>> REPORT

>> RESPONSE TO PUBLIC SUBMISSIONS

>> CASE STUDY ON SEA PORTS AND RESIDENTIAL INTERFACE EXPERIENCES IN AUSTRALIA, SINGAPORE AND NEW ZEALAND

>> VOLUME 1 OF 2

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1 INTRODUCTION

This report presents a series of case studies of Australian and international sea ports and their spatial interface with nearby residential areas. It has been prepared in response to submissions made in relation to the Environment Impact Statement for the proposed Integrated Townsville Ocean Terminal (TOT) project.

This report is in two volumes. This volume (Volume 1) presents a description and an analysis of the case studies, with supporting maps (typically low resolution). Volume 2 presents high resolution aerial imagery for each of the subject ports. Low resolution images are at Appendix 1 in this volume.

The discussion of case studies below is based on a desktop review of location and proximity of sea port operations and nearby residences. The review involved examination of aerial photographs of relevant ports and environs (sourced via Google Maps) and relevant Port facilities maps as available. The identification of residential sites was undertaken through a visual inspection of details available in the aerial imagery. It has not been confirmed by reference to land use zoning maps or other source materials. Distances are usually measured from an identified berth, rather than from either other activities on port lands or the boundaries of the port lands in question, unless otherwise specifically indicated. Mitigating environmental factors such as climatic conditions, prevailing wind directions, intermediating structures and topography have not been considered in this desktop assessment.

The conclusions presented are subject to ground-truthing, which would be recommended to verify these preliminary conclusions.

The situation for the following ports was reviewed:

1. Port of Townsville;
2. Port of Mackay;
3. Port of Gladstone;
4. Brisbane Port;
5. Melbourne Ports Corporation;
6. Port Phillip Bay;
7. Port of Geelong;
8. Sydney Ports Corporation;
9. Port Botany;
10. Port of Newcastle;
11. Port Adelaide;
12. Port of Esperance;
13. Port of Bunbury;
14. Port of Geraldton;
15. Port of Fremantle;
16. Port of Singapore; and
17. Port of Auckland.

As can be seen, the review has been fairly comprehensive for mainland Australia. The exceptions have been Cairns and Darwin. The consultants also reviewed the situation in two Tasmania ports (Hobart and Launceston) and Whyalla (South Australia) but limited public domain information was accessible on their experiences; and as such, they were excluded from this final reporting.

In scanning the experiences across all ports, the consultants have deliberately sought to provide an insight into the diversity of experiences, rather than effectively cherry pick examples to substantiate one argument or another. Individual or groups of case studies neither proves nor disproves the appropriateness of any particular interface management regime; to selectively use case studies to argue one way or another is unhelpful and misleading.

The case studies do, however, provide insights into the diversity of how different stakeholders in a range of jurisdictions and operating environments have responded to the challenges.

2 FINDINGS

2.1 CONTEXT

The interface between industrial ports and its neighbours – be they commercial or residential – is a significant issue for a number of Australian cities. From the point of view of ports and port operators, the issue has been euphemistically described as 'urban encroachment', which is as one of a number of common risks to future port operations and expansions in Australia (Association of Australian Ports and Marine Authorities (AAPMA). Other risks include insufficient appropriately zoned land or availability of land for future expansions.

The general argument is that the proximate location of residents near to operational ports poses significant risks to the ports by virtue of increased likelihood of residential complaints resulting in a curtailment or circumscribing of port expansion and development (Department of Infrastructure, 2004). This report does not address the set of issues, which are examined in more detail separately (refer to separate Transpac Consulting *Report on Port Compatibility*).

Rather than adopt the terminology of one set of interests in the interface debate, the consultants prefer a less pejorative description of the spatial interaction issues arising from proximate location of port activities and non-port land uses. Throughout this report, the issues are described as *port-residential interface* issues. This description has the benefit of not only being less pejorative but also more accurately reflects the diversity of experiences and trajectories driving these interface challenges. The term 'urban encroachment' suggests that the spatial movement is 'one way', namely that it is residential uses that are moving into or crowding into port space. The case studies presented in this report indicate that the experiences across Australia are in fact diverse; in some cases, the interface issues are actually given rise to by the expansion of ports into erstwhile non-port and indeed historic residential areas.

As populations grow, demand for land surrounding port facilities for urban, industrial and commercial purposes is increasing. Similarly, corridors for access to the port come under increased pressure in terms of the interface between the port and urban areas leading to urban amenity issues. In major port cities in Australia and globally, there has been a spate of urban development in and around major ports. There has also been moves by a number of ports to expand, often requiring increased exposure to nearby non-port uses – including residences.

A menu of responses has been developed in different jurisdictions, revolving around core themes such as:

- Establishing and sustaining communication protocols between neighbours to effectively 'manage expectations' and where possible enlist all stakeholders into a shared future;
    - A number of port operators appear to have taken a proactive approach to managing their activities and inter-relationships with their neighbours – including residents. This approach is based on a recognition that residential renewal in and around older 'industrial' areas is a contemporary reality of urban re-settlement patterns, and co-existence with old and new neighbours requires new approaches to responsible corporate behaviour;
- Developing 'appropriate' buffer zones and strategies. It can be noted that what

constitutes an 'appropriate' buffer depends very much on the specific circumstances of the port-residential interface issues in question; and

- Design based mitigation measures, at both source and at receptor. Again, the specific permutations of these measures are dependent on the particular circumstances in question.

2.2 KEY FINDINGS

Table 1 summarises the reviewed ports in terms of:

1. Estimates of proximity between port and nearest residential area;
2. The direction of interface issues (i.e. port expansion encroaching on existing residential or residential development encroaching on port operations); and
3. How the port has responded to various interface issues (e.g. through buffer zones, community engagement programs etc.)

Volume 2 shows aerials of ports and distances from berths to nearest residential areas.

A number of conclusions can be drawn from the case studies:

1. The case study experiences confirm the existence of diversity of experiences and approaches to interface issues. The experiences are idiosyncratic. There is simply no single 'right or wrong' model or a 'one size fits all' approach. In all cases, challenges of port-residential interface have confronted all stakeholders. The imperatives have been informed by a recognition of:
    a. Economic importance of each of the ports;
    b. The economic and social importance of residential development on waterfronts, which draws from extensive international experiences that point to the strategic significance of waterfront development for sustained city prosperity (Urban Land Institute, 2004); and
    c. The need to manage the interface and ultimately negotiate and re-negotiate the co-existence of different neighbours;
2. The distances between port and residential activities vary considerably across the areas that were examined, ranging from as little as ~200m in Sydney and up to ~850m at Port of Botany. Typical distances tend to be between 600-800m;
3. The direction of interface varies across the case studies, as do the nature and extent of the interface issues. These are, in turn dependent on a range of factors surrounding the nature of port activity, the geography of the port and layout of existing facilities which contribute to the ports ability to minimise interface issues and the extent and location of land available for redevelopment;
4. The response of the ports and how they manage their interfaces and impacts is reasonably consistent across all ports, in the sense that all the port authorities and management bodies recognise the importance of community engagement. What does differ appears to be the extent to which the port is prepared to work with communities to identify issues and to minimise or mitigate the impacts; and
5. Ultimately, as the case studies indicate, all interface management outcomes are what can be described as 'negotiated settlements' that effectively balance the needs, expectations and interests of different parties, and that the balance achieved is not static but a constant 'work in progress'.

TABLE 1: SUMMARY OF MAJOR PORT INTERFACE ISSUES AND RESPONSES

Port	Distance from Berth to Nearest Residential Area	Direction of Interface Issue	Interface Management Approaches
Townsville	~750m to Breakwater Quays, Sir Leslie Thiess Drive ~400m to Entertainment Centre ~500m to Casino and Hotel	Residential expansion and urban renewal (South Townsville) and port expansion	City-Port Master Plan. This document was last updated July 2007 and is in draft stage only. Buffer zone to South Townsville (landscaped parklands).
Mackay	~300m from berth	Residential expansion	Land use plan emphasises the use of buffer zones. Acknowledged need to achieve harmonious co-existence with nearby land uses and the community in general.
Gladstone	~500m from McFarlan Drive Berth	Port expansions	Proactive monitoring of amenity impacts e.g. air quality/dust emissions.
Brisbane	~460m to Hamilton Wharves	Residential expansion	Downstream expansion away from other land uses. 500m buffer (Brisbane River) for Northshore Hamilton Development. Community Consultative Committee.
Melbourne Port	~750m	Residential expansion	Victorian Port Strategic Framework identifies the need for the use of "appropriate buffers". Environmental Management Plans in place for Docklands interface with Port activities. Buffer zone strategy adopted, but no specific 'distances' have been prescribed. Proactive engagement with the community.
Port Phillip Bay	~600m from Bass Strait Ferry Terminal	Urban renewal	Port Phillip Industry and Business Strategy has identified a number of objectives for harmonious co-existence, with strategies such as amenity mitigations, consolidation of industrial activities and continued availability of land for industrial and port-related development.
Port of Geelong	~750-800m (Norlane)	Port expansion	Spatial separation of different land uses to minimise potential for disruption. A buffer distance of between 300-500m has been deemed adequate for most port-related industries (mainly in relation to Norlane, where port expansion is impacting on existing residents). Development of a Community Deed of Agreement to manage interface and establish baseline of mutual obligations and expectations.

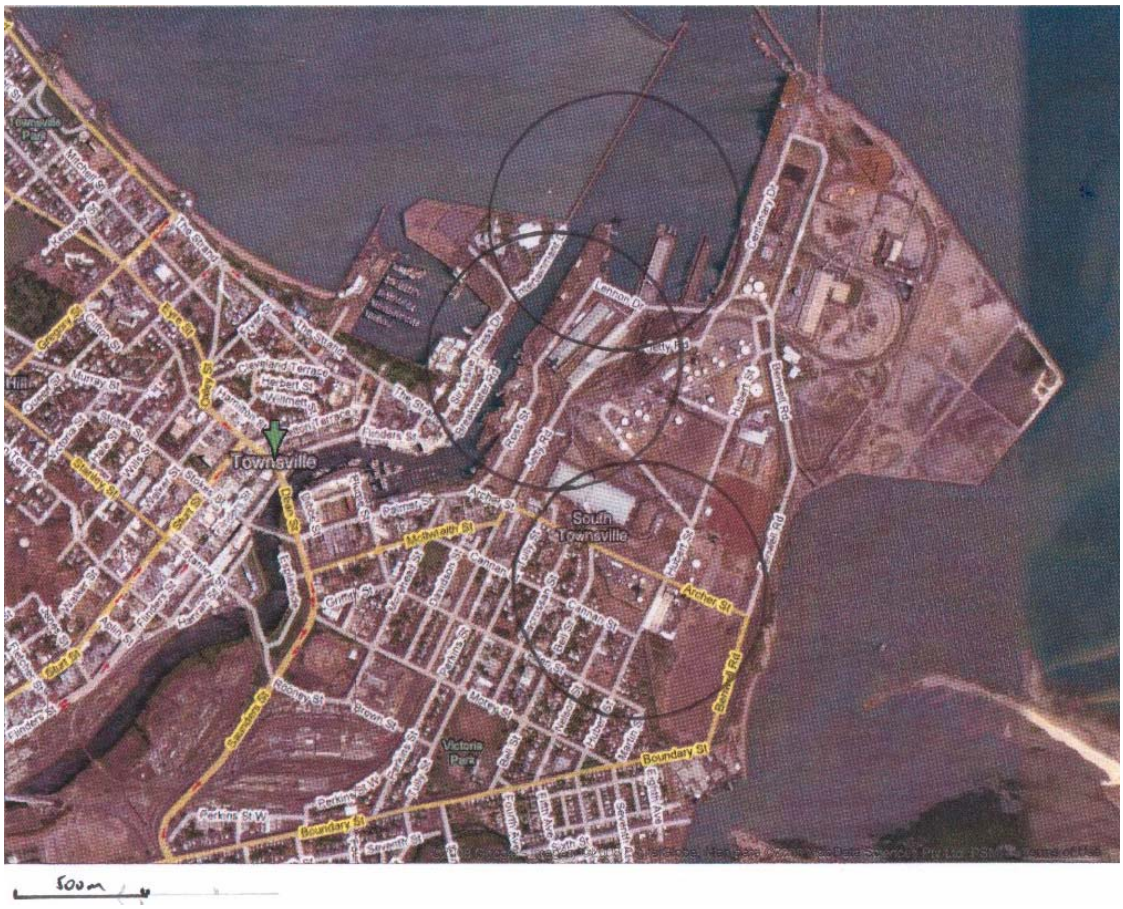
Sydney Ports Corp	~200m	Port expansion	Noise Management Strategy developed in concert between Port, P&O Ports and residents. Land use zonings in the Rozelle and Blackwattle Bay Master Plan prohibits future residential and apartment developments. No specific provision for buffer zones in Master Plan. Design-based mitigations proposed. Buffer zone used in White Bay Park area. SPC operates a number of community consultative processes.
Port Botany	~850m (from existing berth) ~650m (from proposed new berth)	Port expansion	Port expansion impacts have been mitigated through realignment of rail lines and haulage routes, construction of noise barriers. Other amenity impacts managed through management plans. Community Consultative Committee in place.
Port of Newcastle	~700m	Residential expansion	Consideration being given to buffer zones. Noise attenuation measures required by residential developers to minimise or eliminate noise impacts generated by Port.
Port Adelaide	Inner ~500m from dedicated soda ash berth Inner ~450-500m from bulk cement/clinker Outer ~900m from motor vehicle (roll-on/roll-off) terminal	Port expansion and Residential expansion	Buffer in place (golf course and salt marsh). Land use restrictions on future developments. EPA suggestion for 1km buffer as acceptable, but this not always accepted with some proposed residential developments are located <500m from nearby industrial activity.
Port of Esperance	~500-600m	N/A	Buffer zones. Port of Esperance acquires land as provision for future buffers. Development constraints along transport corridors. House design requirements in place on already developed land.
Port of Bunbury	~700-800m	Residential expansion	Port and port operators have modified practices to minimise impact on the community.
Port of Geraldton	~400m	N/A	Land Use Advisory Forum. MOU with City of Geraldton-Greenough.
Port of Fremantle	~700-800m	Port expansion	Buffer scheme in place.
Port of Singapore	~900m	N/A	Quasi buffer zones; land use planning.
Port of Auckland	~600m	Port expansion and Residential expansion	Land use separation and buffering. Building design mitigations.

2.3 CASE STUDIES

2.3.1 PORT OF TOWNSVILLE

The Port of Townsville is a major industrial port, operating on a 24 hour 7 day a week basis. It is located at the mouth of Ross River, and is bordered by Ross Creek to the west. On the east of the creek, the Port is adjacent to the residential suburb of South Townsville. To the west, the nearest residences are located approximately 750m away at Breakwater Quays, from Berth 10.

Figure 1: Port of Townsville



2.3.2 MACKAY

According to its website, Mackay Port Authority owns and operates the Port of Mackay. The port:

- Operates 24 hours per day, 7 days per week;
- Typically handles some 150 major vessels per annum dependent upon seasonally affected agricultural production outcomes;
- Is Queensland's 4th busiest multi-commodity port in terms of cargo throughput; and
- In 2001/02 generated seaport operating revenue of over $8.5 million.

It handles a range of cargo, including Petroleum, Bulk molasses and Sugar, Ethanol, Bunkers and General Cargo.

Port Binnli Pty Ltd developed an award winning marina residential complex in the early 2000s, incorporating private marina berths, tourist accommodation, restaurants and cafés and residential apartment opportunities. Additional residential apartments continue to be developed in the precinct, with the recent release of 29 luxury apartments. Apartments in proximity to the marina are selling for between $650,000 and over $1.6m.

The nearest apartments to the Mackay port berth are located no more than ~300m away.

A *Mackay Seaport Land Use Plan* was prepared in early 2007 to guide the future development of the port, and its interface with surrounding lands (Worley Parsons, 2007). The *Plan* adopts a buffer strategy, to manage the transition between different land uses.

The *Plan* (p. 23) specifically acknowledges the interface between the Port and the local community and states:

- The Mackay Port Authority is a community and civic leader behaving in a socially responsible manner;
- Responsible and sustainable development of Seaport land that has regard to land uses and land use planning for surrounding lands;
- Land use planning undertaken by the Mackay Port Authority on Strategic Port Land does not exacerbate noise and other impacts on residents and the community;
- Enhanced community engagement through visible planning and decision making processes, while executing legal and statutory obligations; and
- The Mackay Port Authority continues to work with the local government to ensure land use planning and the interface of Seaport and non Seaport lands is compatible and does not result in reverse amenity issues and impacts on Strategic Port Lands.

2.3.3 GLADSTONE

Gladstone is one of Queensland's major industrial port cities. The Gladstone Port handles some 50 million tonnes of cargo annually, making it the 5th largest port in Australia. The Gladstone Port handles a broad range of cargoes over six wharf areas, including:

- Petroleum Coke, Liquid Pitch, Aluminium (Boyne Wharf);
- Bauxite, Caustic Soda, Bunker Fuel Oil and Alumina (South Trees Wharves);
- Coal and other dry bulks (Barney Point Terminal);
- Petroleum products, Cement Gypsum, LP Gas, Caustic Soda, Containers, General Cargo, Woodchip, Calcite, Magnesia, Grain and General Cargo (Auckland Point Wharves);
- Coal (RG Tanna Coal Terminal); and
- Caustic Soda, Liquid Ammonia, Cement Clinker, Cement, Fly Ash, Light Fuel Oil and Naphtha (Fisherman's Landing Wharves).

The wharves nearest to residential areas are the Auckland Point Wharves and Barney Point Terminal. The nearest, at Auckland Point Wharves, has the closest residences within ~500m.

2.3.3.1 Air Quality

A recently benchmarking study on air emissions at the RG Tanna Coal Terminal – *Gladstone Port Coal Losses and Air Quality* – noted that the Central Queensland Port Authority receives and logs complaints, and that the number of complaints about dust has declined over the 2002/03 to 2005/06 period, but had experienced an increase in 2006/07 (Connell Hatch, 2008: 24-25). According to the Report, in 2002/03, no more than 29 complaints were received about dust (including coal dust), falling to 21 complaints in 2005/06 before increasing to 31 in 2006/07.

The Report also shows the spatial origin of the complaints (p. 26), and notes that:

> *The spatial extent of complaints amongst the various industrial sources of dust in Gladstone shows that situation is quite complex and the apportionment of responsibility is not straightforward. All industries that are close to residential areas in Gladstone are likely to contribute to some extent to the occurrence of these complaints and therefore will need to work to further reduce dust emissions.* (p. 25)

The study's objectives were to benchmark the performance of the Terminal and recommend strategies to achieve a reduction in dust emissions into the future. The Report recommended a broad range of short-, medium- and longer-term actions that could be taken to reduce dust emissions by an order of 10-20%.

A major expansion of the Port's coal handling capacity has been proposed and approved in January 2008. The proposal involved the development of a new coal terminal at Wiggins Island, and was subject to an Environment Impact Assessment process.

In recent years, there has been growing community concern about the potential health impacts on local residents as a result of air pollution from nearby industry. Major recent milestones in this evolving process are:

1. *Investigation of Chronic Lymphoid Leukaemia Gladstone – Calliope 1996-2004*,

(Queensland Health, August 2007), a report that found that the incidence of Chronic Lymphoid Leukaemia (CLL) for Gladstone- Calliope during the period 1996-2004 was higher than expected.

2. *2007 – Clean and Healthy Air for Gladstone* – a 2 year Queensland Government initiative involving Queensland Health, EPA, industry and the community. This initiative was catalysed by ongoing community concerns about the cumulative impacts on public health from air pollution from local industry. These concerns originally focussed around dust emissions, particularly coal dust emissions from the extensive coal handling facilities at the Port of Gladstone, but later extended to concerns about the minerals processing and chemical manufacturing industries located in Gladstone City and Calliope Shire. One benchmarking air quality study and one pollutant and health outcomes study have now been completed and released as part of this initiative. These are:
    a. EPA (February 2008) *Benchmarking NRG Gladstone Emissions to Australian, European Union, Japanese and USA Black-Coal Fired Power Stations*
    b. Queensland Health (May 2008) *Clean and Healthy Air for Gladstone Key pollutant inventory and Suite of health outcomes to be assessed*
3. *RG Tanna Coal Terminal Dust Benchmarking Study* (Connell Hatch, March 2008) – a report referred to above, which was initiated by Central Queensland Port Authority in response to ongoing community concerns and as part of the EIS for the proposed greenfield development of additional coal loading facilities at a Terminal near to the existing RG Tanna Terminal.
4. *Gladstone Pacific Nickel Limited's* proposed refinery has raised health concerns during the EIS period. Newspaper reports (*The Observer*, 18 March 2008 and 26 March 2008) have indicated that Queensland Health's submission has raised concerns about the project's impacts on air and water quality. This project is currently subject to a Supplementary EIS phase.

It is evident that community concerns regarding industrial emissions have been aggravated in the past 2-3 years. The Queensland Health study, while inconclusive, does point to the higher than expected cases of people with CLL. A higher level of government and industry awareness of community concerns has underpinned recent initiatives to assess the baseline air quality conditions of the Gladstone air shed, which will undoubtedly filter into decisions concerning future development and industrial growth in the region.

The proposed developments of a new coal terminal and nickel refinery have each raised concerns about health implications of major industrial expansions in Gladstone. Both projects are now subject to detailed EIS evaluation processes that are current. Without pre-empting the outcomes of these EIS processes, it can be observed that in both of these cases, detailed air quality impact assessments and extensive management and mitigation proposals were provided.

These mitigations effectively recognised that neither project operated within a social vacuum and project proponents acknowledged the need to ensure that the projects did not adversely affect the quality of life and health of the surrounding community. This emphasis reflects longer term trends in corporate social responsibility, together with greater public emphasis on triple-bottom line evaluations that place weight on not only economic factors, but also social

and environmental sustainability.

2.3.3.2 Noise

Of lesser significance are concerns about the *noise* amenity impacts of the Port. In recognition of this, in 2003-04 the Gladstone Port initiated a project to design and create a landscaped noise barrier at the Barney Point Terminal.

Further, the recent EIS for the proposed RG Tanna Coal Terminal undertook baseline noise monitoring. The assessment found that RBLs during the monitoring period were calculated to be between 29dBA and 45dBA. When compared with the recommended RBLs (45dBA during the day, 40dBA in the evening and 35dBA at night) the monitoring station at 12 Lord Street Gladstone (~500 metres from berths at Auckland Point Wharves) measured exceedances during evenings and nights due to industrial noise (Connell Hatch, November 2006, *CQPA and QR Noise and Vibration Report*, p. 14-5).

The Port Corporation is conscious of its interface with local residents and regularly monitors complaint activity vis-à-vis the Port. The most significant interface issue relates to dust emissions, particularly coal dust emissions into the airshed in Gladstone.

2.3.4 BRISBANE PORT

Brisbane Port is the third largest container port in Australia with a total container trade of 875,069 TEUs and a total tonnage throughput of 28.1 million tonnes in 2006-07. The location of the port has enabled progressive development of the port to focus the Port of Brisbane at the river mouth, consistent with strategic planning aimed at relocating associated industry away from residential areas. Most of the port's major facilities are located at Fisherman Islands at the mouth of the Brisbane River; however some other facilities are located upstream at Hamilton.

There was recognition of the unsuitability of the Hamilton site for ongoing port operations due to vessel size limitations, limited land available for expansion and impacts from port-related heavy-vehicle traffic. Moreover, there has been growing interface challenges on these upstream port facilities from urban development and renewal (source: Northshore Hamilton website). As leases expire, the Brisbane Port Corporation is progressively relocating Hamilton facilities downstream to Fisherman Islands. Fisherman Islands has allowed the port to better cater for the rapid trade growth port expansions could progress with limited impact on surrounding land uses (Figure 1).

Figure 1: Port of Brisbane, Fishermen Islands showing expansion areas and lack of urban encroachment constraints

Source: http://www.portbris.com.au/gallery

This long-term planning approach to port activities in Brisbane has coincided with commencement of the Northshore Hamilton redevelopment project (Figure 2). This redevelopment project is an 80-hectare master-planned community, which will house 10,000 residents. Despite the gradual relocation of specific activities, the potential for inconsistencies between new residential development and legacy industrial and port uses has been

recognised. The Northshore Hamilton Master Plan was finalised in late 2007 and in November of 2007, expressions of interest were invited from developers to purchase and develop the first stages of residential development (Northshore Hamilton website).

The assessment of the interface between future residential development and industrial land uses arising from the Northshore Hamilton redevelopment has indicated that the 500m buffer created by the Brisbane River should minimise potential noise and air quality impacts. Limitation of these impacts has been further augmented by the inclusion of setbacks to maximize residential amenity.

The Port of Brisbane Corporation established a Community Consultative Committee in February 2002 to provide a forum for representatives of conservation and community-based groups to provide input into the Corporation's policies, development plans, management programs and ongoing port operations with respect to potential impacts on the community and to raise environmental and related issues associated with future expansion and new infrastructure development (Port of Brisbane website).

Figure 2: Northshore Hamilton development site showing (a) existing site with Queensland Golf Club on right and (b) proposed master plan redevelopment

(a)

(b)

Source: http://www.northshorehamilton.com.au

2.3.5 VICTORIA STATE GOVERNMENT

The Victorian Government recognises the importance of enhanced community engagement by Victorian Ports.

Management of coexistence with adjoining residential areas has emerged as an issue for port users and neighbours alike as land adjacent to ports is being developed for residential living. Port of Melbourne is a prime example of residential development proceeding in close proximity to active port precincts.

As part of the *Victorian Ports Strategic Study* consultations (Maunsell McIntyre, 2000), long-term planning that considers land utilisation, use of buffer zones, road and rail access and zoning were seen as essential to ensure residential and recreation encroachment does not inhibit trade and undermine port competitiveness.

A key component of addressing conflicts between ports and adjacent land uses, is the use of buffers to address these interface issues and minimise negative impacts and costs on the broader community and to manage risk, residual emission and amenity expectations (Department of Infrastructure, 2004). This strategy recognises that the use of buffers to minimise impacts can be hindered by an inability to meet necessary separation distances, more so where port expansion itself (rather than residential expansion) is the prime cause of potential conflict. This strategy is being applied with the Port of Melbourne Corporation working with the Government and councils to develop a Port of Melbourne Buffer Strategy to:

- Manage issues affecting land nearby and adjacent to its operational areas; and
- Balance the needs of the working port with the expectations of the community in terms of amenity, environment, recreation and open space, and port heritage.

While the *Victorian Ports Strategic Framework* (Department of Infrastructure, 2004) acknowledges that Port Strategic Land Use Plans should "define appropriate buffers around port infrastructure and their transport corridors", no general guidance on buffer type was presented other to recognise that while maintaining physical buffers between different land uses can minimise impacts, the necessary separation distances may not always be available, and that alternative methods of interface management would need to be considered.

2.3.6 PORT PHILLIP BAY

The *Port Phillip Industry and Business Strategy* (2003) was developed by the City of Port Phillip in response to a number of requests for the rezoning of industrial land for other uses, mainly residential and to a lesser extent retail and office/commercial. The *Strategy* acknowledge the Council's various objectives including a desire to "co-exist harmoniously with adjacent residential and other land-use precincts and not compromise the amenity of the nearby areas". The *Strategy* identified a number of specific objectives including:

- Minimising amenity impacts on adjacent residential areas from industrial use and development in the precinct;
- Encourge consolidation of existing industrial uses in the precinct; and
- Ensure availability of large sites for continued use by manufacturing, port related uses and transport/distribution industry.

2.3.7 PORT OF MELBOURNE CORPORATION (PoMC)

The Port of Melbourne is the largest container and general cargo port in Australia with a total trade in 2006-07 of 70.9 million revenue tonnes or 29.5 million mass tonnes (Port of Melbourne Annual Report, 2006-07).

The character of the area surrounding the Port is changing and evolving. With the growing popularity of inner Melbourne as a place to live, residential development has moved closer to the Port and industrial development has made way for urban living. PoMC has recognised the need for balance between the operation of the Port and community expectations for residential and urban amenity and is proactively working with Government to manage interface issues associated with an operational Port, particularly those that may adversely impact on or unreasonably constrain, the future development of the commercial port. Adjacent councils, including the City of Port Philip, City of Hobsons Bay and the City of Melbourne have either endorsed or are considering recent interface policy document prepared by the PoMC (Port of Melbourne Annual Report, 2006-07).

The closest residential areas to the Port are (Figure 3):

- Garden City and Port Melbourne, with interfaces to Webb Dock; and
- Docklands, with interfaces to Victoria Dock and South Wharf.

Environmental Management Plans have been developed for each area of these port interface precincts to mitigate the impact of port operations and development.

Figure 3: Port of Melbourne showing interface with Docklands precinct and the Webb Dock precinct to the west of Port Melbourne.

Source: http://maps.google.com

With the increasing interest, particularly, but not only, in the Melbourne Docklands precinct,

urban expansion has given rise to a range of issues relating to on-site activities of the Port as well as current and potential future traffic impact on particular suburbs associated with the movement of various cargoes to and from the ports. Interface issues for the Port are primarily related to amenity factors such as landscaping, visual impact, noise and traffic (Figure 4).

Figure 4: Looking west from Dockland's precinct (foreground) toward Fishermen's bend and the Port of Melbourne. The Webb Dock existing residential area is in the north-eastern corner.

Co-operation across planning boundaries has therefore been required to protect and secure the Port as well as the safety, quality of life and amenity of its neighbours in surrounding municipalities. The PoMC is working with the State Government and neighbouring municipal councils to develop a buffer strategy for the environs of the Port that seeks to provide a planning framework that will address the Port's interface with more sensitive and incompatible land uses.

The PoMC in consultation with government has developed a *buffer zone strategy* to manage issues affecting users adjacent to operational areas and balance stakeholders needs in terms of amenity, environment and recreation (Maunsell McIntyre, 2004). In terms of specific provisions for buffer zones in relation to distance, it would appear that while recognising the need for "appropriate buffer zones" the buffer areas around the Port are not specifically identified and delineated (Inner Melbourne (IMAP) group of Councils Melbourne Submission to Melbourne 2030 Audit). For example, in terms of the relationship of the Docklands area to the Port of Melbourne, the Melbourne Planning Scheme does refer to a "Docklands Buffer Area", whose main objective is to ensure that the redevelopment of the Docklands Zone is not

prejudiced by the development of tall structures (exceeding 7 meters in height) on nearby land, which may detract from the appearance of the area. No reference can be found however, as to what constitutes an appropriate or acceptable buffer distance.

It should be noted that in some areas the necessary separation distances required to adequately buffer the Port of Melbourne are not available due to historical existence of different land uses. Nonetheless, at residential interfaces such as Garden City and Docklands and in areas abutting commercial development, high quality landscaping buffers have been provided to improve the appearance of the Port and provide an attractive interface area. At Webb Dock, landscaping and acoustic mounds or walls have been or are being implemented, to minimise noise impacts of both construction and port operations. Other key interfaces with the Port of Melbourne, such as key gateway sites, are also being addressed through buffers, which are being landscaped to ensure a positive contribution to the amenity of the area. Moreover, existing open space areas are being retained as landscaped buffers between sensitive land uses and the Port *(Port of Melbourne Planning Scheme, 2008; Port of Melbourne development Plan, 2006; Victoria Dock Environmental Management Plan 2001).*

The range of issues, the diversity of adjoining areas and the need to address transport corridors serving the port and internal buffering issues makes the *Port of Melbourne Buffer Strategy* particularly complex. This complexity clearly demonstrates the need for ports to work with their neighbouring communities and to address broader regional influences, such as transport corridors.

In Melbourne, the PoMC has proactively sought to gain the support of the community by inviting public input on its port strategic plan and environmental management plan, to manage its risk of being placed in a 'defensive' position in the future. According to PoMC's Michael Marley (public affairs), the port was working at establishing a relationship of "construction cooperation" with new residential neighbours that have moved into the upmarket Docklands residential housing development. According to Marley:

> "Co-operating with our new neighbours is all part of our business… some industry people might say this is taking us away from our prime activity of serving the shipping community.
>
> "You really have to be aware of your responsibilities to the public when you occupy 500 hectares of land in the middle of Melbourne." (Quoted in Duffy, 2000).

This approach is consistent with the challenges outlined in the *Port of Melbourne Land Use Plan*, which include "co-existing with its neighbours by minimising disturbance from port operations and ensuring that encroachment of sensitive uses does not impact upon port viability" (quoted in Charter Keck Cramer, p. 51).

2.3.8 PORT OF GEELONG

The Port of Geelong was privatised in July 1996 and is now owned and managed by Toll GeelongPort. It is the largest regional port in Victoria and is of significant importance given its close proximity to Melbourne's eastern growth corridors (Figure 5). The port handles about 25% of Victoria's exports with a total throughput of about 12 million tonnes annually. The Port has eight major piers and twenty-one berths for vessels along with storage and processing facilities on approximately 95 hectares of land (Commonwealth of Australia, 2007).

As part of the *Victorian Ports Strategic Study* (Victorian Government, 2001), the Port of Geelong was identified as developing a niche for the handling of bulk cargos (food manufacture, grains, timber), requiring dedicated terminal space. While the port does have usable land available, major stakeholders believe this is insufficient for future expansion plans. A series of key issues were identified regarding improving port access via road and rail bypasses. The impact on existing residential and industrial areas from noise, dust and port odours has been identified as an ongoing concern for the local community.

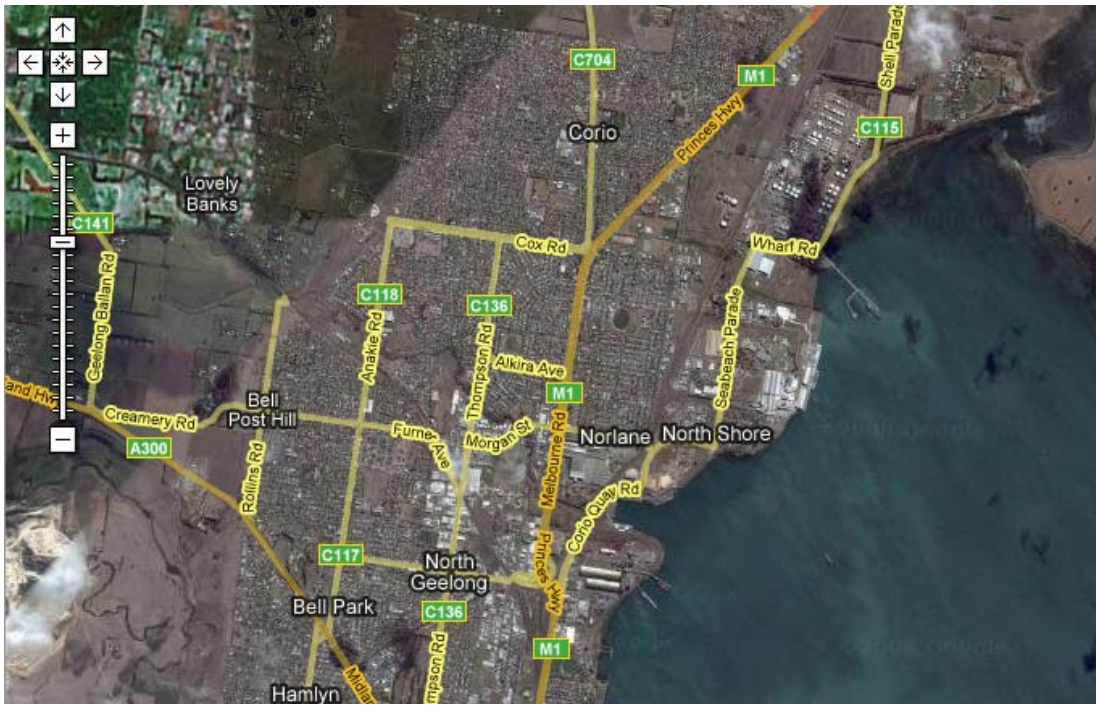
Mainly for historic reasons, limited buffers currently exist between the Port, its associated industries and nearby residential areas.

Effectively managing the interface between port activities and related industries and land uses will be required to enable Geelong Port to grow in an economically sustainable manner. To this end, it is important that effective buffers be developed. A range of options have been proposed which would be implemented through the Greater Geelong Planning Scheme, including maintaining the existing separation of residential areas from industry and Port activities, preventing any further encroachment of housing near the Port and clarification of the entitlements and obligations of the various stakeholders around the Port.

One of the major issues affecting the port and its future growth relates to existing and potential conflicts between the activities of the port and the associated industries and nearby residential areas. The majority of land uses adjoining the port are industrial; however there is some housing north of Corio Quay (Norlane), immediately to the west of the Geelong-Melbourne railway line, the North Shore area immediately to the west of the Geelong-Melbourne railway line and residential to the south of Osborne Park (Figure 5).

Housing to the north and to the west of the railway line is close to industry. According to Sinclair Knight Merz (2003), a buffer distance of 300-500m would be adequate for most port-related industries, excluding those high risk uses (e.g. the Shell Refinery), some of which may require buffers of 1,000m to 2,000m.

Figure 5: Port of Geelong showing residential areas (Norlane and North Shore) in close proximity to the Port. Osborne Park residential area is at the bottom of the figure, immediately to the east of Princes Highway.



Source: http://maps.google.com

The Port of Geelong, in conjunction with the City of Greater Geelong and the Victoria State Government has developed a *Strategic Land Use Plan* (Sinclair Knight Merz, 2003) for future development and management of the Port. The plan includes a strategy for:

- Enhancing and strengthening buffers between the Port, its related industries and nearby residential areas; and
- Developing a community "Deed of Agreement" in addition to planning controls to prevent encroachment of further residential development close to the Port.

Under this Plan, there is a range of approaches that can be used to avoid land use conflicts, ranging from excluding conflicting activities by for example preventing any use of land in a buffer area, separating activities where one is likely to cause nuisance to users of the other – the traditional concept of buffer distances or spatial buffers and managing the expectations of parties.

As an example of how the buffer strategy might be applied, developers have recently indicated a strong interest in undertaking residential, semi-commercial and mixed use redevelopment projects in the industrial zones close to the port. Both sites are located inside the existing Industry 1 and 2 Zones. Under the Strategic Land Use Plan) existing Industry 1 and Industry 2 zones that adjoin the Port are to be maintained as buffers for Geelong Port and allow for no increase in the intensity of existing housing and no new housing to be constructed.

It should be noted that the buffer strategy as outlined in the *Strategic Land Use Plan*, while safeguarding the Geelong Port against encroachment from urban development, is primarily designed to enable and protect the future development and expansion of the Geelong Port, recognising its importance to the Melbourne metropolitan region.

While the Port of Geelong does undertake community consultation, it would appear the impetus for any consultation is to satisfy its legislative obligations in terms of planning and development. The port appear not to have a dedicated community consultation and engagement strategy in the way many other ports do, perhaps as a result of it being a privately as opposed to government owned facility. Nonetheless, the recently completed *Strategic Land Use Plan* does recommend the development of a Community Agreement that would be used to establish the entitlements and obligations of the various port stakeholders, along with the mechanism for applying this Agreement.

2.3.9 SYDNEY PORT CORPORATION (SPC)

The SPC reported total container trade (TEUs) of 1,620,121 containers for a total cargo throughput of 27.8 million mass tonnes in 2006-07 (SPC Annual Report 2006-07). Sydney Harbour port facilities comprise a mix of commercial wharves and passenger terminals located in Darling Harbour and Circular Quay and Glebe Island/White Bay covering a total of 62 hectares. The port handles a wide range of vessels through its 15 berths, including dry bulk, bulk liquids, general cargo and motor vehicles. Sydney is the only port in Australia with two dedicated cruise terminals. Glebe Island and White Bay are the principal centres for receiving, storing and distributing imported motor vehicles and dry bulk goods and has a total of 9 berths (Figure 6).

Figure 6: Sydney Ports Corporation Sydney Harbour facilities and tenants.

Photograph dated January 2005

Sydney Harbour tenants as at 1 October 2006

- A Overseas Passenger Terminal
- B Patrick Stevedores
- C Wharf 8 Passenger Terminal
- D Moores Wharf – SPC Marine Operations
- E Patrick Autocare
- F Australian Amalgamated Terminals
- G Gypsum Resources Australia
- H Sugar Australia
- I Cement Australia
- J Penrice Soda Products
- K Marr Contracting

1 Berth numbers

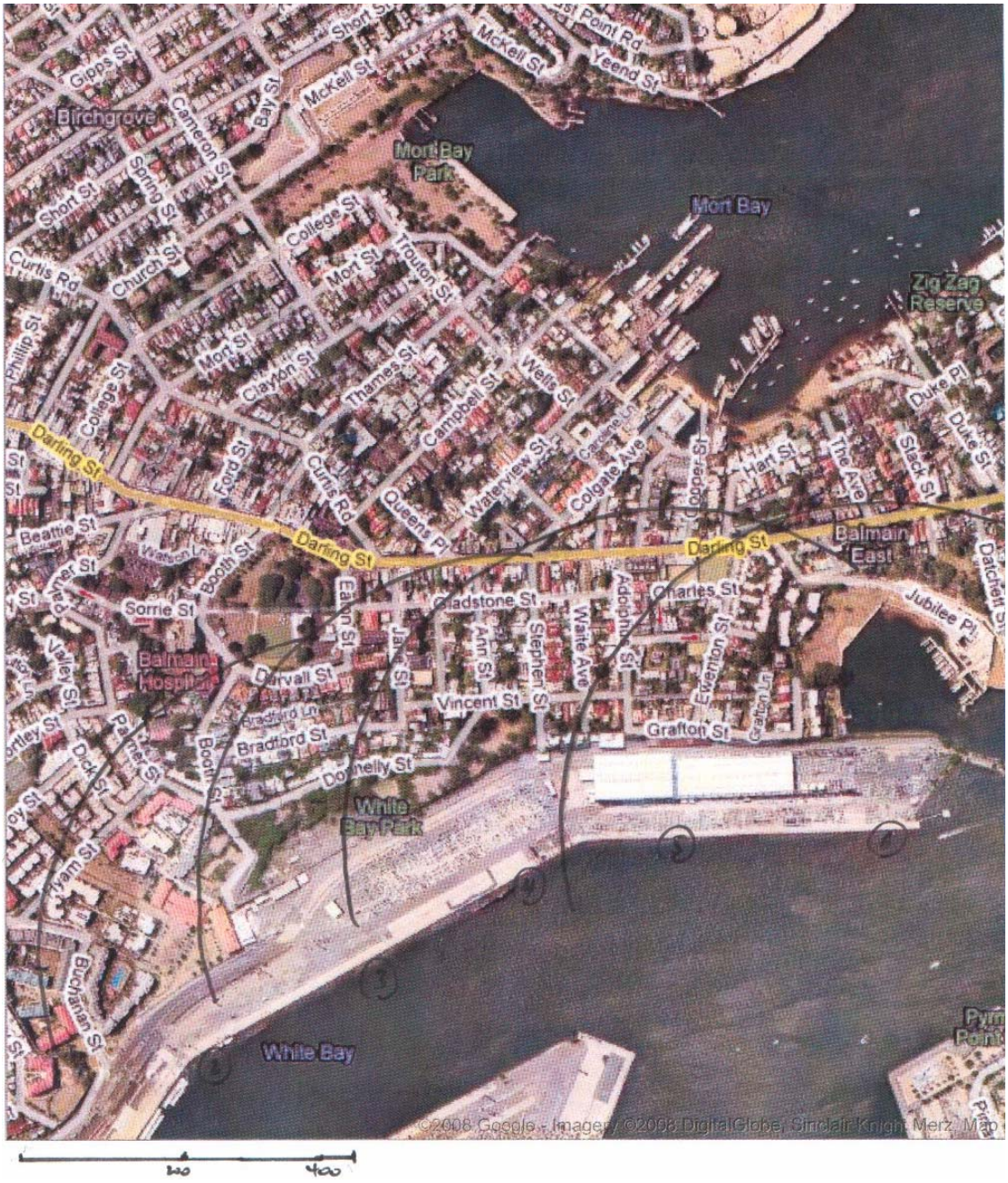
Source: http://www.sydneyports.com.au/

Significant changes have taken place recently in Sydney Harbour, with older industrial sites surrounding the wharves having become obsolete or under-utilised, being considered for or currently undergoing redevelopment for residential purposes.

For example, in 2000 six new residential developments on former industrial sites operated by Ampol, Unilever and CSR were released. At the time, SPC received around 20 complaints each quarter from residents relating to noise from vessels, engines and exhaust and cargo-handing activities. To manage and appease these concerns and prevent future issues, SPC co-operated with P&O Ports and local residents to develop a noise reduction plan. In the main, however, urban interface issues are generally related to port encroachment into residential areas arising from planned expansion activities as opposed to urban expansion onto the port.

Recent areas to come under scrutiny in regards to residential and port interfaces are the lands adjacent to Sydney Harbour around Rozelle and Blackwattle Bays and Glebe Island and White Bay (Figure 7). Under the *Rozelle and Blackwattle Bay Master Plan*, sites are predominantly zoned Waterfront Use which allows for development of water based commercial and recreation activities and commercial maritime facilities but specifically excludes residential and apartment developments. No discussion on buffer zones was contained within this Mast5er Plan report (Waterways Authority, 2002).

Figure 7: Whites Bay



The Master Plan for Glebe Island and White Bay recognises the continued role of White Bay/Glebe Island as the significant commercial port facility in Sydney Harbour and the likely need for future expansion and development of port facilities at this site but in the context of its close proximity to residential areas of Balmain, Rozelle and Pyrmont, as well as the western side of Central Sydney and from the harbour waters.

As such the *Master Plan* is about enabling improved efficiency and competitiveness through future development and growth while minimising land use conflicts between nearby residents

and port operations. The strategies and principles proposed for this range from urban design principles, inter-modal transport access and mitigating impacts from noise, dust and light. In terms of these latter impacts, consideration has been given to the fact that port facilities at Glebe Island and White Bay operate 24 hours per day 7 days a week and generate noise which is experienced in the surrounding areas of Balmain and Pyrmont (Sydney Ports, 2000). Sydney Ports currently implements a *Noise Management Plan* for the Glebe Island and White Bay Port facilities in close liaison with lessees of port lands. As with the *Rozelle and Blackwattle Bay Master Plan*, there is no discussion on buffer zones, probably due to the fact that historical proximity excludes the prospect of using spatial buffers as a mitigation strategy.

There are some examples of the use of buffer zones to delineate residential areas from port operations in White Bay Park. It is an informal park densely planted with native canopy and under-storey species, providing a recreational facility and buffer zone between the White Bay Port and adjacent residences. When onsite, its location provides elevated views across White Bay and across to Sydney Harbour. Views to the port from some locations; however, are limited to breaks in native vegetation (Environmental Resources Management Australia, 2006).

SPC operates community consultation structures for Port Botany, the White Bay/Glebe Island precinct and at Darling Harbour. It also operates an overall Port Users Consultative Group for industry consultation. A particular innovation in Sydney is the First Port Club, which provides ongoing liaison between local government, residents' representatives and lessees through an "exchange of ideas in an informal and informative lunch/lecture format" (Maunsell McIntyre, 2001).

2.3.10 PORT BOTANY

Port Botany – operated by SPC – faces similar issues to those of other ports located in large urban areas and that are constrained in their expansion opportunities. Port Botany is located within an existing high-density residential settlement. As opposed to interface issues arisign from residential expansion into a designated Port area, Port Botany is seeking to expand its operational capacity within the confines of this existing residential settlement of long-standing (Figure 8).

Figure 8: Exiting Port Botany facilities showing land tenure and current tenants

Photograph dated January 2005

Port Botany tenants as at 1 October 2006

A	Austate Logistics	G	Patrick Port Services	M	Australian Customs Service	1	Berth numbers
B	Vopak Terminals	H	P&O Trans Australia	N	Warehouse Solutions International		
C	Orica Australia	I	DP World	O	Randwick City Council		
D	Elgas	J	Patrick Stevedores	P	Australian Maritime Services		
E	Terminals	K	Caltex Australia	Q	Vacant		
F	Origin Energy	L	Adsteam Harbour				

Source: http://www.sydneyports.com.au/

An expansion that will increase its trade and cater for growth in container trade until 2025 has

been approved by the NSW Government, with this decision preceded by two years of community consultation and an EIS. Expansion features include 1,850m of additional wharf face to accommodate five (5) extra shipping berths, 60 hectares of reclaimed land for terminal use, dredging to enable deep water berths, additional rail sidings to provide access to new terminals and additional tug berths and facilities (Sydney Ports, 2008) (Figure 9).

Figure 9: The approved expansion of Port Botany facilities.

Source: http://www.sydneyports.com.au/

The Port Botany expansion presents a number of challenges including:

- Increased road traffic, which is aimed to be mitigated through increasing rail mode's share of delivery from 25% to 40% of total container freight;
- Impacts on local residents arising from increased traffic, loss of public amenity and noise generation; and
- Environmental issues including impacts on bird habitats, seagrass and salt marsh areas and water quality.

Stringent conditions of consent have been attached to the port expansions to protect the amenity of nearby residents. Railway and traffic noise have been addressed by realignment of railway lines and re-routing of haulage routes, in addition to the construction of noise barriers. Management of noise, dust, odour, traffic and frequency and timing of activity are all addressed by management plans, developed in consultation with local councils, during both construction and operational phases. The convening of a Community Consultative Committee to liaise between SPC, future terminal operators and the community is also a condition of future Port expansion.

As noted above, SPC has a comprehensive community engagement strategy. In terms of the

Port Botany expansion, SPC has established a Community Consultative Committee to work with the community and the contractor for the delivery of the project. Local community and environment groups, residents, business representatives and local Councils are all part of this Committee which meets regularly to discuss progress and issues of concern.

2.3.11 PORT OF NEWCASTLE

The Port of Newcastle is one of the world's largest coal tonnage ports, in addition to its bulk exports and growing cargo and container exports. Total trade In 2006-2007 was 86 million tonnes, comprising 81 million tonnes of bulk coal, 4 million tonnes of non-coal bulk trade and 1 million tonnes of general cargo (Port of Newcastle Annual Report – 2006/07). Of the ports examined as part of this study, the Port of Newcastle offers one of the better comparisons with the Port of Townsville given the City's existing plans to boost inner-city housing.

The Honeysuckle Precinct is one of Australia's largest urban renewal projects and involves the redevelopment of 50 hectares of derelict land and buildings, in close proximity to the Port of Newcastle (see Figure 10). Specific projects within the overall Honeysuckle site include the Merewether Wharf development, located between Merewether Street Wharf and Lee Wharf on the southern foreshore of Newcastle Harbour. The development includes shops, cafés, commercial and residential units and a promenade boardwalk.

The Newcastle Ports Corporation was engaged in the application process and while raising no objections to the development proposal did require that the assessment process ensure, among other things, that no aspect of the proposal impacted upon commercial shipping and/or port operations at the Port of Newcastle and that suitable noise attenuation measures be undertaken to minimise or eliminate noise generated from Port activities.

The Newcastle Local Environmental Plan (2002) contains a number of objectives including:

> "*To enable development of waterfront sites to take advantage of the harbour while avoiding a continuous built edge along the waterfront and not compromising or devaluing the scale and operations of the Port of Newcastle.*"

Figure 10: Port of Newcastle showing Honeysuckle precincts. Clockwise from right, these are Honeysuckle, Cottage Creek, Hunter Street, Wickham, Linwood, Marina and Carrington. The Honeysuckle, Hunter Street, Linwood and Marina precincts all comprise a residential component.

Source: http://www.honeysuckle.net

Port Waratah Coal Services Limited (PWCS) owns and operates the Carrington and Kooragang Coal Terminals in the Port of Newcastle in New South Wales (NSW). These terminals receive, assemble and load Hunter Valley coal onto ships for export to customers around the world. To meet the increasing demand for Hunter coal, PWCS has implemented a continuous expansion program that has seen total throughput capacity for the two terminals increase from 46 million tonnes per annum (Mtpa) in 1996 to the present 89 Mtpa capacity (2006).

Expansion works at the Kooragang Coal Terminal (KCT) are being progressed in accordance with the Stage 3 Expansion development consent (DA No 35/96) issued by the Minister for Urban Affairs and Planning in November 1996.

In December 2005 the Newcastle Coal Infrastructure Group initiated a process to seek Ministerial approval to expand the facility. A new coal loader to increase Newcastle Port's coal exports from 80Mtpa to 140Mtpa per year was proposed. A comprehensive EIS was required and was considered by the NSW (Department of Planning).

The proposed loader was sited on lands north of Cormorant Road at Kooragang Island, on the north bank of the River. The site is located over 1,200m away from the nearest residential areas in Mayfield to the south and Fern Bay to the east and Stockton to the south-east.

A series of environment assessments were undertaken as part of this process. The noise assessment found that the Industrial Noise Policy criteria were marginally to moderately exceeded at the closest residential areas of Fern Bay and Stockton during the night (generally 6-7 dB(A) above the amenity criterion), but that the expanded terminal would meet the sleep disturbance criteria. This was because the noise impacts are dominated by the existing coal terminal, which was assessed and approved prior to the introduction of the NSW Industrial Noise Policy.

In recognizing that the existing noise impacts are above contemporary noise standards, the proponents indicated that a number of mitigation measures would be undertaken to ensure that the increased throughout at the expanded terminal would comply with the noise limits. These included:

- The continued implementation of an *Acoustical Design, Procurement, Construction and Commissioning Process* which was initiated as part of the Stage 3 Expansion. This process has proven to be effective as it has reduced noise levels to below those required by existing consents; and
- The use of best available technology which promotes research and development of acoustical solutions.

Air quality impacts were also identified as part of this application. However, the Department was satisfied that the impacts were within the acceptable criteria.

2.3.12 PORT ADELAIDE (FLINDERS PORTS)

During 2006/2007, 10.1 million tonnes of cargo was moved through the Port of Adelaide, with 5.6 million tonnes traded. The Port of Adelaide comprises an outer and inner harbour. The outer harbour caters for motor vehicles and livestock and general cargo as well as most container cargos that enter the Port. The outer harbour also provides the inter-modal facilities that integrate the container terminal with the national rail and road system. The inner harbour caters for roll-on roll-off and bulk cargoes including a wide variety of commodities, metals, manufactured products and fuels (Figure 11).

While expansion of the outer harbour is planned, distances to nearest residential settlement is considerable (>800m) and is separated by a golf course and salt marsh. With minimal urban interface issues at this site future expansion will result in low impacts. Flinders Ports (FP) has identified the need to assist the development and growth of the resource sector and is planning to develop Berth 29 at inner harbour, which is the farthest from urban settlements (>1km), to cater for this trade.

The expansion of activities in the inner precincts is expected to generate increases in road transport of 3% to 4% per annum. The resultant doubling in volume of road transport passing through or nearby to existing residential areas by 2025 has given rise to a number of amenity issues. In addition, international containerised trade through Outer Harbor is expected to triple over the next 20 years, with urban freight distribution activity expected to grow by around 60% and passenger travel distances and times are expected to increase by around 30%.

Port Adelaide is one of the last major ports in Australia that has yet to be redeveloped. The revitalisation of the Port Adelaide Waterfront was initiated by the South Australian Land Management Corporation (LMC) in 2002. Subsequent to that the Newport Quays Consortium was selected as the preferred development partner for the Port Waterfront Redevelopment project, a mix of residential, commercial and tourism. The Newport Quays redevelopment includes 2,000 new residential dwellings on waterfront land surrounded by a number of mixed-use precincts and commercial development opportunities for waterfront dining, cafés and restaurants (Figure 12).

A redevelopment concept plan was initially released in 2002 and subsequently revised following the public consultation and an EIS. The revised redevelopment plan excluded residential and other mixed uses for Cruickshank's Corner precinct because of concerns over interface issues between residential and industrial uses and residential and transport corridors (Hassells, 2003). While the Newport Quays residential precinct complies with the buffer zone of one kilometre proposed by the EPA as an acceptable distance from industrial and port activities, recent approval has been given to the Fletchers Haven precinct within the Newport Quays development, which is less than 500m from the southern boundary of nearby industrial activities (Figure 13).

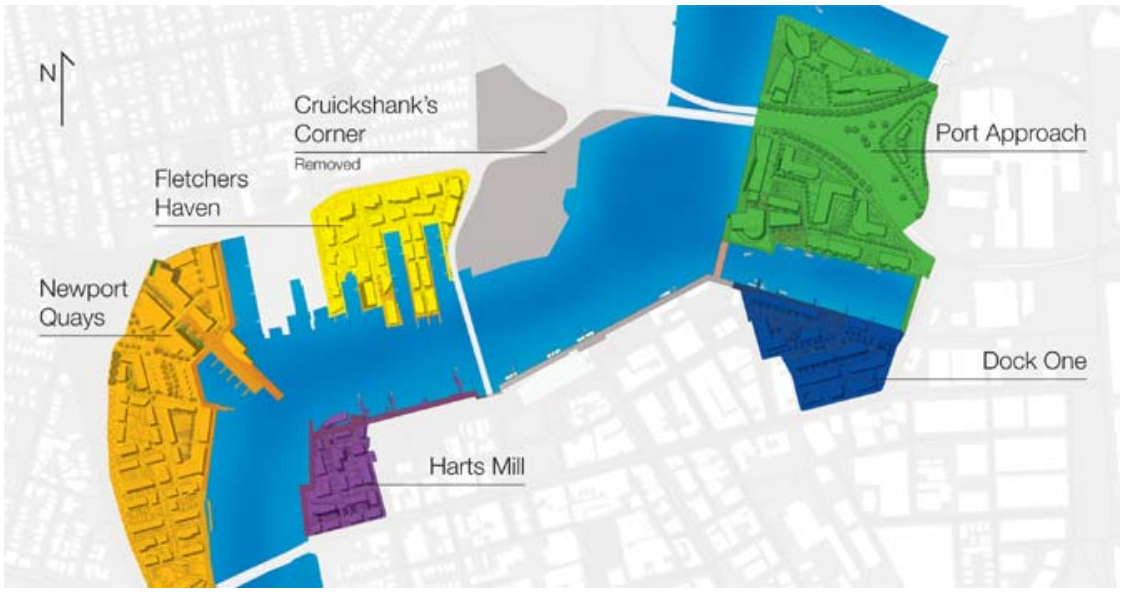
Figure 11: Port of Adelaide showing the Inner and Outer Harbour precincts.

Source: http://www.flindersports.com.au/

Figure 12: Newport Quays redevelopment looking from the Inner Harbour wharves back toward the Port Adelaide Waterfront redevelopment.

Source: http://www.newportquays.com.au/images/

Figure 13: Newport Quays precincts showing Cruikshank's Corner and Fletcher's Haven



Source: http://www.newportquays.com.au/images/

2.3.13 PORT ESPERANCE

Throughput of cargo at the Port of Esperance has risen from 750,000 tonnes in 1991, to over 7.2 million tonnes in 2004. The projection for 2010 is for more than 11.2 million tonnes.

Noise generated by the movement of large freight volumes by rail is a concern for the local community. The Esperance Port has had a policy of strategic buying of buffer land to reduce the impact on local residents.

In terms of transport corridors around the port, Esperance Port has made provision in the town planning scheme to preserve them. All undeveloped land along the main corridor through Esperance has been reserved and cannot be developed. On already developed land, the scheme requires that, if redeveloped, the owners must comply with specified requirements; for example, quiet house design to block out noise. The aim is to ensure that the corridor can operate 24 hours a day, seven days a week, and that there is sufficient room for future expansion.

Figure 14: Port of Esperance

2.3.14 PORT OF BUNBURY

Like the other ports in WA, Bunbury is expecting its throughput to grow rapidly in the next twenty years. As an example of its expectations, the Port Authority explained that the plans of just two exporters could see Bunbury handling considerably more freight than it does now.

Like other ports, Bunbury is experiencing port-residential interface challenges. Responding to a question about public attitudes to the port expansion, the Port Authority said:

> "*Bunbury shares the same problem with a lot of ports around the country: the city has grown closer to us. Some of the residents were close to start with, but certainly we are seeing residential development come closer and closer to the port. Issues of noise, dust, and operations at night, are concerns for the community. …The port is pretty much surrounded by residents and that does cause us issues.*"

The port is not restrained by curfews or restricted access at present, but it restricts the loading of some cargoes to the daytime. For example, scrap metal is not loaded between 10pm and 7am. If the wind is in the wrong direction, the alumina companies will suspend loading to avoid causing air quality emission risks for the community.

Quite a few of the operators have modified their loading and yard practices to try to reduce as far as possible the impact on the community.

2.3.15 PORT OF GERALDTON

The Port of Geraldton handled 6.4m Tonnes of throughout in 2006-07. Its main cargoes are:

- Iron ore;
- Grains;
- Fertilisers;
- Livestock;
- Fuel;
- Mineral sands; and
- Concentrates and Talc.

Port management has acknowledged the need to achieve a "quantum leap in operational standards" in response to an increasing focus on what it describes as its 'community license'. This has resulted in increased expectations about port performance on a range of matters, including amenity and environment management.

The Port recognises the importance of its relationship to the community and actively participates and drives the Land Use Advisory Forum as an important part of its future development program. It is also a signatory to the City of Geraldton-Greenough Memorandum of Understanding.

The Port is located within 400m of the nearest residents. (See Volume 2 for aerial image.)

2.3.16 PORT OF FREMANTLE

The Port of Fremantle is Western Australia largest general cargo port and one of the fastest growing in Australia. Additionally, the Port accommodates cruise ships and visiting naval vessels.

In recent years land traditionally occupied by commercial and industrial premises has been replaced by residential developments, hotels and recreational developments. The Fremantle Port Authority has claimed that 'urban encroachment' would restrict harbour operations and any additional controls would affect Port efficiency and competitiveness.

In recognition of the need to provide adequate separation between the working port and other urban uses the FPA commissioned a Buffer Definition Study in 2001 (Halpern Glick Maunsell Pty Ltd, 2001, *Fremantle Inner Harbour buffer definition study* (Leederville WA)). This report recommended the development of a three level buffer scheme to provide appropriate separation between port activities and surrounding urban areas, depending on the level of individual and societal risk, which has subsequently been implemented. The three areas identified in the buffer zone study pertain to the perceived sensitivity of given urban developments and the perceived potential risk and amenity impacts arising from the sites' proximity to the Port. In addition to outlining appropriate buffer zones based on the type of urban development, the study proposed minimum construction standards as well as design issues relating to windows and opening, balconies, air-conditioning etc. The study's main recommendations have all been incorporated into town planning schemes.

In a study by Sinclair Knight Merz, commissioned by the West Australian Department of Planning and Infrastructure, significant concerns were registered by various stakeholders regarding "incompatible nearby housing developments, some of which are less than 200m fro the nearest berth" (SKM, 2004, *Fremantle Inner Harbour Container Movements Study*).

The redevelopment of the former Leighton Marshalling Yards near City Beach in Fremantle does have some port-residential interface issues, relating mainly to storage and land uses associated with the port (e.g. Fuel tanks). Design Guidelines have been developed by LandCorp (the developer), the City of Fremantle and the Leighton Community Liaison Group to guide the future management of interface issues (Mackay Urban Design, 2005).

2.3.17 PORT OF SINGAPORE, SINGAPORE

The Port of Singapore is the fourth largest port in the world and refers to the collective facilities and terminals that conduct maritime trade handling functions in Singapore's harbours and which handle Singapore's shipping. Singapore is currently the world's busiest port in terms of total shipping tonnage handled, with 1.15 billion gross tons handled in 2005. As the world's busiest container port, it handles a quarter of the world's shipping containers and is also the world's busiest trans-shipment port. Singapore is also the world's leading Bunkering Port, and with 25.48 million tonnes of bunkers, handles half of the world's annual supply of crude oil. The Port of Singapore is an economic necessity arising from the fact that Singapore is lacking in land and natural resources and is critical for importing natural resources for value-adding and further re-export.

With its small land area and with no natural resources, considerable care has been taken to optimise the interface between residential areas and other industrial land uses, including the Port. Give the small land area and the greater likelihood of user-conflict, land use allocation and minimizing of pollution impacts are higher than normal priorities for government agencies responsible for the urban planning of Singapore.

Port areas are located at the southern and western sides of the island of Singapore with a smaller port area (Sembawang) located in the north. Heavy industry, including the most pollutive, tends to be located around Jurong and Jurong Island, adjacent to the Port or the offshore islands which are a considerable distance from residential areas.

It would appear that light industry is considered to act as a "buffer zone" as it often abuts heavy industrial areas around the island and is often adjacent to residential areas and housing estates. This is borne out by the requirement that light industrial meet very strict minimum pollution emission standards, requiring that they produce close to nil pollution. Moreover, major road networks tend to act as spatial buffers between industrial and non-industrial, including commercial, districts. Furthermore, the area closest to Singapore's port is the Central Area, which contains a high concentration of financial and commercial districts and it is this area which also tends to abut residential precincts.

2.3.18 AUCKLAND HARBOUR, AUCKLAND

The Port of Auckland (POAL) is a large container and international trade port, lying to the north of Auckland CBD. Auckland is New Zealand's largest commercial port, handling the movement of 60% of New Zealand's imports and 40% of New Zealand's exports by value as well as around 40% of all New Zealand's container trade. Its throughput is around 4 million tonnes of 'break-bulk' cargo per year, with around 773,160 TEUs per year (2007) as well as approximately 166,000 landed per year. The wharves and storage areas, of which there are nine (9), are mostly for containers, cars and other large cargos and are almost exclusively situated on reclaimed land. Auckland's waterfront is divided into roughly two parts; to the west, a mix of marinas, ships industry, and storage facilities and to the east, the extensive wharf infrastructure of a working port. The eastern end comprises Captain Cook, Marsden, Bledisloe, Jellicoe, Freyburg and Fergusson Wharves (Figure 15).

Redevelopment of the western most wharves commenced in the early 1990s with the conversion of Princes Wharf into a multi-story apartment and hotel complex, including restaurants and commercial spaces, and a new cruise ship terminal. The Port of Auckland caters for around 40 to 50 cruise ship visits annually, with all but the largest cruise ships docking at Princes Wharf. Arguments raised against this redevelopment included the restrictions private owners have placed on public access rights and more recently the inadequacy of the terminal to accommodate the increasing demands of the cruise ship industry.

The second waterfront development, completed in 1999 was the transformation of the Viaduct Basin area to the west of this wharf, incorporating public space, waterfront promenades and a mix of apartments, bars, and restaurants. This redevelopment has been an uneven success regarded positively in terms of architecture and public spaces but negatively in terms of objections by residents of the area to noise generated by use of the public spaces for events and local venues and eateries frequented by Auckland residents and tourists.

Future plans for the Auckland waterfront confirm a west/east separation on the Queen Street/Queens Wharf axis with port development and activities slated to continue to the east, while the new residential and commercial developments are planned to gradually occupy the western part of the waterfront (see below).

Recent issues regarding the interface between urban and port activities take the form of both port expansion giving rise to potential impacts on nearby residential areas (Fergusson Wharf) and redevelopment of existing port facilities at Wynyard Wharf (Figure 15).

Figure 15: Port of Auckland showing all nine (9) wharves. From east to west these are Fergusson, Freyburg, Jellicoe, Bledisloe, Marsden, Captain Cook, Queens and Princes Wharves, the Viaduct Basin and the Wynyard Wharf (Western Reclamation) area.

Source: http://google.scholar.com/

Fergusson Wharf Expansion

The POAL seeks to expand its existing Fergusson Container Terminal facility by about 60%. This is part of the strategy of transferring heavy port activity away from the western end of the waterfront in recognition of the ongoing redevelopment of that area. The terminal is located in a predominantly industrial area, with pockets of residential housing to the south and south-west, separated from the Terminal by a major road and the railway yards. The closest traditional housing is approximately 400m from the Terminal entrance. More recently, apartment-style housing has been developed in the area of the old railway yards land. In recognition of potentials noise impacts from the port, this redevelopment required the adoption of specific acoustic and ventilation standards.

A range of environmental impacts arising from the urban interface associated with this expansion was addressed incrementally via a consultative process. The major issues during the consent process related to noise and visual impacts. In terms of visual impacts, design modification was carried out while noise mitigation was addressed through planning and buffering. Given the proximity of nearby residential areas, POAL has undertaken noise monitoring and has produced a *Noise Management Plan* to assist in ensuring that through mitigation, noise levels in the residential area do not exceed a reasonable level (Marshall Day Acoustics, POAL websites). In terms of buffer zoning, additional tree planting has been carried out on existing grassed and planted area located on the southern boundary of the terminal site in an effort to thicken the planting in order to improve its effectiveness as a noise barrier (source: POAL website).

Western Reclamation (Wynyard Wharf) Redevelopment

The Western Reclamation area is at the western edge of the Auckland waterfront, located to the north-west of Freeman's Bay and to the west of the Viaduct Basin. Much of the area is still covered by petrol and liquid chemical storage facilities owned by POAL and various other

companies. Major changes are proposed for the coming decades, with the area intended to be redeveloped into a mixed-use residential-commercial area with extensive public space (see Figure 16 and Sea+City, 2007). Redeveloping this site will require zoning changes and consideration will also have to be given to existing leases, some with up to 20 years to run, and to remediation of contaminated land. The concept for the area is to develop apartments, restaurants and parks alongside fishing and marine industry uses while office developments are not favoured because of the excessive traffic volumes they create (POAL website).

The redevelopment of the Western Reclamation site is part of a broader vision for the future development of Auckland waterfront and has involved extensive consultation with a wide range of community stakeholders. A revised "waterfront plan" for the site released in 2007 incorporated a large open park space along northern and eastern edge of the site following extensive public opposition to the number of waterfront apartments and their height. Of the remainder of the Western Reclamation area some will be set aside for marine industry, with the main bulk of land being developed as apartments, with some associated smaller-scale retail and entertainment areas (see Figure 16). To a large extent redevelopment of the area in terms of creation of public space and facilities will need to be paid by the development of residential areas (ARC website).

Redevelopment of the site will proceed in two (2) stages. The first stage of the redevelopment, slated for completion by 2011, will be to convert the eastern section of the site into an entertainment strip, to complement the Viaduct Basin redevelopment. This area is to be linked to the Auckland CBD via a new lift- or swing bridge. The next stage will be the development of the "park" areas and residential areas to coincide with the termination of commercial leases. It is also envisaged that the lack of sufficient cruise ship berthing space at the existing Prince's Wharf could be addressed through constructing a new terminal at this site (ARC website).

The major issue for this redevelopment centers around the existing port infrastructure and storage facilities, with proximity to the port not a major issue. The nearest operational areas are more than 1.2km away and buffered by previously redeveloped wharves. Moreover activities at these wharves (Captain Cook and Marsden) are being relocated further east to the newly expanded Fergusson Wharf.

Detailed documentation concerning the redevelopment of the Auckland harbour can be found at www.seacity.co.nz.

Figure 16: Port Redevelopment Master Plan

Community Engagement

In terms of its engagement with community, POAL undertakes regular surveys as to its performance and has developed a community engagement plan to minimise the social impact

of port activities, such as identifying and reducing causes of noise. In terms of the overall future development of the Auckland waterfront, POAL works closely with the Auckland Regional Council and Auckland City on port issues, including managing transport related issues through zoning and development planning controls, provision of buffer zones, including acoustic and visual screening where adequate buffers cannot be provided, and noise insulation of adjacent dwellings in severe cases (Beca Infrastructure Ltd., 2006).

3 CONCLUDING OBSERVATIONS

The Australian, Singapore and Auckland (New Zealand) case studies into port-residential interface are characterised by idiosyncratic experiences. The management of the interface has been driven by a recognition that co-existence is not negotiable; what is negotiable is how that co-existence is to be managed and the interests of different parties balanced.

Just as some ports are experiencing a process of residential expansion 'into' their territories of interest, so are some residential areas experiencing the interface issues caused by port expansions.

The case studies show that there are no simple 'right/wrong' approaches to achieving a satisfactory balance between the various land uses. Specific responses in each of the cities examined have drawn from a myriad of approaches, including planning-based responses (e.g. buffers), design-based mitigations (at both source and receptor) and effective communications to achieve mutual recognition and support of the balance that needs to be achieved. The communications regime also establishes a baseline for expectations from each of the affected parties, which ultimately form a critical pre-condition for achieving a satisfactory balance.

That port and residential uses can co-exist, often in extremely close proximity (e.g. Sydney where the distance is no more than ~200m), is strong evidence that port activities are not necessarily threatened by the presence of nearby residents; and conversely, as in the case of Port Botany, that the amenity of residents can be effectively preserved in the face of port expansion.

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5 APPENDIX 1: AERIAL IMAGES

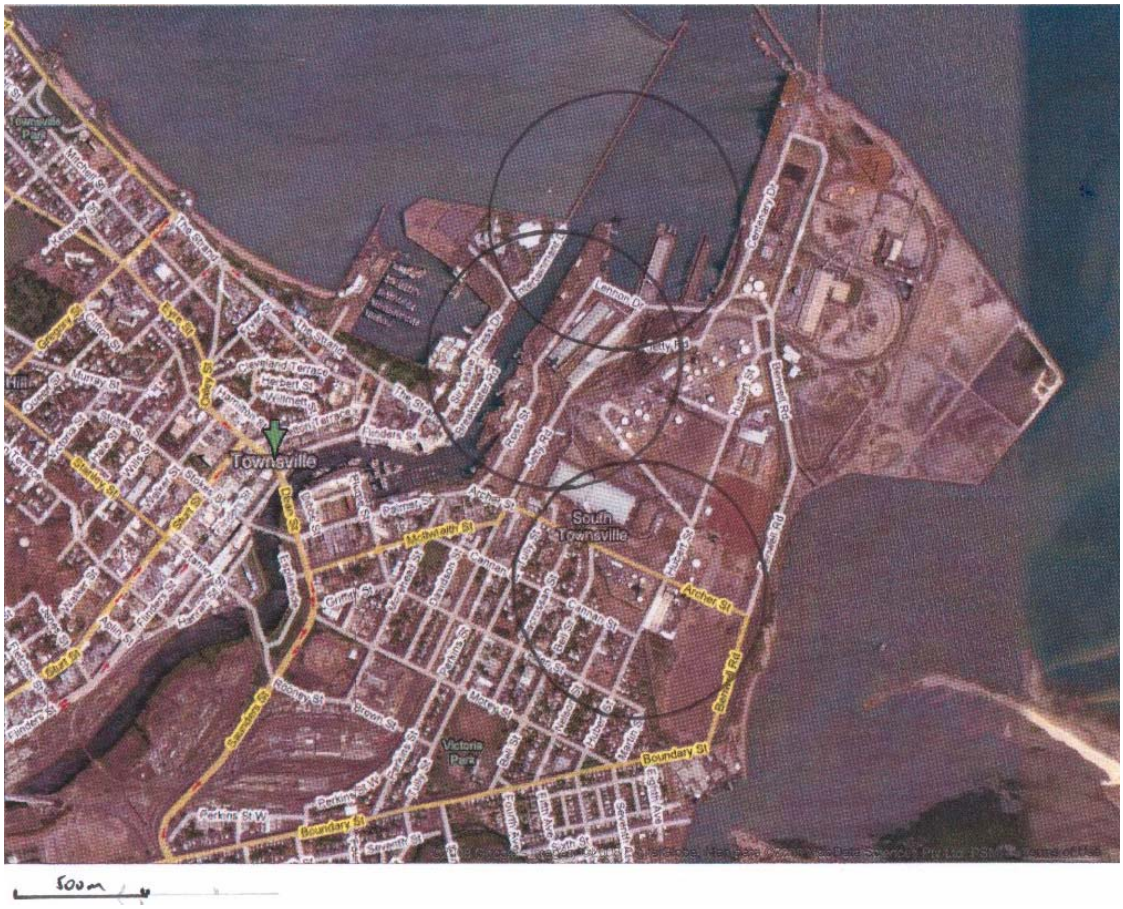
This Appendix provides aerial images of the Australian ports examined in this case study report. The images have been sourced from Google Earth, and are not necessarily current. The images are marked with concentric circles indicating estimated distances from the identified berths to nearest residences. Other features are also noted.

Higher resolution images at A3 size are presented as a separate Volume accompanying this report.

5.1 TOWNSVILLE

Figure 17 shows the proximity of various aspects of the Port of Townsville's operations to nearby non-port uses, including residential uses. The circles are ~500m radii. The northern most measure is taken from Berth 10; the second measure is taken from the southern edge of the Queensland Sugar Bulk Sugar Sheds 1 and 2; the southern most measure is taken from the Ampol fuel storage facilities.

Figure 17: Port of Townsville (500m)



5.2 GLADSTONE

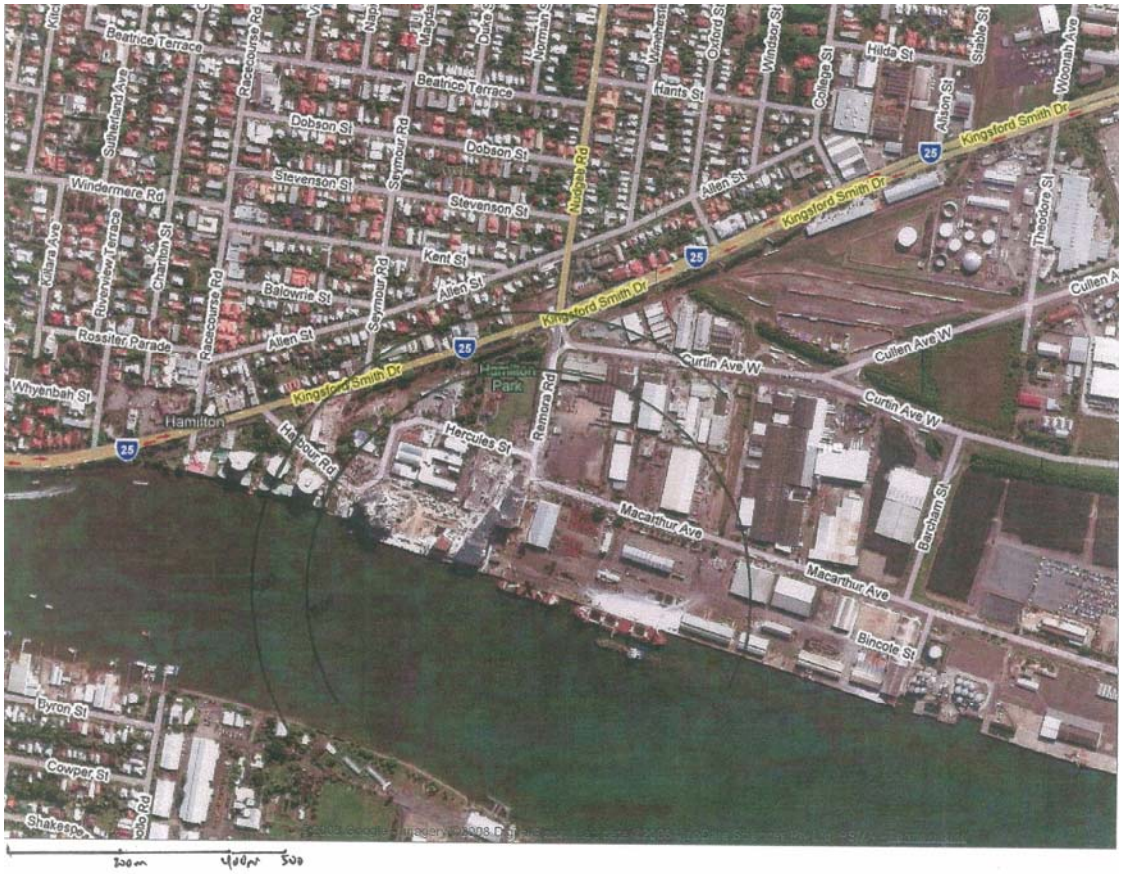
Figure 18 shows the proximity of two Gladstone berths to nearby non-port uses, including residential uses. The circles are ~500m radii. The western measure is ~400m radius and the eastern measure is ~500m radius.

Figure 18: Port of Gladstone

5.3 PORT OF BRISBANE (HAMILTON)

Figure19 shows Brisbane (Hamilton). The two circles are ~400m and ~500m from the berth. It can be seen that the nearest residential uses are ~500m from the berth, across Kingsford Smith Drive. In itself, Kingsford Smith Drive is a significant disamenity for residents.

Figure 19: Brisbane (Hamilton)



5.4 NEWCASTLE

Figure 20 shows the Newcastle Port. The circles emanating from each of the main identified berths are ~500m, ~750m and ~1,000m in radius.

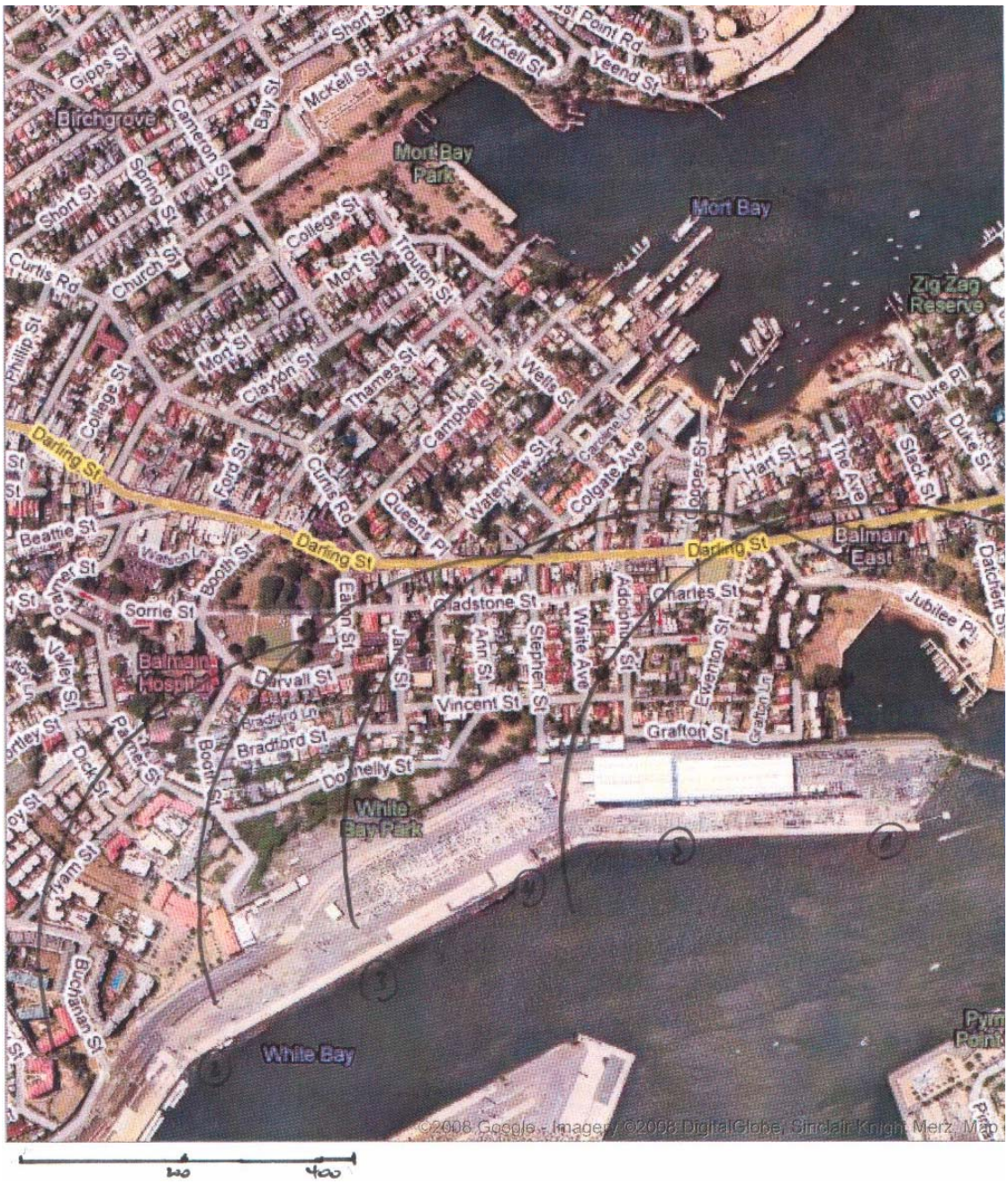
Figure 20: Newcastle

5.5 SYDNEY

Figure 21 shows Sydney Harbour. Figure 25(a) shows the situation around White Bay. The circles are ~400m in radius, and as can be seen, a significant number of residential dwellings are captured within this range. Figure 25(b) shows the situation slightly further to the east, but again, many residential dwellings fall within a ~400m radius of identified Port berths.

Figure 21: Sydney Harbour

(a)



(b)


Ann Cashman Reserve
Theodore St
Little Beattie St
Beattie St
Pashley St
Sorrie St
Roseberry St
Wisbeach St
Norman St
Wise St
Ewell St
Clare St
Bruce St
Nelson St
Merton St
Goodsir St
Perrett St
Pine St
Mansfield St
Victoria Rd
Robert St
Prince St
Quirk St
Alfred St
Hornsey St
Lilyfield Rd
Victoria Road on ramp
Victoria Rd
Western Distri
Sommerville Rd
James Craig Rd
Darling St
Mullens St
Tobruk Ave
Ennis St
Wortley St
Hyam St
Reynolds St
Rumley Ln
Smith St
Parth St
Jerhanan St
Crescent St
Loughlin St
Joseph St
Harley St
Mackenzie St
Cross St
Evans St
Prospect St
Ellen St
Elizabeth St
Maney St
Gordon St
Harris St
Slade St
Clay St
Foy St
Palmer St
Booth St
Bradford St
Darvall St
Balmain Hospital
White
Moore Ln
Rose St
Fraser Ln
20mm
40mm

5.6 PORT OF BOTANY

Figure 22 shows Port Botany (Yarra Bay). Figure 26(a) shows the proposed Port expansion, which takes port activities closer to residents than is presently the case. The circles are ~400m, ~800m and ~1,000m from the identified berth at the northern end of the proposed expansion.

Figure 26(b) shows the existing operations, to the west of the proposed expansion.

Figure 22: Port Botany

(a)

(b)

The circles are ~800m and ~1,000m in radius.

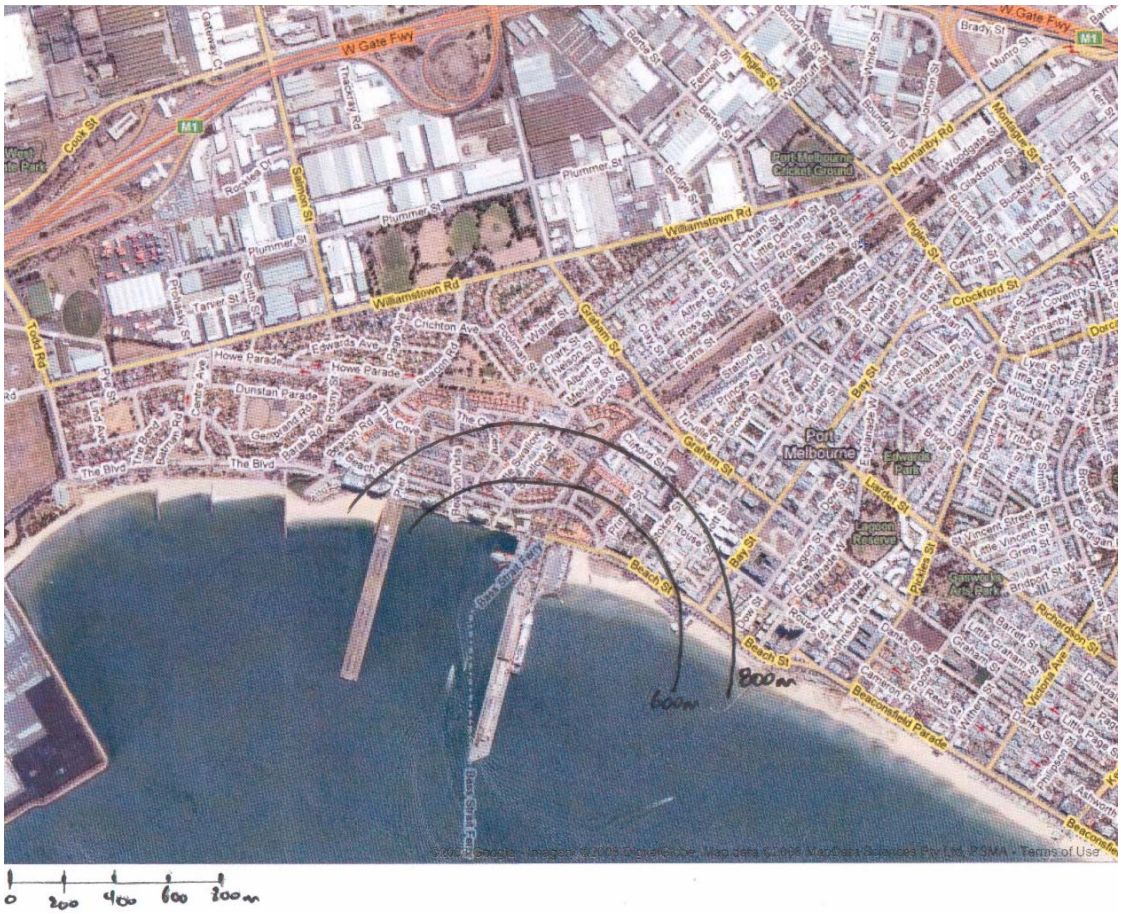
5.7 MELBOURNE (DOCKLANDS) AND PORT PHILLIP BAY

Figure 23 shows Melbourne (Docklands) and Port Phillip Bay. Figure 27(a) shows Melbourne, where the circles are ~500m in radius. Figure 27(b) shows Port Phillip Bay, where the distances have been estimated from the furthest extremities of the pier.

Figure 23: Melbourne (Docklands) and Port Phillip Bay

(a)

(b)


W Gate Fwy
Cook St
M1
Williamstown Rd
Plummer St
Port Melbourne Cricket Ground
Normanby Rd
Graham St
Bay St
Port Melbourne
Beach St
Beaconsfield Parade
Todd Rd
Howe Parade
Dunstan Parade
The Blvd
800m
600m
0
200
400
600
800m

5.8 GEELONG

Figure 24 shows the Port of Geelong. Figure 28(a) the suburb of Norlane (at the south), with residents located ~600m from the berth. The pier at the north of the image is the refinery pier. The circles are ~800m in radius. Figure 28(b) shows the situation to the north. The circles are ~800m in radius.

Figure 24: Geelong

(a)

(b)


Lillian St
Naughton Ave
Deppeler Park
C136
M1
C115
Corio Quay Rd
Cowie St
Victor St
Armstrong St
North Geelong
Separation St
Ewart St
Langdon St
Crowle St
Thompson Rd
Mackey St
Osborne Park
Swinburne St
Vautier St
Bay St
Geelong Golf Course
Victoria St
St Helens Park
Eastern Beach
Corio Quay
Port Arlington

5.9 PORT ADELAIDE

Figure 25 shows Port Adelaide. Figure 29(a) shows distances from the dedicated soda ash berth. The circles radiating out are at distances of ~400m, ~600m and ~800m.

Figure 29(b) shows the situation in the inner harbour. The circles are ~400m and ~800m in radius. The closest residents are located in Peterhead and Birkenhead, within the ~400m and ~800 bands.

Figure 25: Port Adelaide

(a)

(b)


Largs North
Largs Bay
Peterhead
Semaphore
Birkenhead
Exeter
Jetty Rd
Semaphore Rd
Fletcher Rd
Victoria Rd
Elder Rd
Sterling St
Eastern Parade
Francis St
Ocean Steamers Rd
Grand Trunkway
A16
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5.10 PORT OF FREMANTLE

Figure 26 shows the Port of Fremantle. The circles are drawn at ~800m from the berths.

Figure 26: Port of Fremantle

5.11 ESPERANCE

Figure 27 shows the Port of Esperance. The circles are drawn at ~400m and ~600m from the berths.

Figure 27: Port of Esperance

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Case Study on Sea Ports and Residential Interface Experiences in Australia, Singapore and New Zealand Volume 2 of 2

Prepared for City Pacific Limited
Wednesday 30 July 2008
Version 1.4

>> Report

>> Response to Public Submissions

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Contents

Introduction

This document is Volume 2 of 2 of the Report on Case Studies of Sea Ports and Residential Interface issues in Australia, New Zealand and Singapore. It complements the analysis presented in Volume 1 by providing higher resolution aerial imagery of each of the ports considered in the case study.

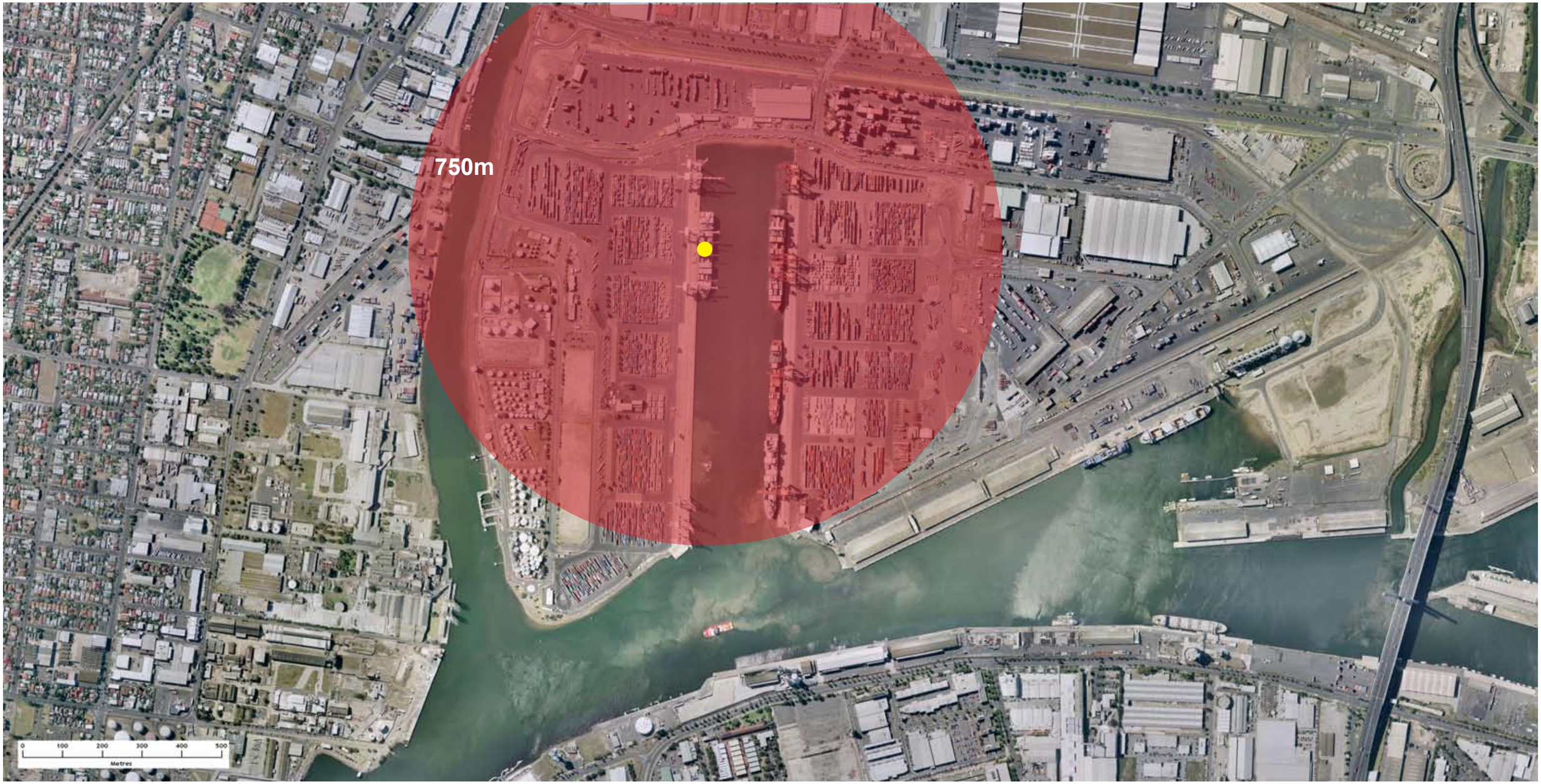
Each of the aerial images has been annotated with markers of distance, taken from port berths (rather than any other feature of the industrial ports that may be generators of nuisance emissions), and the nearest residential dwelling. As with Volume 1, it should be noted that the depictions contained in this document have not been validated through ground-truthing and site inspections.

Townsville Port

Mackay Port

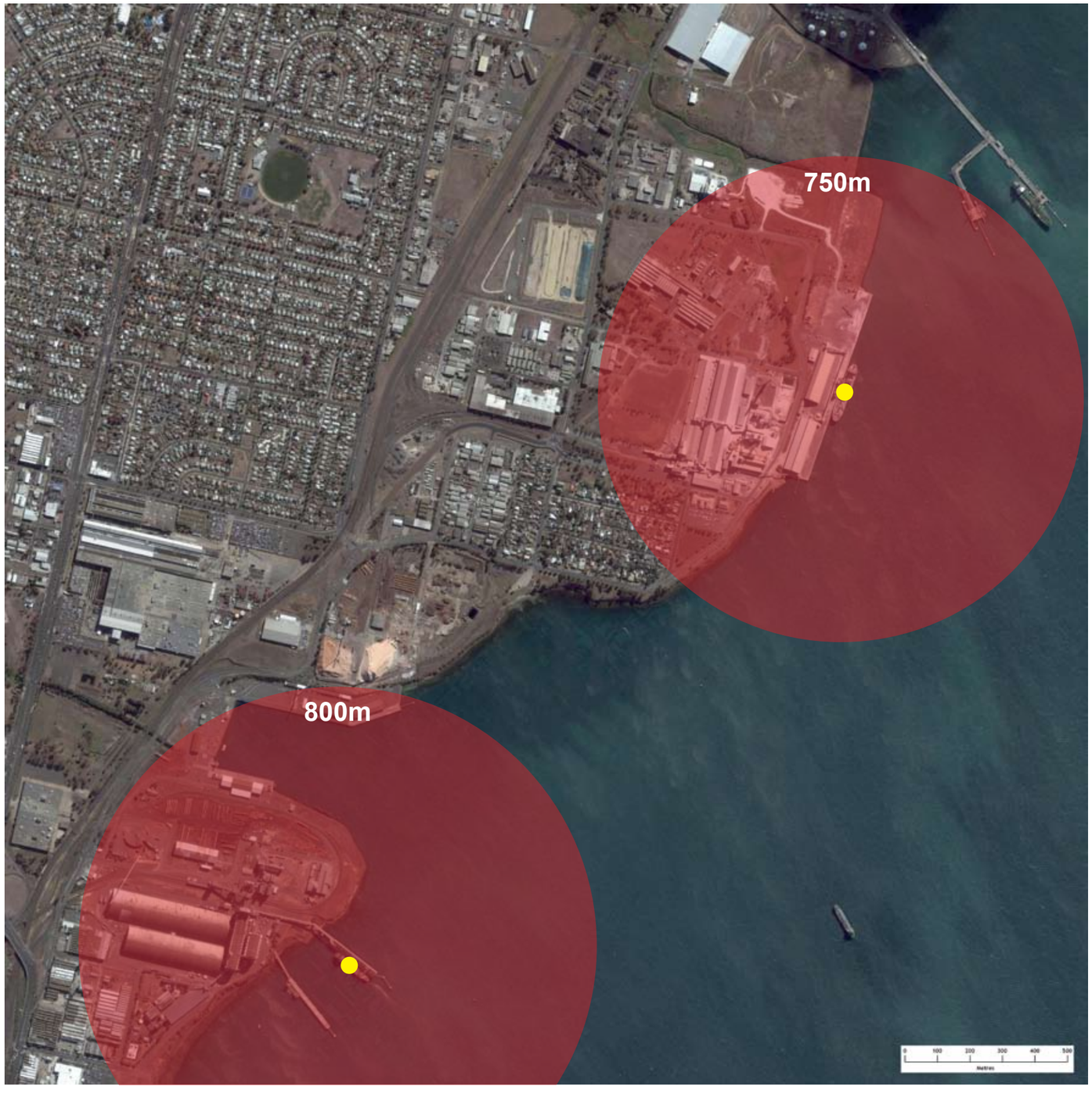
Gladstone Port

Brisbane (Hamilton)

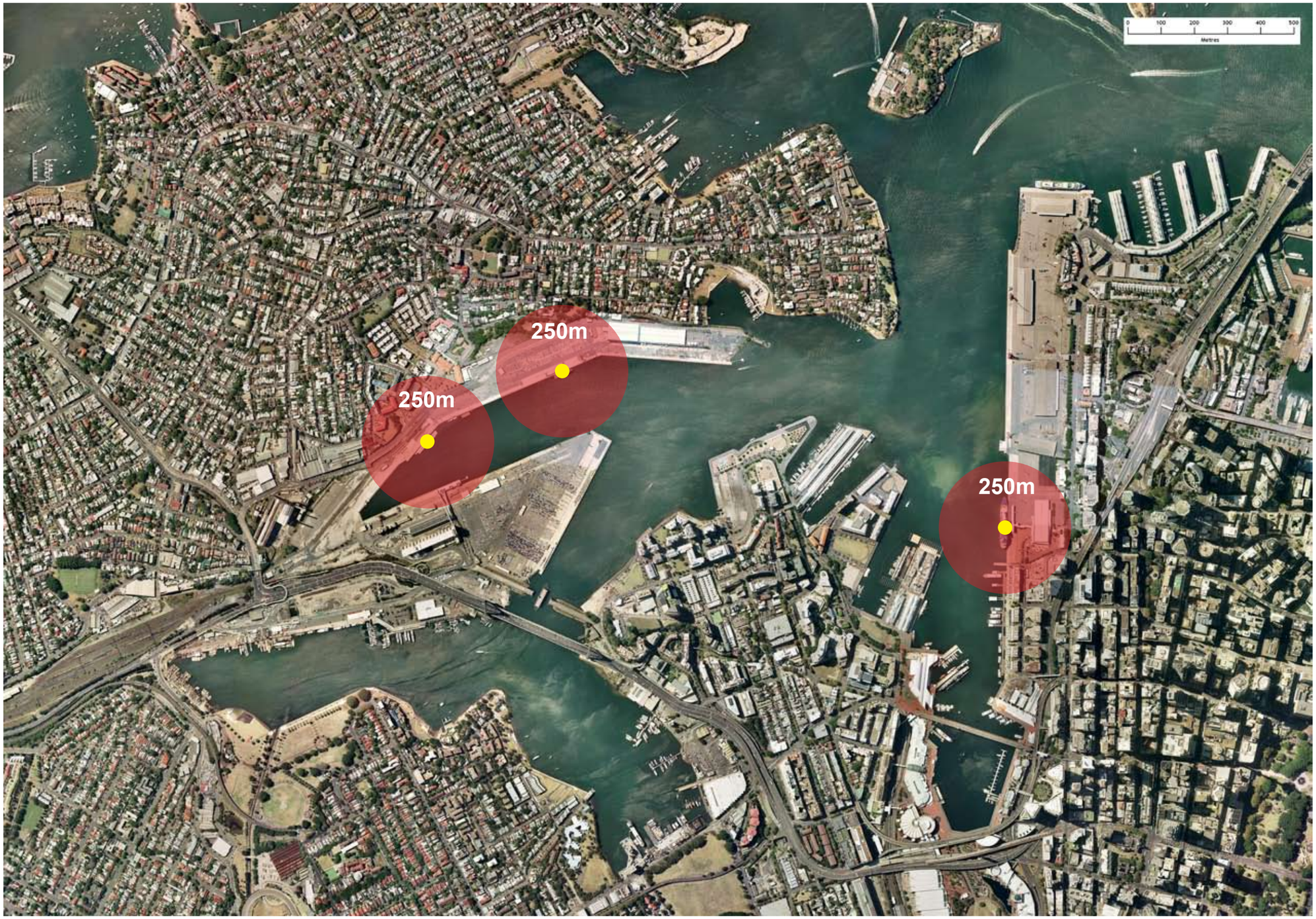


Melbourne - Docklands Port

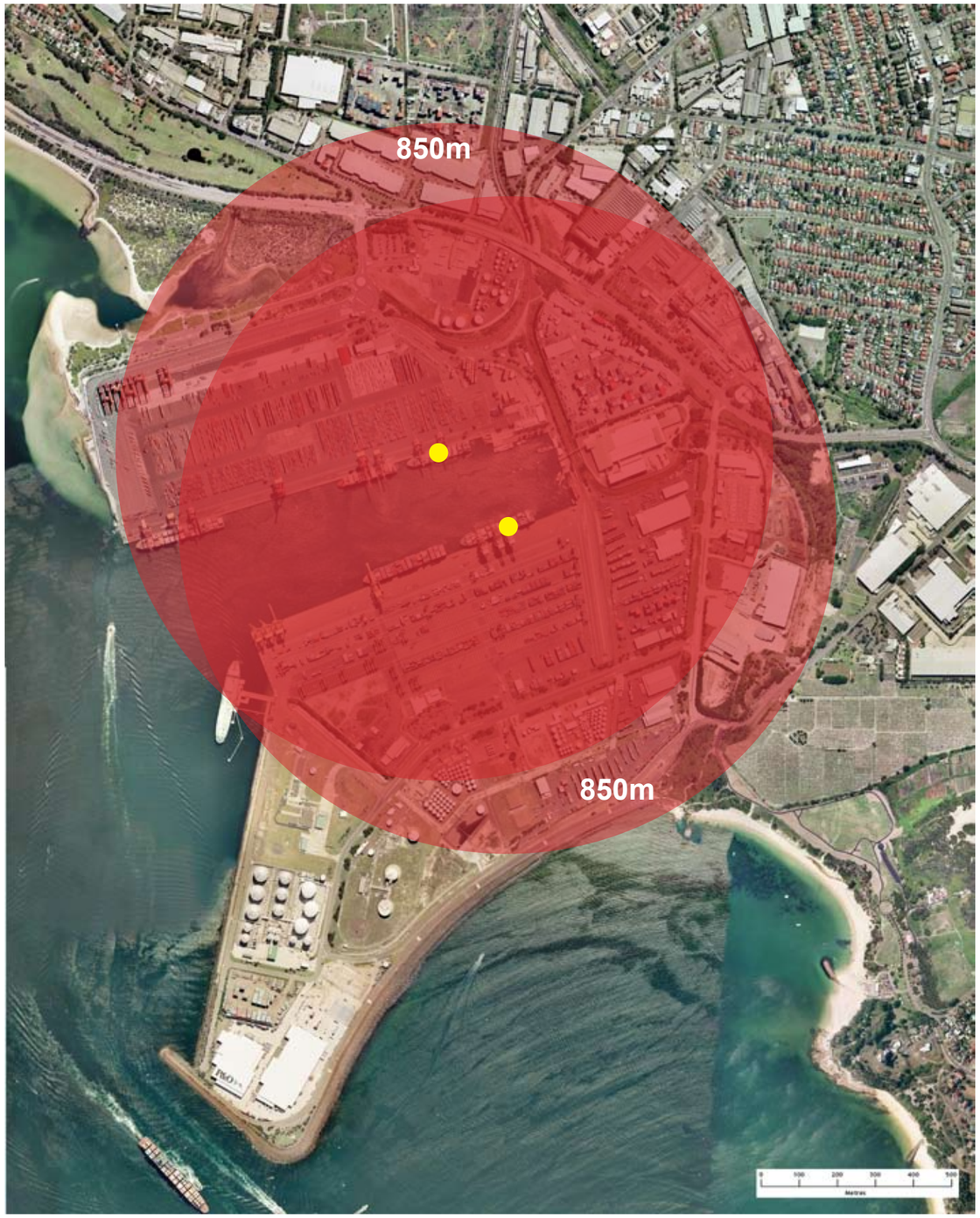
Melbourne - Port Phillip Bay



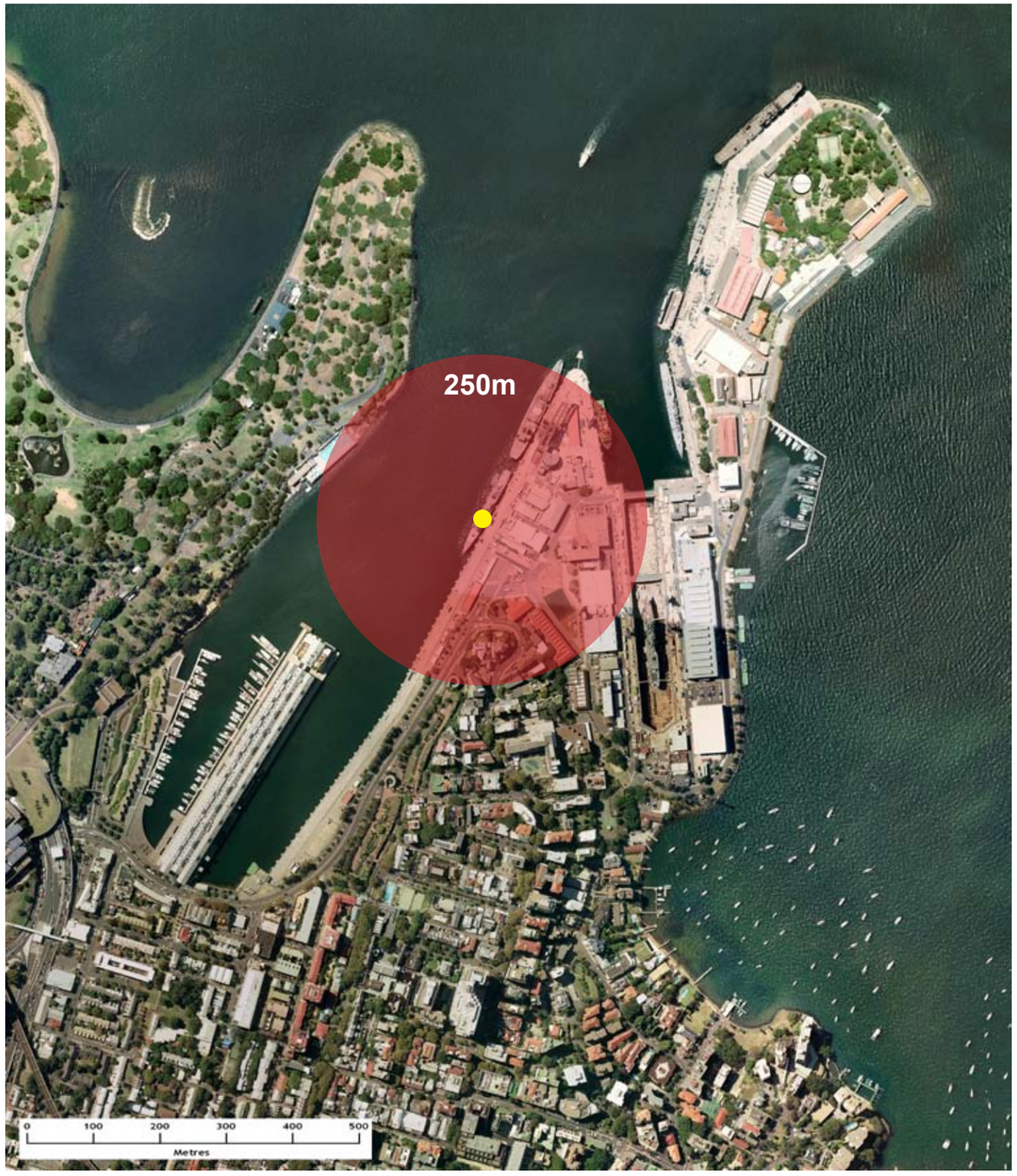
Geelong Port



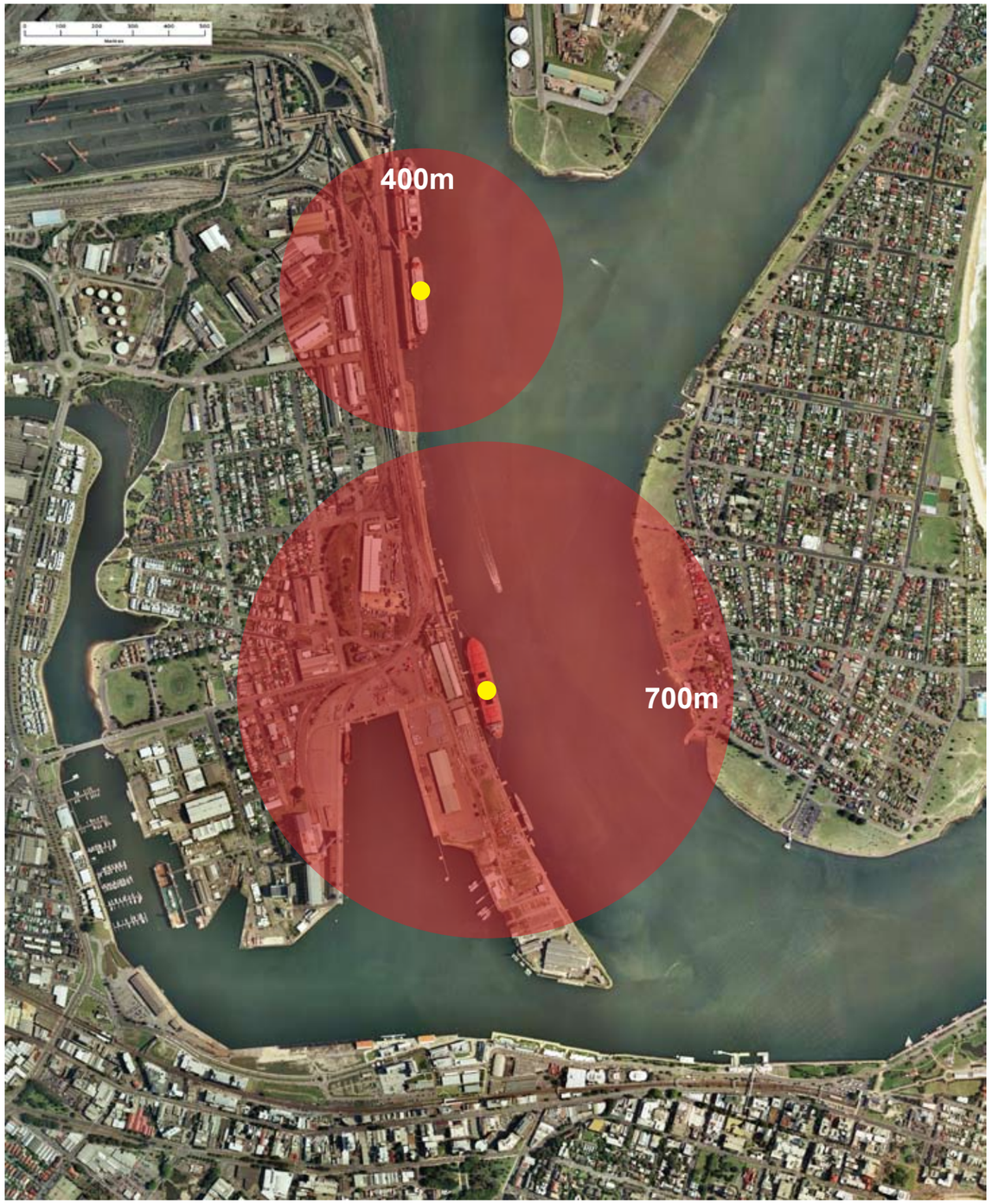
Sydney Harbour



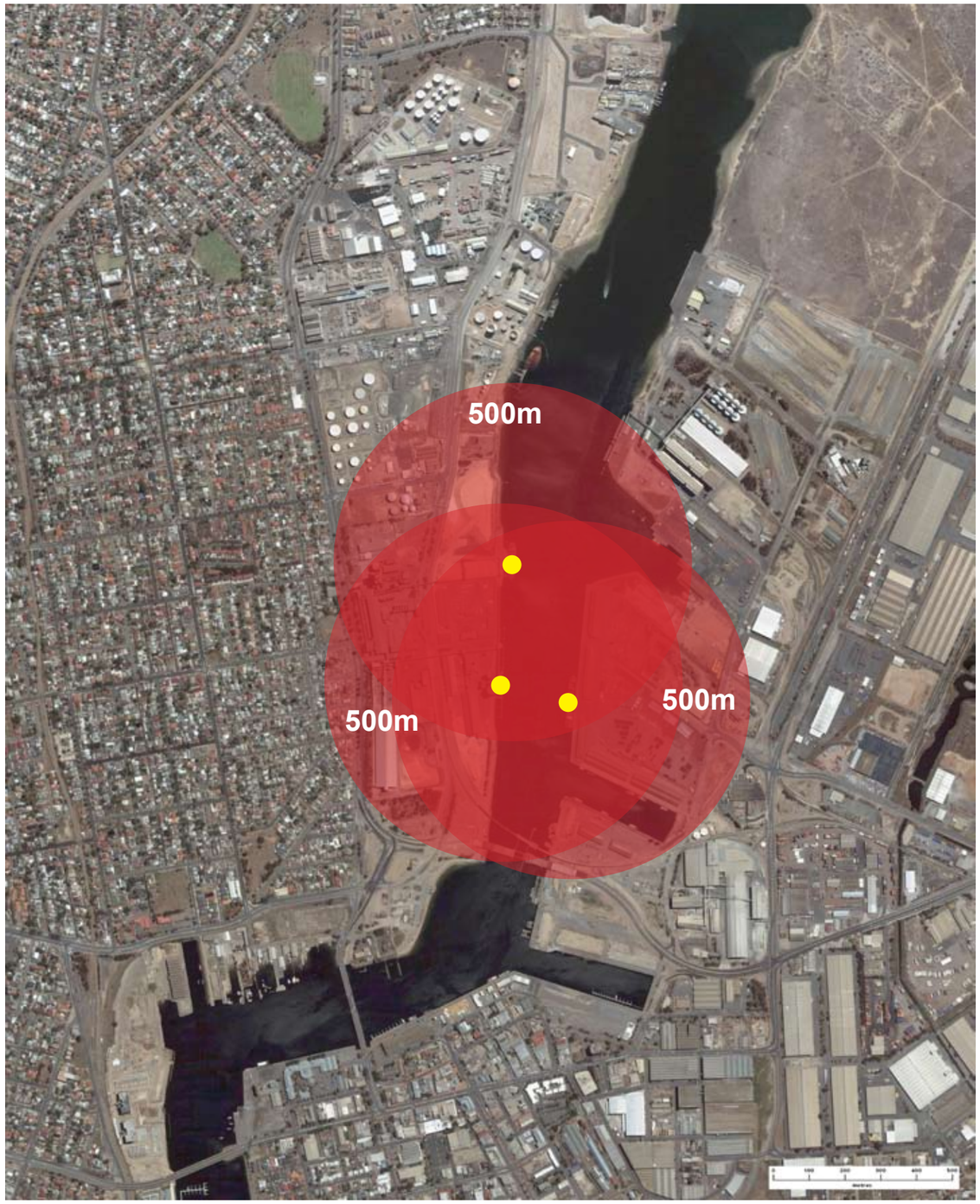
Sydney - Botany Bay



Sydney - Woolloomoloo

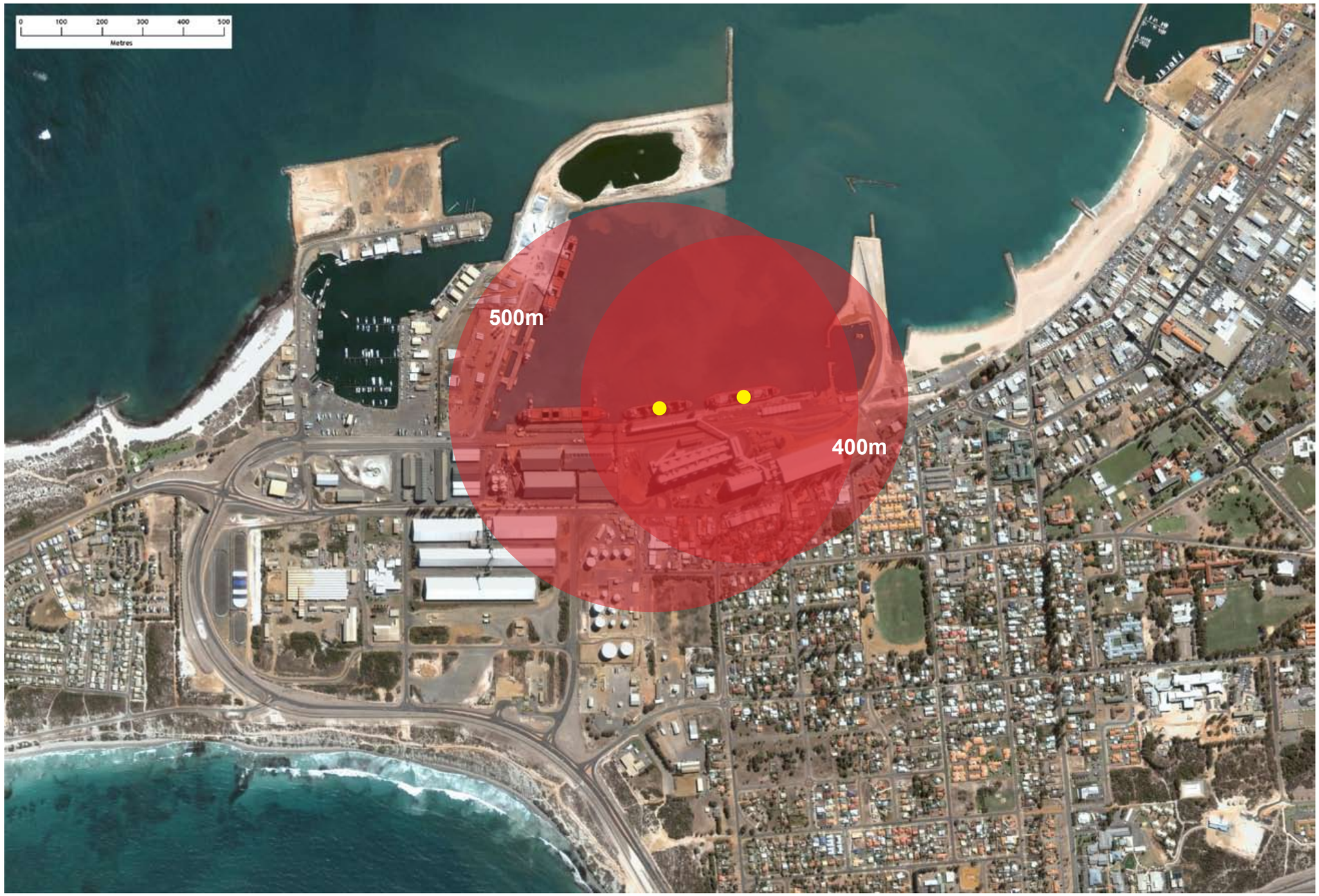


Newcastle Port

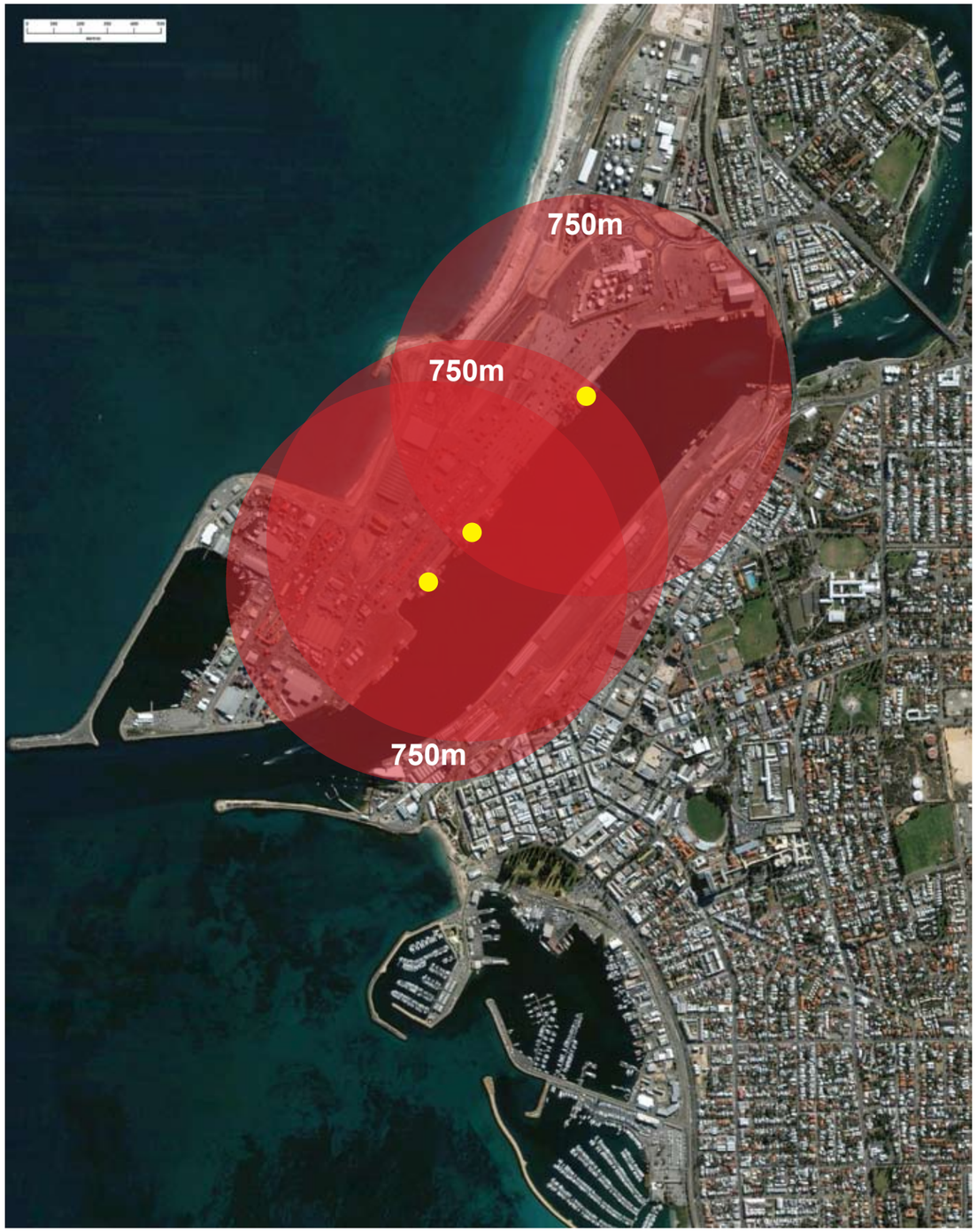


Port Adelaide - Inner Harbour

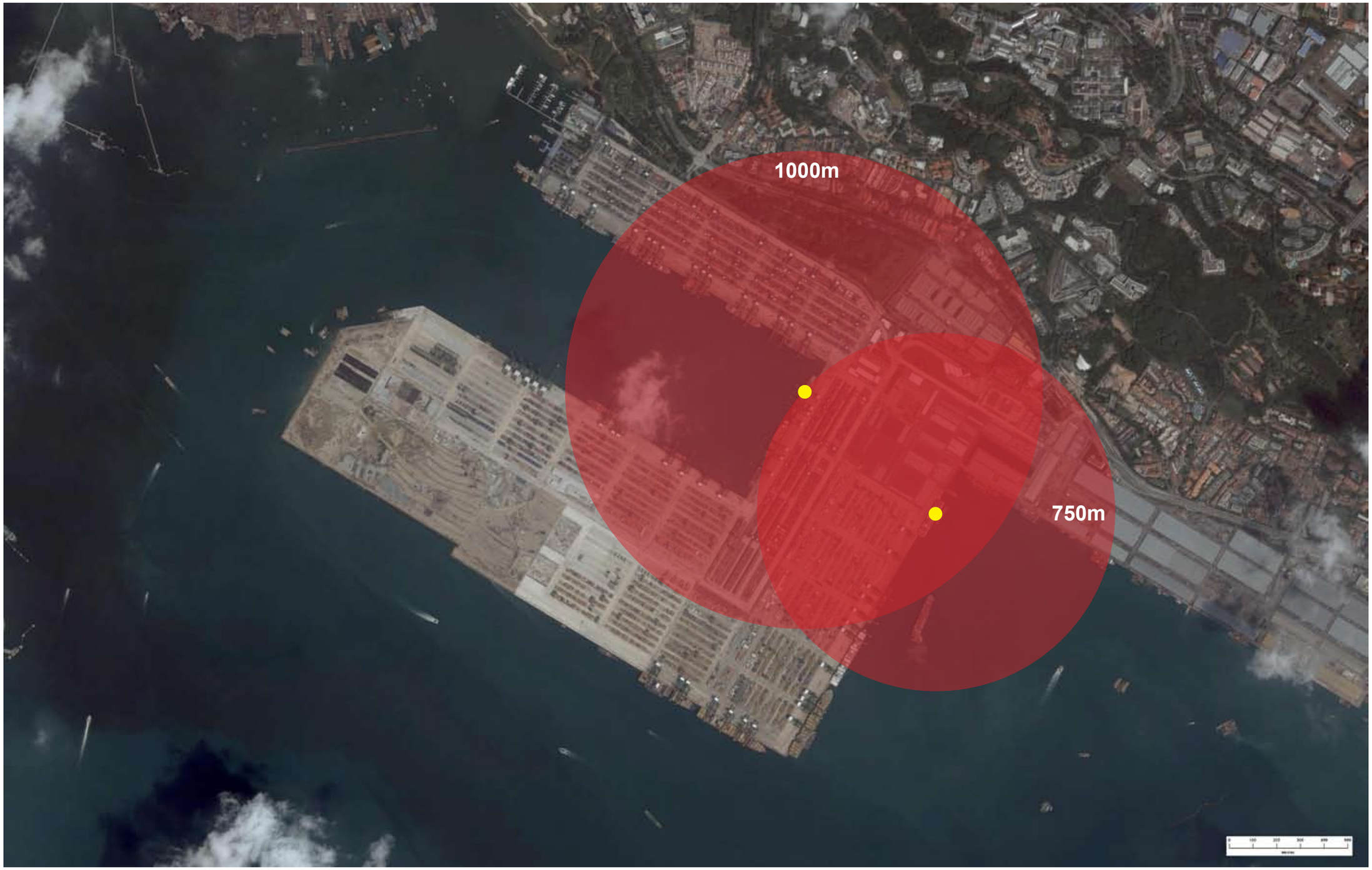
Esperance Port



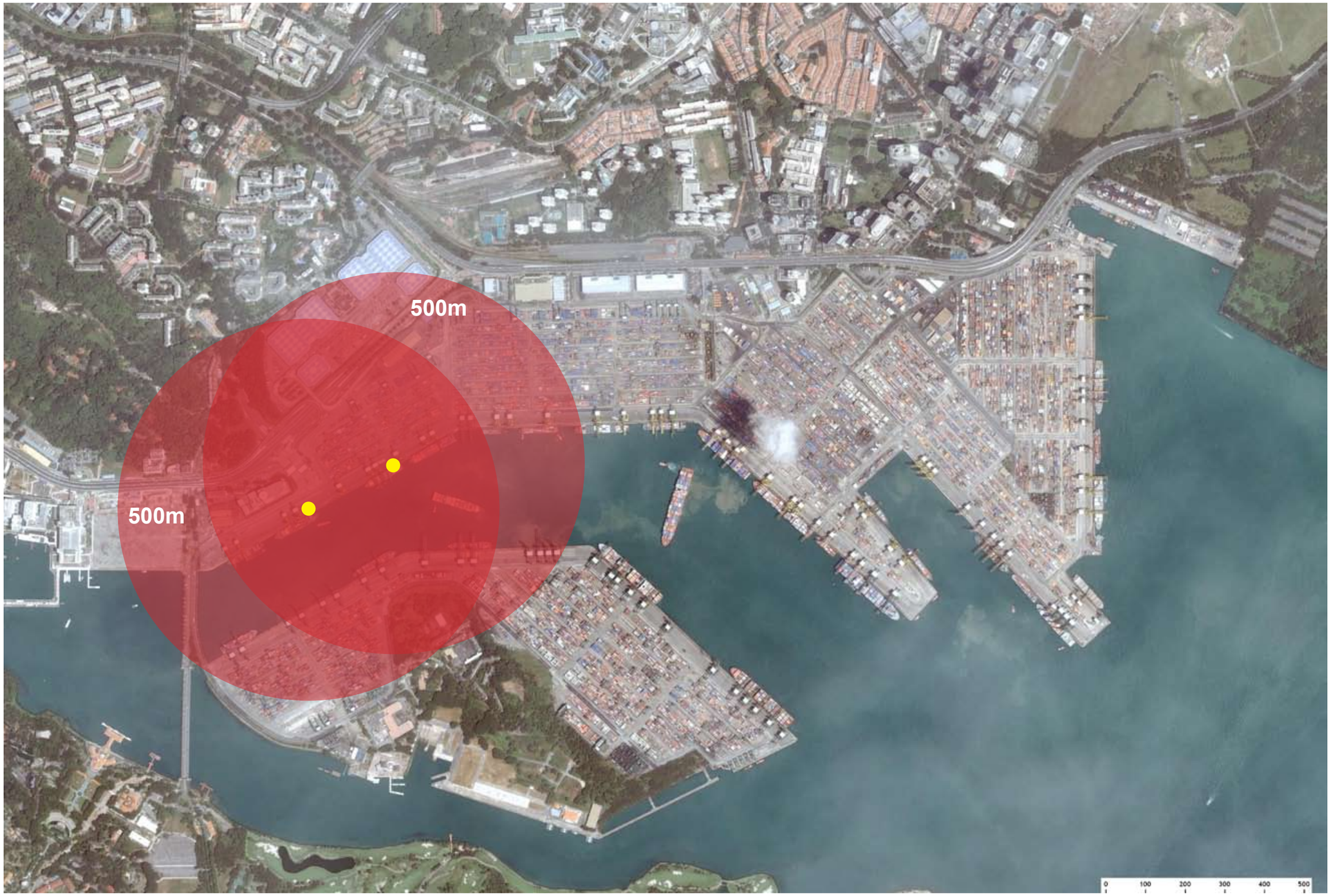
Geraldton Port



Fremantle Port



Singapore - Pasir Panjang



Singapore - Tanjong Pagar

Auckland Port

Cape Town Port