Environmental Resources Management Australia

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12 January, 2012

The Director-General
Department of Planning
GPO Box 39
SYDNEY NSW 2001

Our Reference: *0143175 L05 DOPI FINAL.DOC*

Attention: **Chris Ritchie - Manager Industry,**
Mining and Industry Projects, Major Projects Assessment.

Dear Mr Ritchie,

RE: **CRAWFORDS FREIGHTLINES (SANDGATE) PTY LTD AMMONIUM NITRATE STORAGE AND DISTRIBUTION FACILITY REQUEST FOR DIRECTOR-GENERAL'S REQUIREMENTS**

1. INTRODUCTION

Environmental Resources Management (ERM) Pty Ltd has been engaged by Crawfords Freightlines Pty Ltd (Crawfords) to assist in seeking the Director General's Requirements (DGR's) for the storage and distribution of Ammonium Nitrate at their operation at Sandgate.

The information provided in this letter and attached as annexes, is provided to assist the Department in compiling the DGR's relating to the preparation of the Environmental Impact Statement (EIS) required to accompany a development application for 'State Significant Development' under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to the Department of Planning and Infrastructure (DoPI) for determination by Minister.

Environmental Resources Management Australia Pty Ltd
A.C.N. 002 773 248
A.B.N. 12 002 773 248

Offices worldwide

2. CONSULTATION LOG

Table 1 details the ongoing consultation and correspondence between Crawfords, Newcastle Cite Council (Council) and other government agencies. Copies of relevant correspondence and notices is included in *Annex A.*

Table 1 Consultation Log.

Date	Consultation Log
28 September 2011	ERM sent correspondence on behalf of Crawfords to Council regarding the current situation at Crawfords Sandgate operations. The contents of the letter gave the background of current operations and sought Council's advice regarding the submission of a future development application to store and distribute ammonium nitrate. Councils response dated 10 January 2012 is included in *Annex A.*
2 December 2011	Officers from Council and the Environment Protection Authority (EPA) undertook an inspection at the premises occupied by Crawfords.
6 December 2011	Officers from Council and WorkCover NSW undertook a further inspection of the premises. WorkCover NSW advised that Crawfords held the appropriate licences required by WorkCover NSW and that the premises are identified as a '*Provisionally registered major hazard facility*'.
13 December 2011	Council issued the owners and occupiers of the premises a Notice of Intention to Give an Order. The terms of the proposed order are to "*cease use of the premises as a chemical storage facility, including but not limited to the storage of Ammonium Nitrate*".
13 December 2011	The EPA issued a Notice of Preventative Action to Crawfords.
14 December 2011	Paul McGrath (Crawfords) met with a representative from the EPA regarding site operations and Environmental Protection Licence (EPL) requirements. Later the same day a meeting was convened between NCC, Crawfords and ERM to discuss Councils intention to serve a notice under Section 212 of the EP&A Act.
16 December 2011	Crawfords provided the EPA with a letter detailing their plan to reduce the amount of ammonium nitrate stored on site to below 2000 tonnes, as required by the POEO Act.
20 December 2011	The EPA responded to Crawfords' letter with a Variation of Prevention Notice. The Variation of Preventative Action directs Crawfords to take the following actions: • from 6 January 2012, maintain an accurate, up to date record of all chemical substances stored at the premises;

- between 6 January 2012 and 31 January 2012, Crawfords must not receive any ammonium nitrate products for the purposes of storage while the quantity of ammonium nitrate while the quantity stored at the premises exceeds 2000 tonnes or if the receival of ammonium nitrate would cause the quantity stored at the site to exceed 2000 tonnes;

- by 1 February 2012, reduce in the quantity of ammonium nitrate products stored at the premises to below 2000 tonnes; and

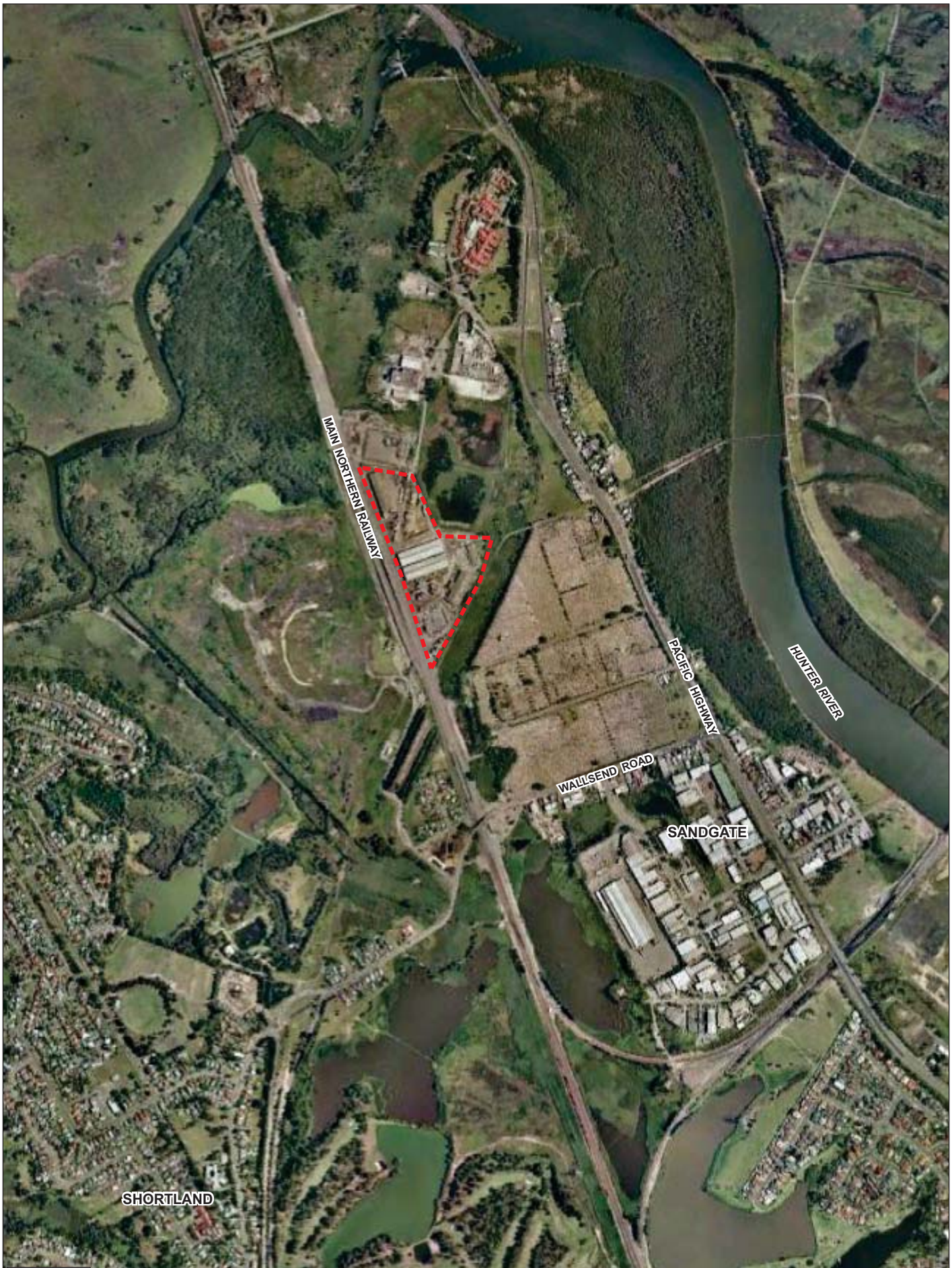
- from 1 February 2012, maintain the total quantity of all chemical substances stored at the premises to below the quantities specified under Schedule 1 of the POEO Act under 'Chemical Storage'.

22 December 2011 — ERM prepared a submission to Council on behalf of Crawfords detailing a response to the concerns raised by Council and the EPA. It provides a succinct summary of the current status of actions being taken to address the various concerns raised by these two agencies. A copy of this submission is included in *Annex A*.

3. SITE REVIEW

3.1 SITE LOCATION: LOT 12 OLD MAITLAND ROAD, SANDGATE NSW (LOT 12 DP DP625053)

The site is located at the southern apex of a small industrial area at Sandgate NSW (refer *Figure 1*). The industrial area is situated to the north of Sandgate Cemetery and the Sandgate bypass which is currently under construction and to the West of Maitland Road and the Hunter River. The Main Northern Railway extends along the western boundary with St Josephs Nursing Home to the north.



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_DGR_C001_R0.cdr		
Date:	11/01/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

Figure 1 - Locality Plan

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management Australia Pty Ltd

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

ERM

3.2 SITE HISTORY

- Crawfords have been operating a storage and distribution depot since 2009 and is licenced for the storage and transportation of up to 13,500 tonnes of Ammonium Nitrate which supplies Hunter Valley mines and other industries. Other tenants operating from the site include Impact Fertilisers, Scafflink, AQIS and their associated offices;

- NCC has previously refused a development application for the storage of ammonium nitrate on the site; and

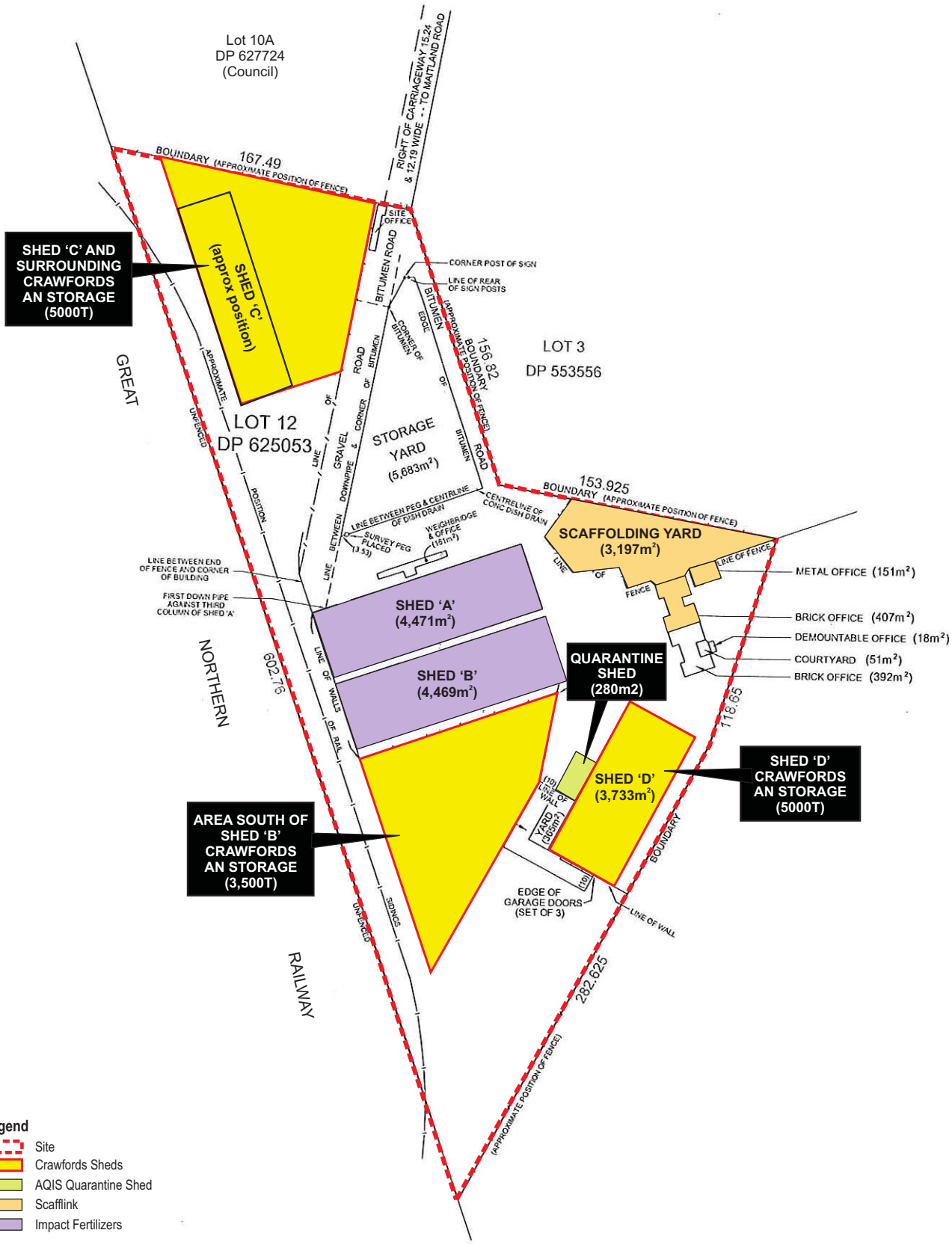
- a current application is with NCC for assessment (DA/11/0889) for the storage of bulk magnetite. This application is held in abeyance awaiting further information.

4. PROPOSED DEVELOPMENT

4.1 DEVELOPMENT DESCRIPTION

Crawfords leases several of the buildings on site from Sierra Sun Pty Ltd. Crawfords occupies the lease over shed 'C' and its surrounds, Shed 'D' and an area to the south of Shed 'B'. Shed 'C' and its surrounds and Shed 'D' are licensed to store 5000 tonnes of ammonium nitrate in each shed. The area to the south of Shed 'B' is licensed to store 3500 tonnes of ammonium nitrate in shipping containers. Other tenants operating from the site include Impact Fertilisers, Scafflink, AQIS and their associated offices. ***Error! Reference source not found.***2 is a site plan which illustrates building locations and tenants.

At present the site receives shipments of Ammonium Nitrate in containers by rail from Sydney (Botany Bay) and in bulk bags brought to the site by truck from the Port of Newcastle. The site receives regular shipments and likewise transport this chemical via truck several times per day mainly to mine sites in the Hunter.



Legend

- Site
- Crawfords Sheds
- AQIS Quarantine Shed
- Scafflink
- Impact Fertilizers

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_DGR_C002_R0.cdr		
Date:	11/01/2012	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

Figure 2 - Site Plan

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management Australia Pty Ltd

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

ERM

4.2 RELEVANT PLANNING PROVISIONS

4.2.1 Environmental Planning and Assessment Act 1979

The proposal as defined below would be assessed as 'State Significant Development' by the Minister under Part 4, Division 4.1 of the EP&A Act 1979. Division 4.1, clause 89C (2), details that *"A State Environmental Planning Policy (SEPP) may declare any development, or any class or description of development, to be State significant development."*

Clause 8(1b) of the State and Regional Development SEPP 2011 declares development to be 'State Significant' if the development is specified in Schedule 1 or 2. Clause 10(3) of Schedule 1 states:

*"Development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility within the meaning of Chapter 6B of the Occupational Health and Safety Regulation 2001"(*OH&S Regulations). Ammonium Nitrate is classified as a Class 5 dangerous good, refer to *Section 4.3.1* for the full definition.

The definitions listed in Chapter 6B of the OH&S Regulations states that a Major Hazard Facility (MHF) is "*a facility at which Schedule 8 materials are present or likely to be present in a quantity that exceeds their threshold quantity.*" Schedule 8 lists Ammonium Nitrate with a threshold quantity of 2500 tonnes.

Crawfords Sandgate operations has been storing and distributing in accordance with their current Workcover licence 13,500 tonnes of Ammonium Nitrate. Therefore the operation is MHF, which is considered to be 'State Significant Development'. An EIS will be prepared in accordance with Schedule 2 of the EP&A Regulations to accompany any development application to be lodged with the Department of Planning and Infrastructure.

It is noted that the *Occupational Health and Safety Regulation 2001* has been repealed and is replaced with the *Work Health and Safety Act 2011*. Notwithstanding this, the OH&S Regulations are still applicable until those provisions in the State and Regional Development SEPP are amended.

4.3 DEFINING THE DEVELOPMENT

4.3.1 Dangerous Goods Classification

The Dangerous Goods Code classifies the storage of Ammonium Nitrate into Class 5 – Oxidising Agents and Organic Peroxides.

Subclass 5.1 of the Dangerous Goods Classification Code states: *oxidising agents; substances which, although not necessarily combustible, may readily liberate oxygen, or be the cause of oxidisation processes. As a result they may start a fire in other materials or stimulate the combustion of other materials thereby increasing the violence of a fire. Examples: ammonium nitrate, hydrogen peroxide, calcium hypochlorite.*

Due to the above classification, the proposal may have the potential to be hazardous or offensive development, therefore assessment against SEPP 33 - Hazardous and Offensive Development would be required

4.3.2 Hazardous or Offensive Development

In determining whether a development is either hazardous or offensive the following policies and guidelines should be considered:

1. State Environmental Planning Policy No 33 (SEPP 33) - Hazardous and Offensive Development;

2. the NSW Department of Planning and Infrastructure (DP&I) guidelines (Hazardous Industry Planning Advisory Papers (HIPAPs)); and

3. the guideline Applying SEPP 33 and Multi-level Risk Assessment).

1. State Environmental Planning Policy 33 - Hazardous and Offensive Development

Sub clause 3 of SEPP 33 provides the following definition for *"potentially hazardous industry":*

potentially hazardous industry means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

(a) to human health, life or property, or

(b) to the biophysical environment,

and includes a hazardous industry and a hazardous storage establishment

Sub clause 2 of SEPP 33 states that in determining whether a development is:

(a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or

(b) an offensive storage establishment, offensive industry or other potentially offensive industry,

consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development.

2. *Applying SEPP 33*

One of the relevant guidelines published by DP&I referred to above is "Applying SEPP 33". In defining the development, Table 1 in the section on "Risk Screening" refers to Class 5 (ammonium nitrate), the table then refers to Table 3 "General Screening Threshold Quantities" in which Class 5.1 has a screening threshold of 5 tonne for ammonium nitrate – 'elsewhere'.

In the notes below Table 1 it states hat "Table 1 indicates that Table 3 is to be used: If the quantity is in excess of the quantity listed in Table 3, the development is potentially hazardous.

As the site is currently licensed to store up to 13,500 tonnes, which is well in excess of the threshold quantity of 5 tonnes, the land use is considered to be "potentially hazardous".

In addition, the last paragraph on page 21 of the guideline states:

"If any of the above tests result in a screening threshold being exceeded, the proposed development should be considered potentially hazardous and SEPP 33 will apply. In such cases, a preliminary hazard analysis (PHA) is required to be submitted with the development application. The PHA should be prepared in accordance with Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 – Guidelines for Hazard Analysis."

In reviewing Table 2 – *"Transport Screening Thresholds" of the guideline "Applying SEPP 33"*, the threshold for the transportation of Class 5 ammonium nitrate may also be exceeded. Table 2 refers to cumulative or annual number of vehicle movements greater than 500; or peak weekly movements greater than 30. If these values are exceeded a route evaluation study would be required to be undertaken.

Crawfords commissioned Health and Safety Essentials (HSE) to prepare a 'Hazard Analysis' and to assess the proposal with regard to the guidelines referred to above.

Page 8 of the Hazard Analysis (HSE 2011) refers to the distribution of ammonium nitrate from the site. The report states:

- 3-4 single trailer and B-Double trailer loads are typical per day;
- 5 bulk trailer loads per day; and
- 1 interstate load per fortnightly.

Therefore based on the estimates in the HSE Hazard Analysis the thresholds for traffic movements would also be exceeded.

3. *HSE Hazard Analysis*

As referred to above, Crawfords commissioned HSE to prepare a "Hazard Analysis" which was completed in July 2011. This Hazard Analysis is included as *Annex B*.

The conclusion of the Hazard Analysis states that the risk criteria for individual risk, societal risk and biophysical risk as set by the Department of Planning in HIPAP 4 have been met.

While it is not stated in SEPP 33, Applying SEPP 33 or any of the HIPAPs, it is generally understood that if the risk criteria of HIPAP 4 can be met,

then the facility does not pose a "significant risk in relation to the locality" and the land use would be defined as a 'potentially hazardous industry'

4. LOCAL ZONING

The site is located within the Port and Industry Zone under the Newcastle Local Environmental Plan 2003 (LEP 2003) and IN3 – Heavy Industrial in Newcastle Draft Local Environmental Plan 2011 (DLEP 2011), see *Annex C* illustrating current and future zonings. The LEP 2003 lists certain development that is permissible with consent in the Port and Industry Zone. The development is defined as a potentially hazardous industry which is permissible with consent in both the Port and Industry Zone as well as the draft zoning IN3 – Heavy Industrial in the DLEP 2011.

5. ENVIRONMENTAL FACTORS

Notwithstanding the Hazard Analysis completed by HSE, a detailed environmental assessment has not been conducted. The following issue identify the potential environmental risks to the site which would need to be investigated and assessed, prior to the preparation of and EIS.

5.1 FLOODING AND STORMWATER

Consultation with Newcastle City Council's engineering department has confirmed that the site is located on the Hunter River Floodplain, see *Annex D*. At the minimum, it is anticipated that a flood risk investigation and assessment would need to be completed.

5.2 ECOLOGY AND SEPP14 – COASTAL WETLANDS

The site is within close proximity of a State Environmental Planning Policy No 14 (SEPP 14) - Coastal Wetland (840), see *Annex D*. This is a state significant wetland and the potential impact of the development on the adjacent wetlands would need to be addressed.

5.3 BUSH FIRE

The south western and south eastern perimeters of the site are mapped as being bush fire prone land (Rural Fire Service 2009), see *Annex D*. The bush fire risk would originate from the grasslands in the north and west and through the open corridor in the south. However, it is noted that the corridor in the south is currently being developed for the Sandgate bypass and therefore should remove this hazard.

The risk of bush fire will need to be assessed through the preparation of a bush fire hazard analysis and measures to be taken to address this risk will have to be documented in the EIS.

5.4 CONTAMINATION

Planning records detail that Lot 10A DP627724, immediately north of the site is currently subject to an ongoing maintenance order issued by the NSW Environmental Protection Agency (EPA): Maintenance of remediation notice under Section 28 of the *Contaminated Lands Management Act 1997* Notice Number:28026. This notice dictates a number of maintenance requirements which will need to be referred to and documented in the EIS.

6. CONCLUSIONS

I trust the information provided above and in the attachments is sufficient for the Department to provide the Director-General's Requirements. However, if you have any questions or require any further information about the proposal, please do not hesitate to contact the undersigned.

Yours sincerely
for Environmental Resources Management Australia Pty Ltd

Jacinta Coulin
Environmental Planner

Steve O'Connor
Principal Consultant

Annex A

CONSULTATION AND NOTICES

Future City: DP
Reference: ECM#3524718

10 January 2012

Ms Jacinta Coulin
Environmental Resource Management
PO Box 71
THORNTON NSW 2322

The City of Newcastle

PO Box 489, Newcastle
NSW 2300 Australia
Phone 02 4974 2000
Facsimile 02 4974 2222
Email mail@ncc.nsw.gov.au
www.newcastle.nsw.gov.au

Dear Ms Coulin,

RE: CHEMICAL STORAGE FACILITY
PROPERTY: LOT 12 DP: 625053, 158 MAITLAND ROAD, SANDGATE

I refer to your letter dated 28 September 2011, concerning the unauthorised chemical storage facility on part of the subject premises. I apology for the long delay in forwarding a response.

It is confirmed that under the provisions of the Newcastle Local Environmental Plan, 2003 the subject site is zoned 4(b) Port and Industry Zone, in which zone the use of the subject premises for the storage and distribution of ammonium nitrate, provided it does not constitute a 'hazardous storage establishment' as defined, is permissible with Council's consent under the provisions of the *Environmental Planning and Assessment Act, 1979.*

Clause 8 of State Environmental Planning Policy (State and Regional Development) (SEPP) 2011, however, indicates that if a proposed development has the following characteristics (refer to Schedule 1 of the SEPP), the proposal is defined as 'State significant development' and therefore the application is to be assessed by the Department of Planning and Infrastructure and the Minister is the consent authority:

> *'10 Chemical, manufacturing and related industries*
>
> *(1) Development that has a capital investment value of more than $30 million for the purpose of the manufacture or reprocessing of the following (not including labelling or packaging):*
>
> *(e) Ammunition or explosives,*
>
> *(3) Development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility within the meaning of Chapter 6B of the Occupational Health and Safety Regulation 2001'.*

This matter will need to be addressed in the supporting documentation for the application.

Based on the information contained in your letter, it is confirmed that use of part of the site as a 'chemical storage facility' to store more than 2000 tonnes of ammonium nitrate within 40 metres of a wetland and on a floodplain constitutes a 'designated

development' under the *Environmental Planning and Assessment Regulation, 2000*. Accordingly, the required development application will need to be accompanied by an Environmental Impact Statement (EIS) prepared in accordance with the relevant requirement s of the Director –General of Planning and Infrastructure.

In addition to the Director-General's requirements the EIS is to also specifically address the following matters:

1.0 PLANNING CONSIDERATIONS

1.1 Draft Local Environmental Plan 2011

The subject site is zoned IN3 – Heavy Industry Zone under the Draft Newcastle LEP 2011. Demonstrate that the proposal complies with the relevant provisions of the Draft Plan. It is anticipated that the Draft Planning Instrument will be gazetted in February.

1.2 Newcastle Local Environment Plan 2003

The subject site is zoned 4(B) Port and Industry Zone under the Newcastle LEP 2003. Demonstrate that the proposal complies with the relevant provisions of the Newcastle Local Environment Plan 2003.

1.3 Newcastle Development Control Plan 2005.

Demonstrate compliance with the relevant requirements of the Newcastle Development Control Plan, 2005.

1.4 State Environmental Planning Policy 33 – Hazardous and Offensive Development

Although, this issue is covered in your letter dated 28 September, 2011 the application needs to address any potential products or processes which may trigger the provisions of State Environmental Planning Policy 33 (SEPP33). Using the Department of Planning's document 'Applying SEPP 33' guidelines, the storage of various products triggers the requirements of SEPP 33. Where SEPP 33 is triggered a Preliminary Hazard Analysis is to be prepared and submitted as part of the EIS.

1.5 Section 94A

The proposal would be required to pay a Section 94A contribution under Council's 'Section 94A Development Contributions Plan 2006'. The contribution amount is 1% of the cost of development which is required to be certified by a Quantity Surveyor as per the report form within Schedule 3 of the Plan.

2.0 ENVIRONMENTAL IMPACTS

2.1 Polluted waste water from site

- Assess the potential for any spilt ammonium nitrate to be tracked outside the storage sheds and contaminate underlying soil and groundwater.
- Provide details of the process for cleaning storage facilities and sheds and the collection and disposal of potentially polluted wastewater.
- Assess the potential for polluted wastewater to enter storm water drains and flow into an adjacent wetland identified in State Environmental Planning Policy No 14- 'Coastal wetlands' and coastal protection zone.

It being noted that excess nutrients in these ecosystems can trigger algal blooms.

2.2 Contamination

- Assess the suitability of the site for use as industrial storage facility in accordance with State of Environmental Planning Policy (SEPP) No. 55 – 'Remediation of land' and the Newcastle Development Control Plan, 2005 (DCP).
- Assess the potential for further contamination of the land as a result of the proposal.

2.3 Hazardous material handling

- Provide further details regarding the appropriate handling and storage of ammonium nitrate.
- Assess the potential for hazardous ammonium nitrate spills and dust from loading and unloading activities.

2.4 Noise

- Provide details of the hours of operation.
- Identify site transport and traffic generating noise that may impact on surrounding residents. In particular, noise generated by heavy vehicles, rail operations and off rail sidings.

2. 5 Sediment and erosion control

Provide details of measures to seal all heavy vehicle access areas to prevent the generation of dust and minimise soil erosion.

2.6 Joint Audit Report

Respond to the findings of the Joint Audit Report prepared by Newcastle City Council and the Environment Protection Authority.

2.7 Bushfire risk

Assess the risk of bush fire to the proposal. In this regard, the subject site is identified as being bush fire prone land on the Newcastle City Council Bush Fire Prone Land Map.

3.0 ENGINEERING CONSIDERATIONS

3.1 Traffic

Assess the likely impact of traffic movements generated by the proposal on the safety and efficiency of the local road network. In this regard, the application is be supported by a Traffic Impact Statement.

3.2 Flooding

Exam the suitability of the site for the proposed use given its location on a flood plain. In this regard, it is recommended a Flood information Certificate should be obtained from Council prior to lodging the development application.

3.4 Stormwater Management

Provide a Stormwater Management plan prepared in accordance with Element 4.5 –'Water Management' of Council's Development Control Plan 2005.

3.5 Waste Disposal

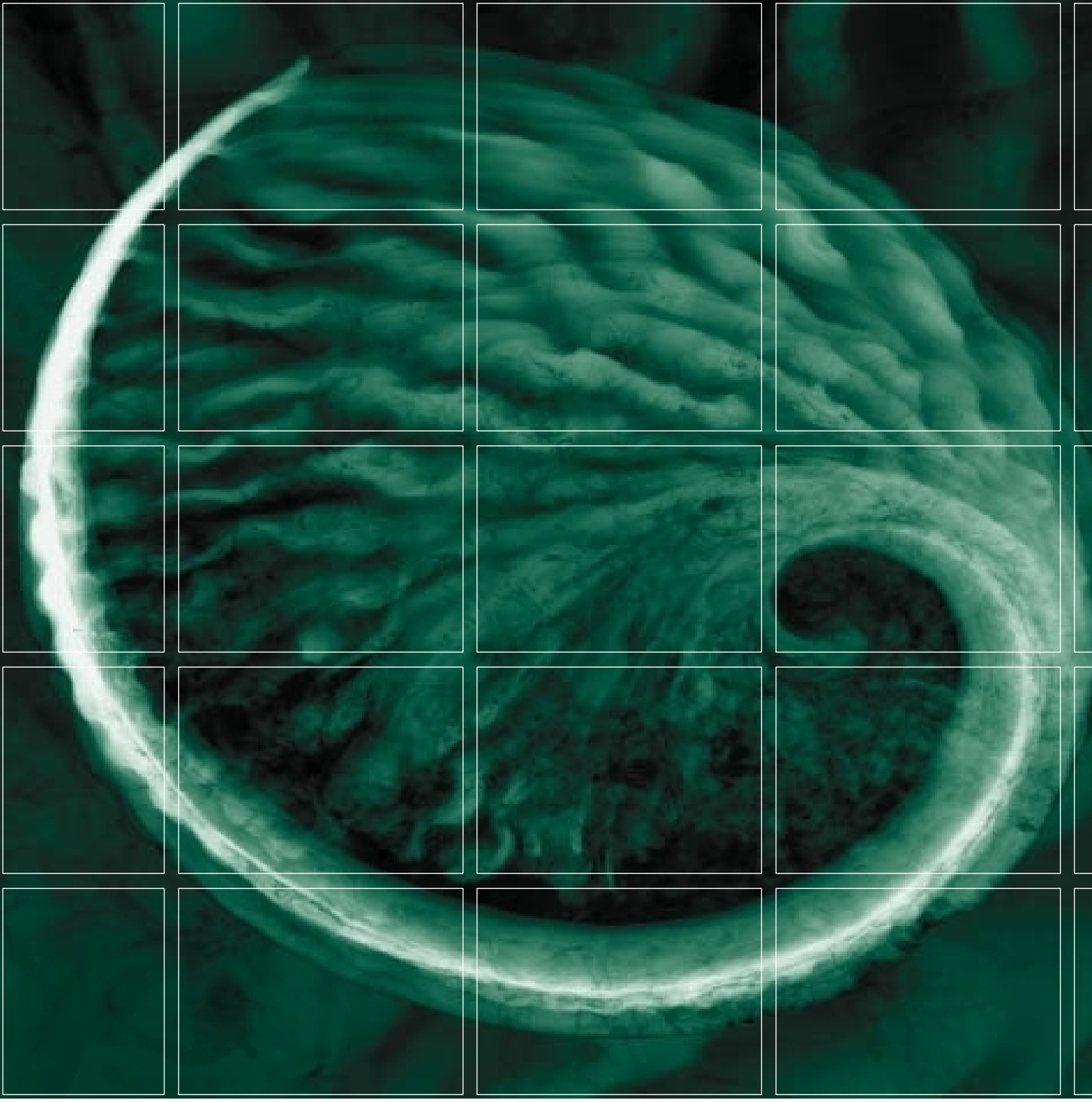
Provide details of any waste materials from the proposal including any specific properties or issues associated with its disposal (i.e. preventing is disposal to landfill if necessary). A waste management plan prepared in accordance with Element 4.6-'Waste Management' of the Newcastle DCP 2005 is to be submitted.

Given the significance of the proposed development, early consultation with the community will be important to ensure all issues and concerns are addressed appropriately in the EIS.

If you have any further enquiries regarding this advice please contact me on 4974 2747.

Yours sincerely

David Paine
SENIOR DEVELOPMENT OFFICER (PLANNING)



Crawfords Freightlines Pty Ltd

Submission to Newcastle City Council Regarding Lot 12 DP 625053, 158 Old Maitland Road, Sandgate

Crawfords Freightlines Pty Ltd

December 2011

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Crawfords Freightlines Pty Ltd

Submission to Newcastle City Council Regarding Lot 12 DP 625053, 158 Old Maitland Road, Sandgate

Crawfords Freightlines Pty Ltd

Approved by:	*Jacinta Coulin*
Position:	Project Manager
Signed:	
Date:	*22 December, 2011*
Approved by:	*Steve O'Connor*
Position:	Principle
Signed:	
Date:	*22 December, 2011*

Environmental Resources Management Australia Pty Ltd Quality System

Quality-ISO-9001-PMS302

December 2011

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FINAL REPORT

Crawfords Freightlines Pty Ltd

Crawfords Freightlines Pty Ltd

Submission to Newcastle City Council Regarding Lot 12 DP 625053, 158 Old Maitland Road, Sandgate

December 2011

Reference: 0143175 NCCSubmission

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CONTENTS

ANNEXES

LIST OF FIGURES

1 INTRODUCTION

1.1 PURPOSE OF SUBMISSION

On 2 December 2011, officers from Newcastle City Council (Council) and the Environment Protection Authority (EPA) undertook an inspection of Lot 12 DP 625053, 158 Old Maitland Road, Sandgate (referred to hereafter as "the premises"). The premises are occupied by Crawfords Freightlines Pty Ltd (Crawfords), which operates an ammonium nitrate storage and transportation business.

On 6 December 2011, officers from Council and WorkCover NSW undertook a further inspection of the premises. WorkCover NSW advised that Crawfords held the appropriate licences required by WorkCover NSW and that the premises are identified as a '*Provisionally registered major hazard facility*'.

This submission has been prepared in response to the concerns raised by Council and the EPA. It aims to provide a succinct summary of the current status of actions being taken to address the various concerns raised by these two agencies. It also provides a recommendation regarding the future action Council should take in relation to the issue of an Order under Section 121 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 INTENTION TO ISSUE AN ORDER FROM COUNCIL

On 13 December 2011, Council issued the owners and occupiers of the premises a Notice of Intention to Give an Order (*Annex A*). The terms of the proposed order are to "*cease use of the premises as a chemical storage facility, including but not limited to the storage of Ammonium Nitrate*". The reasons for the service of the proposed Order are explained in *Chapter 2*.

Section 121I of the *Environmental Planning and Assessment Act 1979* (EP&A Act) provides that representations may be made to Council as to why the Order should not be given or as to the terms of or the period for compliance with the Order. Representations must be received by Council by 5:00pm on 23 December 2011. Should Council proceed with the service of the Order, compliance will be required within 14 days of the date of issue with the proposed Order.

1.3 NOTICE FROM EPA

On 13 December 2011, the EPA issued a Notice of Preventative Action (Notice No. 1503295) under Section 96 of the *Protection of the Environment Operations Act 1997* (POEO Act) to Crawfords (*Annex B*). The EPA alleges that Crawfords have committed, and are potentially continuing to commit, an offence under Section 48 of the POEO Act, which states that the occupier of any premises at

which any scheduled activity is carried out on is guilty of an offence, unless the occupier holds an Environmental Protection License (EPL) that authorises the activity to be carried out on those premises.

Schedule 1 of the POEO Act lists the scheduled activities for which an EPL is required. General chemical storage is defined as the storage or packaging in containers, bulk storage facilities or stockpiles of any chemical substance classified as a dangerous good in the *Transport of Dangerous Goods Code*,. Ammonium nitrate is classified as a dangerous good under this code. Premises that have the capacity to store more than 2000 tonnes (chemicals in forms other than pressurised or liquefied gases) are scheduled activities. The premises was identified as having capacity to store up to approximately 13,500 tonnes of ammonium nitrate during the inspection. At the time of the inspection, over 10,000 tonnes of ammonium nitrate products were being stored at the premises.

The initial Notice of Preventative Action directed Crawfords to reduce the quantity of ammonium nitrate stored at the premises to below 2000 tonnes within 7 days. Crawfords responded to the EPA on 16 December 2011 (*Annex E*) outlining a plan to achieve this over a three month period (*see Section 3.2*).

On 20 December 2011, the EPA responded to Crawfords' letter with a Variation of Prevention Notice (*Annex E*). The Variation of Preventative Action directs Crawfords to take the following actions:

- from 6 January 2012, maintain an accurate, up to date record of all chemical substances stored at the premises;
- between 6 January 2012 and 31 January 2012, Crawfords must not receive any ammonium nitrate products for the purposes of storage while the quantity of ammonium nitrate while the quantity stored at the premises exceeds 2000 tonnes or if the receival of ammonium nitrate would cause the quantity stored at the site to exceed 2000 tonnes;
- by 1 February 2012, reduce in the quantity of ammonium nitrate products stored at the premises to below 2000 tonnes; and
- from 1 February 2012, maintain the total quantity of all chemical substances stored at the premises to below the quantities specified under Schedule 1 of the POEO Act under 'Chemical Storage'.

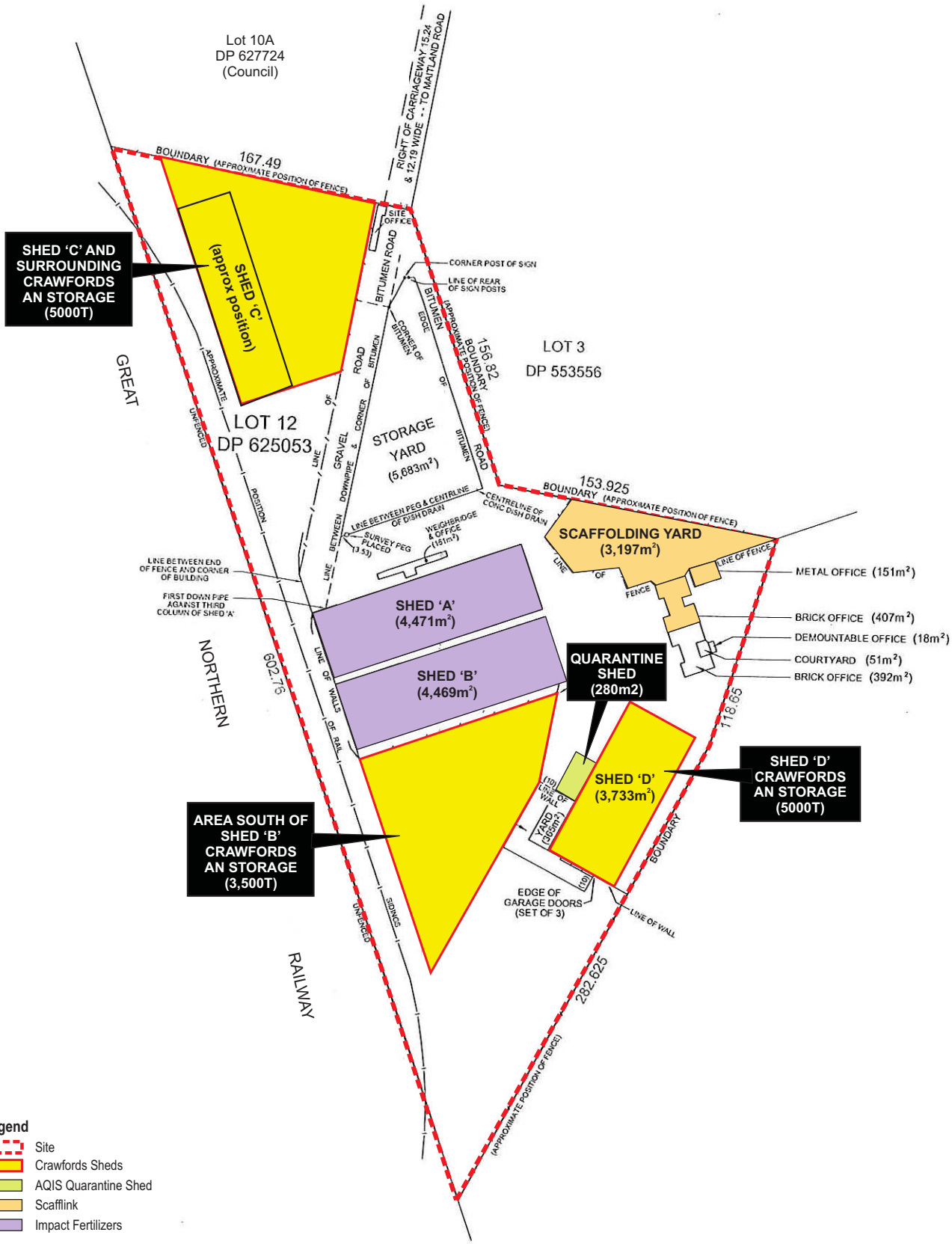
1.4 HISTORY OF DEVELOPMENT

Crawfords have been operating a storage and distribution depot, since May 2008, at the premises for the storage of up to 13,500 tonnes of ammonium nitrate to supply Hunter Valley mines and other industries with this chemical. The premises is located within a relatively small industrial area at Sandgate and is leased from Sierra Sun. Other tenants operating from the site include Impact Fertilisers, Scafflink and AQIS.

Prior to Crawfords occupying the premises, these premises had been used as an ammonium nitrate storage and distribution facility since 2000. From 2000 – 2005 the premises were occupied by R&H Transport, with Sierra Sun licensed to store ammonium nitrate at the premises. From 2005 – 2010 Toll Resources occupied part of the premises and held a license to store ammonium nitrate.

Crawfords holds the lease over shed 'C' and its surrounds, Shed 'D' and an area to the south of Shed 'B'. Crawfords hold WorkCover licences for the storage of 13,500 tonnes of ammonium nitrate and for the transportation of ammonium nitrate. Shed 'C' and its surrounds and Shed 'D' are licensed to store up to 5,000 tonnes of ammonium nitrate in each shed. The area to the south of Shed 'B' is licensed to store up to 3,500 tonnes of ammonium nitrate in shipping containers (see *Figure 1*).

In July 2011, Health and Safety Essential Pty Ltd undertook a hazard analysis of activities at the premises. The analysis found that the facility meets NSW Department of Planning and Infrastructure (DP&I) criteria for individual and societal risk. The level of societal risk falls under the As Low As Reasonably Possible criteria set by DP&I. Crawfords have developed and implemented a Site Emergency Plan for the premises. This Site Emergency Plan has been approved by the NSW Fire and Emergency Services Commissioner.



Legend

- Site
- Crawfords Sheds
- AQIS Quarantine Shed
- Scafflink
- Impact Fertilizers

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_SMNCC_C001_R0.cdr		
Date:	20/12/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: SO'C	

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 Plan

Crawfords Freightlines Pty Ltd
Submission to Newcastle City Council

Environmental Resources Management Australia Pty Ltd

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

ERM

2 *CONCERNS BEING RAISED*

A number of concerns regarding the use of the premises have been raised by Council and the EPA following the site inspection undertaken on 2 December 2011. These are documented in this chapter, together with a summary of the legal framework within which the premises must be operated.

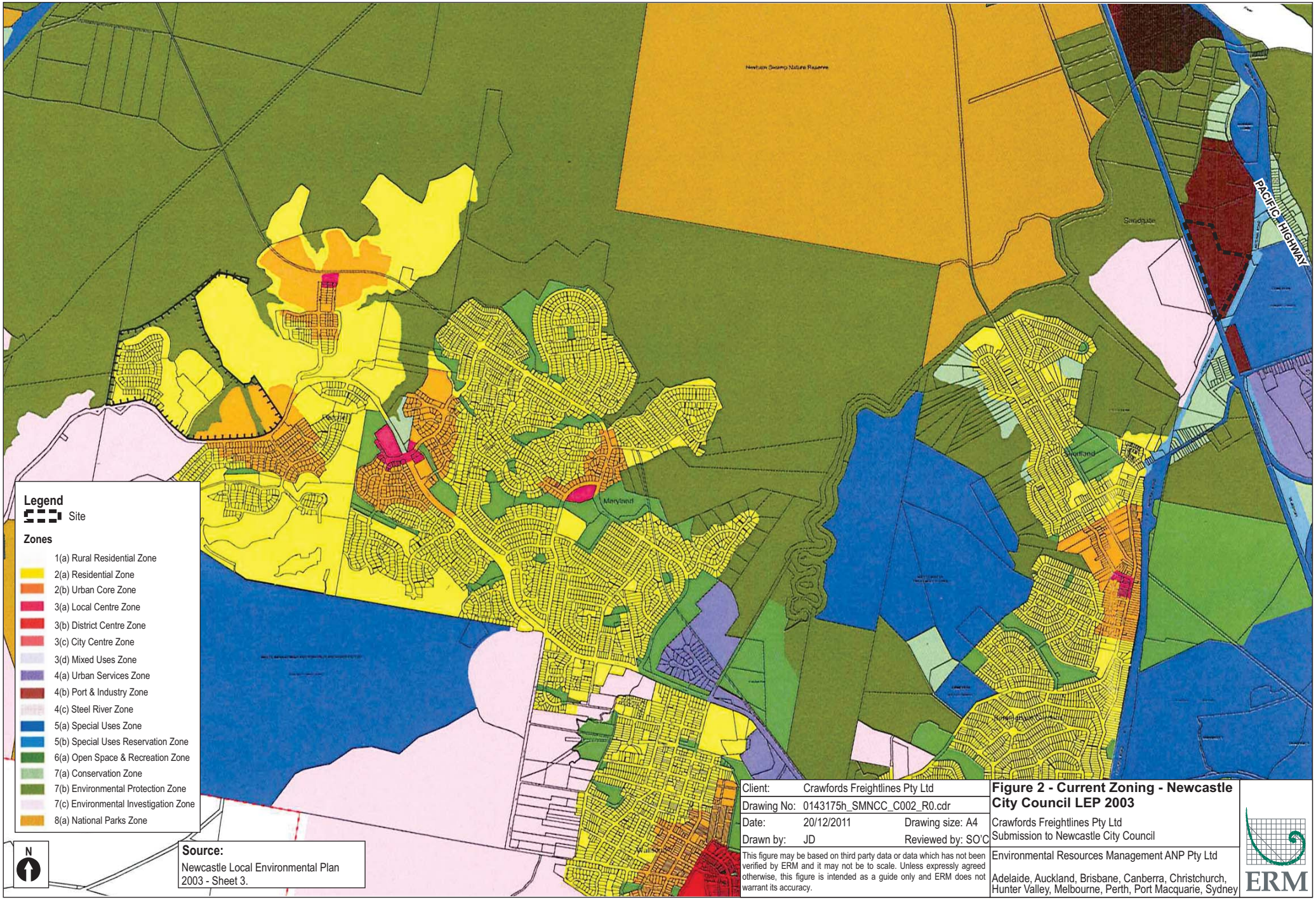
2.1 *LEGAL FRAMEWORK*

The Newcastle Local Environmental Plan 2003 (LEP 2003) lists certain development that is permissible with consent in the Port and Industry Zone which applies to the premises. The development is defined as a potentially hazardous industry which is permissible with consent in both the Port and Industry Zone under LEP 2003 as well as the draft zoning IN3 – Heavy Industrial in Newcastle Draft Local Environmental Plan 2011 (LEP 2011) see *Figures 2 and 3*.

Due to the chemical nature of the material being stored at the facility, Schedule 3 of the Environmental Planning and Assessment Regulations 2000 (EP&A Regulations) defines the use as designated development under Part 1, subclause 10; Chemical Storage Facility. As the storage of a chemical substance is in excess of 2,000 tonnes, the site is within 40 metres of a natural waterbody or wetland, and is also located on a floodplain the thresholds specified in Schedule 3 are exceeded and therefore an environmental impact statement (EIS) must be prepared in accordance with Schedule 2 of the EP&A Regulations to accompany any development application to be lodged with Council.

In June 2011, Crawfords were advised by officers from the Department of Planning and Infratructure who were working with the Major Hazardous Facilities (MHF) Unit, that there is no record of a development consent for the land uses undertaken at the premises. Crawfords then commenced negotiations with Council regarding the development application (DA) process, and were advised that Sierra Sun had submitted a DA in 2000 which was rejected. In August 2011, Crawfords engaged Environmental Resources Management Australia Pty Ltd (ERM) to commence work on the preparation of the DA and Environmental Impact Statement (EIS) process for the site. On 28 September 2011, ERM provided Council with a letter (*Annex C*) seeking confirmation that Council was in agreement with ERM's interpretation of relevant planning and associated legislation and regulations, planning instruments and other parts of the regulatory framework and were prepared to accept lodgement of a development application and associated EIS.

ERM has prepared a correspondence to the Director General of the Department of Planning and Infrastructure (DP&I) seeking the Director General's Requirements (DGRs) for the preparation of an EIS, but has not sent this correspondence to the DP&I, as a response from Council has yet to be received. Council's response will form an important attachment to the ERM correspondence to the DP&I seeking the DGRs for the EIS.



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_SMNCC_C002_R0.cdr		
Date:	20/12/2011	Drawing size:	A4
Drawn by:	JD	Reviewed by:	SO'C

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.

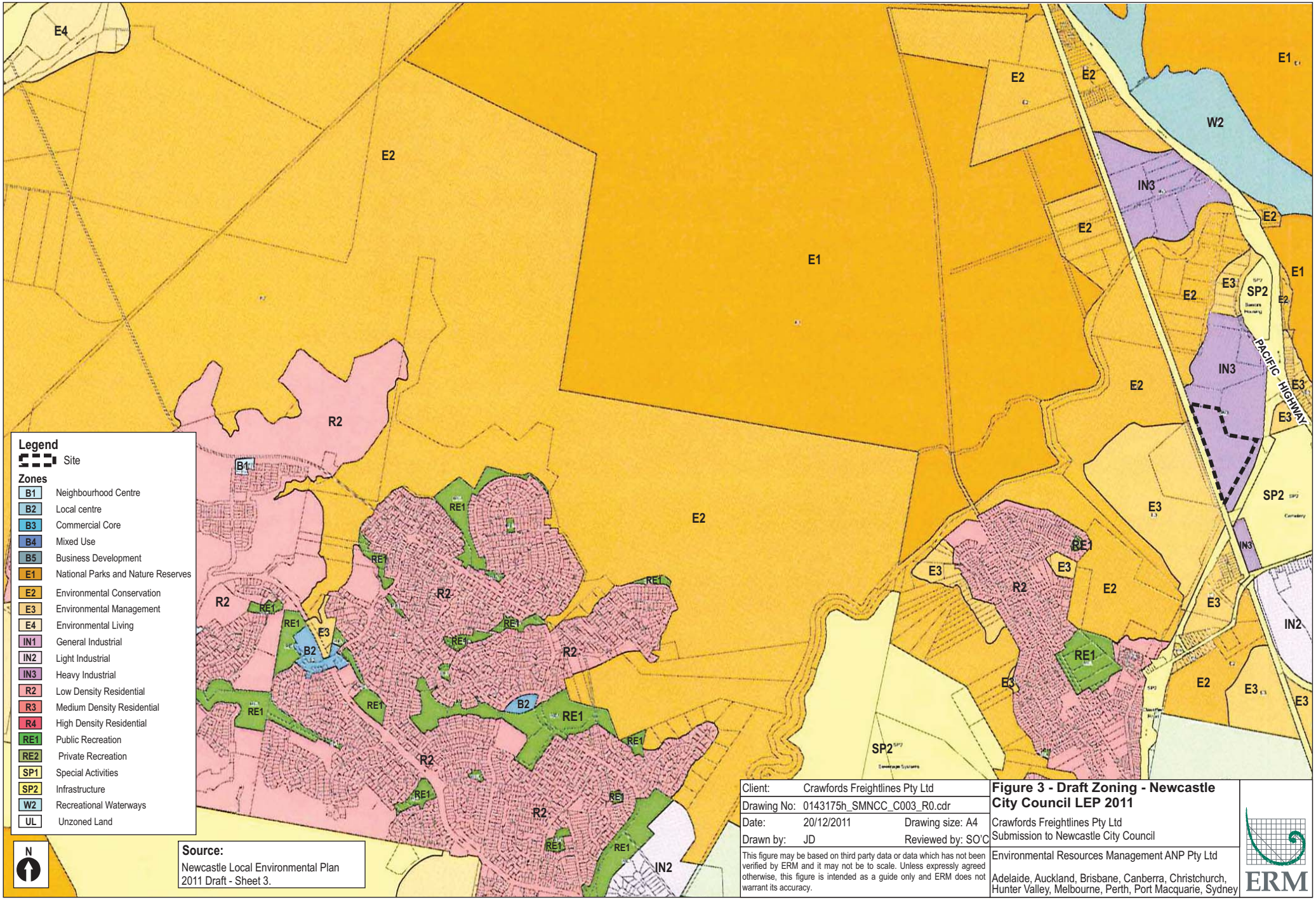
Figure 2 - Current Zoning - Newcastle City Council LEP 2003

Crawfords Freightlines Pty Ltd
Submission to Newcastle City Council

Environmental Resources Management ANP Pty Ltd

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

ERM



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_SMNCC_C003_R0.cdr		
Date:	20/12/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: SO'C	

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 - Draft Zoning - Newcastle City Council LEP 2011

Crawfords Freightlines Pty Ltd
Submission to Newcastle City Council

Environmental Resources Management ANP Pty Ltd

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

ERM

As mentioned in *Section 1.3*, the premises are currently in breach of Section 48 of the POEO Act, as more than 2000 tonnes of ammonium nitrate is stored on the premises. To comply with the Notice of Preventative Action and the POEO Act, Crawfords must reduce and maintain the amount of ammonium nitrate stored on site to below 2000 tonnes. Crawfords may apply for an Environment Protection License from the EPA to increase its storage capacity at the premises if development consent is granted for more than 2000 tonnes to be stored at the premises at some future date.

2.2 *POTENTIAL RISK TO THE ENVIRONMENT*

During the inspection of the premises undertaken on December 2011, a number of environmental issues arising from the use of the premises were identified, including, but not limited to, inadequate dust suppression, poor stormwater controls, and close proximity to watercourses and wetlands.

2.2.1 *Inadequate Dust Suppression*

The main source of dust from the site is due to truck and forklift movements on unsealed internal roads. The solicitors for the owners of the premises, Sierra Sun, have agreed on behalf of the owners to arrange for work to be undertaken to seal all unsealed surfaces within the premises. A suitably qualified earthworks contractor has been engaged to do carry out this as a matter of urgency. The solicitors have provided Crawfords with a letter agreeing to undertake this work which has been submitted to Council (*Annex D*).

Council and the EPA also noted the there was inadequate dust suppression associated with repackaging ammonium nitrate.

2.2.2 *Poor Stormwater Controls*

A major issue raised by Council during the inspection on 2 December 2011 was the lack of adequate stormwater controls. This problem is exacerbated by the close proximity of the site to State Environmental Planning Policy No 14 – Coastal Wetlands (SEPP 14) wetlands. The lack of adequate stormwater controls on site could potentially result in heightened nutrient load entering these neighbouring wetlands. Council are particularly concerned over the lack of a 'first flush' system, which would reduce the sediment load entering the wetlands.

2.2.3 Other Issues

Council and the EPA identified a number of other environmental issues during the 2 December 2011 inspection. These issues include:

- the refuelling of forklifts is not being undertaken in a suitably contained area;
- the bund surrounding the diesel fuel storage area is not compliant;
- the containment and recovery of residual ammonium nitrate on outside areas is not sufficient;
- there is waste oil and rubbish requiring removal from the premises;
- the location of the mechanics workshop is not suitable; and
- the standard of general housekeeping, including the timely recovery of waste ammonium nitrate in stores, requires improvement.

3 ACTIONS PROPOSED

3.1 SUBMISSION OF DA WITH AN EIS

If confirmation from Council is forthcoming, ERM will seek the Director General's Requirements (DGRs) from the Department of Planning and Infrastructure (DP&I) which will set out the issues which must be addressed in an EIS. ERM will then prepare and lodge the EIS as part of the development application documentation. Depending on the time taken for Council to respond to ERM's letter of 28 September 2011 and the time taken for the DP&I to issue DGRs, it is anticipated that a DA and EIS could be lodged by 30 April 2012.

3.2 INTERIM OPERATIONAL PROCEDURES

On 16 December 2011, Crawfords provided the EPA with a letter (*Annex E)* detailing their plan to reduce the amount of ammonium nitrate stored on site to below 2000 tonnes, as required by the POEO Act. Due to the quantities currently onboard vessels headed to NSW ports, Crawfords proposed the following actions:

- Crawfords will attempt to limit or divert imported break bulk shipments of ammonium nitrate to alternative licensed storage facilities, subject to license to store limitations for individual sites;
- Crawfords' customers will investigate the transfer of stock from Sandgate to their own licensed facilities in the Hunter Valley. Quantities transferred will be dependant on licensed storage limits at each site, which at this point in time are approaching maximum capacity; and
- Ammonium nitrate imports arriving at Sandgate in containers will be transferred directly from containers to transport where possible, again subject to user site storage limits.

In consideration of the time required to achieve the above actions and the limited availability of alternative sites due to restrictions applied to storage of ammonium nitrate, vessels transporting ammonium nitrate currently enroute, and port time limitations applicable to imported Dangerous Goods, Crawfords requested an extension of 3 months to manage stock levels down to the 2000 tonnes threshold of the POEO Act.

On 20 December 2011, the EPA responded to Crawfords' letter with a Variation of Prevention Notice (*Annex E*). The Variation of Preventative Action directs Crawfords to take the following actions:

- from 6 January 2012, maintain an accurate, up to date record of all chemical substances stored at the premises;

- between 6 January 2012 and 31 January 2012, Crawfords must not receive any ammonium nitrate products for the purposes of storage while the quantity of ammonium nitrate while the quantity stored at the premises exceeds 2000 tonnes or if the receival of ammonium nitrate would cause the quantity stored at the site to exceed 2000 tonnes;
- by 1 February 2012, reduce in the quantity of ammonium nitrate products stored at the premises to below 2000 tonnes; and
- from 1 February 2012, maintain the total quantity of all chemical substances stored at the premises to below the quantities specified under Schedule 1 of the POEO Act under 'Chemical Storage'.

This Variation requires Crawfords to reduce stock levels of ammonium nitrate on the premises to 2000 tonnes in a shorter time period than the three months proposed by Crawfords. Crawfords propose to reduce the quantity of ammonium nitrate stored at the premises to 4000 tonnes rather than 2000 tonnes. It will do this by maintaining two separate 2000 tonne stores of ammonium nitrate, one in Shed 'C' and one in Shed 'D'.

As mentioned in *Section 2.2.1*, action is underway to seal the unsealed surfaces within the premises. The earthworks contractor commenced work on 19 December 2011, with work expected to be completed by 31 January 2012. The sealing works will improve the drainage of the site, by draining stormwater towards the existing drainage pits along the rail line.

3.3 SAFE OPERATING HISTORY

Crawfords have operated in a safe manner without any major incidents at the premises since May 2008 when they commenced operations. A record of all incidents at the premises has been kept since 2004, with only nine incidents recorded since that time. The majority of incidents have been minor thefts and vandalism. The most serious incident occurred in July 2010 when there was a break in and some bags of ammonium nitrate were sliced.

As mentioned in *Section 1.4*, Health & Safety Essentials Pty Ltd undertook a hazard analysis risk assessment at the premises in July 2011. The hazard analysis identified and analysed five scenarios that have the potential for significant consequences, namely:

1 the explosion of ammonium nitrate in storage,

2 the explosion of ammonium nitrate during road transport,

3 the explosion of ammonium nitrate during loading;

4 the sustained release of toxic decomposition products of ammonium nitrate in storage; and

5 the sustained release of toxic decomposition products of ammonium nitrate during road transport.

The analysis found that the level of risk for all scenarios meets the DP&I criteria for individual risk in relation to fatality, injury and irritation, and was is the 'As Low As Reasonably Practicable' for societal risk.

Crawfords have developed and implemented a Site Emergency Plan for the premises. The plan covers all types of incidents, including fire, explosion, loss of containment, and natural events such as floods and bushfire. The plan has been reviewed and approved by the NSW Fire and Emergency Services Commissioner.

3.4 IMPLICATIONS OF CLOSURE OF OPERATION

If operations at the premises were to cease, there would be significant impacts on the local, regional, state and national economies as Crawfords play a key role in providing essential inputs which the NSW mining industry relies upon. Closure of the premises would directly place 95 people employed by Crawfords out of a job and impact on the employment of other companies which supply services to Crawfords.

As previously mentioned, Crawfords distribute ammonium nitrate, an essential ingredient for explosives, which is produced by Dyno Nobel and Downer EDI Mining, who together with Orica supply the mining industry of NSW with this product. As has been widely publicised Orica has had its manufacturing plant shut down and is currently unable to produce and supply ammonium nitrate to the mines of NSW in the quantities required. As a result, many mines throughout NSW are currently experiencing a shortage of explosives, which is having an impact on operations.

If Crawfords storage and distribution site was closed, the impacts on the mining industry would be potentially catastrophic at a time when supply has been reduced.

3.5 THE WAY FORWARD

Crawfords will reduce the quantity of ammonium nitrate stored on the premises to 4000 tonnes by 31 January 2012. This will be achieved through the storage of 2000 tonnes in Shed 'C' for Dyno Nobel and 2000 tonnes in Shed 'D' for EDI Downer Mining. Crawfords will gradually reduce the quantity of ammonium nitrate stored at the premises over this timeframe to allow ammonium nitrate to continue to be delivered to mine sites throughout the State. It will be maintained at 4000 tonnes until such time as a development consent is issued which allows it to be increased beyond this level.

The development application and EIS will be lodged with Council by 30 April 2012 provided confirmation is received from Council regarding the approval process proposed by 9 January 2012 and the DP&I issue the DGRs by 29 February 2012. The assessment of the DA and EIS is expected to take a period of from 6 to 12 months, depending on the response during the public exhibition period. If development consent is granted an application for an EPL will be lodged so that the operation can increase the quantity of ammonium nitrate stored on the premises.

Works have commenced to seal the unsealed surfaces within the premises and are scheduled for completion by 31 January 2012. These works will be augmented by improved stormwater controls and installation of drainage devices to capture and treat the first flush after a storm event. Discussions are currently being held with the landlord over the proposal to install a first flush system.

Works are planned to address all the environmental issues identified during the 2 December inspection. A hardstand area is to be constructed for the refuelling of forklifts. The area will be suitably contained to prevent fuel spills. The bund surrounding the diesel fuel storage area will be replaced with a compliant bund. The containment and recovery of residual ammonium nitrate on outside work areas will be improved. The mechanics workshop area will also be relocated to a more suitable location.

The standard of general housekeeping at the premises will also be upgraded. All waste oils and rubbish will be removed from the site and processed by a suitably qualified waste contractor. The recovery of waste ammonium nitrate will also be increased.

All these works are scheduled to be completed by 31 March 2012.

3.6 RECOMMENDED ACTION

In light of the information contained in this submission, Council is requested not to proceed and issue the proposed Section 121 Order under the EP& A Act. The consequences of issuing the proposed Order would be dire and not justified given the circumstances outlined in this submission.

Rather it is proposed that Crawfords provide monthly progress reports to Council documenting the progress made each month in implementing the actions set out in *Section 3.5* above by the 10th day of the following month. If at anytime Council wishes to undertake inspections to satisfy itself that the necessary actions are being carried out, Crawfords will cooperate fully with Council to provide whatever information it requires to conduct its investigations.

Annex A

Intention to Issue an Order from Newcastle City Council

Liveable City.Plovelock.
Reference: 3524718
Phone: 02 4974 2530

13 December 2011

The City of Newcastle

PO Box 489, Newcastle
NSW 2300 Australia
Phone 02 4974 2000
Facsimile 02 4974 2222
Email mail@ncc.nsw.gov.au
www.newcastle.nsw.gov.au

Sierra Sun (NSW) Pty. Limited
ACN 081 043 914
1 Warabrook Boulevarde
WARABROOK NSW 2304

Dear Sir,

NOTICE OF INTENTION TO GIVE AN ORDER

SECTION 121B OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

Premises: LOT: 12 DP: 625053, known as 158 Maitland Road Sandgate ("the premises").

Background

1. You are an owner of the premises.
2. On 2 December 2011, Council officers inspected the premises following a request from the NSW Office of Environment and Heritage (OEH).
3. During the inspection, it was found that the premises were being used for the storage of bulk quantities of up to 13 500 tonnes of Ammonium Nitrate.
4. Chemical storage facilities with the capacity to store more than 2000 tonnes of any chemical substance, or that are within 40 metres of a natural waterbody or wetland or on a floodplain are identified as "designated development" under the Environmental Planning and Assessment Regulation 2000.
5. Chemical storage means the storage or packaging in containers, bulk storage facilities or stockpiles of any chemical substance classified as a dangerous good in the Transport of Dangerous Goods Code, other than petroleum or petroleum products, or radioactive substances.
6. The premises are found to store more than 2000 tonnes of a chemical substance, are situated within 40 metres of a wetland and located on a floodplain.
7. Designated development requires an Environmental Impact Statement (EIS) be submitted with a development application.
8. A search of Council records found no development consent for the storage of Ammonium Nitrate at the premises and no submitted EIS detailing the likely environmental impacts of such a use.
9. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.

10. A further inspection was conducted by Council Officers accompanied by an Officer of WorkCover NSW on 6 December 2012. The WorkCover Officer advised that Crawford Freightlines, the occupier of the premises held the appropriate licences required by WorkCover NSW and that the premises are identified as a "Provisionally registered major hazard facility".
11. Advice from OEH found that premises used for the storage of over 2000 tonnes of Ammonium Nitrate requires an environment protection licence.
12. Advice from OEH states that the premises do not hold such a licence.
13. Section 121B(1) of the Environmental Planning and Assessment Act 1979 ("the Act") provides that a Council may serve an Order upon the owner of premises, or person by whom premises are being used for the purpose specified in the order to cease using premises for a purpose specified in the order in circumstances where premises are being used for a purpose for which development consent is required but has not been obtained.

Notice of intention to give an Order

In accordance with the requirements of section 121H of the *Environmental Planning & Assessment Act* 1979 ("the Act"), Council hereby gives notice of Council's intention to give an Order to Sierra Sun Pty. Limited ("an owner of the premises") in the terms of Order No.1 in the Table to Section 121B of the Act.

The proposed Order requires the things specified below to be done at the premises to demolish or remove a building.

Terms of the proposed Order

Cease use of the premises as a chemical storage facility, including but not limited to the storage of Ammonium Nitrate.

Reasons for service of the proposed Order

1. To prevent the use of the premises for a purpose for which development consent is required but has not been obtained.
2. Ammonium Nitrate is being stored in bulk at the premises. This storage constitutes use of the premises as a chemical storage facility.
3. The use of the premises as a chemical storage facility requires development consent.
4. Development consent for the use of the premises as a chemical storage facility has not been obtained.
5. The use of the premises as a chemical storage facility is occurring without the submission of an EIS detailing the likely environmental impacts and required environmental controls.
6. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.
7. Council is not satisfied that use of the premises as a chemical storage facility is being undertaken in such a way that addresses environmental issues due to the quantity being stored and the proximity of the premises to the adjoining wetland and location on a flood plain.

Proposed time for compliance

Should Council proceed with the service of the proposed Order, compliance will be required within 14 days of the date of issue of the proposed Order.

Penalty for non-compliance

Section 125 of the *Environmental Planning & Assessment Act* 1979, provides that a person who fails to comply with a requirement under the Act is guilty of an offence. The maximum penalty for this offence is $1,100,000.

Right of Appeal

You may appeal to the Land and Environment Court against the Order or a specified part of the Order within twenty-eight (28) days after the Service of the Order upon you. If an appeal is made to the Land and Environment Court against an Order, the appeal does not operate as a stay of the Order.

Representations may be made

1 Section 121I of the Environmental Planning & Assessment Act 1979 provides that you may make representations to the Council as to why the intended Order should not be given or as to the terms of or the period for compliance with the Order. **Any representations should be made in writing to the Manager, Compliance Services, The City of Newcastle and sent to PO Box 489 NEWCASTLE NSW 2300**.

2 Representations must be received on or before **5.00pm on Friday 23 December 2011** and these may be made by you or through representation by a barrister, solicitor or agent.

3 Should Council proceed with the service of the Order, you, or any other person affected by the Order may appeal to the Land and Environment Court against the Order or a specified part of the Order within twenty-eight (28) days after the Service of the Order upon you.

13 DEC 2011

.....

Adam Gilligan
MANAGER COMPLIANCE SERVICES
AUTHORISED AND ACTING FOR AND ON BEHALF
OF THE COUNCIL OF THE CITY OF NEWCASTLE

Liveable City.Plovelock.
Reference: 3524718
Phone: 02 4974 2530

13 December 2011

The City of Newcastle

PO Box 489, Newcastle
NSW 2300 Australia
Phone 02 4974 2000
Facsimile 02 4974 2222
Email mail@ncc.nsw.gov.au
www.newcastle.nsw.gov.au

Crawfords Freightlines Pty Ltd
ACN 069 024 899
C/- PriceWaterhouseCoopers
Level 6 26 Honeysuckle Drive
NEWCASTLE NSW 2300

Dear Sir,

NOTICE OF INTENTION TO GIVE AN ORDER

SECTION 121B OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

Premises: LOT: 12 DP: 625053, known as 158 Maitland Road Sandgate ("the premises").

Background

1. You are an occupier of the premises.
2. On 2 December 2011, Council officers inspected the premises following a request from the NSW Office of Environment and Heritage (OEH).
3. During the inspection, it was found that the premises were being used for the storage of bulk quantities of up to 13 500 tonnes of Ammonium Nitrate.
4. Chemical storage facilities with the capacity to store more than 2000 tonnes of any chemical substance, or that are within 40 metres of a natural waterbody or wetland or on a floodplain are identified as "designated development" under the Environmental Planning and Assessment Regulation 2000.
5. Chemical storage means the storage or packaging in containers, bulk storage facilities or stockpiles of any chemical substance classified as a dangerous good in the Transport of Dangerous Goods Code, other than petroleum or petroleum products, or radioactive substances.
6. The premises are found to store more than 2000 tonnes of a chemical substance, are situated within 40 metres of a wetland and located on a floodplain.
7. Designated development requires an Environmental Impact Statement (EIS) be submitted with a development application.
8. A search of Council records found no development consent for the storage of Ammonium Nitrate at the premises and no submitted EIS detailing the likely environmental impacts of such a use.
9. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but

not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.

10. A further inspection was conducted by Council Officers accompanied by an Officer of WorkCover NSW on 6 December 2012. The WorkCover Officer advised that Crawford Freightlines held the appropriate licences required by WorkCover NSW and that the premises are identified as a "Provisionally registered major hazard facility".
11. Advice from OEH found that premises used for the storage of over 2000 tonnes of Ammonium Nitrate requires an environment protection licence.
12. Advice from OEH states that the premises do not hold such a licence.
13. Section 121B(1) of the Environmental Planning and Assessment Act 1979 ("the Act") provides that a Council may serve an Order upon the owner of premises, or person by whom premises are being used for the purpose specified in the order to cease using premises for a purpose specified in the order in circumstances where premises are being used for a purpose for which development consent is required but has not been obtained.

Notice of intention to give an Order

In accordance with the requirements of section 121H of the *Environmental Planning & Assessment Act* 1979 ("the Act"), Council hereby gives notice of Council's intention to give an Order to Crawfords Freightlines Pty Ltd ("person by whom premises are being used for the purpose specified in the order") in the terms of Order No.1 in the Table to Section 121B of the Act.

The proposed Order requires the things specified below to be done at the premises to demolish or remove a building.

Terms of the proposed Order

Cease use of the premises as a chemical storage facility, including but not limited to the storage of Ammonium Nitrate.

Reasons for service of the proposed Order

1. To prevent the use of the premises for a purpose for which development consent is required but has not been obtained.
2. Ammonium Nitrate is being stored in bulk at the premises. This storage constitutes use of the premises as a chemical storage facility.
3. The use of the premises as a chemical storage facility requires development consent.
4. Development consent for the use of the premises as a chemical storage facility has not been obtained.
5. The use of the premises as a chemical storage facility is occurring without the submission of an EIS detailing the likely environmental impacts and required environmental controls.
6. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.
7. Council is not satisfied that use of the premises as a chemical storage facility is being undertaken in such a way that addresses environmental issues due to the quantity being stored and the proximity of the premises to the adjoining wetland and location on a flood plain.

Proposed time for compliance

Should Council proceed with the service of the proposed Order, compliance will be required within 14 days of the date of issue of the proposed Order.

Penalty for non-compliance

Section 125 of the *Environmental Planning & Assessment Act* 1979, provides that a person who fails to comply with a requirement under the Act is guilty of an offence. The maximum penalty for this offence is $1,100,000.

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You may appeal to the Land and Environment Court against the Order or a specified part of the Order within twenty-eight (28) days after the Service of the Order upon you. If an appeal is made to the Land and Environment Court against an Order, the appeal does not operate as a stay of the Order.

Representations may be made

1 Section 121I of the Environmental Planning & Assessment Act 1979 provides that you may make representations to the Council as to why the intended Order should not be given or as to the terms of or the period for compliance with the Order. **Any representations should be made in writing to the Manager, Compliance Services, The City of Newcastle and sent to PO Box 489 NEWCASTLE NSW 2300**.

2 Representations must be received on or before **5.00pm on Friday 23 December 2011** and these may be made by you or through representation by a barrister, solicitor or agent.

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13 DEC 2011

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Adam Gilligan
MANAGER COMPLIANCE SERVICES
AUTHORISED AND ACTING FOR AND ON BEHALF
OF THE COUNCIL OF THE CITY OF NEWCASTLE

Liveable City.Plovelock.
Reference: 3524718
Phone: 02 4974 2530

13 December 2011

The City of Newcastle

PO Box 489, Newcastle
NSW 2300 Australia
Phone 02 4974 2000
Facsimile 02 4974 2222
Email mail@ncc.nsw.gov.au
www.newcastle.nsw.gov.au

Mr Russell MacFarlane
602/6 Watt Street
NEWCASTLE NSW 2300

Dear Sir,

NOTICE OF INTENTION TO GIVE AN ORDER

SECTION 121B OF THE ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

Premises: LOT: 12 DP: 625053, known as 158 Maitland Road Sandgate ("the premises").

Background

1. You are an owner of the premises.
2. On 2 December 2011, Council officers inspected the premises following a request from the NSW Office of Environment and Heritage (OEH).
3. During the inspection, it was found that the premises were being used for the storage of bulk quantities of up to 13 500 tonnes of Ammonium Nitrate.
4. Chemical storage facilities with the capacity to store more than 2000 tonnes of any chemical substance, or that are within 40 metres of a natural waterbody or wetland or on a floodplain are identified as "designated development" under the Environmental Planning and Assessment Regulation 2000.
5. Chemical storage means the storage or packaging in containers, bulk storage facilities or stockpiles of any chemical substance classified as a dangerous good in the Transport of Dangerous Goods Code, other than petroleum or petroleum products, or radioactive substances.
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7. Designated development requires an Environmental Impact Statement (EIS) be submitted with a development application.
8. A search of Council records found no development consent for the storage of Ammonium Nitrate at the premises and no submitted EIS detailing the likely environmental impacts of such a use.
9. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.
10. A further inspection was conducted by Council Officers accompanied by an Officer of WorkCover NSW on 6 December 2012. The WorkCover Officer

advised that Crawford Freightlines, the occupier of the premises held the appropriate licences required by WorkCover NSW and that the premises are identified as a "Provisionally registered major hazard facility".

11. Advice from OEH found that premises used for the storage of over 2000 tonnes of Ammonium Nitrate requires an environment protection licence.
12. Advice from OEH states that the premises do not hold such a licence.
13. Section 121B(1) of the Environmental Planning and Assessment Act 1979 ("the Act") provides that a Council may serve an Order upon the owner of premises, or person by whom premises are being used for the purpose specified in the order to cease using premises for a purpose specified in the order in circumstances where premises are being used for a purpose for which development consent is required but has not been obtained.

Notice of intention to give an Order

In accordance with the requirements of section 121H of the *Environmental Planning & Assessment Act* 1979 ("the Act"), Council hereby gives notice of Council's intention to give an Order to Russell MacFarlane ("an owner of the premises") in the terms of Order No.1 in the Table to Section 121B of the Act.

The proposed Order requires the things specified below to be done at the premises to demolish or remove a building.

Terms of the proposed Order

Cease use of the premises as a chemical storage facility, including but not limited to the storage of Ammonium Nitrate.

Reasons for service of the proposed Order

1. To prevent the use of the premises for a purpose for which development consent is required but has not been obtained.
2. Ammonium Nitrate is being stored in bulk at the premises. This storage constitutes use of the premises as a chemical storage facility.
3. The use of the premises as a chemical storage facility requires development consent.
4. Development consent for the use of the premises as a chemical storage facility has not been obtained.
5. The use of the premises as a chemical storage facility is occurring without the submission of an EIS detailing the likely environmental impacts and required environmental controls.
6. The inspection by Council and OEH on 2 December 2011 identified a number of environmental issues arising from the use of the premises, including but not limited to poor stormwater controls, inadequate dust suppression, all in close proximity to watercourses and wetlands.
7. Council is not satisfied that use of the premises as a chemical storage facility is being undertaken in such a way that addresses environmental issues due to the quantity being stored and the proximity of the premises to the adjoining wetland and location on a flood plain.

Proposed time for compliance

Should Council proceed with the service of the proposed Order, compliance will be required within 14 days of the date of issue of the proposed Order.

Penalty for non-compliance

Section 125 of the *Environmental Planning & Assessment Act* 1979, provides that a person who fails to comply with a requirement under the Act is guilty of an offence. The maximum penalty for this offence is $1,100,000.

Right of Appeal

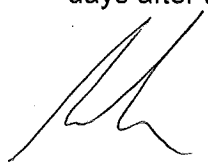
You may appeal to the Land and Environment Court against the Order or a specified part of the Order within twenty-eight (28) days after the Service of the Order upon you. If an appeal is made to the Land and Environment Court against an Order, the appeal does not operate as a stay of the Order.

Representations may be made

1 Section 121I of the Environmental Planning & Assessment Act 1979 provides that you may make representations to the Council as to why the intended Order should not be given or as to the terms of or the period for compliance with the Order. **Any representations should be made in writing to the Manager, Compliance Services, The City of Newcastle and sent to PO Box 489 NEWCASTLE NSW 2300**.

2 Representations must be received on or before **5.00pm on Friday 23 December 2011** and these may be made by you or through representation by a barrister, solicitor or agent.

3 Should Council proceed with the service of the Order, you, or any other person affected by the Order may appeal to the Land and Environment Court against the Order or a specified part of the Order within twenty-eight (28) days after the Service of the Order upon you.



13 DEC 2011

.....

Adam Gilligan
MANAGER COMPLIANCE SERVICES
AUTHORISED AND ACTING FOR AND ON BEHALF
OF THE COUNCIL OF THE CITY OF NEWCASTLE

Annex B

Notice of Preventative Action from EPA

NSW EPA

ENVIRONMENT PROTECTION AUTHORITY

Our reference: DOC11/53785,
File No. FIL06/924-07
Contact: Hamish Rutherford
(02) 4908 6824

The Proper Officer
Crawfords Freightlines Pty Ltd
c/- PricewaterhouseCoopers
Level 6, 26 Honeysuckle Drive
NEWCASTLE NSW 2300

Dear Sir/Madam

NOTICE OF PREVENTATIVE ACTION

On 2 December 2011 officers of Newcastle City Council and the Environment Protection Authority ("the EPA") undertook an inspection of Lot 12, Deposited Plan (DP) 625053, 158 Old Maitland Road, Sandgate ("the premises"). The EPA understands that the premises are occupied by Crawfords Freightlines Pty Ltd ("Crawfords").

The inspection identified that the premises are used to, among other things, store ammonium nitrate products; and, has a capacity to store approximately 13,500 tonnes of ammonium nitrate. At the time of the inspection over 10,000 tonnes of ammonium nitrate products were being stored at the premises.

Ammonium nitrate is classified as a dangerous good under the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2007).

Under section 48 of the *Protection of the Environment Operations Act 1997* ("POEO Act") a person who is the occupier of any premises at which any scheduled activity is carried on is guilty of an offence, unless the person is, at the time that activity is carried on, the holder of a licence that authorises that activity to be carried on at those premises. In the case of a corporation the maximum penalty for such an offence is $1,000,000, and a further penalty of $120,000 for each day the offence continues. The EPA considers such matters serious.

Scheduled activities for which an Environment Protection Licence is required are listed under Schedule 1 of the POEO Act. In respect of general chemical storage, meaning the storage or packaging in containers, bulk storage facilities or stockpiles of any chemical substance classified as a dangerous good in the *Transport of Dangerous Goods Code*, premises that have the capacity to store more than 20 tonnes (pressurised gases), 200 tonnes (liquefied gases) or 2,000 tonnes (chemicals in any other form) are scheduled activities.

The EPA considers that the activities undertaken at the premises are scheduled under the POEO Act for which an Environment Protection Licence is required. The EPA has not issued an Environment Protection Licence in respect of any scheduled activity undertaken at the premises, and alleges Crawfords have committed, and are potentially continuing to commit, an offence under section 48 of the POEO Act.

Please find enclosed Notice of Preventative Action (Notice No. 1503295), issued under section 96 of the POEO Act, that directs you to take certain action in respect of this alleged offence.

PO Box 488G Newcastle NSW 2300
117 Bull Street, Newcastle West NSW 2302
Tel (02) 4908 6800 Fax: (02) 4908 6810
ABN 30 841 387 271
www.environment.nsw.gov.au

The Notice remains in force until such time as it is revoked by the EPA. Please note that under section 50 of the POEO Act the EPA is unable to grant an Environment Protection Licence in respect of any scheduled activity unless development consent has been granted under the *Environmental Planning and Assessment Act 1979*.

Crawfords is invited to show cause why the EPA should not take regulatory action in respect of the alleged offence under section 48 of the POEO Act. Any submission you wish to make should be provided to the EPA's Regional Manager – Hunter at PO Box 488G, Newcastle NSW 2300 and received **within three weeks** of the date of this letter.

If you require any further information regarding this matter please contact Hamish Rutherford on (02) 4908 6824.

Yours sincerely

13 DEC 2011

MARK HARTWELL
Head Regional Operations Unit – Hunter
Environment Protection Authority

Encl. Notice of Preventative Action – Notice No. 1503295.

Section 96 Protection of the Environment Operations Act 1997

Prevention Notice

NSW GOVERNMENT | Office of Environment & Heritage

CRAWFORDS FREIGHTLINES PTY LTD

ABN 22 069 024 899

c/- PricewaterhouseCoopers, Level 6, 26 Honeysuckle Drive

NEWCASTLE NSW 2300

Attention: The Proper Officer

Notice Number	1503295
File Number	FIL06/924-07
Date	13-Dec-2011

NOTICE OF PREVENTIVE ACTION

BACKGROUND

A. The New South Wales ("NSW") Environment Protection Authority ("the EPA") is the appropriate regulatory authority for the purposes of the *Protection of the Environment Operations Act 1997* ("the Act"), except as provided for by section 6 of the Act.

B. CRAWFORDS FRIEGHTLINES PTY LTD (ABN 22 069 024 899) ("Crawfords") is the occupier of Lot 12, Deposited Plan ("DP") 625053, 158 Old Maitland Road, Sandgate, NSW, 2304 ("the premises").

C. On 2 December 2011 officers of Newcastle City Council and the EPA conducted an inspection of the premises for the purposes of determining compliance with or contravention of the Act. The inspection identified:

   (i) That the premises are used, among other things, to store ammonium nitrate.

   (ii) Over 10,000 tonnes of ammonium nitrate products were being stored at the premises at the time of the inspection.

   (iii) The premises has the capacity to store approximately 13,500 tonnes of ammonium nitrate.

D. Section 48 of the Act makes it an offence to carry on a scheduled activity without an Environment Protection Licence. Scheduled activities are defined under Scheduled 1 of the Act and includes ***general chemical storage***, meaning the storage or packaging in containers, bulk storage facilities, or stockpiles of any chemical substance classified as a dangerous good under the *Transport of Dangerous Goods Code*, which has the capacity to store more than 2,000 tonnes of chemicals.

E. Ammonium nitrate is classified as a dangerous good under the *Australian Code for the Transport of Dangerous Goods by Road and Rail, Seventh Edition* (National Transport Commission, 2007).

F. The EPA alleges that activities being carried on at the premises constitute an offence under section 48 of the Act.

G. The EPA alleges that the activities undertaken at the premises are being carried on in an environmentally unsatisfactory manner.

DIRECTION TO TAKE PREVENTIVE ACTION

1. The Environment Protection Authority ("the EPA") directs CRAWFORDS FREIGHTLINES PTY LTD to take the following action:

   (a) Within seven days of the date of issue of this Notice, reduce the quantity of ammonium nitrate products stored at the premises to a quantity below 2,000 tonnes.

   (b) From seven days of the date of issue of this Notice, maintain the quantity of ammonium nitrate products stored at the premises at all times to a quantity below 2,000 tonnes.

   (c) From seven days of the date of issue of this Notice, maintain the total quantity of all chemical substances, as classified as a dangerous good under the *Transport of Dangerous Goods Code*, stored at the premises to quantities below the quantities specified under Scheduled 1 of the Act under "Chemical Storage".

   (d) From seven days of the date of issue of this Notice, maintain an accurate, up to date a record of all chemical substances, as classified as a dangerous good under the *Transport of Dangerous Goods Code*, stored at the premises. This record must be produced to any authorised officer under the Act who asks to see it.

FEE TO BE PAID

2. You are required by law to pay a fee of $455 for the administrative costs of issuing this notice.

3. It is an offence not to pay this fee. However you can apply for an extension of time to pay the fee or for the fee to be waived. At the end of this notice there is information about how and when to pay the fee and how to apply for an extension or a waiver of the fee.

.....

Mark Hartwell

Acting Unit Head

North East - Hunter

(by Delegation)

Prevention Notice

NSW GOVERNMENT | Office of Environment & Heritage

INFORMATION ABOUT THIS PREVENTION NOTICE

- This notice is issued under section 96 of the *Protection of the Environment Operations Act 1997.*
- It is an offence against the Act not to comply with this notice.
- Details provided in this notice will be available on the Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997.*

Penalty for not complying with this notice

- The maximum penalty for a corporation is $1,000,000 and a further $120,000 for each day the offence continues. The maximum penalty for an individual is $250,000 and a further $60,000 for each day the offence continues.

Appeals against this notice

- You can appeal to the Land and Environment Court against this notice. The deadline for lodging your appeal is 21 days after you were served with the notice.

When this notice begins to operate

- This notice operates from the day the notice is given, unless a later date is specified in the notice.
- If an appeal is made against the notice, and the Land and Environment Court directs that the notice is stayed, the notice does not operate until the stay ceases to have effect, or the Land and Environment confirms the notice, or the appeal is withdrawn (whichever occurs first).

Deadline for paying fee

- The fee must be paid by **no later than 30 days after the date of this notice unless you appeal** to a court against the notice, or unless the EPA extends the time for payment of the fee or waives the fee. If you do appeal this notice the fee does not have to be paid unless and until the court confirms the notice.

How to pay fee

- Possible methods of payment are listed on the last page of the attached invoice/statement.
- Please include the payment slip from the attached invoice/statement with your payment.

How to apply for extension of time to pay/waiver of fee

- Any application for an extension of time to pay the fee, or waive the fee should be made in writing to and sent to . The application should set out clearly why you think the application should be granted.

Other costs

- The *Protection of the Environment Operations Act 1997* allows the EPA to recover from you reasonable costs and expenses it incurs in monitoring action taken under this notice, ensuring the notice is complied with and associated matters. (If you are going to be required to pay these costs and

expenses you will be sent a separate notice called a "Notice Requiring Payment of Reasonable Costs and Expenses".)

Continuing obligation

- Under section 319A of the Act, your obligations to comply with the requirements of this notice continues until the notice is complied with, even if the due date for compliance is passed.

Variation of this notice

- This notice may only be varied by subsequent written notices issued by the EPA,

TAX INVOICE / STATEMENT

The fees on this statement are exempt from GST by the Treasurer's determination under Division 81 of A New Tax System Act, 1999

NSW GOVERNMENT | Environment, Climate Change & Water

(incorporating Environment Protection Authority)

ABN 43 692 285 758

For all invoice/statement enquiries phone (02) 9995 5700

CRAWFORDS FREIGHTLINES PTY LTD
c/- PricewaterhouseCoopers, Level 6
NEWCASTLE NSW 2300

Statement Date

13.12.2011

Customer No: 320206 **Licence/Notice No:** 1503295

Description	Date	Reference No.	Debit	Credit	Balance	Due Date
Carried Forward			0.00		0.00	
Prevention Notice	13.12.2011	0390101239	455.00		455.00	12.01.2012

Total Amount Owing $ 455.00

Remittance Advice

Customer	Customer Number	Licence/Notice No.
CRAWFORDS FREIGHTLINES PTY LTD	320206	1503295

Page 1 of 2

Total Amount Owing $ 455.00

The fees on this statement are exempt from GST by the Treasurer's determination under Division 81 of A New Tax System Act, 1999.

PAYMENT METHODS ARE LISTED ON THE LAST PAGE OF THIS INVOICE

Cheque or Money Order

If making payment by cheque or money order, please make cheques payable to the **Environment Protection Authority** and post your payment, with the **Remittance Advice**, to:

Regulatory and Compliance Support Unit
Department of Environment, Climate Change and Water
PO Box A290
SYDNEY SOUTH NSW 1232

Electronic Funds Transfer (EFT)

Payments made by EFT must be deposited to the following account:

Bank:	**Westpac Banking Corporation**
Account Name:	**EPA Remit Account**
BSB:	**032 001**
Account No:	**205 469**

If you make payment(s) by EFT you **MUST** provide the following details to the Department on the day that payment is made, either by

Fax	(02) 9995 5922
Email	poeo.licensing@environment.nsw.gov.au
Licence Holder:	CRAWFORDS FREIGHTLINES PTY LTD
Licence/Notice No:	1503295
Customer No:	320206

Amount Paid: _____
Date of Payment: _____
Contact Person: _____
Telephone No: _____

PLEASE NOTE

If you do not submit this information when payment is made, the payment will not be receipted to your account and PENALTY INTEREST may accrue.

The Department of Environment, Climate Change and Water DOES NOT accept payment of Environment Protection Licence fees by credit card.

FOR ALL INVOICE/STATEMENT ENQUIRIES PHONE (02) 9995 5700

Annex C

Correspondence from ERM Sent to Council on 28 September 2011

Environmental Resources Management Australia

53 Bonville Avenue,
Thornton NSW 2322

PO Box 71,
Thornton NSW 2322
AUSTRALIA

Telephone +61 2 4964 2150
Facsimile +61 2 4964 2152

www.erm.com

28 September, 2011

General Manager
Newcastle City Council
PO Box 489
Newcastle NSW 2300

Our Reference: *0143175 L02NCC FINAL.DOC*

Attention: **Geof Mansfield**

Dear Geof,

RE: **AMMONIUM NITRATE STORAGE FACILITY SANDGATE**

Site Details: **LOT 12 OLD MAITLAND ROAD, SANDGATE (LOT 12 DP625053)**

1. INTRODUCTION

Further to my discussion with David Paine, Environmental Resources Management Pty Ltd (ERM) have prepared the following documentation with a view to gain confirmation from Newcastle City Council (NCC) that Council is in agreement with ERM's advice contained in this letter and confirmation that Council is happy to accept a development application for Designated Development and associated Environmental Impact Statement (EIS). If confirmation is forthcoming, ERM will seek the Director General's Requirements (DGRs) from the Department of Planning and Infrastructure (DP&I) which will set out the issues which must be addressed in an EIS. Following the review of this documentation, if Council identifies any further issues pertaining to the site and/or its operations ERM would welcome your feedback.

2. BACKGROUND

Crawfords Freightlines Pty Ltd (Crawfords) commissioned Environmental Resources Management Australia Pty Ltd (ERM) to provide advice on the appropriate approvals path for the storage and distribution of ammonium nitrate at their operation at Sandgate. This letter provides relevant background

information and details the necessary steps to be taken to secure approval for this land use.

2.1 SITE REVIEW

- Crawfords have been operating a storage and distribution depot, since 2009, at Lot 12 Old Maitland Road, Sandgate NSW for the storage of up to 13,500 tonnes of Ammonium Nitrate to supply Hunter Valley mines and other industries;

- the site is located at the southern apex of a small industrial area and is leased from Sierra Sun. Other tenants operating from the site include Impact Fertilisers, Scafflink, AQIS and their associated offices. *Figure 1* is a site plan which illustrates shed location and tenants.

- Crawfords occupies the lease over shed 'C' and its surrounds, Shed 'D' and and an area to the south of Shed 'B'. Shed 'C' and its surrounds and Shed 'D' are licensed to store 5000 tonnes of ammonium nitrate in each shed. The area to the south of Shed 'B' is licensed to store 3500 tonnes of ammonium nitrate in shipping containers.

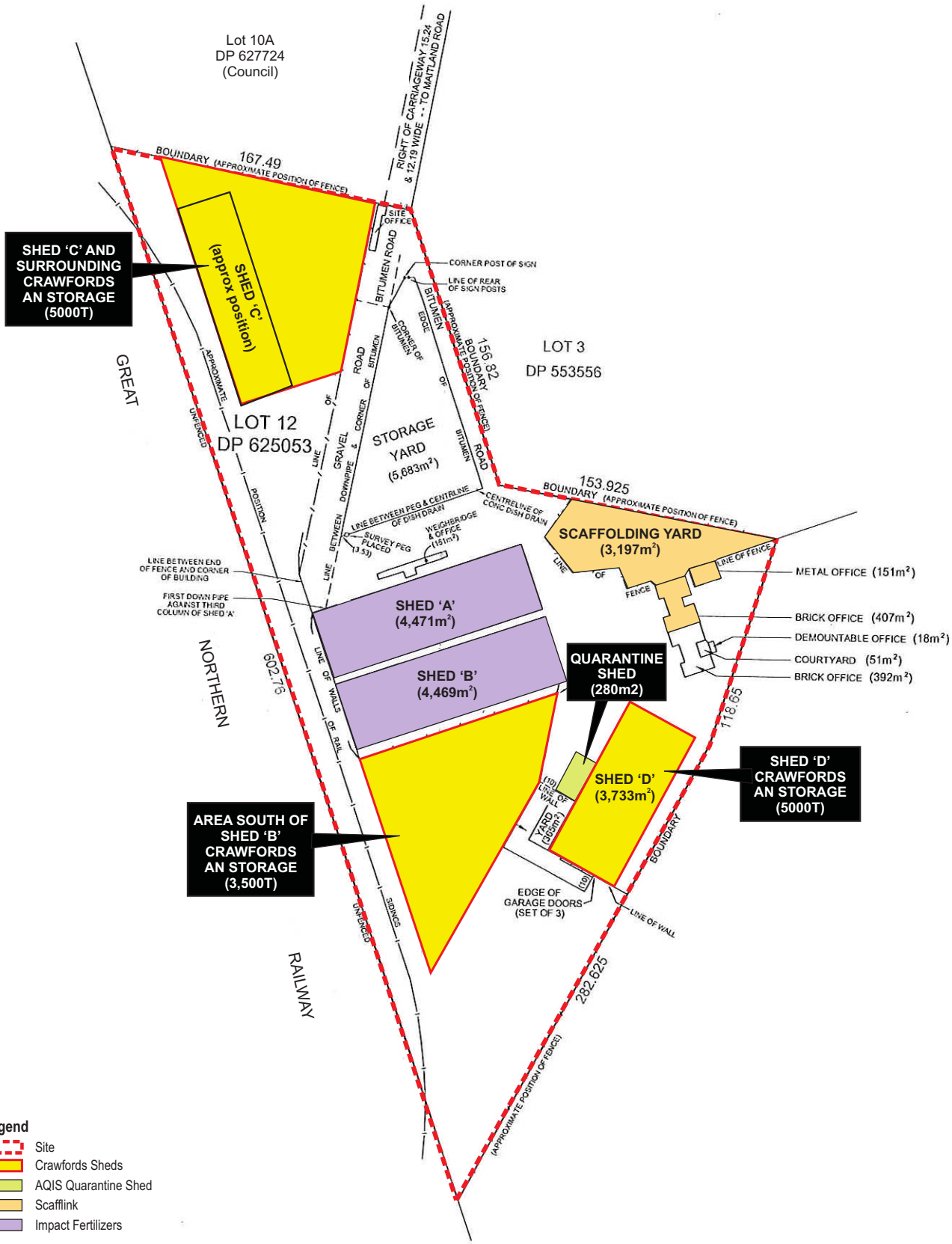
- at present the site receives shipments of this chemical in containers by rail from Sydney (Botany Bay) and in bulk bags brought to the site by truck from the Port of Newcastle. The site receives regular shipments and likewise transport this chemical via truck several times per day mainly to mine sites in the Hunter;

- Crawfords hold Workcover licences for the storage of 13,500 tonnes of Ammonium Nitrate;

- Crawfords hold Workcover licences for the transportation of Ammonium Nitrate;

- NCC has previously refused a development application for the storage of ammonium nitrate on the site; and

- a current application is with NCC for assessment (DA/11/0889) for the storage of bulk magnetite. This application is held in abeyance awaiting further information.



Legend

- Site
- Crawfords Sheds
- AQIS Quarantine Shed
- Scafflink
- Impact Fertilizers

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_LetNCC_C001_R0.cdr		
Date:	28/09/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

Figure 1 - Site Plan

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management Australia Pty Ltd

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

ERM

3. CLASSIFYING AND DEFINING THE DEVELOPMENT.

3.1 DANGEROUS GOODS CLASSIFICATION

The Dangerous Goods Code classifies the storage of Ammonium Nitrate into Class 5 – Oxidising Agents and Organic Peroxides.

Subclass 5.1 of the Dangerous Goods Classification Code states: *oxidising agents; substances which, although not necessarily combustible, may readily liberate oxygen, or be the cause of oxidisation processes. As a result they may start a fire in other materials or stimulate the combustion of other materials thereby increasing the violence of a fire. Examples: ammonium nitrate, hydrogen peroxide, calcium hypochlorite.*

3.2 DEFINING THE DEVELOPMENT

In determining whether a development is either hazardous or offensive State Environmental Planning Policy No 33 (*SEPP 33) - Hazardous and Offensive Development,* both the NSW Department of Planning and Infrastructure (DP&I) guidelines (*Hazardous Industry Planning Advisory Papers (HIPAPs)*), the guideline *Applying SEPP 33* and *Multi-level Risk Assessment)* should be considered.

3.2.1 State Environmental Planning Policy 33 - Hazardous and Offensive Development

Sub clause 3 of SEPP 33 provides the following definition for *"potentially hazardous industry":*

> ***potentially hazardous industry*** means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:
>
> (a) to human health, life or property, or
>
> (b) to the biophysical environment,
>
> and includes a hazardous industry and a hazardous storage establishment

Sub clause 2 of SEPP 33 states that in determining whether a development is:

> (a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or
>
> (b) an offensive storage establishment, offensive industry or other potentially offensive industry,
>
> consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development.

3.2.2 Applying SEPP 33

One of the relevant guidelines published by DP&I referred to above is *"Applying SEPP 33"*. In defining the development, *Table 1* in the section on *"Risk Screening"* refers to Class 5 (ammonium nitrate), the table then refers to *Table 3 "General Screening Threshold Quantities"* in which Class 5.1 has a screening threshold of 5 tonne for ammonium nitrate – 'elsewhere'.

In the notes below *Table 1* it states hat *"Table 1 indicates thatTable 3 is to be used: If the quantity is in excess of the quantity listed in Table 3, the development is potentially hazardous.*

As the site is currently licensed to store up to 13,500 tonnes, which is well in excess of the threshold quantity of 5 tonne, the land use is considered to be "potentially hazardous".

In addition, the last paragraph on page 21 of the guideline states:

"If any of the above tests result in a screening threshold being exceeded, the proposed development should be considered potentially hazardous and SEPP 33 will apply. In such cases, a preliminary hazard analysis (PHA) is required to be submitted with the development application. The PHA should be prepared in accordance with Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 — Guidelines for Hazard Analysis."

It is noted that a "Hazard Analysis" has been prepared by Health and Safety Essentials (HSE 2011)

In reviewing *Table 2 – "Transport Screening Thresholds"* of the guideline *"Applying SEPP 33"*, the threshold for the transportation of Class 5 ammonium nitrate may also be exceeded. *Table 2* refers to cumulative or annual number of vehicle movements greater than 500; or peak weekly movements greater than 30. If these values are exceeded a route evaluation study would be required to be undertaken.

Page 8 of the Hazard Analysis (HSE 2011) refers to the distribution of ammonium nitrate from the site. The report states:

- 3-4 single trailer and B-Double trailer loads are typical per day;
- 5 bulk trailer loads per day; and
- 1 interstate load per fortnightly.

Therefore based on the estimates in the HSE Hazard Analysis the thresholds for traffic movements would also be exceeded.

3.2.3 HSE Hazard Analysis

The conclusion of the Hazard Analysis states that the risk criteria for individual risk, societal risk and biophysical risk as set by the Department of Planning in HIPAP 4 have been met.

While it is not stated in SEPP 33, Applying SEPP 33 or any of the HIPAPs, it is generally understood that if the risk criteria of HIPAP 4 can be met, then the facility does not pose a "significant risk in relation to the locality" and the land use would be defined as a 'potentially hazardous industry'.

3.3 ASSESSMENT PATHWAY

Table 1 LGA Zonings

NCC Local Environmental Plan (LEP) 2003	NCC Draft LEP 2011
4(b) – Port and Industry Zone	IN3 - Heavy Industrial

The Newcastle Local Environmental Plan 2003 (LEP 2003) lists certain development that is permissible with consent in the Port and Industry Zone. The development is defined as a potentially hazardous industry which is permissible with consent in both the Port and Industry Zone as well as the draft zoning IN3 – Heavy Industrial in Newcastle Draft Local Environmental Plan 2011 (LEP 2011), see *Annex A* illustrating current and future zonings.

Due to the chemical nature of the material being stored at the facility, Schedule 3 of the Environmental Planning and Assessment Regulations 2000 (EP&A Regulations) defines the use as designated development under Part 1, sub clause 10; Chemical Storage Facility. As the storage of a chemical substance is in excess of 2,000 tonnes, the site is within 40 metres of a natural waterbody or wetland, and is also located on a floodplain the thresholds specified in Schedule 3 are exceeded and therefore an environmental impact statement (EIS) must be

prepared in accordance with Schedule 2 of the EP&A Regulations to accompany any development application to be lodged with Newcastle City Council.

3.4 ENVIRONMENTAL ISSUES

Notwithstanding the above Hazard Analysis completed by HSE, a detailed environmental assessment has not been conducted. The items below identify the potential environmental risks to the site which would need to be investigated and assessed, prior to the preparation of and EIS.

3.4.1 Flooding and Stormwater

Consultation with Newcastle City Council's engineering department has confirmed that the site is located on the Hunter River Floodplain, see *Annex B*. At the minimum, it is anticipated that a flood risk investigation and assessment would need to be completed.

3.4.2 Ecology and SEPP14 – Coastal Wetlands

The site is within close proximity of a State Environmental Planning Policy No 14 (SEPP 14) - Coastal Wetland (840), see *Annex C*. This is a state significant wetland and the potential impact of the development on the adjacent wetlands would need to be addressed.

3.4.3 Bush Fire

The south western and south eastern perimeters of the site are mapped as being bush fire prone land (Rural Fire Service 2009), see *Annex D*. The bush fire risk would originate from the grasslands in the north and west and through the open corridor in the south. However, it is noted that the corridor in the south is currently being developed for the Sandgate bypass and therefore should remove this hazard.

The risk of bush fire will need to be assessed through the preparation of a bush fire hazard analysis and measures to be taken to address this risk will have to be documented in the EIS.

3.4.4 Contamination

Planning records detail that Lot 10A DP627724, immediately north of the site is currently subject to an ongoing maintenance order issued by the NSW Environmental Protection Agency (EPA): Maintenance of remediation notice under Section 28 of the *Contaminated Lands Management Act 1997* Notice Number:28026. This notice dictates a number of maintenance requirements which will need to be referred to and documented in the EIS.

4. CONCLUSIONS

The investigations ERM has undertaken have assisted in identifying what we believe the appropriate approval path to be, given the circumstances of this particular development.

If you are require any additional information or clarification in relation to the contents of this letter please do not hesitate to contact the undersigned.

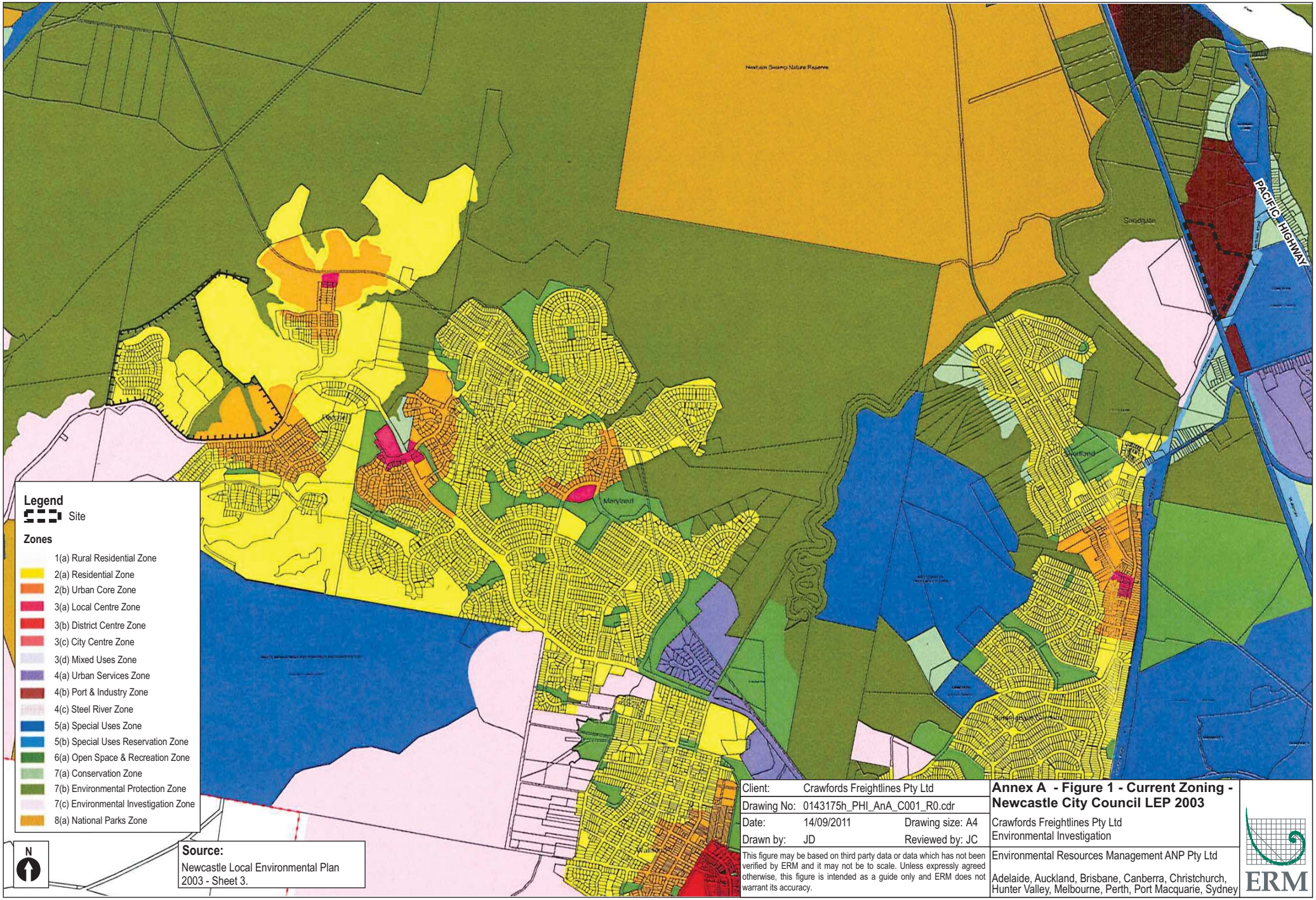
Yours sincerely,
for Environmental Resources Management Australia Pty Ltd

Jacinta Coulin
Environmental Planner

Steve O'Connor
Principal Consultant

Annex A

NCC ZONING PLANS



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_PHI_AnA_C001_R0.cdr		
Date:	14/09/2011	Drawing size:	A4
Drawn by:	JD	Reviewed by:	JC

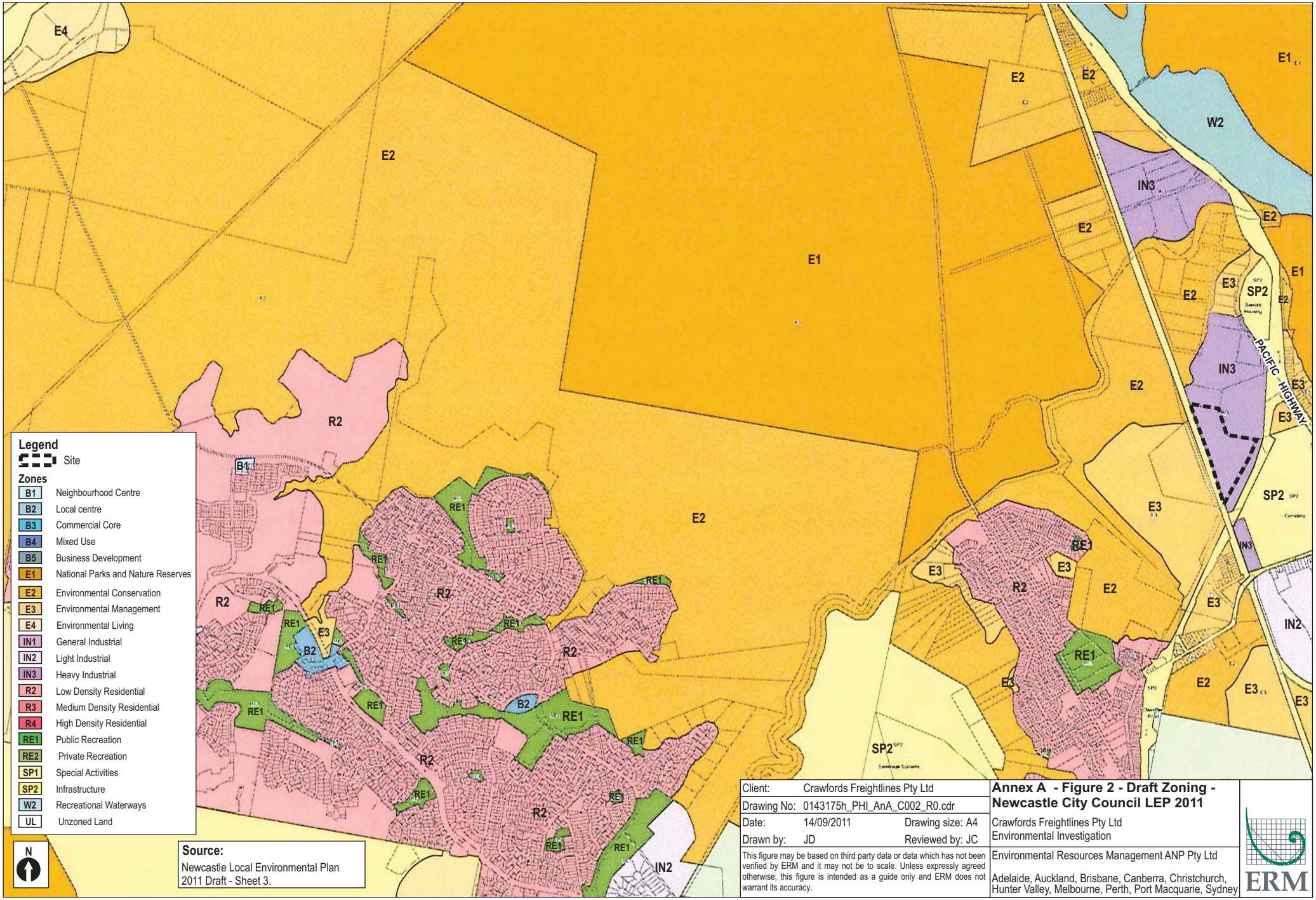
Annex A - Figure 1 - Current Zoning - Newcastle City Council LEP 2003

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management ANP Pty Ltd

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

ERM



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_PHI_AnA_C002_R0.cdr		
Date:	14/09/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

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.

Annex A - Figure 2 - Draft Zoning - Newcastle City Council LEP 2011

Crawfords Freightlines Pty Ltd
Environmental Investigation

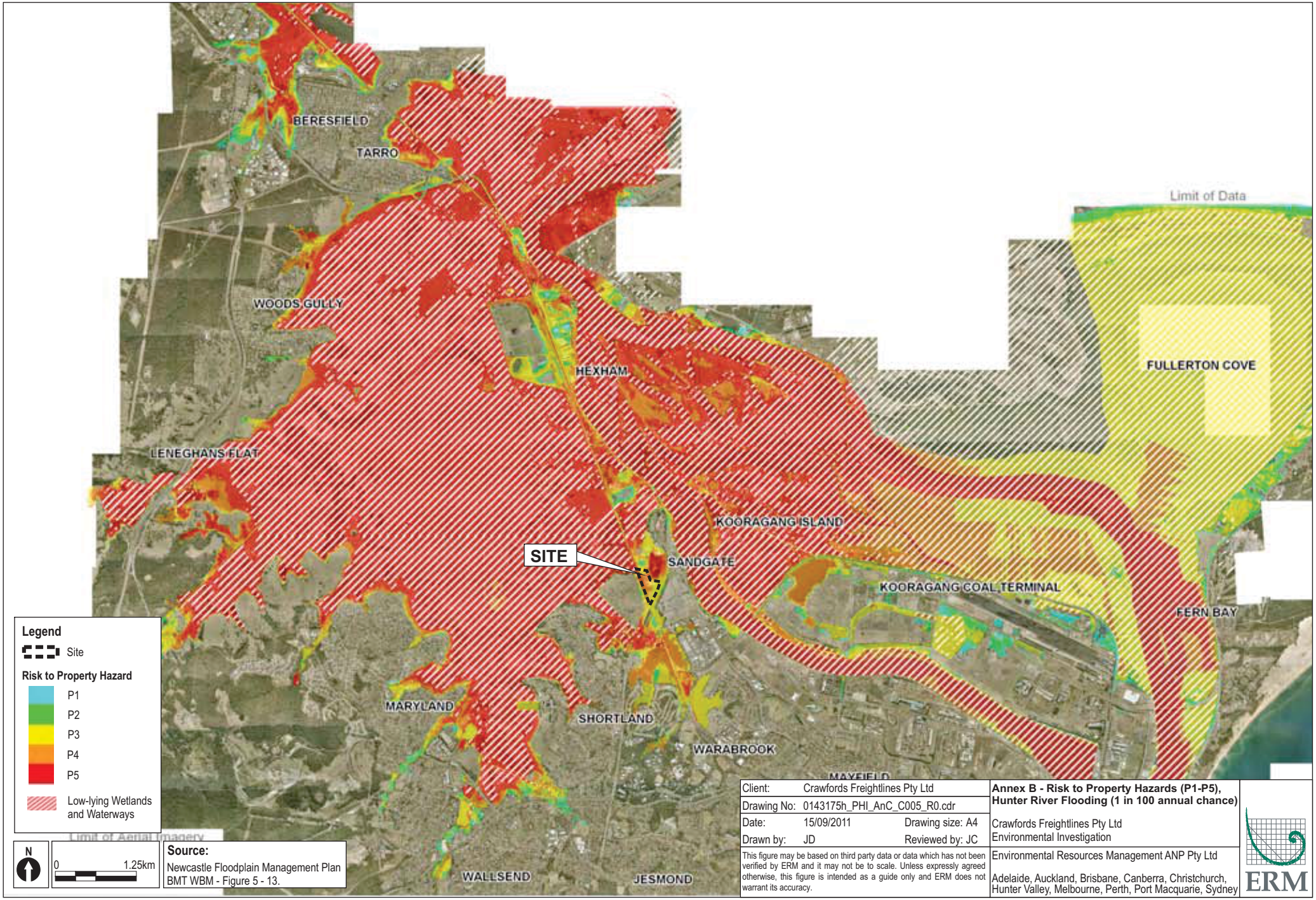
Environmental Resources Management ANP Pty Ltd

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

ERM

Annex B

FLOOD RISK INFORMATION



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Drawing No:	0143175h_PHI_AnC_C005_R0.cdr		
Date:	15/09/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

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.

Annex B - Risk to Property Hazards (P1-P5), Hunter River Flooding (1 in 100 annual chance)

Crawfords Freightlines Pty Ltd
Environmental Investigation

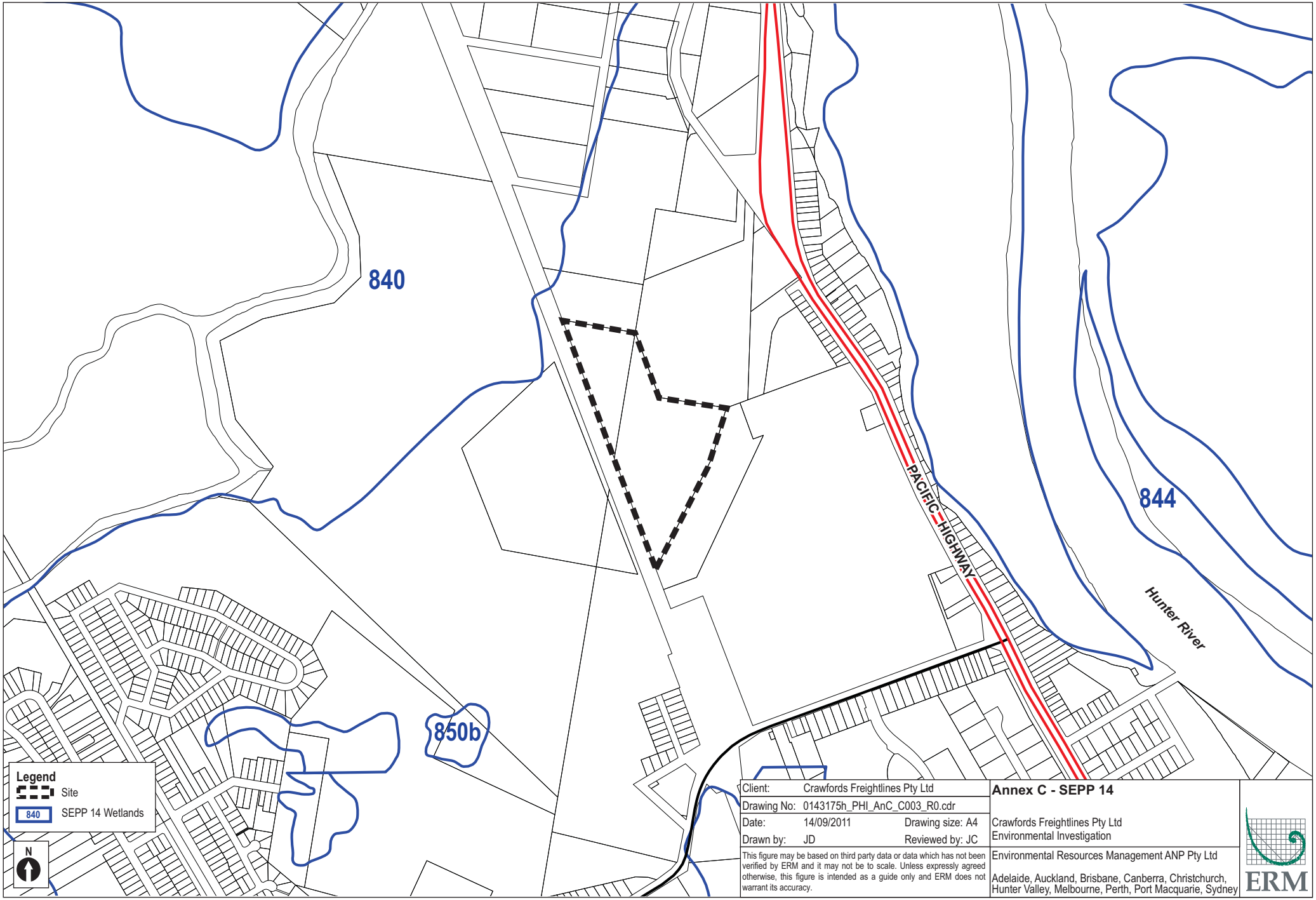
Environmental Resources Management ANP Pty Ltd

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

ERM

Annex C

SEPP 14 - COASTAL WETLAND MAPPING



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Date:	14/09/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

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Annex C - SEPP 14

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management ANP Pty Ltd

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

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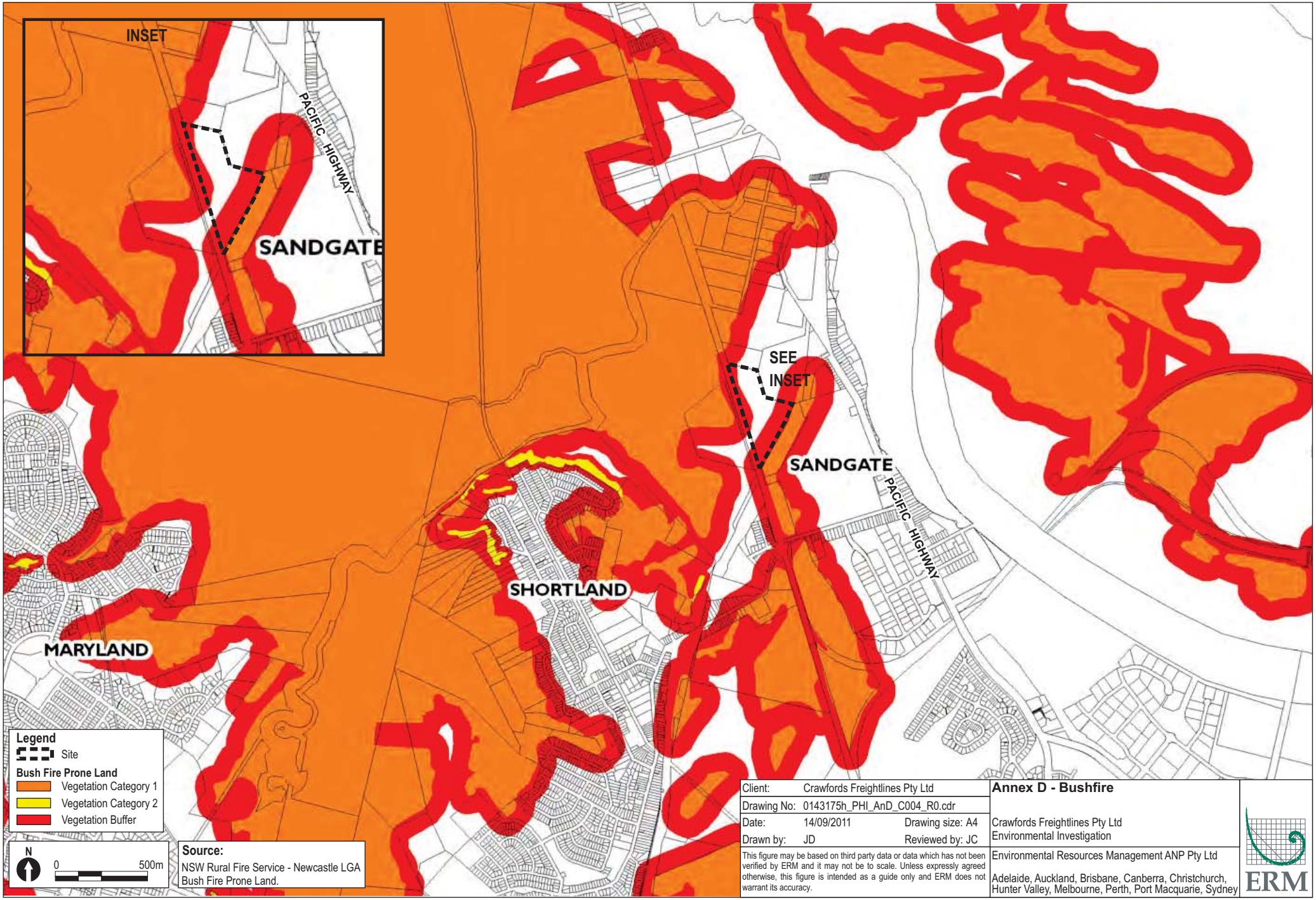
Annex D

NSW RFS BUSH FIRE MAPPING



Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_PHI_AnD_C004_R0.cdr		
Date:	14/09/2011	Drawing size: A4	
Drawn by:	JD	Reviewed by: JC	

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Annex D - Bushfire

Crawfords Freightlines Pty Ltd
Environmental Investigation

Environmental Resources Management ANP Pty Ltd

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

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Annex D

Letter from Sierra Sun's Solicitor

Our Ref: IWS:AS:SAN01540
Newcastle Office

14 December 2011

EMERY PARTNERS
Solicitors
ABN 90 864 700 129

1st Floor 796 Hunter St
NEWCASTLE WEST 2302
P.O. Box 2124
Dangar NSW 2309
DX 7832 Newcastle
Tel: (02) 4016 5100
Fax: (02) 4961 1849

50 Vincent St
CESSNOCK
P.O. Box 164
Cessnock NSW 2325
DX 21509 Cessnock
Tel: (02) 4993 9400
Fax: (02) 4961 1849

enquiries@emery.com.au
www.emery.com.au

The Managing Director
PHC Sandgate Pty Ltd
Old Main Road
SANDGATE NSW 2304

Dear Sirs

RE: SANDGATE MANAGEMENT SERVICES PTY LTD LEASE TO PHC SANDGATE PTY LTD LOT 12, OLD MAIN ROAD SANDGATE

In response to the demands made during our meeting on-site on Tuesday 13 December 2011 we have engaged the firm of McGree Earthmoving Pty Limited to attend a further on-site meeting at 12 noon on Friday 16 December 2011.

McGree has undertaken road works at the Terminal in recent times and will be consulted in relation to the road works and drainage issues that have been raised by Council and EPA.

The Landlords will do all things reasonably necessary to ensure compliance with their obligations as regards road works and drainage at the site. It is proposed that McGree immediately undertakes the necessary work in consultation with the relevant authorities.

Yours faithfully
EMERY PARTNERS

Ian Sheriff
PARTNER

Annex E

Correspondence between Crawfords and the EPA

CRAWFORDS Freightlines Pty Ltd

16 December 2011

The Regional Manager - Hunter

Environmental Protection Agency

PO Box 488G

Newcastle NSW 2300

Dear Sir,

In response to Prevention Notice1503295 - Your reference DOC 11/53785, File No. FIL06/924-07.

Crawfords Freightlines and Environmental Resources Management Australia met with Mr Adam Gilligan, Compliance Manager Newcastle City Council on 14 December 2011 to resolve issues related to Crawfords development application for storage of Ammonium Nitrate at 158 (lot 12) Old Maitland Rd Sandgate.

Crawfords Freightlines with the assistance of Environmental Resources Management Australia have committed to submission of a comprehensive proposal to Newcastle City Council by 23 December 2011 detailing interim operational procedures for storage of Ammonium Nitrate at the site and actions to be undertaken to manage environmental issues identified at the site by EPA and NCC.

Crawfords Freightlines have engaged with the owners of the Ammonium Nitrate stored at the Sandgate site to manage redistribution and limited storage at the site and the implications associated with restricting the quantity of Ammonium Nitrate stored at the site.

Due to regulations controlling the storage of Ammonium Nitrate in Australia the availability of alternative storage sites is limited. Immediate actions agreed to commence reducing quantities stored on site in consideration of the quantities currently on board vessels to NSW ports are:

- We will attempt to limit or divert imported break bulk shipments of Ammonium Nitrate to alternative licensed storage facilities, subject to license to store limitations for individual sites.
- Crawfords Freightlines customers will investigate the transfer of stock from Sandgate to their own licensed facilities in the Hunter Valley. Quantities transferred will be dependant on licensed storage limits at each site, which at this point in time are approaching maximum capacity.
- Ammonium Nitrate imports arriving at Sandgate in containers will be transferred directly from containers to transport where possible, again subject to user site storage limits.

In consideration of the time required to achieve the above actions and the limited availability of alternative sites due to restrictions applied to storage of Ammonium Nitrate, vessels transporting Ammonium Nitrate currently enroute, and port time limitations applicable to imported Dangerous Goods, Crawfords Freightlines request an extension of 3 months to manage stock levels down to the threshold limit of 2000 tonnes.

Crawfords Freightlines will commit to total transparency in achieving the above outcomes in the best interest of industry and regulators.

Trusting the above proposal is satisfactory.

Regards,

Paul McGrath

Compliance Manager

Crawfords Freightlines

EPA

ENVIRONMENT PROTECTION AUTHORITY

FAXED 20/12/2011

Our reference: DOC11/57852,
File No. FIL06/924-07
Contact: Hamish Rutherford
(02) 4908 6824

Mr Paul McGrath
Crawfords Freightlines Pty Ltd
c/- PricewaterhouseCoopers
Level 6, 26 Honeysuckle Drive
NEWCASTLE NSW 2300

Dear Mr McGrath

VARIATION OF PREVENTION NOTICE

Reference is made to your letter to the Environment Protection Authority ("the EPA") dated 16 December 2011 providing a submission in respect of Notice of Preventative Action ("Notice No. 1503295") issued to Crawfords Freightlines Pty Ltd ("Crawford's") on 13 December 2011 as a result of Crawford's conducting a scheduled activity without an Environment Protection Licence ("EPL") or development consent.

As explained in a meeting with your Mr Peter Crawford and you on 14 December 2011 the EPA understands that ammonium nitrate products, classified as dangerous goods under the *Australian Code for the Transport of Dangerous Goods by Road and Rail*, are being stored at the premises without an appropriate Development Consent under the *Environmental Planning and Assessment Act 1979*.

The EPA is aware that the quantity of ammonium nitrate products stored at the premises exceeds the threshold for which an EPL is required under the *Protection of the Environment Operations Act 1997* ("POEO Act"), and that the activity is being carried on without an EPL. This is a potential offence under section 48 of the POEO Act.

The EPA acknowledges your submission requesting an extension in time of three months to allow the quantity of ammonium nitrate products stored at the premises to be reduced below the quantity for which an EPL is required. However given that the activity is being allegedly carried on unlawfully, EPA is of the view that such a request is unreasonable and unwarranted in the circumstances.

In consideration of your submission, please find enclosed Variation of Prevention Notice (Notice No. 1503467), issued under section 110 of the POEO Act, which amends the direction to take preventative action in response to the alleged offence. This variation will allow until the 1st February 2012 to remove the product already located at the premises and from 6 January 2012 prevent further receiving of material that would cause you to carry out an unlawful activity. EPA is of the view that this provides you with sufficient time to take the necessary action to comply with this notice.

Please note that the issue of Notice No. 1503295 and Notice No. 1503467 does not prevent the EPA, or any third party, commencing legal proceedings in respect of the alleged offence under section 48 of the POEO Act.

PO Box 488G Newcastle NSW 2300
117 Bull Street, Newcastle West NSW 2302
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 30 841 387 271
www.environment.nsw.gov.au

If you require any further information regarding this matter please contact Hamish Rutherford on (02) 4908 6824.

Yours sincerely

20 DEC 2011

MARK HARTWELL
Head Regional Operations Unit – Hunter
Environment Protection Authority

Encl. Variation of Prevention Notice – Notice No. 1503467.

Section 110 Protection of the Environment Operations Act 1997

Variation of Prevention Notice

NSW EPA
ENVIRONMENT PROTECTION AUTHORITY

CRAWFORDS FREIGHTLINES PTY LTD

ABN 22 069 024 899

c/- PricewaterhouseCoopers, Level 6, 26 Honeysuckle Drive

NEWCASTLE NSW 2300

Attention: The Proper Officer

Notice Number	1503467
File Number	FIL06/924-07
Date	20-Dec-2011

VARIATION OF PREVENTION NOTICE

BACKGROUND

A. The New South Wales ("NSW") Environment Protection Authority ("the EPA") is the appropriate regulatory authority for the purposes of the *Protection of the Environment Operations Act 1997* ("the Act"), except as provided by section 6 of the Act.

B. On 13 December 2011 the EPA issued CRAWFORDS FREIGHTLINES PTY LTD ("Crawfords") with Prevention Notice No. 1503295 issued under section 96 of the Act ("Notice No. 1503295").

C. On 14 December 2011 the EPA met with representatives of Crawfords to explain the licensing requirements under the Act and the requirements of Notice No. 1503295.

D. On 16 December 2011 the EPA received via email a letter from Crawfords dated 16 December 2011 requesting a variation to the requirements of Notice No. 1503295. The EPA has reviewed and considered this submission.

VARIATION OF PREVENTION NOTICE

1. By this Notice the EPA varies Prevention Notice No. 1503295 ("Notice No. 1503295") in the following manner:
   (a) By deleting paragraph 1.(a) of Notice No. 1503295.
   (b) By deleting paragraph 1.(b) of Notice No. 1503295.
   (c) By deleting paragraph 1.(c) of Notice No. 1503295.
   (d) By deleting paragraph 1.(d) of Notice No. 1503295.

Variation of Prevention Notice

NSW EPA
ENVIRONMENT PROTECTION AUTHORITY

(e) By adding paragraph 1.(e) to Notice No. 1503295 under the heading *DIRECTION TO TAKE PREVENTATIVE ACTION* that shall read:

*"(e) **By 6 January 2012** Crawfords Freightlines Pty Ltd must make and maintain an accurate and up to date record of the total quantity of ammonium nitrate products stored at the premises at the time. The record must be kept at the premises and produced to any authorised officer under the Act who asks to see it."*

(f) By adding paragraph 1.(f) to Notice No. 1503295 under the heading *DIRECTION TO TAKE PREVENTATIVE ACTION* that shall read:

*"(f) "**Between 6 January 2012 and 31 January 2012** Crawfords Freightlines Pty Ltd must not receive any ammonium nitrate products at the premises for the purpose of storage while the quantity of ammonium nitrate products stored at the premises exceeds 2,000 tonnes or the receival of ammonium nitrate products for the purposes of storage would cause the quantity of ammonium nitrate products stored at the premises to exceed 2,000 tonnes.*

(g) By adding paragraph 1.(g) to Notice No. 1503295 under the heading *DIRECTION TO TAKE PREVENTATIVE ACTION* that shall read:

*"(g) "**By 1 February 2012** Crawfords Freightlines Pty Ltd must reduce the quantity of ammonium nitrate products stored at the premises to a quantity below 2,000 tonnes, unless a Development Consent is granted under the Environmental Planning and Assessment Act 1979 and an Environment Protection Licence is granted under the Act that authorises this activity."*

(h) By adding paragraph 1.(h) to Notice No. 1503295 under the heading *DIRECTION TO TAKE PREVENTATIVE ACTION* that shall read:

*"(h) "**From 1 February 2012** Crawfords Freightlines Pty Ltd must maintain the quantity of ammonium nitrate products stored at the premises at a quantity below 2,000 tonnes, unless a Development Consent is granted under the Environmental Planning and Assessment Act 1979 and an Environment Protection Licence is granted under the Act that authorises this activity."*

.....

Mark Hartwell
Acting Unit Head
North East - Hunter

(by Delegation)

Variation of Prevention Notice

EPA
ENVIRONMENT PROTECTION AUTHORITY

INFORMATION ABOUT THIS PREVENTION NOTICE

This notice is issued under section 110 of the *Protection of the Environment Operations Act 1997.*

It is an offence against the Act not to comply with this notice.

Details provided in this notice will be available on the Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997.*

Penalty for not complying with this notice

- The maximum penalty for a corporation is $1,000,000 and a further $120,000 for each day the offence continues. The maximum penalty for an individual is $250,000 and a further $60,000 for each day the offence continues.

Appeals against this notice

- You can appeal to the Land and Environment Court against this notice. The deadline for lodging your appeal is 21 days after you were served with the notice.

When this notice begins to operate

- This notice operates from the day the notice is given, unless a later date is specified in the notice.
- If an appeal is made against the notice, and the Land and Environment Court directs that the notice is stayed, the notice does not operate until the stay ceases to have effect, or the Land and Environment confirms the notice, or the appeal is withdrawn (whichever occurs first).

Other costs

The *Protection of the Environment Operations Act 1997* allows the EPA to recover from you reasonable costs and expenses it incurs in monitoring action taken under this notice, ensuring the notice is complied with and associated matters. (If you are going to be required to pay these costs and expenses you will be sent a separate notice called a "Notice Requiring Payment of Reasonable Costs and Expenses".)

Continuing obligation

Under section 319A of the Act, your obligations to comply with the requirements of this notice continues until the notice is complied with, even if the due date for compliance is passed.

Variation of this notice

This notice may only be varied by subsequent written notices issued by the EPA.

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Sweden
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UK
USA
Venezuela
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Environmental Resources Management

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Thornton NSW 2322

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ERM

Annex B

HAZARD ANALYSIS

HEALTH & SAFETY essentials

Crawford Freightlines Pty Ltd

CRAWFORDS Freightlines Pty Ltd

180 Old Maitland Road, Sandgate (NSW)

Ammonium Nitrate Storage Facility

HAZARD ANALYSIS

Report Date: 20 July 2011

Prepared by:

Janelle Adrain
Principal Consultant
Health & Safety Essentials Pty Ltd

EXECUTIVE SUMMARY

Crawfords Freightlines Pty Ltd operate a storage and distribution depot at 180 Old Maitland Road, Sandgate (NSW). At this depot, Crawfords store and distribute ammonium nitrate on behalf of customers, including Dyno Nobel and Downer EDI Mining. The maximum quantity of ammonium nitrate stored at the site is 13,500 tonnes. This Hazard Analysis has been prepared in support of a Development Application being lodged by Crawfords in relation to this site.

The site is located at the southern apex of a small industrial area and is leased from Sierra Sun. Other tenants at the site include Impact Fertilisers and Scafflink.

Ammonium nitrate is received in bulka bags through the Port of Newcastle (truck deliveries) or the Port ogf Sydney (rail-container deliveries). Ammonium nitrate is stored in three locations at the site (2 indoors and 1 outdoors). Ammonium nitrate is distributed in bags, and is also decanted from bags into bulk trucks for distribution to Hunter Valley and other NSW mining areas. The site is also used for general freight storage and distribution, but no other dangerous goods are stored at the site.

The three main hazards associated with ammonium nitrate are fire due to its oxidising properties, decomposition and the release of NO_x gases, and explosion. Temperatures approaching the melting point of pure ammonium nitrate (169degC) represent a significant hazard due to increased shock sensitivity of molten ammonium nitrate and potential for self-sustained decomposition reaction. Confinement, in combination with high temperatures, increases the risk of explosion due to a build-up of pressure caused by the gases produced by the decomposition reaction. Contamination, particularly with catalysts such as chlorides or other oxidising agents such as sodium nitrate, sodium nitrite and sodium perchlorate, increases the risk of heat generation and the potential for self-sustaining decomposition, with the possibility of detonation.

Various risk assessments have been completed by Crawfords to meet the operational requirements of the site. These risk assessments, together with the hazards of ammonium nitrate, have been reviewed in order to identify those events which have the potential for significant consequences. Based on this analysis, the following scenarios have been considered in this hazard analysis:

- Storage: Explosion and Sustained release of decomposition products.
- On vehicle / truck: Explosion and Sustained release of decomposition products.
- Transfer conveyor / auger: Explosion.

The distance to a range of explosion overpressures has been calculated using the TNT equivalency method. The release and dispersion of decomposition gases has been considered using an approach developed by the UK Health & Safety Executive, and modelled using Ausplume, developed by the Victorian Environment Protection Authority.

Numerous conditions, procedures and practices are in place at the facility to minimise the likelihood of exposure of ammonium nitrate to unsafe conditions (ie heat, confinement, contamination). The site operates under a comprehensive Safety Management System which also incorporates a Security Plan, Emergency Plan and Environmental Management Plan.

The Hazard Analysis has considered the qualitative principles for land use safety, and presented brief information on controls in place to reduce risk to 'As Low As Reasonably Practicable'.

Findings and Recommendations

The results of the dispersion modelling of ammonium nitrate decomposition gases show that:

- There is no risk of fatality or injury due to the sustained release of ammonium nitrate decomposition products. These incidents do not contribute to the individual risk of fatality.
- The maximum possible risk of irritation is 2×10^{-6} per year.

Therefore, the following risk criteria are met:

- Toxic concentrations in residential and sensitive use areas should not exceed a level which would be seriously injurious to sensitive members of the community following a relatively short period of exposure at a maximum frequency of 10 in a million per year.
- Toxic concentrations in residential and sensitive use areas should not cause irritation to eyes or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year.

Estimates of explosion frequency have been made with reference to the "TNO Purple Book"[1]. On this basis, the maximum off-site risk of fatality, property damage or injury due to an explosion is estimated to be 33×10^{-6} per year. Therefore, the following risk criteria are met:

- Individual fatality risk levels for industrial sites at levels of 50 in a million per year (50×10^{-6} per year) should, as a target, be contained within the boundaries of the site where applicable.
- Incident explosion overpressure at neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings should not exceed a risk of 50 in a million per year for the 14 kPa explosion overpressure level.
- Incident explosion overpressure at residential and sensitive use areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year.

[1] VROM *Publication Series on Dangerous Substances (PGS 3): Guidelines for quantitative risk assessment* (December 2005).

Risk contours for individual fatality have been calculated. These contours show that the following risk criteria are met:

- Hospitals, schools, child-care facilities and old age housing development should not be exposed to individual fatality risk levels in excess of half in one million per year (0.5×10^{-6})
- Residential developments and places of continuous occupancy, such as hotels and tourist resorts, should not be exposed to individual fatality risk levels in excess of one in a million per year (1×10^{-6} per year).
- Commercial developments, including offices, retail centres, warehouses with showrooms, restaurants and entertainment centres, should not be exposed to individual fatality risk levels in excess of five in a million per year (5×10^{-6} per year).
- Sporting complexes and active open space areas should not be exposed to individual fatality risk levels in excess of ten in a million per year (10×10^{-6}).

Societal Risk has been calculated based on estimates of employee numbers at Crawfords and adjacent businesses, and community populations at nearby residential, commercial and recreational facilities. The results of these calculations show that the level of Societal Risk falls into the ALARP (As Low As Reasonably Practicable) region of the indicative societal risk criteria set by NSW Department of Planning.

While a detailed environmental assessment has not been conducted, it is believed that as any recovery from a release is likely to be relatively swift, it is not expected that any accidental release from the site would threaten the long-term viability of any ecosystem or species.

Based on this assessment, it is believed the following risk criteria set for the biophysical environment by the NSW Department of Planning in HIPAP No. 4 will be met:

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects (consequences) of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it.
- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood (probability) of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the background level of threat to the ecosystem.

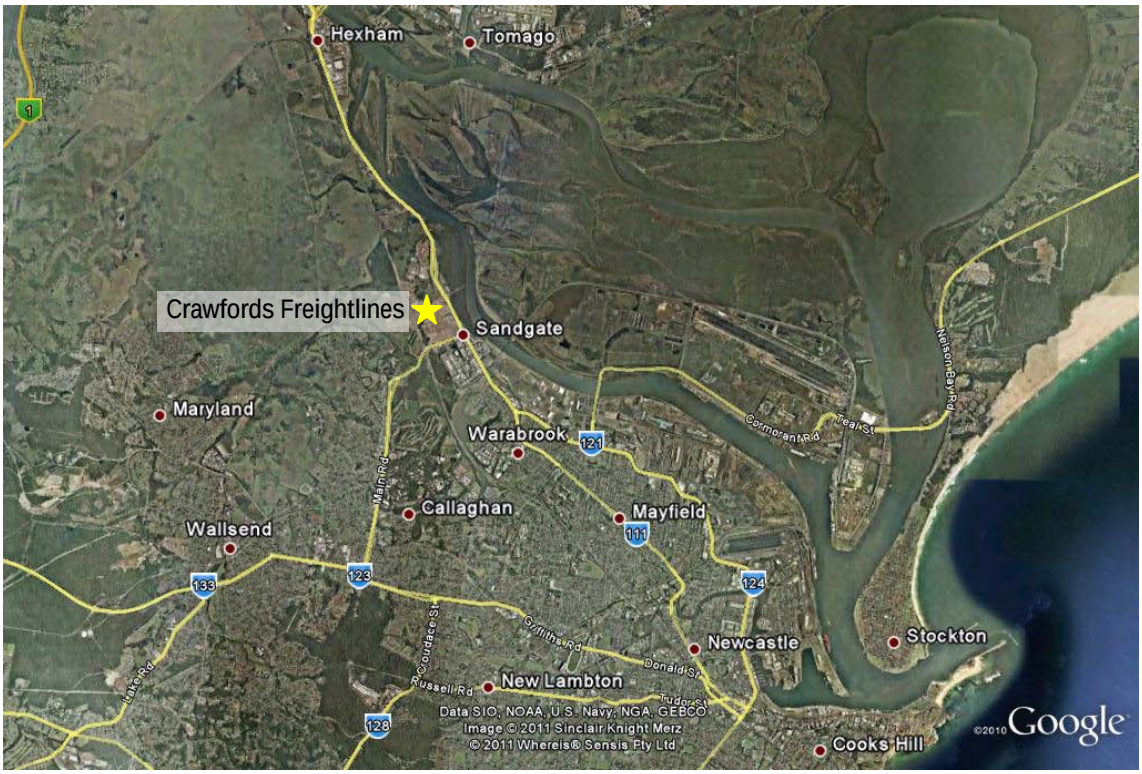
The facility meets NSW Department of Planning criteria for individual risk in relation to fatality, injury and irritation. The level of Societal Risk falls into the 'As Low As Reasonably Practicable' (ALARP) region. While a detailed environmental assessment has not been conducted, it is believed that criteria in relation to risks to the biophysical environment will be met.

A consideration of the qualitative risk principles for land use safety shows that these concepts are being applied at the site. Based on this Hazard Analysis, and provided risk is managed to ALARP, the ongoing operation of this facility presents an acceptable level of risk.

TABLE OF CONTENTS

INTRODUCTION

Crawfords Freightlines Pty Ltd operate a storage and distribution depot at 180 Old Maitland Road, Sandgate (NSW).



At this depot, Crawfords store and distribute ammonium nitrate on behalf of customers, including Dyno Nobel and Downer EDI Mining. The maximum quantity of ammonium nitrate stored at the site is 13,500 tonnes.

This Hazard Analysis has been prepared in support of a Development Application being lodged by Crawfords in relation to this site.

SITE DESCRIPTION & LOCATION

Site Layout

The Crawford depot is located on part of industrial premises leased from Sierra Sun. Other tenants at the site include Impact Fertilisers and Scafflink.

Ammonium nitrate is stored in three locations at the site.

Ammonium nitrate is decanted from bags into bulk trucks at the rear of Shed D.

PRODUCT STORAGE				
Location	Product stored	UN No.	DG Classification	Quantity (max)
Shed C & Compound	Ammonium Nitrate	1942	Class 5.1 PG III	5,000 tonne
Shed D	Ammonium Nitrate	1942	Class 5.1 PG III	5,000 tonne
Outdoor Compound	Ammonium Nitrate	1942	Class 5.1 PG III	3,500 tonne


Shed C & Compound
Scafflink
Impact Fertilisers
Shared Offices
Outdoor Compound
Shed D

Site Location

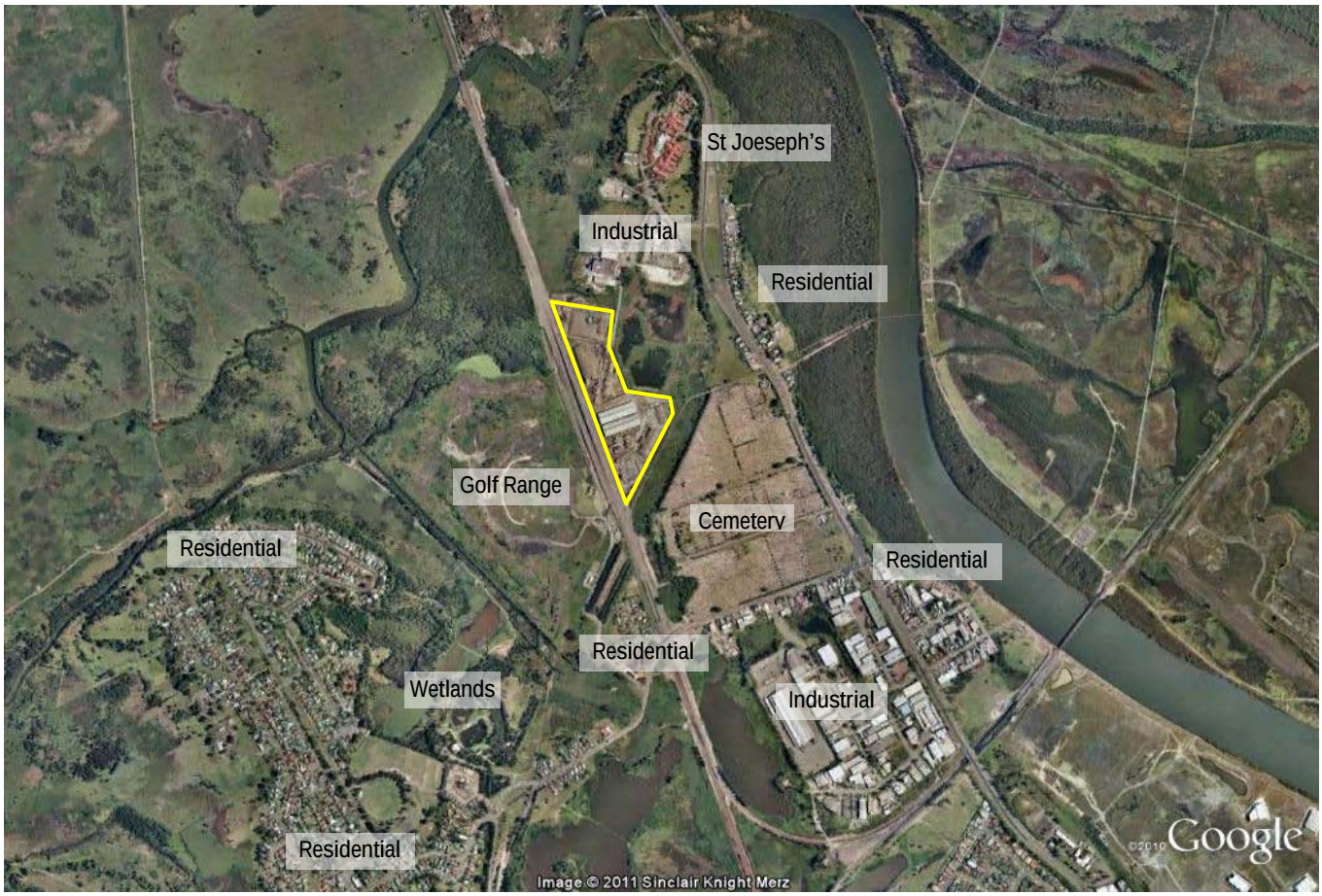
The site is located at the southern apex of a small industrial area and is bounded by the Newcastle-Maitland (Hunter) railway line (to the west of the site) and the new Newcastle Inner City Bypass (to the east of the site).

Further to the east are the Pacific Highway, including a strip of residential / commercial development along the highway, and the south channel of the Hunter River.

To the north of the site are other industrial premises (including Sibelco, previously Unimin) and the St Joseph's Home (Residential Aged Care) and St Joseph's Village (Independent Living).

Residential areas are located to the south-west of the site (beyond the Hunter Wetlands area) and to the south-east of the site (beyond the Sandgate Cemetery).

Below is a locality map, and the following page presents a table outlining the distance from the closest storage area to nearby premises and facilities.



DISTANCES TO NEARBY PREMISES AND FACILITIES			
Origin	Premises / Facility	Description	Distance
Industrial / Commercial			
Outdoor Compound	Impact fertilisers B Shed	Fertiliser storage and distribution (situated within complex, accessed on common property)	3 m
Outdoor compound	Scafflink	Scaffolding contractor	60 m
Shed C	Sibelco (previously Unimin)	Minerals processing	210 m
Shed C	Mullane Plumbing	Commercial contractors	530 m
Shed D	Pacific Highway Service Station	Service Station (commercial)	350 m
Shed D	Sandgate Industrial Area	Llight industrial area	560 m
Public Areas / Recreational Areas			
Outdoor compound	Golf range	Outdoor recreational area	120 m
Shed D	Sandgate Cemetery	Cemetery	100 m
Outdoor compound	Hunter Wetlands	Outdoor recreational area	560 m
Residential			
Shed D	Pacific Highway Residential	Residential strip along Highway	350 m
Shed D	Sandgate Residential (S)	Residential area	440 m
Shed D	Sandgate residential (SE)	Residential area	740 m
Outdoor compound	Shortland (W)	Residential area	800 m
Shed D	Shortland residential (SW)	Residential area	860 m
Sensitive Land Use			
Shed C	St Joseph's	Aged care facility	580 m
Transport Facilities			
Shed D	Newcastle Inner City Bypass (under construction)	Extension of Newcastle Inner City Bypass, 4 lane Sandgate - Shortland link to Pacific Highway	25 m
Shed C	Hunter Railway Line	North South (Newcastle-Maitland) rail corridor	35 m
Shed D	Pacific Highway	Main link road Newcastle to North Coast and Hunter Valley	410 m
Shed D	Sandgate Railway Station	Situated on Main North South (Newcastle-Maitland) rail corridor	420 m

Site history and development

Crawfords first occupied the site in early-2008 and occupied Shed D, the Outdoor Compound, open areas and the office facilities. Crawfords initially undertook general freight storage and transport, with no storage of ammonium nitrate or any other dangerous goods.

During this period, Toll occupied Shed C & Compound and stored ammonium nitrate on pallets awaiting export for Orica (licence for 2,600 tonnes).

Crawfords obtained a licence in December 2008 for the storage of 10,000 tonne of ammonium nitrate (5,000 tonne in Shed D and 5000 tonne in the Outdoor Compound).

Toll vacated Shed C & Compound in August 2010 and Crawfords took on the lease for this area in addition to already occupied site areas. At this time, Crawfords submitted an application to increase their licensed storage of ammonium nitrate to 13,500 tonne (5000 tonne in Shed D; 5000 tonne in Shed C & Compound; 3,500 tonne in the Outdoor Compound).

In September 2010, WorkCover issued a licence for 15,000 tonne. Crawfords responded to WorkCover requesting that the licence be reduced to 13,500 tonne, as was specified in the application. No change to the licence has been made by WorkCover. However, in renewing their licence with WorkCover in February 2011, Crawfords have again requested a licence for 13,500 tonne as per the application submitted in August 2010.

Current operations require the storage of a maximum of 10,000 tonne on an ongoing basis. The additional 3,500 tonne storage capacity in the Outdoor Compound is only for extenuating circumstances and is rarely used. Crawfords are considering removing the licence for the Outdoor Compound, as the storage of up to 5,000 tonne in each of Shed D & Compound and Shed C appears to be adequate for operating requirements.

Storage and handling activities

Receipt of Ammonium Nitrate

Port of Newcastle: Ammonium nitrate is received in bulka bags (1-1.25 tonne per bag) through the Port of Newcastle as a break-bulk shipment (ie bags transported in hold of ship with no pallets and no shipping containers).

The maximum shipment is 3,000 tonne which is the maximum berth-limit at the Port.

Unloading is generally completed in 5 x 8-hour shifts using single and double trailers.

Port of Sydney: Ammonium nitrate is received as containerised bulka bags (1-1.25 tonne per bag; 20 tonne per container) by rail from the Port of Sydney.

The maximum shipment received is 400 tonne which is the maximum berth-limit at the Port.

The container-wagons are delivered to the rail-siding at the site, lifted off by container-forklift and emptied immediately so that empty containers can be returned as quickly as possible.

Standard unloading time is one working day.

Storage of Ammonium Nitrate

Ammonium nitrate is stored in bags indoors in Shed C and Shed D. Storage is in 500 tonne pyramidal stacks with 3 metres separation distance between the stacks. Stacking height is maintained below 4 metres.

Product is located outdoors in the Shed C Compound on a temporary basis only. This is generally done when unloading containers, to ensure a rapid operation so that empty containers can be returned. Product is then re-located to permanent storage within Shed C.

Product is stored outdoors in the Outdoor Compound only if Shed C & Compound and Shed D are at maximum capacity. Once space becomes available indoors, product stored outdoors is relocated to Shed C or Shed D.

Distribution of Ammonium Nitrate

Ammonium nitrate is distributed from the site in bags on flat-top trucks direct to Hunter Valley and other NSW mining areas (currently the furtherest site is located at Boggabri, NSW). Single trailer vehicles carry up to 20 bags (approximately 25 tonne) while B-double vehicles (2 trailers) carry up to 30 bags (approximately 37.5 tonne). The number of trucks per day varies, but 3-4 vehicles per day is typical.

Ammonium nitrate is also distributed in bulk directly to mine sites in the Hunter Valley and other NSW mining areas (currently the furtherst site is located in Boggabri, NSW). Bags are emptied into a hopper and transferred by conveyor or auger into bulk trailers. Approximately 5 bulk trailers per day are distributed in this manner with B-double vehicles carrying approximately 35 tonne in total, and single trailer vehicles carrying approximately 23 tonne.

Interstate distribution occurs irregularly (no more than once per fortnight) and is generally only required if local depots (eg Gracemere, Qld) are unable to supply product.

Other storage and distribution activities

The site is also used for general freight storage and distribution. This currently includes:

- Receipt of timber (logs) by road and packing into containers for export through the Port of Sydney (dispatched from the site by train).
- Locally produced aluminium finished product (ingots, billets, brown bar) is received and then packed into containers for export through the Port of Sydney (dispatched from the site by train).
- Receipt of containerised steel products (pipes, bars, etc) from Port of Sydney (arrives at site by train). Containers are unpacked and product is distributed by truck to One Steel in Newcastle.
- Iso-containers of Orica sodium hydroxide are delivered to the site by train from the Orica facility in Port Botany. Iso-containers are lifted off the train and delivered directly to the Port of Newcastle by truck for export. Approximately 15 containers are transferred once every 3 months. Product is not stored at the site.
- General freight (no dangerous goods), receipt, storage and distribution, as required by clients.

Future development

The quantity of ammonium nitrate stored at the site will not increase, however the specific clients may alter over time (currently product is stored for Dyno and Downer).

Other storage and distribution activities at the site may vary over time depending on contracts and client requirements. However, they are likely to be similar to the activities currently undertaken at the site.

HAZARDS OF AMMONIUM NITRATE[2,3,4,5]

From the 1870s ammonium nitrate was widely used as a supplementary oxidising agent in dynamites. While it had been demonstrated that it behaved as a powerful explosive when blended with organic material, ammonium nitrate was largely ignored as an explosive in its own right because of its extreme insensitivity.

It was only following major explosions at Oppau (Germany) in 1921 and Texas City (USA) in 1947 involving fertiliser grade ammonium nitrate, and the subsequent development of safe practices for storage and handling, that the commercial potential of ammonium nitrate as an explosive was recognised. Since the 1950s ammonium nitrate blasting agents have been introduced into most large scale explosives applications – they are considered to be much safer than traditional explosives (such as dynamites) as they require large amounts of energy to initiate the explosion, and they are economical.

The three main hazards associated with ammonium nitrate are fire due to its oxidising properties, decomposition and explosion. The key factors that govern the hazards of ammonium nitrate are particle size, bulk density or porosity, presence of contaminants, nitrogen content and confinement.

Fire

Ammonium nitrate is an oxidising agent and will support fires involving combustible material by providing oxygen, but it will not burn itself. Gases emitted include nitrogen oxides and ammonia. In its pure form, ammonium nitrate melts at 169°C and in a fire can flow away from the fire location.

[2] Meyers, S. And Shanley, E.S. *Industrial Explosives – A Brief History of their Development and Use*, Journal of Hazardous Materials, Volume 23, 1990, pages 183-201.

[3] Begg, A.H. *Hazads in Emulsion Explosives Manufacture and Handling – Undersanding what they are and how to avoid them*, SAFEX Topical Papers Series Paper No. 05/2008, August 2008.

[4] Moreton, P.A., *An analysis of some accidents involving manufacture, transport and storage of base emulsion*, Explosives Engineering, December 2009.

[5] Major Accident Hazards Bureau, *Summary Report, Workshop on Ammonium Nitrate 30 January – 1 February 2002, Ispra, Italy.*

Decomposition

Ammonium nitrate can undergo thermal decomposition if it receives enough energy. Gases emitted include nitrogen oxides and ammonia. A key parameter is the temperature at which the ammonium nitrate based products begin to self-heat through a runaway exothermic decomposition (decomposition onset temperature). Self-heating occurs when the rate of heat generation is greater than the rate of heat loss to the environment.

Once the decomposition onset temperature is reached, the decomposition proceeds exothermically at a rate that is an exponential function of the temperature. However, there is a secondary mechanism which has the potential to interrupt the self-accelerating decomposition and limit the temperature rise. This secondary reaction is the endothermic dissociation of ammonium nitrate into ammonia and nitric acid.

Therefore, at moderate temperature, the exothermic decomposition is balanced by endothermic dissociation. Provided the gases produced can escape freely and no heat is being added to the system (eg through a fire) a steady state is reached.

The decomposition can also become self-sustaining in the presence of contaminants which catalyse the reaction (eg chlorides), in the presence of combustible materials which generate heat as they are oxidised, of if the initial temperature is high enough.

Explosion

An explosion of ammonium nitrate can occur by three different mechanisms:

- ***Heating and confinement:*** If there is insufficient ventilation, decomposition due to heating can result in a build-up in pressure and a subsequent explosion. Molten ammonium nitrate is more sensitive to initiation than solid ammonium nitrate.
- ***Run-away reaction:*** This occurs when the heat generated by the decomposition reaction exceeds the heat loss. For pure ammonium nitrate, this is difficult to achieve when unconfined.
- ***Detonation:*** Neither flame, nor spark, nor friction can cause detonation of uncontaminated ammonium nitrate. Initiation by shock wave requires large amounts of energy, and is strongly dependent on the presence of voids (ie the bulk density). Contamination by organic matter or fuel increases the risk of detonation. Another important factor is the critical charge diameter – which is very high for high density ammonium nitrate (> 7 metres for a bulk density of 1g/cm^3).

Accident history

The most memorable recent incident occurred in Toulouse, France (2001). An explosion occurred in a warehouse for storage of "off-spec" ammonium nitrate. The cause has not been conclusively identified however there is speculation that incompatible products also stored at the site may have been brought into contact with the off-spec ammonium nitrate. It is believed that an energy source was required to trigger the blast, and an underground electric arc has been presented as a possible cause. [6,5]

Other notable incidents include:

SUMMARY: Significant Accidents Involving Ammonium Nitrate – Post 1950 (from MAHB, 2002; COAG, 2004; Productivity Commission 2008)			
Date	Location	Product	Likely Causes
1954	Red Sea	AN fertiliser + paper, organic/copper product	Fire and explosion in ships hold.
1960	Traskwood, USA	Hydrocarbons, nitric acid, AN fertiliser	Train derailment and fire followed by explosion.
1963	Traskwood, USA	Oil, AN fertiliser	Train derailment and fire. No explosion.
1966	USA	AN fertiliser, combustibles, pesticides	Fire in storage followed by explosion.
1967	USA	AN fertiliser in paper bags	Fire in rail wagons with wooden interior. No explosion.
1972	Taroom, Qld	Low density AN and oil	Fire on semi-trailer with low density AN and oil. Explosion.
1972	France	AN Solution	Tanker lagging contaminated with organics and AN, explosion.
1973	USA	AN fertiliser	Fire in store of wooden structure. Explosion of <1% of storage quantity.
1978	USA	AN fertiliser	Fire in warehouse. No explosion.
1982	UK	AN fertiliser, timber furniture	Fire involving AN fertiliser. Explosion (deflagration).
1997	Brazil	AN and fuel	AN truck stopped due to fire. Fuel tanker passing caught fire and exploded. AN explosion, possibly triggered by exploding propane cylinder.
1998	Kentucky, USA	AN fertiliser	Fire in basement storage area. Explosions involving propane cylinders.

[6] Dechy, N., Bourdeaux, T., Ayrault, N., Kordek, M., Le Coze, J., *First lessons of the Toulouse ammonium nitrate disaster, 21st September 2001, AZF plant, France*, Journal of Hazardous Materials, Volume 111, 2004, pages 131–138.

SUMMARY: Significant Accidents Involving Ammonium Nitrate – Post 1950 (from MAHB, 2002; COAG, 2004; Productivity Commission 2008)			
Date	Location	Product	Likely Causes
2000	Florida, USA	AN fertiliser and fuel	Collision between AN truck and fuel tanker. Fire. No explosion.
2001	Toulouse, France	AN	400 tonnes of ammonium nitrate exploded (likely due to contamination / off-spec product / electrical arc)
2004	North Korea	Ammonium nitrate and fuel oil	During shunting, train wagons carrying ammonium nitrate came into contact with wagon containing fuel oil and exploded.
2004	Glenden, Qld	Ammonium nitrate	Truck fire on vehicle carrying containerised ammonium nitrate. Melting of some AN. No explosion.
2004	Romania	Ammonium nitrate fertiliser	Truck overturned and exploded.
2007	Mexico	Ammonium nitrate explosive	Fire and explosion following collision of two vehicles.

References:

- Major Accidents Hazards Bureau (MAHB), Summary Report – Workshop on Ammonium Nitrate (30 January–1 February 2002), Ispra, Italy, 2002.
- Council of Australian Governments (COAG), Regulatory Impact Statement in relation to the Regulation and Control of Ammonium Nitrate, 2004.
- Australian Government Productivity Commission, Chemical and Plastics Regulation – Chapter 10, 2008.

Safe operating conditions

Temperature

Temperatures approaching the melting point of pure ammonium nitrate (169degC) represent a significant hazard due to increased shock sensitivity of molten ammonium nitrate and potential for self-sustained decomposition reaction.

Confinement

Confinement, in combination with high temperatures, increases the risk of explosion due to a build-up of pressure caused by the gases produced by the decomposition reaction.

Contamination

Contamination, particularly with catalysts such as chlorides or other oxidising agents such as sodium nitrate, sodium nitrite and sodium perchlorate, increases the risk of heat generation and the potential for self-sustaining decomposition, with the possibility of detonation.

HAZARD IDENTIFICATION

Various risk assessments have been completed by Crawfords to meet the operational requirements of the site. These risk assessments, together with the hazards of ammonium nitrate, have been reviewed in order to identify those events which have the potential for significant consequences. The table on the following pages provides an overview of the hazards, causes and contributing factors and controls in place for significant incidents associated with this site.

Based on this analysis, the following scenarios will be considered further for consequence and likelihood analysis:

Incident Scenarios			
Ref	Description	Quantity involved	Locations
Ammonium Nitrate Explosions			
1	Ammonium nitrate explosion (storage)	500 tonne AN	Shed C & Compound Shed D Outdoor Compound
2	Ammonium nitrate explosion (truck)	37.5 tonne AN	Shed C & Compound Shed D Outdoor Compound
3	Ammonium nitrate explosion (auger)	50 kg AN	Rear of Shed D
Release of Ammonium Nitrate Decomposition Products			
4	Sustained release of ammonium nitrate decomposition products (storage)	500 tonne AN	Shed C & Compound Shed D Outdoor Compound
5	Sustained release of ammonium nitrate decomposition products (truck)	37.5 tonne AN	Shed C & Compound Shed D Outdoor Compound

Hazard Identification					
Location / Activity	Hazard	Causes & Contributing Factors	Controlling risk	Potential Consequences	Scenario
Storage: Shed C & Compound	Temperature	• External fire. • Rail incident (railway line adjacent to building). • Building fire. • Forklift / Vehicle fire. • Electrical fault. • Lightning.	• Fire extinguishers, external and internal hydrants with hose and branch pipes. • Forklifts to be upgraded to meet requirements of AS 4326. • Forklifts are not garaged in the store, or started in the store. • Store construction steel frame, metal cladding, fibrous asbestos roof. • Dedicated AN storage – no combustible materials stored. • No trees / vegetation surrounding building.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 500 tonne stack of ammonium nitrate.
	Confinement	Nil.			
	Contamination	• Oil leak or spill from vehicle / forklift. • Product supplied contaminated. • Historical contamination within building.	• Pre-start forklift checks for oil leaks. • Dedicated AN storage – no organic materials stored. • Product arrives from ports – product must meet UN 1942 in order to meet requirements for IMDG code to allow transport by sea. • Any product identified as potentially contaminated is isolated. • No evidence of historical contamination.		

Hazard Identification					
Location / Activity	Hazard	Causes & Contributing Factors	Controlling risk	Potential Consequences	Scenario
Storage: Shed D	Temperature	• External fire (reeds and trees adjacent to building) • Road incident (new bypass road adjacent to building). • Building fire. • Forklift / Vehicle fire. • Electrical fault. • Lightning.	• Fire extinguishers, external and internal hydrants with hose and branch pipes. • Forklifts to be upgraded to meet requirements of AS 4326. • Forklifts are not garaged in the store, or started in the store. • Dedicated AN storage – no combustible materials stored. • Store construction steel frame, metal cladding, fibrous asbestos roof.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 500 tonne stack of ammonium nitrate.
	Confinement	Nil.			
	Contamination	• Oil leak or spill from vehicle / forklift. • Product supplied contaminated. • Historical contamination within building.	• Pre-start forklift checks for oil leaks. • Dedicated AN storage – no organic materials stored. • Product arrives from ports – product must meet UN 1942 in order to meet requirements for IMDG code to allow transport by sea. • Any product identified as potentially contaminated is isolated. • No evidence of historical contamination.		

Hazard Identification					
Location / Activity	Hazard	Causes & Contributing Factors	Controlling risk	Potential Consequences	Scenario
Storage: Outdoor Compound	Temperature	• External fire (adjacent building of timber construction). • Forklift / Vehicle fire. • Lightning.	• Fire extinguishers, external and internal hydrants with hose and branch pipes. • Forklifts to be upgraded to meet requirements of AS 4326. • Forklifts are not garaged in the compound, or started in the compound.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 500 tonne stack of ammonium nitrate.
	Confinement	Nil.			
	Contamination	• Oil leak or spill from vehicle / forklift. • Product supplied contaminated. • Historical contamination of compound base.	• Pre-start forklift checks for oil leaks. • Product arrives from ports – product must meet UN 1942 in order to meet requirements for IMDG code to allow transport by sea. • Any product identified as potentially contaminated is isolated. • No evidence of historical contamination.		
Transfer (conveyor / auger into to bulk trailer): Rear of Shed D	Temperature	• Overheating of bearing. • Spark – metal-on-metal. • Friction.	• Design requirements for AN conveyor / auger. • Pre-start checks.	• Heating and decomposition of ammonium nitrate in confined area. • Release of decomposition gases. • Potential for explosion.	• Explosion of 50 kg ammonium nitrate. (Note: 50 kg is estimated quantity of AN in auger).
	Confinement	• Potential in bearing housing. • Blockage.	• Design requirements for AN conveyor / auger.		
	Contamination	• Oil leak from bearings.	• Design requirements for AN conveyor / auger. • Pre-start checks.		

Hazard Identification					
Location / Activity	Hazard	Causes & Contributing Factors	Controlling risk	Potential Consequences	Scenario
Loading bags on/off flat-bed truck trailer (Shed C & Compound; Shed D; Outdoor Compound)	Temperature	• Vehicle fire (tyre fire; engine fire; electrical fault). • External fire (trees, vegetation). • Rail / Road incident. • Adjacent building fire. • Forklift fire. • Lightning.	• Vehicles licensed as dangerous goods vehicles. • Fire extinguishers, external and internal hydrants with hose and branch pipes. • Forklifts to be upgraded to meet requirements of AS 4326. • Store construction steel frame, metal cladding, fibrous asbestos roof. • Dedicated AN storage – no combustible materials stored.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 37.5 tonne of ammonium nitrate (maximum trailer load).
	Confinement	Nil.			
	Contamination	• Oil leak or spill from vehicle / forklift. • Product supplied contaminated. • Contamination on trailer bed.	• Pre-start forklift checks for oil leaks. • Product arrives from ports – product must meet UN 1942 in order to meet requirements for IMDG code to allow transport by sea.		

Hazard Identification					
Location / Activity	Hazard	Causes & Contributing Factors	Controlling risk	Potential Consequences	Scenario
Unloading bags from shipping container (Shed C & Compound)	Temperature	• Forklift / Vehicle fire. • Lightning. • Adjacent building fire.	• Fire extinguishers, external and internal hydrants with hose and branch pipes. • Forklifts to be upgraded to meet requirements of AS 4326. • Forklifts are not garaged in the compound, or started in the compound.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 500 tonne stack of ammonium nitrate. of ammonium nitrate.
	Confinement	Nil.			
	Contamination	• Oil leak or spill from vehicle / forklift. • Product supplied contaminated. • Historical contamination in compound area.	• Pre-start forklift checks for oil leaks. • Product arrives from ports – product must meet UN 1942 in order to meet requirements for IMDG code to allow transport by sea. • Any product identified as potentially contaminated is isolated. • No evidence of historical contamination.		
All locations	Security Breach (sabotage / vandalism)	• Security breach of site.	• Security fencing. • Security patrols. • Security Plan.	• Heating and decomposition of ammonium nitrate. • Release of decomposition gases. • Potential for explosion.	• Sustained release of decomposition gases. • Explosion of 500 tonne stack of ammonium nitrate.

CONSEQUENCE ANALYSIS

Explosions

The effects of explosions are due to the damage caused by the blast overpressure and projectiles. The following table describes the effects at different explosion overpressures (NSW Department of Planning, HIPAP 6, 2011).

Impacts of Explosion Overpressure	
Explosion Overpressure	Effect
3.5 kPa (0.5psi)	90% glass breakage No fatality and very low probability of injury from overpressure.
7 kPa (1 psi)	Damage to internal partitions and joinery, but can be repaired. Probability of injury is 10%. No fatality.
14 kPa (2 psi)	House uninhabitable and badly cracked.
21 kPa (3 psi)	Reinforced structures distort. Storage tanks fail. 20% chance of fatality to a person in a building.
35 kPa (5 psi)	House damaged beyond repair. Wagons and plant items overturned. Threshold of eardrum damage. 50% chance of fatality for a person in a building. 15% chance of fatality for a person in the open.
70 kPa (10 psi)	Threshold of lung damage 100% chance of fatality for a person in a building or in the open. Complete demolition of houses.

The simplest way of determining the distance to a particular overpressure, and the most appropriate for ammonium nitrate explosions, is through the use of the TNT equivalency method. This method equates the quantity of material involved in the explosion to TNT, based on the relative energy and efficiency of the two products. The distance to a certain overpressure can then be calculated using formulas developed for TNT explosions.

These formulas are taken from graphs developed from available experimental data using TNT. These charts plot "scaled distance" (x-axis) against "peak overpressure" (y-axis), where

"scaled distance" = actual distance / $Q^{1/3}$ where Q is the quantity of TNT

To calculate the distance to the overpressure of interest, the constant for the "scaled distance" can be read from the graphs, and used to calculate the actual distance to this overpressure depending on the quantity of explosives (TNT equivalent) involved in the explosion.

Graphs can be found in references such as:

- DEOP 103 – Defence Explosive Ordnance Manual, Department of Defence (Australia).
- Publication Series on Dangerous Substances (PGS 2): Methods for the calculation of physical effects due to releases of hazardous materials (liquids and gases), VROM (Netherlands), 2005.[7]

The following formulas (based on the graph presented in DEOP 103) have been used to determine the distance to these peak overpressures:

Distance (m) to	3.5 kPa	=	30.5 $Q^{1/3}$	where Q is the equivalent quantity of TNT (kg)
Distance (m) to	7 kPa	=	17.8 $Q^{1/3}$	
Distance (m) to	14 kPa	=	10.4 $Q^{1/3}$	
Distance (m) to	21 kPa	=	8 $Q^{1/3}$	
Distance (m) to	35 kPa	=	6 $Q^{1/3}$	
Distance (m) to	70 kPa	=	4 $Q^{1/3}$	

Numerous values are presented for the TNT equivalency of ammonium nitrate, with the maximum value being 32%. To apply a conservative approach, a value of 32% will be used for this study.

The table on the following page shows the calculated distance to various overpressures.

[7] Previously known as the TNO *CPR14E Methods for the calculation of physical effects due to releases of hazardous materials (liquids and gases)* (the "Yellow Book").

Distances to Explosion Overpressure				
		Incident Reference		
		1	2	3
	Quantity of Ammonium Nitrate (kg)	500,000	37,500	50
	Equivalent Quantity of TNT (kg)	160,000	12,000	16
Overpressure	Effect			
3.5 kPa	90% glass breakage No fatality and very low probability of injury from overpressure.	1656 m	698 m	77 m
7 kPa	Damage to internal partitions and joinery, but can be repaired. Probability of injury is 10%. No fatality.	966 m	408 m	45 m
14 kPa	House uninhabitable and badly cracked.	565 m	238 m	26 m
21 kPa	Reinforced structures distort. Storage tanks fail. 20% chance of fatality to a person in a building.	434 m	183 m	20 m
35 kPa	House damaged beyond repair. Wagons and plant items overturned. Threshold of eardrum damage. 50% chance of fatality for a person in a building. 15% chance of fatality for a person in the open.	326 m	137 m	15 m
70 kPa	Threshold of lung damage 100% chance of fatality for a person in a building or in the open. Complete demolition of houses.	217 m	92 m	10 m

Release and dispersion of toxic gases

As ammonium nitrate decomposes it releases oxides of nitrogen, including nitrogen dioxide (NO_2), nitrous oxide (N_2O) and nitric oxide (NO). As the gases are released they will be dispersed and diluted in the atmosphere according to weather conditions at the time. The concentration of the gases in the air will decrease as they move away from the source of release. Each of these gases has various toxicity characteristics, and the effects that an exposed person will experience will depend on the concentration and duration of exposure.

Toxicity

This information is sourced from the US Environmental Protection Agency's program for the development of Acute Exposure Guideline Levels (AEGLs)[8]. The Acute Exposure Guideline Levels have been developed primarily to provide guidance in situations where there can be a rare, typically accidental exposure to a particular chemical that can involve the general public. They are based primarily on acute toxicology data and not subchronic or chronic data, and they are designed to protect the general population including the elderly and children, groups that are generally not considered in the development of workplace exposure levels.

AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. The three AEGLs have been defined as follows:

> **AEGL-1** is the airborne concentration (ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience ***notable discomfort, irritation, or certain asymptomatic nonsensory effects***. However, the effects are ***not disabling and are transient and reversible*** upon cessation of exposure.
>
> **AEGL-2** is the airborne concentration (expressed as ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience ***irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape***.
>
> **AEGL-3** is the airborne concentration (expressed as ppm or mg/m^3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience ***life-threatening health effects or death***.

[8] http://www.epa.gov/opptintr/aegl/index.htm

Nitrogen dioxide is an irritant to the mucous membranes and may cause coughing, difficulty in breathing and shortness of breath. Symptoms may persist for several hours before subsiding. High levels of exposure can cause spasms and swelling of tissues in the throat and upper respiratory tract, reduced oxygenation of body tissues, a build-up of fluid in your lungs, and death. AEGLs have been set as shown in the table below.

AEGLs for Nitrogen Dioxide (NO_2)					
	10 min	30 min	60 min	4 hr	8 hr
AEGL-1 (irritation)	0.5 ppm	0.5 ppm	0.5 ppm	0.5 ppm	0.5 ppm
AEGL-2 (irreversible injury)	20 ppm	15 ppm	12 ppm	8.2 ppm	6.7 ppm
AEGL-3 (life-threatening)	34 ppm	25 ppm	20 ppm	14 ppm	11 ppm

Nitrous oxide is used as an anaesthetic and analgesic in medicine, dentistry and veterinary medicine. Effects of short-term exposure are generally related to the euphoric effect, hence the term "laughing gas". No significant health effects are associated with short-term exposure and no AEGLs have been set for nitrous oxide.

Nitric oxide affects the respiratory system in a similar way to nitrogen dioxide, but is considerably less toxic. AEGLs for nitric oxide have not been set due to insufficient data. Short-term exposures below 80ppm nitric oxide should not constitute a health hazard. It is recommended that AEGLs for nitrogen dioxide should be used for emergency planning.

Release Rate

A release rate of 15 g/m^2/s for NO and 3 g/m^2/s for NO_2 has been used based on the methodology developed by the UK Health & Safety Executive.[9]

In determining the area of ammonium nitrate releasing NO and NO_2, the following assumptions have been made:

- AN Stack: Area of release equals floor area of single stack (length x width of stack)
- Truck: Area of release equals floor area of single trailer (length x width of trailer)

While it is possible that larger quantities of material may be involved, an incident of this magnitude is more likely to result in potential explosive effects whereas smaller scale incidents are more likely to result in fume release only.

[9] Atkinson, G.T. & Adams, W.D. (2002) Ammonium nitrate: Toxic fume risk from fires in storage. *Proceedings of International Fertiliser Society Oct 2002,* 496.

Dispersion

Once the amount of product released into the atmosphere has been determined, it is then necessary to model the dispersion of this product in the atmosphere.

When modelling dispersion, a range of weather conditions needs to be considered. The release from ammonium nitrate decomposition has a temperature above the ambient temperature and is therefore buoyant. The wind speed, the atmospheric stability and the height of an inversion layer affect the rise of a buoyant plume. For buoyant plumes, the highest ground level concentrations often occur at high wind speeds.[10] At these high wind speeds, the wind tends to overcome the buoyancy of the plume, and therefore its vertical rise, resulting in higher ground level concentrations.

Weather data has been obtained for Williamtown Airport (approximately 15km from the site). A summary of the frequency of different wind directions and weather conditions is provided below.

Weather Data							
	B3	D3	D6	D12	E3	F2	TOTAL
	(all Stability Category A & B)	(Stability Category C & D, wind speed <4m/s)	(Stability Category C & D, wind speed 4-10m/s)	(Stability Category C & D, wind speed >10m/s)	(all Stability Category E)	(all Stability Category F)	
Ambient temp (average)	20.8 degC	16.1 degC	18.2 degC	16.9 degC	16.0 degC	13.2 deg C	
Mixing height (average)	968 m	716 m	1481 m	2653 m	846 m	472 m	
N	1.23 %	2.66 %	0.42 %	0.00 %	1.32 %	3.14 %	8.77 %
NE	0.90 %	3.15 %	3.08 %	0.00 %	3.34 %	3.17 %	13.64 %
E	0.42 %	2.08 %	3.89 %	0.01 %	1.04 %	1.08 %	8.52 %
SE	0.57 %	1.29 %	7.53 %	0.17 %	0.89 %	0.55 %	11.00 %
S	0.43 %	1.55 %	7.04 %	0.32 %	0.40 %	0.61 %	10.35 %
SW	0.55 %	2.23 %	3.43 %	0.13 %	0.53 %	0.66 %	7.53 %
W	1.43 %	4.73 %	10.21 %	1.11 %	2.31 %	1.97 %	21.76 %
NW	2.30 %	6.06 %	3.58 %	0.64 %	2.25 %	3.60 %	18.43 %
TOTAL	7.83 %	23.75 %	39.18 %	2.38 %	12.08 %	14.78 %	

[10] Kinsman, P. and Maddison, T.E., *Hazard Assessment for Fires in Agrochemical Warehousees*, Transactions of IChemE, Vol 79, Part B, May 2001, pages 145-156.

For warehouse fires, the UK Health and Safety Executive indicates that the flow velocity from small vents in warehouses during a serious fire is likely to be of the order of 10 m/s, with velocities up to 20 m/s possible if the roof collapses.[11] A release velocity of 10m/s has been used for ammonium nitrate stored indoors; a release velocity of 20m/s has been used for ammonium nitrate stored outdoors or on trucks.

A release temperature of 100degC has been used.[9]

The rougher the ground over which a gas is dispersing the more rapid is the rate of air entrainment and the shorter is the hazard range. A ground roughness value of 0.1 corresponding to elements on the ground about 0.5-1 metre high is recommended for dispersion over agricultural land. A roughness value of 0.3 should be used for dispersion over a suburban area. Although higher roughness values may be assigned to some industrial sites, their use results in a reduced hazard range that could, under certain circumstances, be optimistic.[11] A roughness value of 0.3 has been used.

Due to the variability of atmospheric conditions a dispersing gas plume meanders and the concentration at a fixed point downwind of a release fluctuates. Most dispersion models account for this phenomena by introducing an averaging period. The longer this is, the more allowance is made for the variations in wind direction and the smaller is the predicted concentration. There is no consensus on the most appropriate averaging period for dispersion calculations, but widespread support exists for use of 600 seconds for continuous releases and 10 seconds for instantaneous releases.[11] An averaging period of 10 minutes (600 seconds) has been used.

Ausplume, a Gaussian plume dispersion model developed by the Victorian Environment Protection Authority, has been used to model this dispersion. Ausplume is designed to predict ground-level concentrations of pollutants emitted from one or more sources. Sources can be modelled as stacks, area sources, volume sources, or any combination of these.

The results of this modelling for the decomposition of a single stack of ammonium nitrate (Incident Reference 4) show:

- A concentration of 0.5ppm NO_2 (irritation) is exceeded at a maximum distances of 360 metres from the source.
- Based on weather data, the maximum probability of exceeding a concentration of 0.5ppm NO_2 (irritation) at any point is 5.71×10^{-4}.
- The maximum ground level concentration of NO_2 is 3.1 mg/m^3.
- A concentration of 80ppm NO (no health hazard) is not exceeded.
- The maximum ground level concentration of NO is 15.4 mg/m^3.

[11] UK Health & Safety Executive, *Safety Report Assessment Guide – Chemical Warehouses,* http://www.hse.gov.uk/comah/sragcwh/index.htm.

The results of this modelling for the decomposition of a single vehicle trailer of ammonium nitrate (Incident Reference 5) show:

- A concentration of 0.5ppm NO_2 (irritation) is exceeded at a maximum distances of 120 metres from the source.
- Based on weather data, the maximum probability of exceeding a concentration of 0.5ppm NO_2 (irritation) at any point is 5.71×10^{-4}.
- The maximum ground level concentration of NO_2 is 1.8 mg/m^3.
- A concentration of 80ppm NO (no health hazard) is not exceeded.
- The maximum ground level concentration of NO is 8.9 mg/m^3.

LIKELIHOOD & RISK ANALYSIS

Individual Risk: Toxic gas incidents

Based on a study into ammonium nitrate storage fires, a frequency of 6×10^{-4} per year is proposed as a cautious best estimate for fires occurring at ammonium nitrate storage facilities.[9] This value has been used as the incident frequency for incidents at this site involving ammonium nitrate in storage (Incident Reference 4) and on vehicles (Incident Reference 5).

Based on the results of the consequence modelling (page 26), the following conclusions can be made regarding the risk of fatality, injury and irritation due to the sustained release of ammonium nitrate decomposition products:

- There is no risk of fatality due to the sustained release of ammonium nitrate decomposition products. These incidents do not contribute to the individual risk of fatality.
- There is no risk of injury due to the sustained release of ammonium nitrate decomposition products.
- The maximum possible risk of irritation due to the sustained release of ammonium nitrate decomposition products from an incident involving ammonium is 0.34×10^{-6} per year (fire frequency of 6×10^{-4} x maximum probability of 5.71×10^{-4}).
- For three different storage locations, and three different vehicle loading locations, the maximum possible risk of irritation is 2×10^{-6} per year (6 incidents x 0.34×10^{-6}).

Therefore, the following risk criteria presented in HIPAP No. 4[12] are met:

- Toxic concentrations in residential and sensitive use areas should not exceed a level which would be seriously injurious to sensitive members of the community following a relatively short period of exposure at a maximum frequency of 10 in a million per year.
- Toxic concentrations in residential and sensitive use areas should not cause irritation to eyes or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year.

[12] NSW Department of Planning, Hazardous Industry Planning Advisory Paper No 4, Risk Criteria for Land Use Safety Planning, January 2011.

Individual Risk: Explosion incidents

The VROM *Publication Series on Dangerous Substances (PGS 3): Guidelines for quantitative risk assessment* (December 2005)[13] provides some guidance on the frequency of incidents. In particular, a frequency of 1×10^{-5} per year is specified for a mass detonation of explosives in storage.

As ammonium nitrate is much less sensitive than products classified as explosives, an explosion frequency per ammonium nitrate storage facility of 1×10^{-6} per year has been assumed. For explosions involving vehicle loads, a higher frequency of 10×10^{-6} per year has been used to reflect the higher chance of initiating events, such as fires. As the consequences of an explosion in the auger results in localised effects only, the frequency of this incident does not contribute to any off-site risk.

For three different storage locations, and three different vehicle loading locations, the absolute maximum off-site risk of fatality, property damage or injury due to an explosion is 33×10^{-6} per year (3 storage locations at 1×10^{-6} + 3 vehicle locations at 10×10^{-6}).

Therefore, the following risk criteria presented in HIPAP No. 4[12] are met:

- Individual fatality risk levels for industrial sites at levels of 50 in a million per year (50×10^{-6} per year) should, as a target, be contained within the boundaries of the site where applicable.
- Incident explosion overpressure at neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings should not exceed a risk of 50 in a million per year for the 14 kPa explosion overpressure level.
- Incident explosion overpressure at residential and sensitive use areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year.

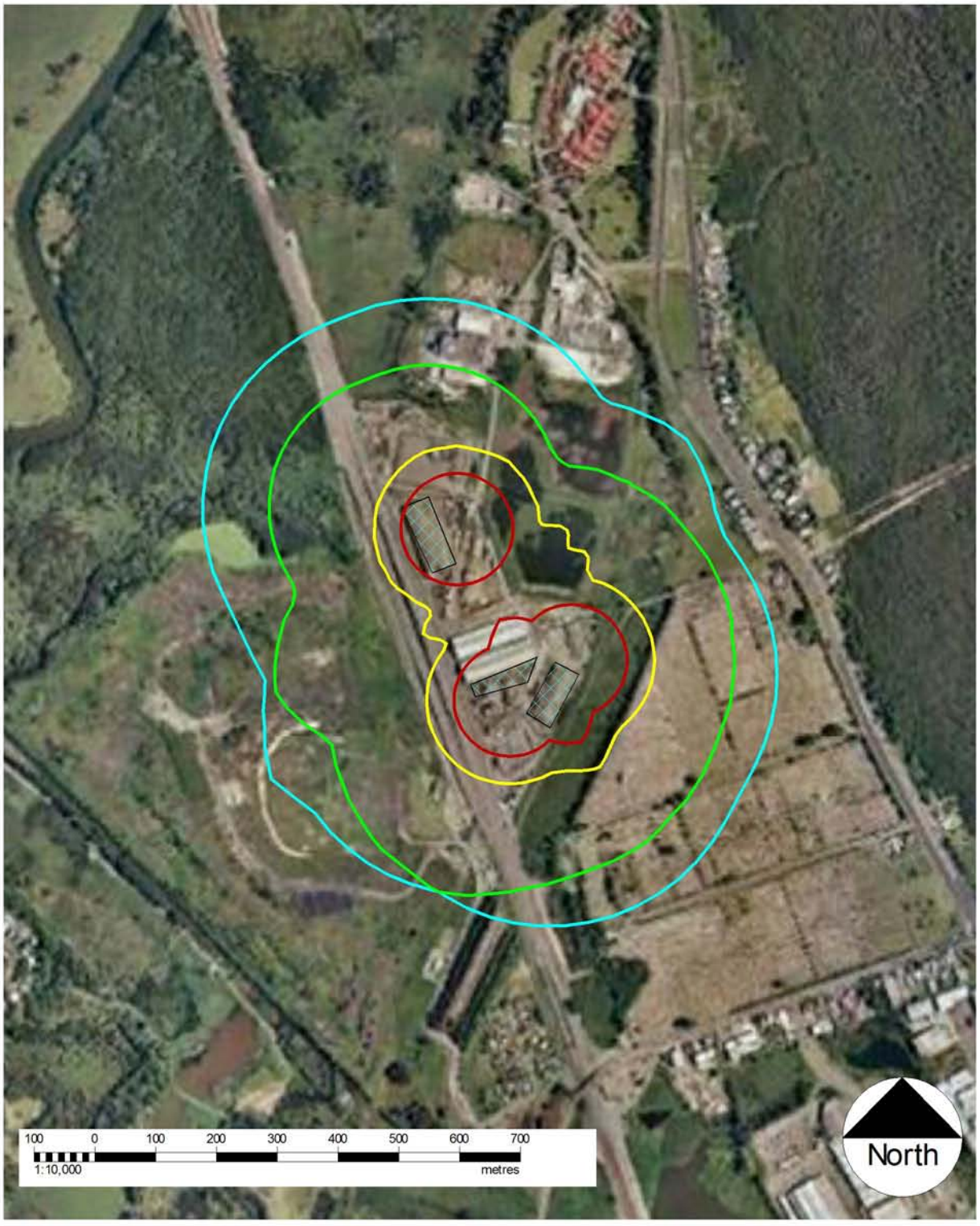
In calculating individual risk of fatality, the following assumptions have been made regarding probability of fatality (refer to page 20):

- Overpressure ≥ 70kPa: Probability of fatality = 100%
- 35kPa ≥ Overpressure < 70kPa: Probability of fatality = 50%
- 21kPa ≥ Overpressure < 35 kPa: Probability of fatality = 20%
- Overpressure < 21kPa: Probability of fatality = 0%

[13] Previously known as the TNO *CPR18E Guideline for Quantitative Risk Assessment* (the "Purple Book")

The calculated risk contours (shown on the following page) show that the following individual fatality risk criteria presented in HIPAP No. 4[12] are met:

- Hospitals, schools, child-care facilities and old age housing development should not be exposed to individual fatality risk levels in excess of half in one million per year (0.5×10^{-6})
- Residential developments and places of continuous occupancy, such as hotels and tourist resorts, should not be exposed to individual fatality risk levels in excess of one in a million per year (1×10^{-6} per year).
- Commercial developments, including offices, retail centres, warehouses with showrooms, restaurants and entertainment centres, should not be exposed to individual fatality risk levels in excess of five in a million per year (5×10^{-6} per year).
- Sporting complexes and active open space areas should not be exposed to individual fatality risk levels in excess of ten in a million per year (10×10^{-6}).



10 x 10-6

5 x 10-6

1 x 10-6

0.5 x 10-6

AN Storage

CRAWFORDS Freightlines Pty Ltd

Hazard Analysis

Crawfords Freightlines Pty Ltd- 180 Old Maitland Road, Sandgate (NSW)

prepared by
Health & Safety
Essentials Pty Ltd

Individual Fatality Risk Contours

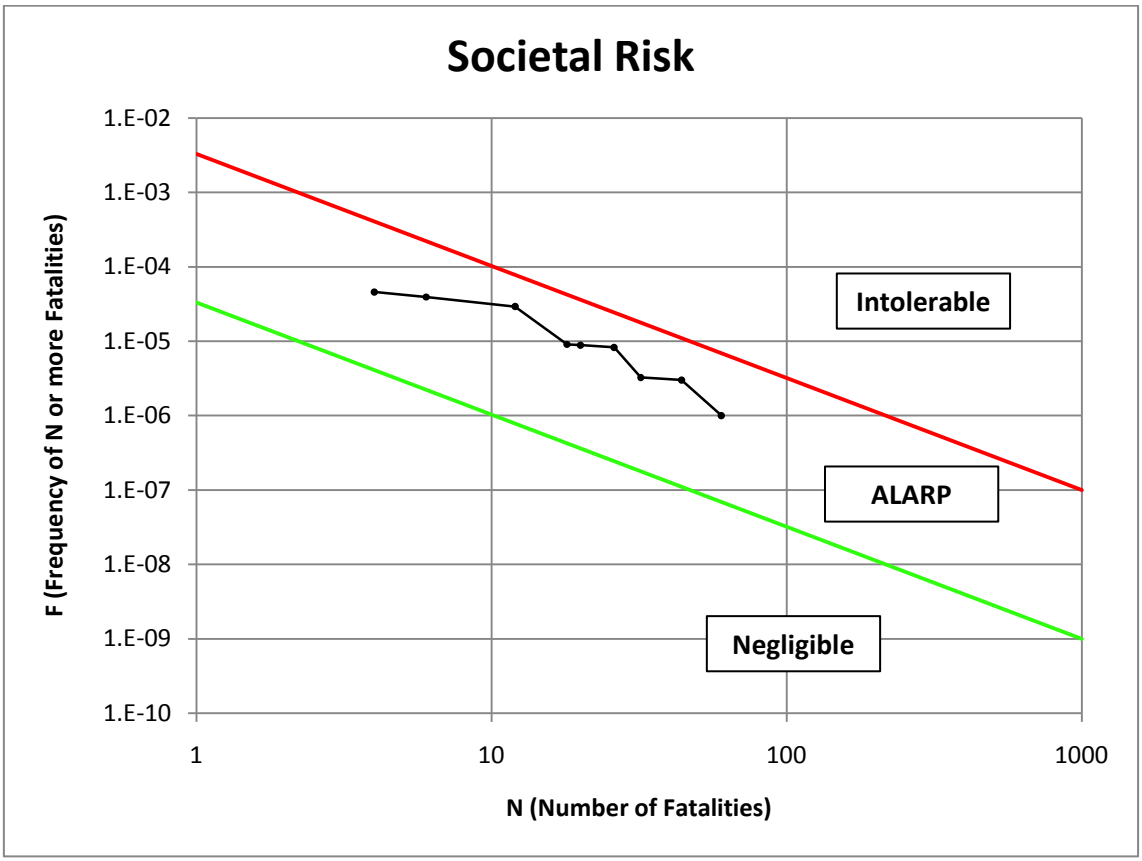
Societal Risk

The concept of Societal Risk is used to address community concerns when there is a risk of multiple fatalities occurring in one event. Societal Risk criteria are generally presented as FN-curves, obtained by plotting the frequency (F) at which such events result in the fatality of N or more people, against N.

The criteria take into account the fact that society is particularly intolerant of accidents, which though infrequent, have a potential to create multiple fatalities.

Societal Risk has been calculated based on estimates of employee numbers at Crawfords and adjacent businesses, and community populations at nearby residential, commercial and recreational facilities. Calculations have been based on estimated day-time and night-time populations (it should be noted that the only workplace in the immediate vicinity to operate at night is Impact Fertilisers).

The following chart shows the level of Societal Risk compared with the indicative societal risk criteria set by NSW Department of Planning in HIPAP No. 4.



Environmental Risk

In the case of impacts on the biophysical environment, the concern is generally related to whole systems or populations, rather than individual plants or animals.

The major environmental concern associated with the storage and handling of ammonium nitrate is in relation to increased levels of nitrogen. This may occur when spills of ammonium nitrate are washed into nearby waterways or underground water tables during rain events.

Ammonium nitrate has traditionally been used as a fertiliser, and any releases of ammonium nitrate into the environment may result in increased growth rates of vegetation, including increased algae growth in waterways. Excessive levels of nitrogen may kill vegetation, and excessive growth of algae in waterways can lead to eutrophication resulting in decreased oxygen levels and death of fish and other organisms.

To the east of the site is the south channel of the Hunter River; to the north through to the west of the site is Ironbark Creek; to the south-west of the site is the Shortland Wetlands Area incorporating the Hunter Wetlands Centre.

While a detailed environmental assessment has not been conducted, it is believed that any environmental impacts that may occur would be less than 'Moderate' as defined in the NSW Department of Planning HIPAP No. 4 (ie less than "Temporary alteration or disturbance beyond natural viability. Effects confined <5000 m^2, not accumulating or impairment. Loss of resources but sustainability unaffected. Recovery temporarily affected. Recovery < 5 years). As any recovery from a release is likely to be relatively swift, it is not expected that any accidental release from the site would threaten the long-term viability of any ecosystem or species.

Based on this assessment, it is believed the following risk criteria set for the biophysical environment by the NSW Department of Planning in HIPAP No. 4 will be met:

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects (consequences) of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it.
- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood (probability) of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the background level of threat to the ecosystem.

RISK ASSESSMENT & EVALUATION

Qualitative risk principles for land use safety

HIPAP No. 4 (*Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4*, New South Wales Department of Planning, 2011) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses.

Avoidable risks should be avoided

HIPAP No. 4 states:

> All 'avoidable' risks should be avoided. This necessitates the investigation of alternative locations and alternative technologies, wherever applicable, to ensure that risks are not introduced in an area where feasible alternatives are possible and justified.

Storage and handling of ammonium nitrate presents inherent hazards due to the chemical nature and physical properties of the product. The only way to avoid these risks is not to store or handle ammonium nitrate. However, as the supply of ammonium nitrate is a fundamental requirement for the ongoing feasibility of mining in the Hunter Valley (and other areas), it is not possible to avoid the storage and handling of ammonium nitrate. As it is, ammonium nitrate is used because of its inherent safety as opposed to older more traditional explosives, ie alternative technologies (products) present a higher level of risk.

The current location of the site is ideal for the operations undertaken:

- It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate.
- It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product.
- It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used.

Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk.

Reduce risk wherever practicable

HIPAP No. 4 states:

> The risk from a major hazard should be reduced wherever practicable.....In all cases, if the consequences (effects) of an identified hazardous incident are significant to people and the environment, then all feasible measures (including alternative locations) should be adopted so that the likelihood of such an incident occurring is made very low.....

The consequences of the potential accidents identified in this hazard analysis are significant, particularly within the site which is shared by other businesses. Therefore, this principle requires that all feasible measures (including alternative locations) should be considered to reduce the likelihood of these incidents to a very low level. As discussed previously, the current location of the site is ideal for the operations undertaken, and any alternative locations having these characteristics are likely to be located in similar industrial areas within the Newcastle region, with similar levels of risk.

All feasible measures are taken at the site to reduce the likelihood of any incident occurring. These controls are discussed in the section on Reducing Risk (page 38).

Consequences contained within installation boundaries

HIPAP No. 4 states:

> The consequences (effects) of the more likely hazardous events (ie those of high probability of occurrence) should wherever possible, be contained within the boundaries of the installation.

The likelihood of occurrence of all potential accidents identified in this hazard analysis is considered to be low. The more likely hazardous events (ie incidents involving ammonium nitrate on vehicles) have limited impact beyond the site boundaries.

Do not allow additional high risk developments

HIPAP No. 4 states:

> Where there is an existing high risk from a hazardous installation, additional hazardous developments should not be allowed if they add significantly to that existing risk.

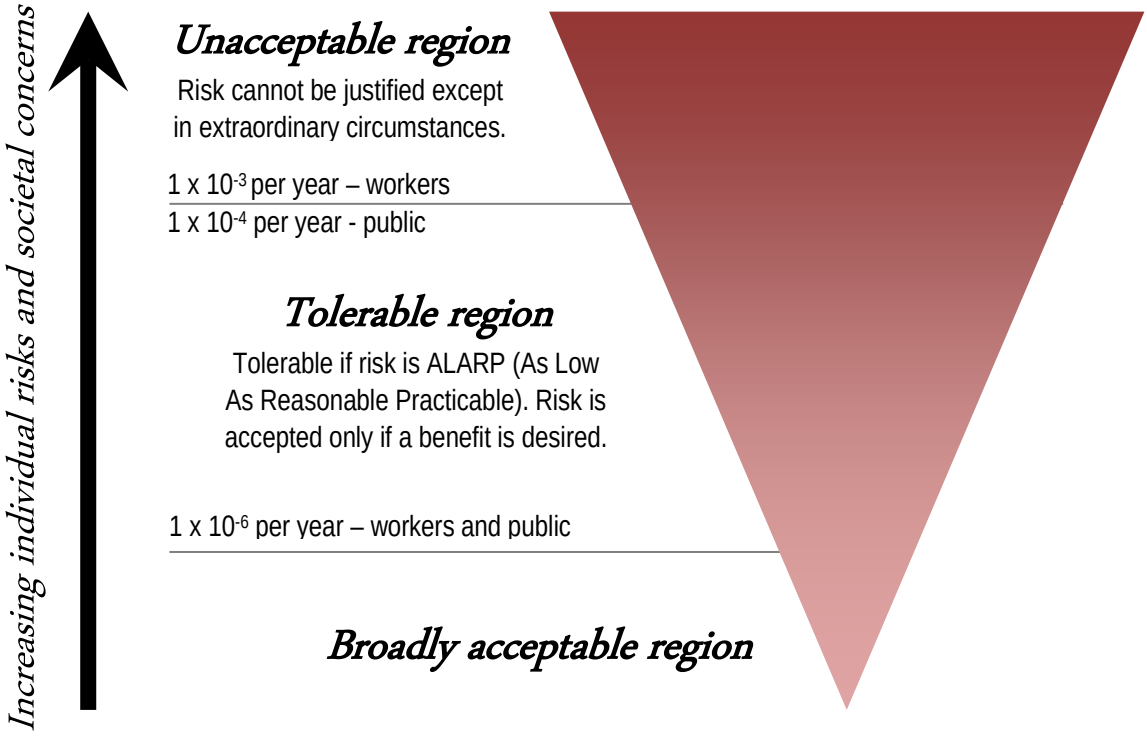
Storage and distribution of ammonium nitrate has been undertaken at this site for many years, and prior to Crawfords occupying the site. The site has been licensed by WorkCover for this period. There are no other hazardous industries in the immediate vicinity.

Risk criteria for land use safety

As presented in the section on "Likelihood & Risk Analysis" (commencing on page 28), all quantitative risk criteria presented in HIPAP 4 have been met.

Acceptability of risk

The UK Health and Safety Executive provide guidance on "acceptable risk" in their publication *Reducing Risk, Protecting People: HSE's decision making process* (2001). Their basic framework for assessing the tolerability of risk is described by the following diagram.



In terms of frequency, the UK Health & Safety Executive has proposed the following cut-offs between the different regions of this diagram:

- An individual risk of death of one in a million per annum for both workers and the public corresponds to a very low level of risk and should be used as a guideline for the boundary between the broadly acceptable and tolerable regions.
- An individual risk of death of one in a thousand per annum should represent the dividing line between what could be just tolerable for any substantial category of workers for any large part of a working life, and what is unacceptable for any but fairly exceptional groups. For members of the public who have a risk imposed on them 'in the wider interest of society' this limit is judged to be an order of magnitude lower – at 1 in 10 000 per annum.

Based on this concept, and the levels of risk determined previously, the risk to members of the public would be considered as 'broadly acceptable', while the risk to workers at Crawfords and nearby sites would fall within the lower portion of the 'tolerable region'. In this case, risk should be reduced to 'As Low As Reasonably Practicable'.

REDUCING RISK

As discussed previously, the hazards of ammonium nitrate are related to exposure to unsafe conditions – heat, confinement and contamination. Therefore, risk is reduced if exposure of the operations involving ammonium nitrate to these conditions is minimised.

The following conditions, procedures and practices are in place at the facility to minimise the likelihood of these conditions:

- Regular inspections of equipment (eg auger; forklifts; vehicles) to ensure correct and safe operation.
- Regular housekeeping inspections.
- Audits of storage areas and vehicles.
- Permit to work procedures.
- Provision of fire fighting equipment.
- No other chemicals or dangerous goods are stored at the site.
- Security plan.
- Emergency plan.
- Environmental management plan.

A comprehensive Safety Management System has been developed and implemented at the site covering these, and other aspects impacting on the safe operation of the facility.

In relation to the biophysical risks, the most significant risks are related to the outdoor storage of ammonium nitrate. The current operations at Crawfords are being managed so that long-term outdoor storage of ammonium nitrate is not required. Crawfords have applied to WorkCover to have the licence for storage of ammonium nitrate in the Outdoor Compound removed.

CONCLUSIONS

This Hazard Analysis has considered the risks associated with the storage and handling of ammonium nitrate at the Crawfords Freightlines storage and distribution centre at 180 Old Maitland Road, Sandgate. It has considered the risks of explosions, decomposition and release of toxic gases, and risks to the biophysical environment.

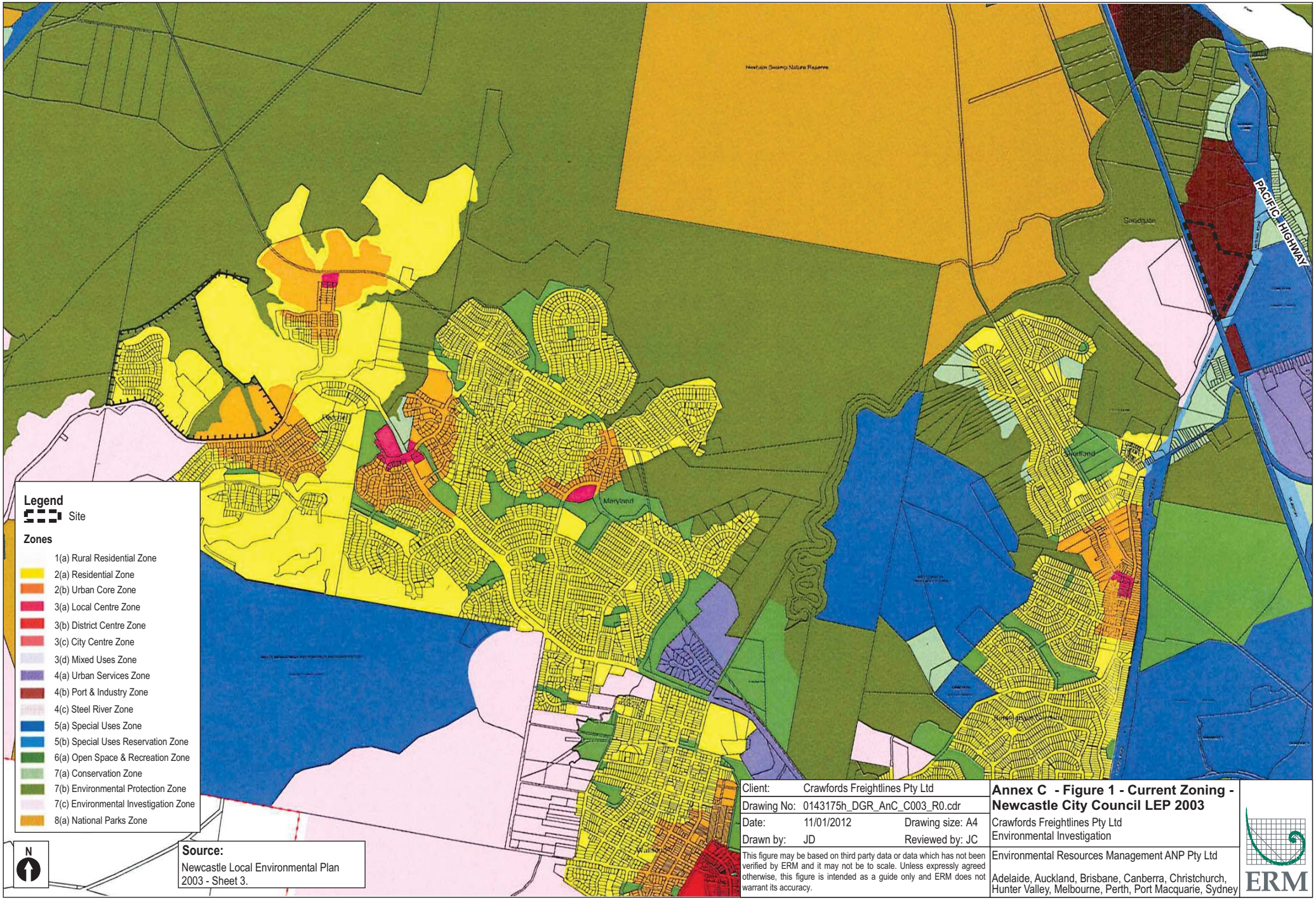
The Hazard Analysis has shown that the risk criteria for individual risk (fatality, explosion overpressure, toxic exposure), societal risk and biophysical risk, as set by the NSW Department of Planning in HIPAP 4 are met.

The Hazard Analysis has also considered the qualitative principles for land use safety, and presented brief information on controls in place to reduce risk to 'As Low As Reasonably Practicable'.

In relation to the biophysical risks, the most significant risks are related to the outdoor storage of ammonium nitrate. The current operations at Crawfords are being managed so that long-term outdoor storage of ammonium nitrate is not required. Crawfords have applied to WorkCover to have the licence for storage of ammonium nitrate in the Outdoor Compound removed.

Annex C

ZONING PLANS



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Annex C - Figure 1 - Current Zoning - Newcastle City Council LEP 2003

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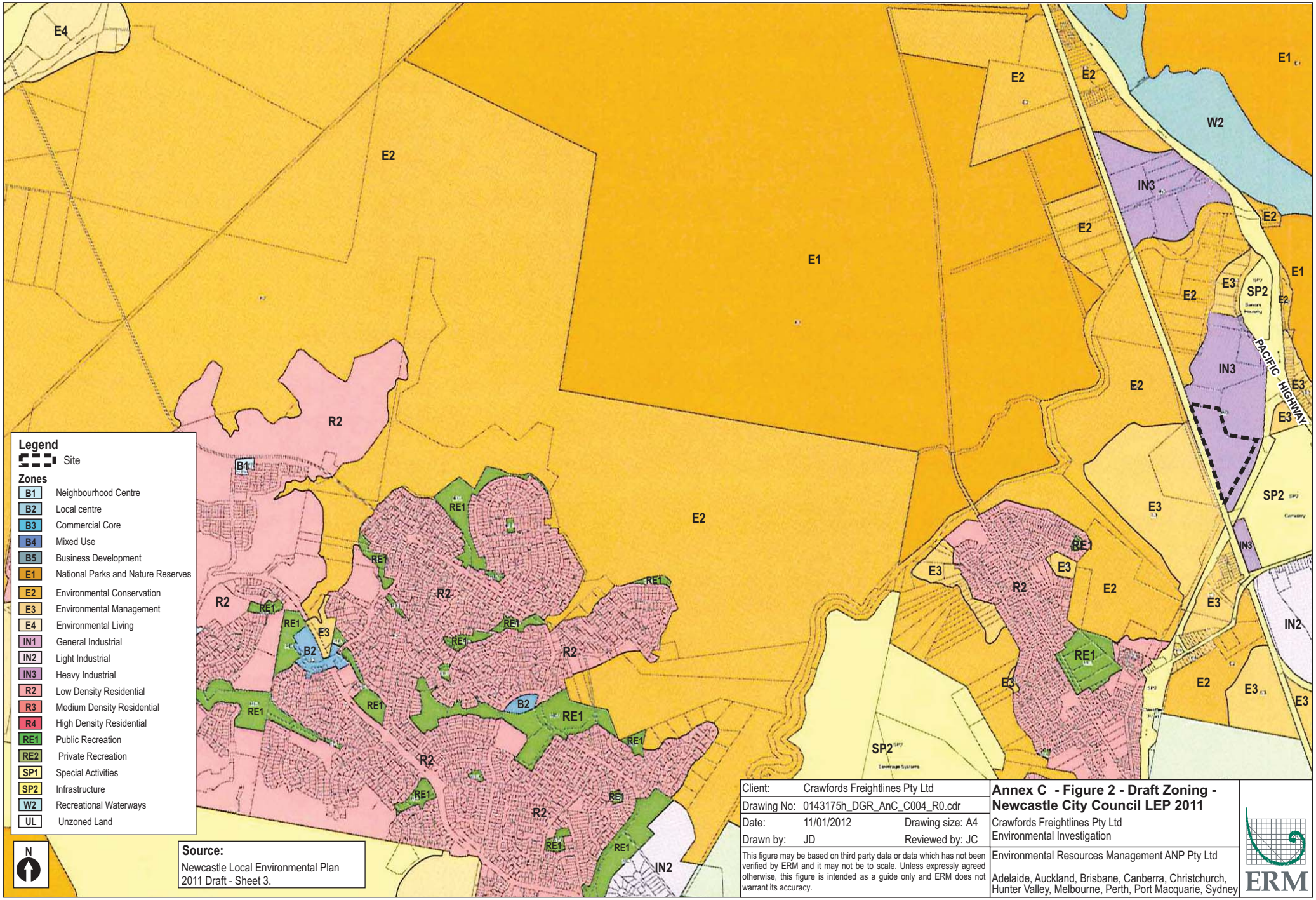

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Annex C - Figure 2 - Draft Zoning - Newcastle City Council LEP 2011

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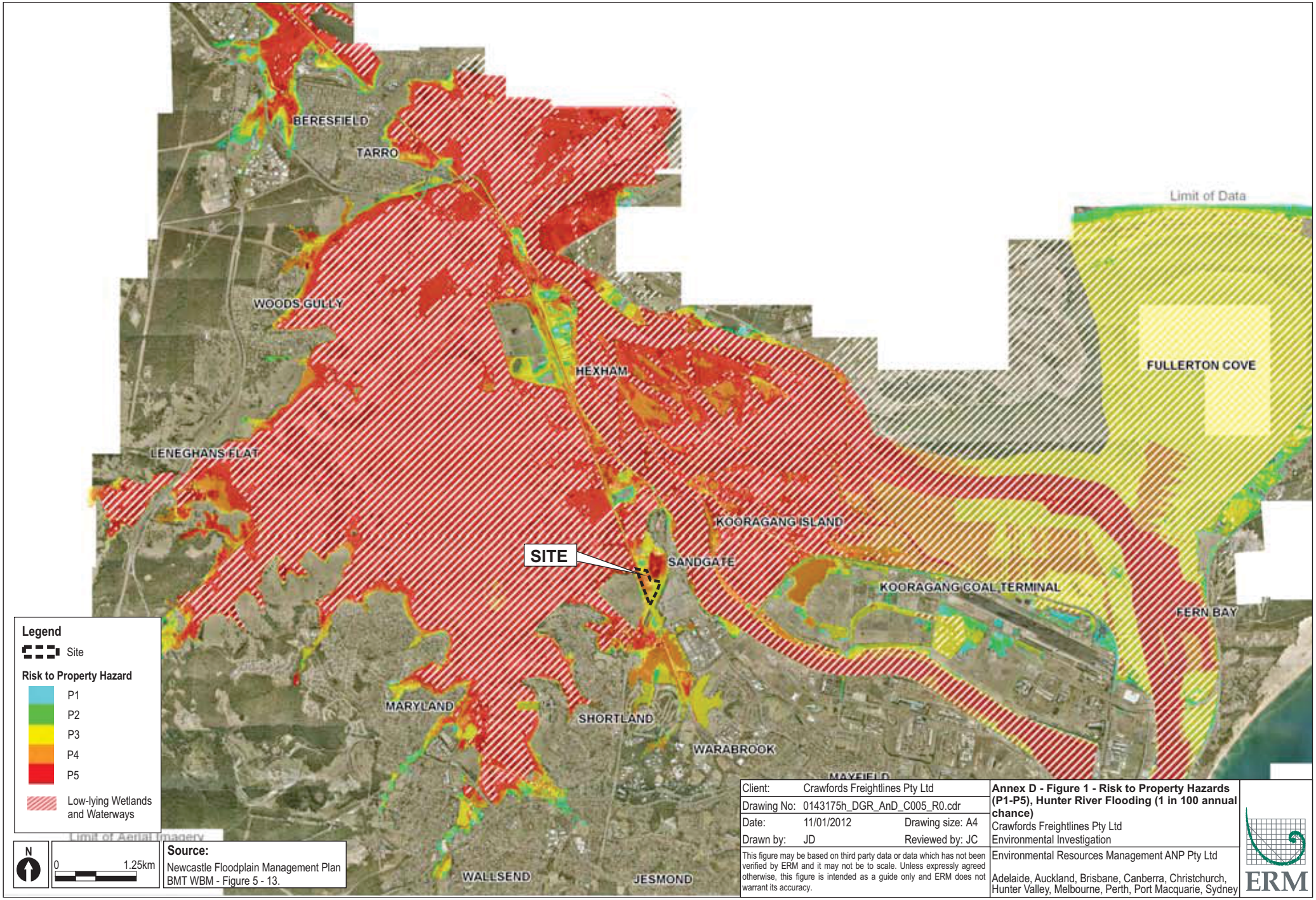
Annex D

ENVIRONMENTAL FACTORS



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Annex D - Figure 1 - Risk to Property Hazards (P1-P5), Hunter River Flooding (1 in 100 annual chance)

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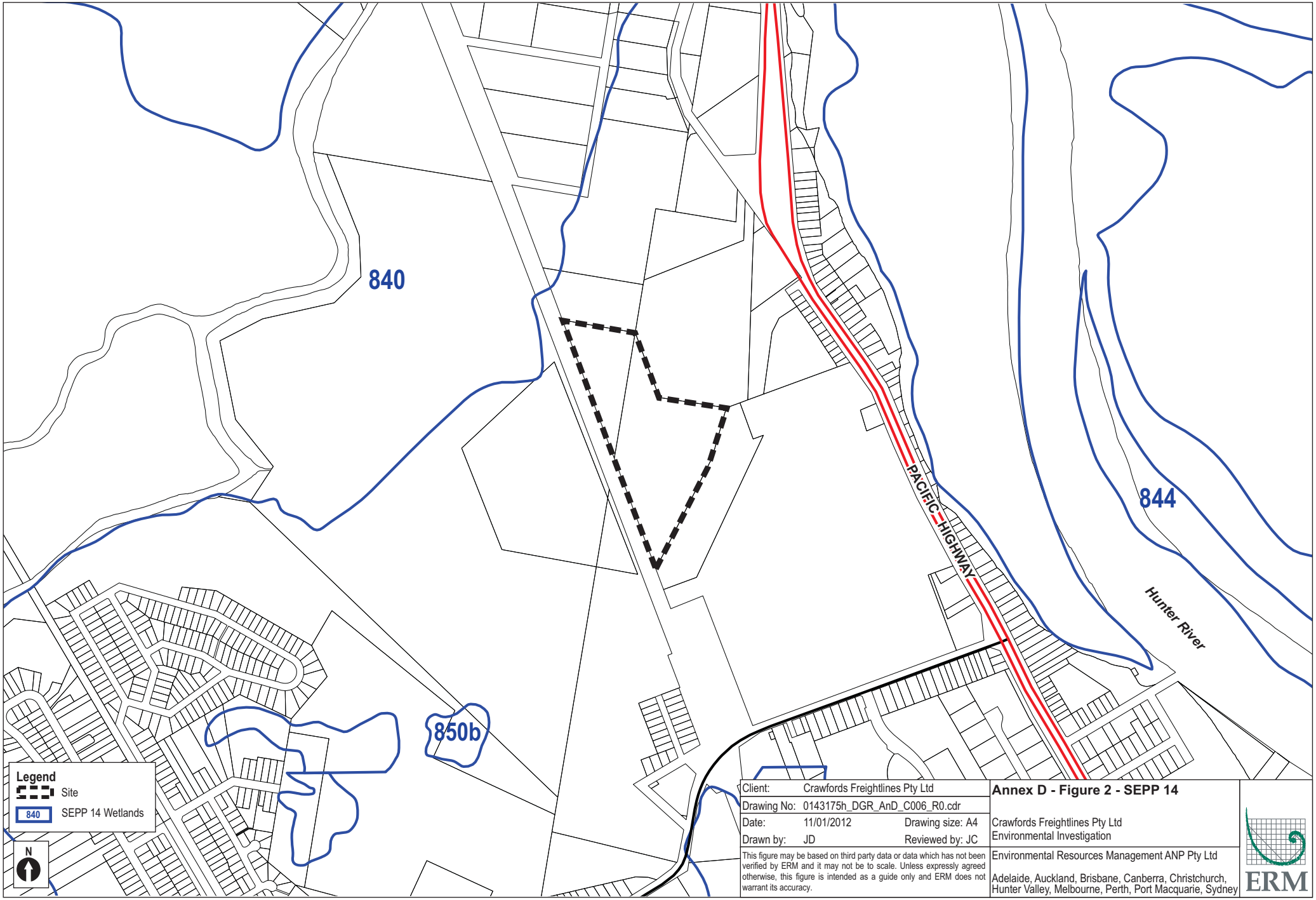

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Annex D - Figure 2 - SEPP 14

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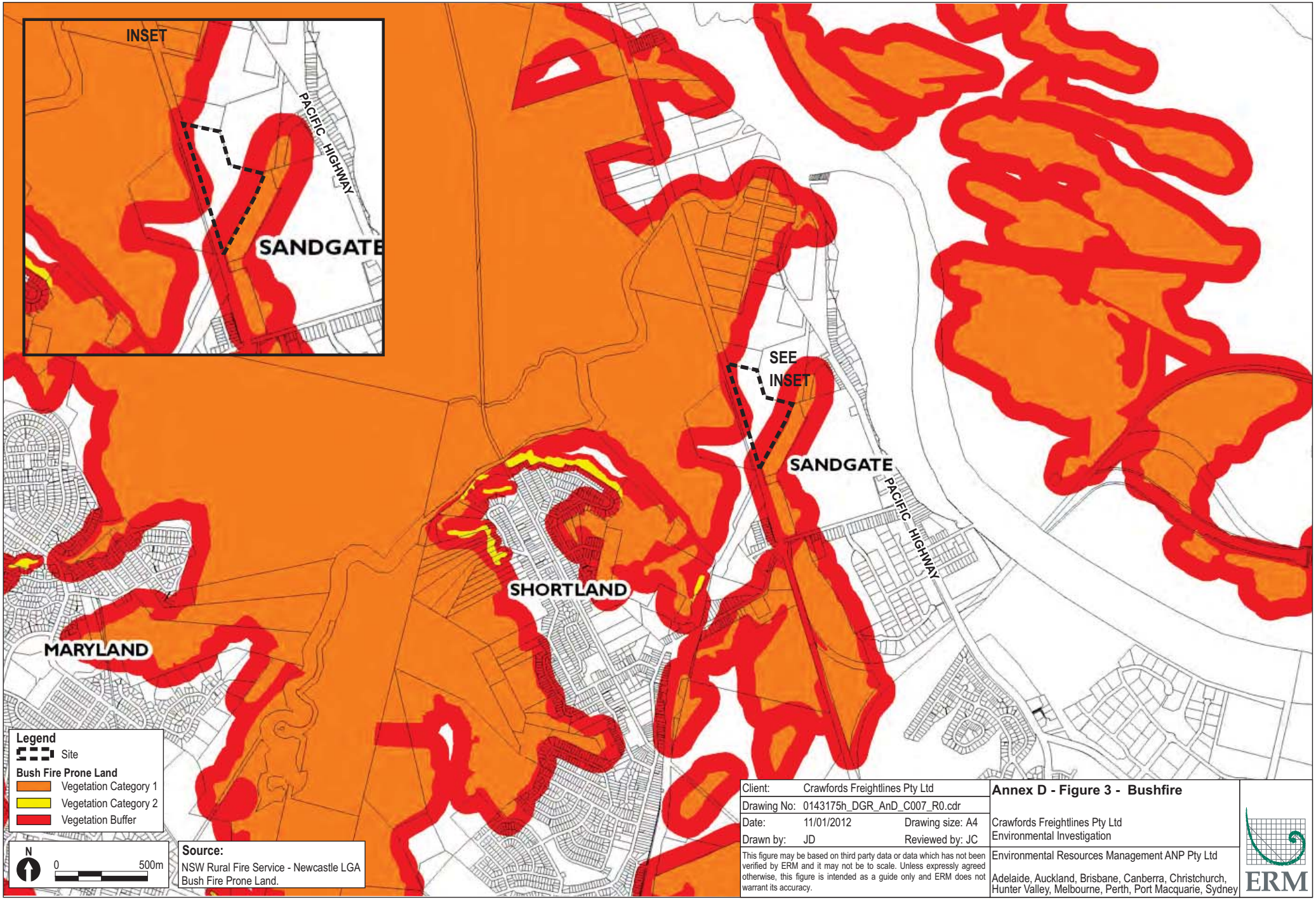

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Annex D - Figure 3 - Bushfire

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