Code**	**Sampled Date**																				
ES1211770001	MW01	ES1211770	MW01	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
ES1211770002	MW02	ES1211770	MW02	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
ES1211770003	MW03	ES1211770	MW03	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
ES1211770004	MW04	ES1211770	MW04	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
ES1211770005	MW05	ES1211770	MW05	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
ES1211770006	D_140512_01	ES1211770	MW04	14/05/2012	<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
Statistical Summary																								
Number of Results					6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration					<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
Minimum Detect					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration					<0.5	<0.5	<0.5	<0.5	<0.5	<0.0005	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<2	<0.5	<0.5	<0.5	<2	<0.5	<1
Maximum Detect					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration					0.25	0.25	0.25	0.25	0.25	0.00025	0.25	0.25	0.25	0.25	0.25	0.25	1	1	0.25	0.25	0.25	1	0.25	0.5
Median Concentration					0.25	0.25	0.25	0.25	0.25	0.00025	0.25	0.25	0.25	0.25	0.25	0.25	1	1	0.25	0.25	0.25	1	0.25	0.5
Standard Deviation					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

#1 ESDAT Combined with Non-Detect Multiplier of 0.5.

#2 ESDAT Combined.

Table 11 - QA/QC Analytical Results - Soil Duplicates
Crawfords Freightlines
Targeted Phase II ESA - 0143175

Field Duplicates (SOIL)
Filter: SDG in('ES1211770','ES1211396')

SDG	ES1211396	ES1211396		ES1211396	ES1211396		ES1211396	ES1211396	
Field ID	MW03_0.15	D_070512_01	**RPD**	MW04_0.05	D_080512_01	**RPD**	BH10_0.4	D_080512_02	**RPD**
Sampled Date	7/05/2012	7/05/2012		8/05/2012	8/05/2012		8/05/2012	8/05/2012	
Chem_Group	**ChemName**	**Units**	**EQL**									
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0						
	Toluene	mg/kg	0.5	<0.5	<0.5	0						
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	0						
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	0						
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	0						
	Xylene Total	mg/kg	0.5	<0.5	<0.5	0						
Inorganics	Ammonia as N	mg/kg	20	<20.0	<20.0	0	50.0	50.0	0	<20.0	<20.0	0
	Moisture	%	1	**<1.0**	**9.3**	**161**	**18.4**	**11.6**	**45**	17.0	18.2	7
	Nitrate (as N)	mg/kg	0.1	1.0	0.9	11	**107.0**	**326.0**	**101**	**6.1**	**1.7**	**113**
	Nitrite (as N)	mg/kg	0.1	<0.1	<0.1	0	**1.3**	**5.6**	**125**	<0.1	<0.1	0
	Nitrogen (Total Oxidised)	mg/kg	0.1	1.0	0.9	11	**108.0**	**332.0**	**102**	**6.1**	**1.7**	**113**
PAH/Phenols	Naphthalene	mg/kg	1	6.0	9.0	40						
TRH	C6 - C9	mg/kg	10	<10.0	<10.0	0						
	C6-C10	mg/kg	10	<10.0	<10.0	0						
	C6-C10 less BTEX (F1)	mg/kg	10	<10.0	<10.0	0						
	C10 - C14	mg/kg	50	<50.0	<50.0	0						
	C10-C16	mg/kg	50	70.0	80.0	13						
	C15 - C28	mg/kg	100	3670.0	4260.0	15						
	C29-C36	mg/kg	100	580.0	680.0	16						
	C16-C34	mg/kg	100	3990.0	4640.0	15						
	C34-C40	mg/kg	100	330.0	390.0	17						
	+C10 - C36 (Sum of total)	mg/kg	50	4250.0	4940.0	15						
	C10 - C40 (Sum of total)	mg/kg	50	4390.0	5110.0	15						

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-5 x EQL); 40 (5-10 x EQL); 40 (> 10 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 12 - QA/QC Analytical Results - Water Duplicates
Crawfords Freightlines
Targeted Phase II ESA - 0143175

Field Duplicates (WATER)
Filter: SDG in('ES1211770','ES1211396')

SDG	ES1211770	ES1211770	
Field ID	MW04	D_140512_01	**RPD**
Sampled Date	14/05/2012	14/05/2012	

Chem_Group	ChemName	Units	EQL			
BTEX	Benzene	µg/L	1	<1.0	<1.0	0
	Toluene	µg/L	2	<2.0	<2.0	0
	Ethylbenzene	µg/L	2	<2.0	<2.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0
	Xylene (o)	µg/L	2	<2.0	<2.0	0
	Xylene Total	µg/L	2	<2.0	<2.0	0
Halogenated Benzenes	Hexachlorobenzene	µg/L	0.5	<0.5	<0.5	0
Halogenated Phenols	2,4,5-trichlorophenol	µg/L	1	<1.0	<1.0	0
	2,4,6-trichlorophenol	µg/L	1	<1.0	<1.0	0
	2,4-dichlorophenol	µg/L	1	<1.0	<1.0	0
	2,6-dichlorophenol	µg/L	1	<1.0	<1.0	0
	2-chlorophenol	µg/L	1	<1.0	<1.0	0
	Pentachlorophenol	µg/L	2	<2.0	<2.0	0
Inorganics	Ammonia as N	µg/l	10	**4620.0**	**12300.0**	**91**
	Nitrate (as N)	mg/l	0.01	0.76	0.75	1
	Nitrite (as N)	mg/l	0.01	<0.01	0.01	0
	Nitrogen (Total Oxidised)	mg/l	0.01	0.76	0.76	0
Lead	Lead (Filtered)	mg/l	0.001	<0.01	<0.01	0
Metals	Arsenic (Filtered)	mg/l	0.001	<0.01	<0.01	0
	Cadmium (Filtered)	mg/l	0.0001	<0.001	<0.001	0
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.01	<0.01	0
	Copper (Filtered)	mg/l	0.001	<0.02	<0.02	0
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	<0.01	<0.01	0
	Zinc (Filtered)	mg/l	0.005	<0.05	<0.05	0
Organochlorine Pesticides	4,4-DDE	µg/L	0.5	<0.5	<0.5	0
	a-BHC	µg/L	0.5	<0.5	<0.5	0
	Aldrin	µg/L	0.5	<0.5	<0.5	0
	b-BHC	µg/L	0.5	<0.5	<0.5	0
	Chlordane (cis)	µg/L	0.5	<0.5	<0.5	0
	Chlordane (trans)	µg/L	0.5	<0.5	<0.5	0
	d-BHC	µg/L	0.5	<0.5	<0.5	0
	DDD	µg/L	0.5	<0.5	<0.5	0
	DDT	µg/L	2	<2.0	<2.0	0
	Dieldrin	µg/L	0.5	<0.5	<0.5	0
	Endosulfan I	µg/L	0.5	<0.5	<0.5	0
	Endosulfan II	µg/L	0.5	<0.5	<0.5	0
	Endosulfan sulphate	µg/L	0.5	<0.5	<0.5	0
	Endrin	µg/L	0.5	<0.5	<0.5	0
	Endrin aldehyde	µg/L	0.5	<0.5	<0.5	0
	Endrin ketone	µg/L	0.5	<0.5	<0.5	0
	g-BHC (Lindane)	µg/L	0.5	<0.5	<0.5	0
	Heptachlor	µg/L	0.5	<0.5	<0.5	0
	Heptachlor epoxide	µg/L	0.5	<0.5	<0.5	0
	Methoxychlor	µg/L	2	<2.0	<2.0	0
Organophosphorous Pesticides	Azinophos methyl	µg/L	0.5	<0.5	<0.5	0
	Bromophos-ethyl	µg/L	0.5	<0.5	<0.5	0
	Carbophenothion	µg/L	0.5	<0.5	<0.5	0
	Chlorfenvinphos	µg/L	0.5	<0.5	<0.5	0
	Chlorpyrifos	µg/L	0.5	<0.5	<0.5	0
	Chlorpyrifos-methyl	mg/l	0.0005	<0.0005	<0.0005	0
	Diazinon	µg/L	0.5	<0.5	<0.5	0
	Dichlorvos	µg/L	0.5	<0.5	<0.5	0
	Dimethoate	µg/L	0.5	<0.5	<0.5	0
	Ethion	µg/L	0.5	<0.5	<0.5	0
	Fenthion	µg/L	0.5	<0.5	<0.5	0
	Malathion	µg/L	0.5	<0.5	<0.5	0
	Methyl parathion	µg/L	2	<2.0	<2.0	0
	Monocrotophos	µg/L	2	<2.0	<2.0	0
	Prothiofos	µg/L	0.5	<0.5	<0.5	0

Field Duplicates (WATER)
Filter: SDG in('ES1211770','ES1211396')

SDG	ES1211770	ES1211770	
Field ID	MW04	D_140512_01	**RPD**
Sampled Date	14/05/2012	14/05/2012	

PAH/Phenols	Sum of polycyclic aromatic hydrocarbons	mg/l	0.0005	0.005	0.0045	11
	2,4-dimethylphenol	µg/L	1	<1.0	<1.0	0
	2-methylphenol	µg/L	1	1.0	<1.0	0
	2-nitrophenol	µg/L	1	<1.0	<1.0	0
	3-&4-methylphenol	µg/L	2	<2.0	<2.0	0
	4-chloro-3-methylphenol	µg/L	1	<1.0	<1.0	0
	Acenaphthene	µg/L	1	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0
	Benzo(a) pyrene	µg/L	0.5	0.5	<0.5	0
	Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0
	Fluoranthene	µg/L	1	1.6	1.6	0
	Fluorene	µg/L	1	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0
	Naphthalene	µg/L	5	<5.0	<5.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0
	Phenanthrene	µg/L	1	1.5	1.5	0
	Phenol	µg/L	1	<1.0	<1.0	0
	Pyrene	µg/L	1	1.4	1.4	0
Pesticides	Demeton-S-methyl	µg/L	0.5	<0.5	<0.5	0
	Fenamiphos	µg/L	0.5	<0.5	<0.5	0
	Parathion	µg/L	2	<2.0	<2.0	0
	Pirimphos-ethyl	µg/L	0.5	<0.5	<0.5	0
Polychlorinated Biphenyls	PCBs (Sum of total)	µg/L	1	<1.0	<1.0	0
TRH	C6 - C9	µg/L	20	<20.0	<20.0	0
	C6-C10	mg/l	0.02	<0.02	<0.02	0
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
	C10 - C14	µg/L	50	<50.0	<50.0	0
	C10-C16	mg/l	0.1	<0.1	<0.1	0
	C15 - C28	µg/L	100	<100.0	<100.0	0
	C29-C36	µg/L	50	<50.0	<50.0	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	+C10 - C36 (Sum of total)	µg/L	50	<50.0	<50.0	0
	C10 - C40 (Sum of total)	µg/L	100	<100.0	<100.0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-5 x EQL); 40 (5-10 x EQL); 40 (> 10 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table 13 - QA/QC Analytical Results - Field Blanks (Soil)
Crawfords Freightlines
Targeted Phase II ESA - 0143175

Field Blanks (SOIL)
Filter: SDG in('ES1211770','ES1211396')

SDG	ES1211396
Field ID	T/BLANK
Sampled Date	8/05/2012
Sample Type	Trip_B

Chem_Group	ChemName	Units	EQL	
BTEX	Benzene	mg/kg	0.2	<0.2
	Toluene	mg/kg	0.5	<0.5
	Ethylbenzene	mg/kg	0.5	<0.5
	Xylene (m & p)	mg/kg	0.5	<0.5
	Xylene (o)	mg/kg	0.5	<0.5
	Xylene Total	mg/kg	0.5	<0.5
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.05	
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	
	2,4,6-trichlorophenol	mg/kg	0.5	
	2,4-dichlorophenol	mg/kg	0.5	
	2,6-dichlorophenol	mg/kg	0.5	
	2-chlorophenol	mg/kg	0.5	
	Pentachlorophenol	mg/kg	1	
Inorganics	Ammonia as N	mg/kg	20	
	Moisture	%	1	
	Nitrate (as N)	mg/kg	0.1	
	Nitrite (as N)	mg/kg	0.1	
	Nitrogen (Total Oxidised)	mg/kg	0.1	
Lead	Lead	mg/kg	5	
Metals	Arsenic	mg/kg	5	
	Cadmium	mg/kg	1	
	Chromium (III+VI)	mg/kg	2	
	Copper	mg/kg	5	
	Mercury	mg/kg	0.1	
	Nickel	mg/kg	2	
	Zinc	mg/kg	5	
Organochlorine Pesticides	4,4-DDE	mg/kg	0.05	
	a-BHC	mg/kg	0.05	
	Aldrin	mg/kg	0.05	
	b-BHC	mg/kg	0.05	
	Chlordane (cis)	mg/kg	0.05	
	Chlordane (trans)	mg/kg	0.05	
	d-BHC	mg/kg	0.05	
	DDD	mg/kg	0.05	
	DDT	mg/kg	0.2	
	Dieldrin	mg/kg	0.05	
	Endosulfan I	mg/kg	0.05	
	Endosulfan II	mg/kg	0.05	
	Endosulfan sulphate	mg/kg	0.05	
	Endrin	mg/kg	0.05	
	Endrin aldehyde	mg/kg	0.05	
	Endrin ketone	mg/kg	0.05	
	g-BHC (Lindane)	mg/kg	0.05	
	Heptachlor	mg/kg	0.05	
	Heptachlor epoxide	mg/kg	0.05	
	Methoxychlor	mg/kg	0.2	
Organophosphorous Pesticides	Azinophos methyl	mg/kg	0.05	
	Bromophos-ethyl	mg/kg	0.05	
	Carbophenothion	mg/kg	0.05	
	Chlorfenvinphos	mg/kg	0.05	
	Chlorpyrifos	mg/kg	0.05	
	Chlorpyrifos-methyl	mg/kg	0.05	
	Diazinon	mg/kg	0.05	
	Dichlorvos	mg/kg	0.05	
	Dimethoate	mg/kg	0.05	
	Ethion	mg/kg	0.05	
	Fenthion	mg/kg	0.05	
	Malathion	mg/kg	0.05	
	Methyl parathion	mg/kg	0.2	
	Monocrotophos	mg/kg	0.2	
	Prothiofos	mg/kg	0.05	

Field Blanks (SOIL) Filter: SDG in('ES1211770','ES1211396')			**SDG** **Field ID** **Sampled Date** **Sample Type**	ES1211396 T/BLANK 8/05/2012 Trip_B
PAH/Phenols	Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	
	2,4-dimethylphenol	mg/kg	0.5	
	2-methylphenol	mg/kg	0.5	
	2-nitrophenol	mg/kg	0.5	
	3-&4-methylphenol	mg/kg	1	
	4-chloro-3-methylphenol	mg/kg	0.5	
	Acenaphthene	mg/kg	0.5	
	Acenaphthylene	mg/kg	0.5	
	Anthracene	mg/kg	0.5	
	Benz(a)anthracene	mg/kg	0.5	
	Benzo(a) pyrene	mg/kg	0.5	
	Benzo(b)fluoranthene	mg/kg	0.5	
	Benzo(g,h,i)perylene	mg/kg	0.5	
	Benzo(k)fluoranthene	mg/kg	0.5	
	Chrysene	mg/kg	0.5	
	Dibenz(a,h)anthracene	mg/kg	0.5	
	Fluoranthene	mg/kg	0.5	
	Fluorene	mg/kg	0.5	
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	
	Naphthalene	mg/kg	0.5	<1
	Phenanthrene	mg/kg	0.5	
	Phenol	mg/kg	0.5	
	Pyrene	mg/kg	0.5	
Pesticides	Demeton-S-methyl	mg/kg	0.05	
	Fenamiphos	mg/kg	0.05	
	Parathion	mg/kg	0.2	
	Pirimphos-ethyl	mg/kg	0.05	
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.1	
TRH	C6-C10	mg/kg	10	<10
	C6-C10 less BTEX (F1)	mg/kg	10	<10
	C6 - C9	mg/kg	10	<10
	C10 - C14	mg/kg	50	<50
	C15 - C28	mg/kg	100	<100
	C29-C36	mg/kg	100	<100
	+C10 - C36 (Sum of total)	mg/kg	50	<50
	C10 - C40 (Sum of total)	mg/kg	50	<50
	C10-C16	mg/kg	50	<50
	C16-C34	mg/kg	100	<100
	C34-C40	mg/kg	100	<100

Table 14 - QA/QC Analytical Results - Field Blanks (Water)
Crawfords Freightlines
Targeted Phase II ESA - 0143175

Field Blanks (WATER)
Filter: SDG in('ES1211770','ES1211396')

SDG	ES1211396	ES1211396	ES1211770	ES1211770
Field ID	R_070512_01	R_080512_01	R_140512_01	TRIP BLANK
Sampled Date	7/05/2012	8/05/2012	14/05/2012	14/05/2012
Sample Type	Rinsate	Rinsate	Rinsate	Trip_B

Chem_Group	ChemName	Units	EQL				
BTEX	Benzene	µg/L	1			<1	<1
	Toluene	µg/L	2			<2	<2
	Ethylbenzene	µg/L	2			<2	<2
	Xylene (m & p)	µg/L	2			<2	<2
	Xylene (o)	µg/L	2			<2	<2
	Xylene Total	µg/L	2			<2	<2
Halogenated Benzenes	Hexachlorobenzene	µg/L	0.5			<0.5	
Halogenated Phenols	2,4,5-trichlorophenol	µg/L	1			<1	
	2,4,6-trichlorophenol	µg/L	1			<1	
	2,4-dichlorophenol	µg/L	1			<1	
	2,6-dichlorophenol	µg/L	1			<1	
	2-chlorophenol	µg/L	1			<1	
	Pentachlorophenol	µg/L	2			<2	
Inorganics	Ammonia as N	µg/l	10	**30**	**20**	**10**	
	Nitrate (as N)	mg/l	0.01	**0.01**	<0.01	**0.03**	
	Nitrite (as N)	mg/l	0.01	<0.01	<0.01	<0.01	
	Nitrogen (Total Oxidised)	mg/l	0.01	**0.01**	<0.01	**0.03**	
Lead	Lead (Filtered)	mg/l	0.001			<0.001	
Metals	Arsenic (Filtered)	mg/l	0.001			<0.001	
	Cadmium (Filtered)	mg/l	0.0001			<0.0001	
	Chromium (III+VI) (Filtered)	mg/l	0.001			<0.001	
	Copper (Filtered)	mg/l	0.001			<0.001	
	Mercury (Filtered)	mg/l	0.0001			<0.0001	
	Nickel (Filtered)	mg/l	0.001			<0.001	
	Zinc (Filtered)	mg/l	0.005			<0.005	
Organochlorine Pesticides	4,4-DDE	µg/L	0.5			<0.5	
	a-BHC	µg/L	0.5			<0.5	
	Aldrin	µg/L	0.5			<0.5	
	b-BHC	µg/L	0.5			<0.5	
	Chlordane (cis)	µg/L	0.5			<0.5	
	Chlordane (trans)	µg/L	0.5			<0.5	
	d-BHC	µg/L	0.5			<0.5	
	DDD	µg/L	0.5			<0.5	
	DDT	µg/L	2			<2	
	Dieldrin	µg/L	0.5			<0.5	
	Endosulfan I	µg/L	0.5			<0.5	
	Endosulfan II	µg/L	0.5			<0.5	
	Endosulfan sulphate	µg/L	0.5			<0.5	
	Endrin	µg/L	0.5			<0.5	
	Endrin aldehyde	µg/L	0.5			<0.5	
	Endrin ketone	µg/L	0.5			<0.5	
	g-BHC (Lindane)	µg/L	0.5			<0.5	
	Heptachlor	µg/L	0.5			<0.5	
	Heptachlor epoxide	µg/L	0.5			<0.5	
	Methoxychlor	µg/L	2			<2	
Organophosphorous Pesticides	Azinophos methyl	µg/L	0.5			<0.5	
	Bromophos-ethyl	µg/L	0.5			<0.5	
	Carbophenothion	µg/L	0.5			<0.5	
	Chlorfenvinphos	µg/L	0.5			<0.5	
	Chlorpyrifos	µg/L	0.5			<0.5	
	Chlorpyrifos-methyl	mg/l	0.0005			<0.0005	
	Diazinon	µg/L	0.5			<0.5	
	Dichlorvos	µg/L	0.5			<0.5	
	Dimethoate	µg/L	0.5			<0.5	
	Ethion	µg/L	0.5			<0.5	
	Fenthion	µg/L	0.5			<0.5	
	Malathion	µg/L	0.5			<0.5	
	Methyl parathion	µg/L	2			<2	
	Monocrotophos	µg/L	2			<2	
	Prothiofos	µg/L	0.5			<0.5	

Table 14 - QA/QC Analytical Results - Field Blanks (Water)
Crawfords Freightlines
Targeted Phase II ESA - 0143175

Field Blanks (WATER) Filter: SDG in('ES1211770','ES1211396')			**SDG**	ES1211396	ES1211396	ES1211770	ES1211770
			Field ID	R_070512_01	R_080512_01	R_140512_01	TRIP BLANK
			Sampled Date	7/05/2012	8/05/2012	14/05/2012	14/05/2012
			Sample Type	Rinsate	Rinsate	Rinsate	Trip_B
PAH/Phenols	Sum of polycyclic aromatic hydrocarbons	mg/l	0.0005			<0.0005	
	2,4-dimethylphenol	µg/L	1			<1	
	2-methylphenol	µg/L	1			<1	
	2-nitrophenol	µg/L	1			<1	
	3-&4-methylphenol	µg/L	2			<2	
	4-chloro-3-methylphenol	µg/L	1			<1	
	Acenaphthene	µg/L	1			<1	
	Acenaphthylene	µg/L	1			<1	
	Anthracene	µg/L	1			<1	
	Benz(a)anthracene	µg/L	1			<1	
	Benzo(a) pyrene	µg/L	0.5			<0.5	
	Benzo(b)fluoranthene	µg/L	1			<1	
	Benzo(g,h,i)perylene	µg/L	1			<1	
	Benzo(k)fluoranthene	µg/L	1			<1	
	Chrysene	µg/L	1			<1	
	Dibenz(a,h)anthracene	µg/L	1			<1	
	Fluoranthene	µg/L	1			<1	
	Fluorene	µg/L	1			<1	
	Indeno(1,2,3-c,d)pyrene	µg/L	1			<1	
	Naphthalene	µg/L	1			<5	<5
	Phenanthrene	µg/L	1			<1	
	Phenol	µg/L	1			<1	
	Pyrene	µg/L	1			<1	
Pesticides	Demeton-S-methyl	µg/L	0.5			<0.5	
	Fenamiphos	µg/L	0.5			<0.5	
	Parathion	µg/L	2			<2	
	Pirimphos-ethyl	µg/L	0.5			<0.5	
Polychlorinated Biphenyls	PCBs (Sum of total)	µg/L	1			<1	
TPH	C6 - C9	µg/L	20			<20	<20
	C6-C10	mg/l	0.02			<0.02	<0.02
	C6-C10 less BTEX (F1)	mg/l	0.02			<0.02	<0.02
	C10 - C14	µg/L	50			<50	
	C10-C16	mg/l	0.1			<0.1	
	C15 - C28	µg/L	100			<100	
	C29-C36	µg/L	50			<50	
	C16-C34	mg/l	0.1			<0.1	
	C34-C40	mg/l	0.1			<0.1	
	+C10 - C36 (Sum of total)	µg/L	50			<50	
	C10 - C40 (Sum of total)	µg/L	100			<100	

Annex A

References

REFERENCES

Australia and New Zealand Environmental and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*

Environmental Resources Management (2011) *Phase I Environmental Site Assessment, Lot 12 Old Maitland Road, Sandgate NSW.*

enHealth, 2002. *Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards.* Department of Health and Ageing, Canberra, ACT.

National Environment Protection Council, (1999a). *National Environment Protection (Assessment of Site Contamination) Measure.* Schedule B(4) – Guideline on Health Risk Assessment.

National Environment Protection Council, (1999b). *National Environment Protection (Assessment of Site Contamination) Measure.* Schedule B(5) – Guideline on Ecological Risk Assessment.

National Environment Protection Council, (1999c). *National Environment Protection (Assessment of Site Contamination) Measure.* Schedule B(7a) – Guideline on Health-Based Investigation Levels.

National Environment Protection Council, (1999d). *National Environment Protection (Assessment of Site Contamination) Measure.* Schedule B(7b) – Guideline on Exposure Scenarios and Exposure Settings.

NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd Edition).*

NSW EPA (1994) *Guidelines for the Assessment of Service Station Sites.*