

Summary of key outcomes:

The proposed Port Botany Expansion would maintain Port Botany's position as NSW's main container port and help maintain the importance of the Botany area as a regionally significant employment base. The new terminal would be compatible with industrial development and transport infrastructure already existing in the area and with the port Master Plan dating back to the 1960s.

The proposed development could affect the environment, mainly through increases in traffic and noise in certain areas. The implementation of environmental mitigation measures would minimise impacts on surrounding land uses, including the operations of Sydney Airport.

The proposal would enable the continued use of the public open space corridor between Penrhyn Road and the Mill Stream outlet, including Foreshore Beach and Penrhyn Estuary. Improvements on Foreshore Beach would enhance access arrangements and public recreation opportunities along the foreshore.

Enhancement of Penrhyn Estuary would provide ecological benefits and protection. A recreational boating channel would always be maintained to allow access to Botany Bay.

Access to certain areas would be restricted temporarily due to construction activities and permanently due to port operational and environmental protection requirements.

14.1 History of Land Use

Since the time of European settlement, northern Botany Bay has attracted industry because of available natural resources, water supply and the naturally deeper waters of the northern foreshore. The first manufacturing industry was a mill built in about 1815 adjacent to the Botany Wetlands, which furnished water power to drive machinery. When certain trades were banned from Sydney in 1848, several of these trades, such as tanneries, wool scourers, soap works and candle makers, shifted to Botany.

In 1880, the Government Pier was built at Banksmeadow principally to unload coal from Newcastle to supply the industries established in the area. Its construction is considered to be the first effort by government to establish Botany Bay as a functioning port.

Botany has had a long association with recreation and tourism. The semi-rural character of the area also attracted weekenders from Sydney. As early as the 1830's the area was a location for society picnic parties. The Sir Joseph Banks Hotel, built around 1844, established a history of sporting recreation.

In the early 1900's, chemical and manufacturing industries began to develop in Botany. Major industries established include Davis Gelatine (1917), Kelloggs (1928), Johnson & Johnson (1936), ICI (1941, now known as Orica), AC Hatricks (1949, now known as Nuplex), and BP petroleum depot (1960, decommissioned in 1998). The Bunnerong Power Station was built in 1929.

Industrial development was complemented by major transport infrastructure. The airport was established at Mascot in 1921, redeveloped in 1946 to accommodate jet aircraft and further expanded in 1992. The construction of Port Botany commenced in the late 1970's.

In the 1960's, industrial land use in the area started shifting away from manufacturing towards transport and storage with the emergence of industries associated with the movement of goods at Sydney Airport and Port Botany, such as freight forwarders and customs agents.

Smaller factory units, warehousing and associated office development were in demand in the area in the 1970's and 1980's due to the region's proximity to the CBD of Sydney. Airport related developments like office towers and hotels emerged in the 1980's. Business park developments incorporating office and warehouse/distribution facilities became more common in the 1990's.

Reclamation has been a major feature of developments on the shores of Botany Bay. Major facilities like Sydney Airport and Port Botany are associated with reclamation beyond the natural shoreline.

14.2 Surrounding Land Use

The areas immediately surrounding the project site are used for industrial, special uses, commercial, residential and recreational purposes.

Land surrounding Port Botany is subject to planning provisions contained in the Botany LEP 1995 and Randwick LEP 1998. The proposed site and surrounding land uses are illustrated in **Figure 9.1**.

14.2.1 Industrial

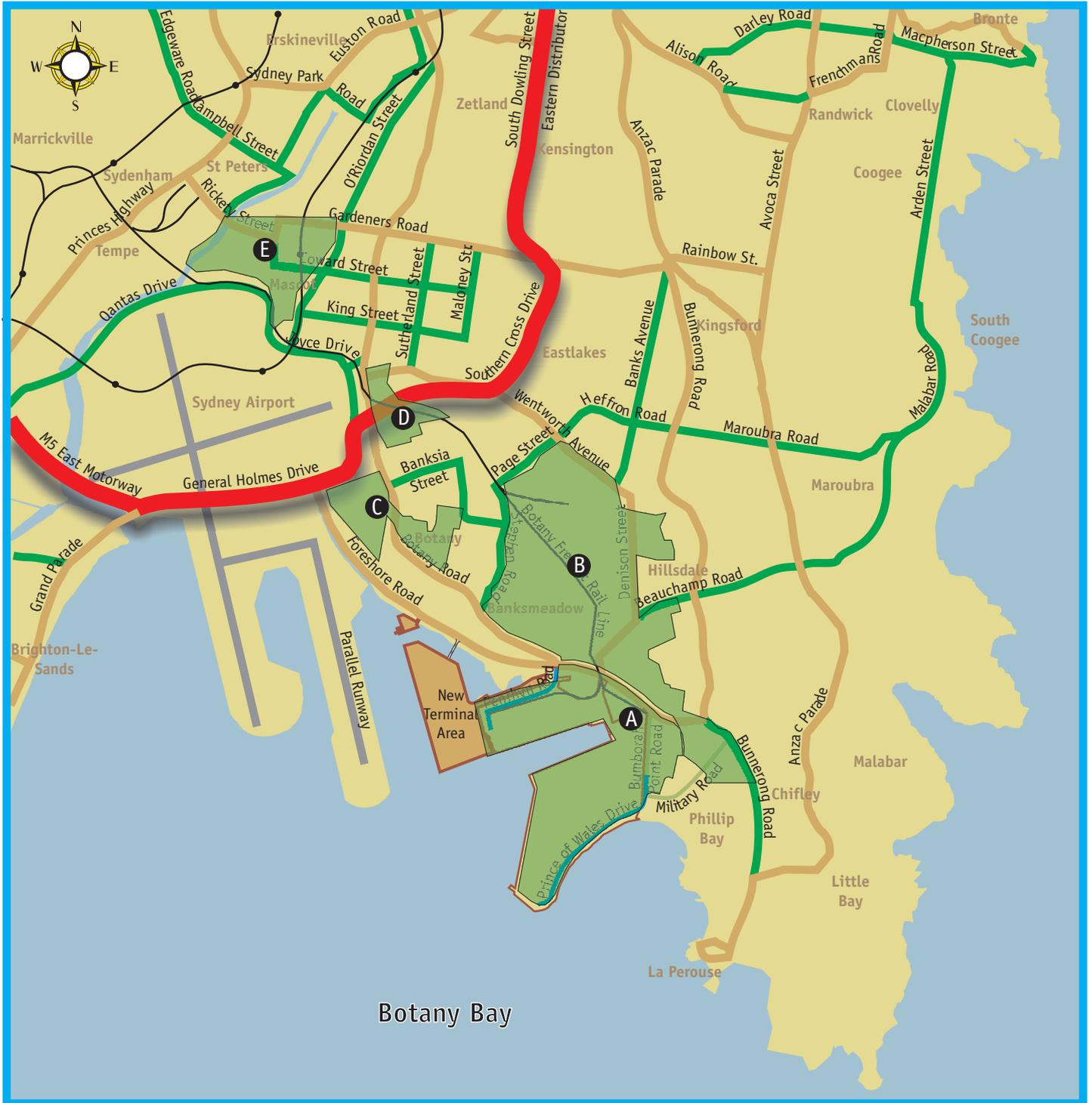
Port Botany is one of Sydney's major port and industrial regions, and a large portion of the area surrounding the site is devoted to industrial land uses.

The types of industrial zones in the vicinity of the proposed site are:

- general industrial, covering most industrial activities;
- mixed industrial, including light industrial, commercial and retail land uses;
- airport related; and
- port related, including container and bulk liquids storage.

These industrial land uses are located within five major industrial clusters which are described below (**Figure 14.1**):

- Port Botany – Facilities include container terminals, container park and bulk liquid facilities (refer to **Chapter 3 Existing Port Operations**).
- Banksmeadow/Hillsdale/Matraville – This area accommodates heavy industrial land uses such as chemical manufacturing, food manufacturing, container storage, and port related facilities. Major industrial sites in the area are Botany Industrial Park, Air Liquide, BOC Gases, Nuplex Industries, Johnson & Johnson Pacific, Kellogg, Solvay Interlox; Amcor Fibre Packaging, Nalco and Mobil Oil Terminal.
- Botany West – This area adjoins the airport to the east and comprises a range of industrial land uses including container parks and motor vehicle repair shops.
- Botany/Mascot – This area comprises a variety of industrial land uses, including new industries which are more compatible with residential and open space land uses, such as the Lakes Business Park located along the banks of the Mill Ponds at Lord Street. The business park tenants include small to large commercial and light industrial businesses, warehousing and distribution, textile manufacturing and food retailing supplies.
- Mascot – This area north of the airport has shown an emergence of airport related industries (e.g. aircraft equipment and maintenance) as well as commercial premises, transport and storage, high technology enterprises and hotels.



Source 1: Botany Local Environment Plan 1995,
Council File ST/4/33, Dept File R91/01472
Source 2: Randwick Local Environment Plan 1998,
Council File T-19-170, Dept File R96/00140

Location of Major Industrial Clusters

Figure 14.1

Major Industrial Clusters:

- A** Port Botany
- B** Banksmeadow/Hillsdale/Matraville
- C** Botany West
- D** Botany/Mascot
- E** Mascot

14.2.2 Special Uses

Aside from Port Botany, areas zoned for special purpose land use in the vicinity of the proposed site include the following:

- Sydney Airport – NSW's major domestic and international airport. It is located approximately 1.5 km west of the Port Botany Expansion site. As the major international gateway into Australia, Sydney Airport is Australia's busiest passenger airport. Sydney Airport is the main port of call for international travellers with approximately 50% of international and 33% of domestic passenger traffic. The airport is also Australia's busiest cargo airport, handling about 600,000 tonnes of air freight a year or 44% of all airfreight. Some 38 international airlines, two domestic airlines, four regional and nine freight airlines operate through Sydney Airport. There are also about 80 air cargo companies located in the South Sydney/Botany area; and
- Botany Freight Rail Line – This is a dedicated freight rail line which operates from Port Botany and links into the metropolitan network.

There are also various easements for existing services including the following:

- pipelines under Botany Bay which connect the Caltex Oil Refinery at Kurnell with the Caltex terminals at Banksmeadow and Silverwater;
- the Sydney to Newcastle fuel pipeline, which is a buried pipeline located on the southern side of the Foreshore Road reserve which connects the Caltex terminal at Banksmeadow with Newcastle; and
- the Sydney Airport jet fuel line which is also a buried pipeline which connects the Caltex terminal at Banksmeadow with Sydney Airport. The pipeline is generally located on the northern side of Foreshore Road, except for a short section near the Caltex terminal where it is located on the southern side of Foreshore Road.

14.2.3 Commercial

Commercial development in the vicinity of the Port Botany Expansion is primarily located in strip centres, local neighbourhood shopping centres and regional shopping centres.

Strip centres are located along main roads such as Botany Road in Botany and Mascot, and Anzac Parade in Maroubra. These centres tend to offer basic necessities such as butchers, bakeries, newsagents and fast food outlets.

Local neighbourhood shopping centres include Eastlakes and Southpoint Shopping Centres and the regional shopping centre is Westfield Eastgardens.

The Discovery Cove Business Park, a commercial business centre, is located on Botany Road, Banksmeadow, north of Port Botany and includes a café, commercial office accommodation and truck parking bays.

14.2.4 Residential

Residential areas in the vicinity of Port Botany are located to the north, northwest and east of the site, in the suburbs of Matraville, Hillsdale, and Botany. The closest residential dwelling to the proposed expansion is located approximately 500 m northwest of the proposed new terminal in the residential area of Botany. The residential area to the north of the new terminal consists primarily of one and two storey detached dwellings and is bounded by Southern Cross Drive, Wentworth Avenue, Sir Joseph Banks Park and the Banksmeadow industrial area.

There is a relatively large residential area located to the northeast and east of Denison Street that consists of Hillsdale, Matraville and Maroubra, and extends as far as the coast to the east. At its closest point, this area is located approximately 2.5 km from the proposed development.

Residential land uses surrounding Port Botany are accompanied by community support services and facilities such as schools, hospitals, libraries, community halls and churches.

The closest school to the new terminal is Banksmeadow Primary School located approximately 1.25 km north of the site. Other schools in the region include South Sydney High School, La Perouse Primary School, Daceyville Primary School, Matraville Primary School, Pagewood Marist Brothers School, Pagewood Primary School, Our Lady of the Annunciation Primary School and St Agnes Primary School.

14.2.5 Recreational Uses

Open space resources surrounding the site provide for: recreational opportunities; pedestrian and cyclist thoroughfares; areas of environmental protection including wetlands, remnant bushland and coastal foreshore zones; and the separation of different land uses.

Botany Bay is one of the most important water bodies in the region both as an ecological habitat and recreation resource. The recreational uses of the Bay include fishing, boating and swimming.

Penrhyn Estuary, which lies to the north of the existing terminal, is a small tidal inlet on the northern shores within Botany Bay. The Estuary is essentially comprised of sand and mudflats. Stormwater from the Botany/Banksmeadow catchment discharges into the upper reaches of the Estuary via Springvale and Floodvale Drains. Penrhyn Estuary provides feeding and roosting habitat for migratory and non-migratory shorebird and seabird species. There are signs advising against swimming and fishing in the area.

There is a boat ramp on the southern side of Penrhyn Estuary off Penrhyn Road. This facility is used by recreational fishers particularly during the summer months. Users include many formally organised groups as well as lone fishermen.

Foreshore Beach, which lies directly north of the proposed development site, is a beach comprised of estuarine sands dredged from Botany Bay during the Port Botany construction activities in the 1970's / 1980's. Coastal dune heath was planted and has colonised the hind dunes of the beach. Foreshore Beach is commonly used for various recreational activities including dog walking, fishing and swimming. Bacterial water quality sampling at Foreshore Beach indicated that the waters are unsuitable for swimming for about 40% of the sampling days in summer, but generally complied with criteria during winter (BBCC 2000). Reasons for this non-compliance are related at least in part to the South and Western Suburbs Ocean Outfall Sewer which crosses the Mill Stream upstream of Foreshore Road and is prone to overflowing into the Mill Stream in both dry and wet weather.

Foreshore Beach users come from within and beyond the Botany and Randwick City LGAs, such as Marrickville, Rockdale, Bankstown and Campbelltown. The lack of built concrete structures at Foreshore Beach and its relative length attracts users to the beach. Unlike the majority of Sydney's beaches, dog walking is permitted on Foreshore Beach which makes it appealing to the community.

The Botany Wetlands or Mill Ponds are located approximately 2 km north of the site and comprise a series of artificial lakes or ponds along the upper reaches of the Mill Stream. The wetlands provide roosting and feeding habitat for a small number of shorebird species.

Other recreational areas located in the suburbs surrounding Port Botany include Botany Golf Course, Eastlakes Golf Course, Bonnie Doon Golf Course, Botany Athletic Centre and Bunnerong Equestrian Park. Small reserves and sports grounds such as tennis courts and rugby fields are scattered throughout the residential areas, usually catering for active recreation activities and children's playgrounds. In addition, there are several parks and reserves in the area including Sir Joseph Banks Park, Garnet Jackson Reserve, Woomera Reserve, Yarra Bay Bicentennial Park and Botany Bay National Park. The beaches along Yarra Bay and Brighton Le Sands are also used extensively by the public during summer months.

14.2.6 Botany Bay Southern Foreshore

The southern foreshore of Botany Bay is dominated by the Towra Point Nature Reserve and associated aquatic reserve sanctuary zone off Kurnell Peninsula. Other open spaces include the Botany Bay National Park, Silver Beach and Towra Beach.

Major built areas along the southern foreshore include the following:

- residential – Kurnell with a population of some 2,600; and
- industrial – Caltex oil refinery, sand mining and landfill operations.

Maritime transport related land use along the southern foreshore includes the Caltex wharf at Kurnell which extends more than one kilometre from the shore line.

14.3 Land Use Trends

Reduced availability of land in the Sydney region has put pressure on residential land supplies, resulting in demand for multi-unit housing. Several new residential areas in the area have been created in the past 5 to 10 years from areas previously used for industrial purposes, for example multi-unit housing development in Botany (e.g. Banksia/Morgan Street, William Street and the Fairways development) and the rezoning by Botany Council of the Mascot Station Precinct (the land bounded by O'Riordan Street, Kent Road, Coward Street and Gardeners Road, Mascot) to 10(a) mixed use residential/commercial, 10(b) mixed use commercial/warehouse, and 3(b) business restricted. The number of residential developments has resulted in an increase in housing density. The increase in medium density housing within the region is being driven by lifestyle considerations associated with the proximity of services, the improvement of infrastructure (e.g. Airport Rail Link and Eastern Distributor) and the availability of large development sites.

The City of Botany Bay Council noted that heavy industry is slowly being replaced by light industrial, high-tech development, commercial and warehouse uses, with a high level of associated office component (BBCC 2000). This type of development also occurs in Mascot industrial zones north of Sydney Airport.

The competing demand for residential land has led the City of Botany Bay Council to allow residential uses and residential flat buildings in the general business zone (Zone 3a).

Local councils are also improving the environment of neighbourhoods where residential and industrial land uses co-exist, such as in Mascot, Botany and Banksmeadow within Botany Bay LGA and in Matraville within Randwick LGA. The coexistence of residential and industrial land uses would allow councils to accommodate increased demand for residential development while retaining the supply of industrial land and thus maintaining the region's significance as an employment base.

Botany Bay is one of 29 sites along the NSW coastline where commercial fishing has recently been banned by NSW Fisheries. The ban is expected to ease pressure on popular angling areas and provide the average enthusiast better access to fishing.

14.4 Assessment of Impacts During Construction

The potential impacts on land use arising from the construction of the new terminal and related developments in public recreation areas include:

- reclamation of a portion of northern Botany Bay to create approximately 60 ha of land for the new container terminal;
- impacts on the biophysical environment potentially affecting local amenity;
- increased traffic flows along certain routes and traffic disruptions at the construction site;
- operational issues to users of adjoining land; and
- changed access arrangements to public recreation areas adjacent to the construction site.

14.4.1 Noise

Construction noise would exceed noise criteria from some activities, particularly during piling for wharf construction. However, it should be noted that the Port Botany area is already subject to noise emissions from a variety of land uses including Sydney Airport, existing operations at Port Botany, road and rail traffic, and various industrial facilities.

Mitigation measures would be implemented to minimise the noise from construction activities, including a combination of restriction of work to daylight hours for most construction activities including piling, control of piling noise by using resilient dollies and hammer shrouds, and fitting noise control kits to machinery where practical. With the implementation of these mitigation measures the impact on the surrounding land uses from construction noise would not be significant and would be temporary. Further details of potential impacts of noise during construction are provided in **Chapter 22 Noise**.

14.4.2 Dust Generation

Dispersion modelling of dust emissions from construction of the proposed new terminal showed that incremental PM₁₀ (24-hour) concentrations and monthly dust deposition would not exceed the EPA site criteria of 16 µg/m³ and 2 g/m²/month respectively (PM₁₀ or Particulate Matter less than 10 microns is an indicator of inhalable particulate which penetrates the upper respiratory tract). Therefore, there would not be

a significant impact on surrounding land uses from dust during construction. Further details of the assessment of the potential impacts of dust generation during construction are provided in **Chapter 23 Air Quality**.

14.4.3 Visual Amenity

Construction activity would affect visual amenity:

- from the land including
 - Foreshore Beach, Penrhyn Estuary, the existing boat ramp; and
 - to some extent from Botany Golf Course and Sir Joseph Banks Park;
- from the water (Botany Bay); and
- from the air (Sydney Airport).

This impact on visual amenity during construction would be temporary, although the effect on visual amenity would be significant in areas close to the construction site. Further details on the assessment of the impacts of construction on visual amenity are provided in **Chapter 25 Visual Impact Assessment**.

14.4.4 Construction Traffic

Construction traffic volumes would represent a minor proportion of local peak traffic flows. Most construction traffic would be approaching the project site from the south, using Foreshore Road and Penrhyn Road, thereby not directly affecting the amenity of residential and local commercial areas. Further details on the assessment of the impacts of construction traffic are provided in **Chapter 21 Traffic and Transportation**.

14.4.5 Adjoining Land

The construction including staging, specification of equipment, lighting, and deployment of personnel and machinery would be planned and managed to comply with the operational safety requirements of Sydney Airport. Specific safety considerations to be addressed during construction planning include operational airspace safety, lighting, dust and communication equipment. Further information on the operational aviation issues is provided in **Chapter 30 Operational Aviation Issues**.

Dredging operations and the reclamation area once above the surface of the water may attract birds which may increase bird strike hazards at Sydney Airport. Mitigation measures would be implemented to discourage the attraction of birds and minimise any roosting activity on the reclaimed surface as described in **Chapter 29 Bird Hazard**.

The operations at the adjoining port terminals would not be affected by the construction of the Port Botany Expansion, except for temporary delays to trucks and trains due to road and rail infrastructure work.

The pipelines under Botany Bay are located outside the dredging footprint for the new terminal and would not be impacted by construction activities. Various components of the Port Botany Expansion would involve construction in areas over or adjacent to the Sydney to Newcastle pipeline and the jet fuel pipeline near

Foreshore Road. However, standard construction safeguards and notification procedures exist for construction activities in or near these types of pipelines. These safeguards and notification procedures would be strictly adhered to which would ensure that these pipelines would not be affected by any element of the construction campaign. Risks associated with a release from these pipelines are addressed in **Chapter 28 Preliminary Hazard Analysis**.

14.4.6 Access Arrangements to Roads and Public Recreation Areas

Construction activities would result in changed access arrangements to roads and public recreation areas adjacent to the construction site as follows:

- Foreshore Road – Traffic flow disruption would be experienced during construction of the intersections for the proposed access road to the main terminal and the new boat ramp.
- Penrhyn Road – Traffic flow disruption would be experienced during construction of the grade separation.
- Existing boat ramp – Access to the facility would be impacted on during construction because the western end of Patrick Stevedores terminal would be the main works area. The main works area would be accessed through a temporary construction road to be built through the back of the existing boat ramp parking area. To compensate for the loss of parking area, additional car and trailer parking would be provided at the western side of the existing boat ramp car park.
- Foreshore Beach – Access to some parts of Foreshore Beach would be restricted during construction of the rail bridge and the main access road bridge. Access to the middle section of the beach would be restricted during the construction of the tug berth, new boat ramp, car park and amenities, and to the northern section during beach improvement works.
- Penrhyn Estuary – Access to Penrhyn Estuary from Foreshore Road would be restricted during the construction of the rail line and the intertidal flats. Active construction areas may restrict movement of recreational craft from time to time.
- Botany Bay off Foreshore Beach – Recreational fishing and boating would be restricted in active areas of dredging and reclamation. Access to Botany Bay would be maintained at all times. A boating channel would be defined close to the Parallel Runway and marked by buoys.

14.5 Assessment of Impacts During Operation

The potential impacts on land use arising from the operation of the new terminal include:

- biophysical environmental impacts affecting local amenity and environmental protection values;
- increased road and rail traffic volumes;
- hazards and risks;
- operational issues to users of adjoining land;
- changes in demand for different land uses; and
- access arrangements to public recreation areas adjacent to the site.

14.5.1 Biophysical Environmental Impacts

Noise

The predicted L_{Aeq} noise levels from the new terminal would exceed the site criteria by up to 15 dBA during certain wind conditions, even with the construction of noise barriers along the northern and eastern boundaries of the new terminal. (L_{Aeq} is the equivalent sound pressure level or the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.) However, it should be noted that the predicted L_{Aeq} noise levels from the proposed expansion would be lower than the existing L_{Aeq} levels both during day and night time, even without a noise barrier.

The predicted L_{Aeq} noise levels from the operation of all terminals including the proposed Port Botany Expansion would exceed the predicted noise from the operation of the existing terminals by approximately 1 dBA, which would not be perceptible to the human ear.

The noise barriers would serve as a mitigation measure for predicted L_{A1} noise exceeding the sleep disturbance criteria for the site. (L_{A1} is the noise level exceeded for 1% of the time during a sampling interval. It represents the typical maximum noise level of transient events such as container impacts and horns.) It should be noted, however, that existing local noise sources, particularly traffic on Foreshore Road and Botany Road, Bunnerong Road and Military Road, all currently result in L_{A1} noise levels which already exceed the sleep disturbance criteria.

The contribution of port truck movements to overall road traffic noise levels, including at night time, is considered minor. Noise modelling showed that increased truck movements due to the proposed Port Botany Expansion would not raise overall noise level more than 0.4 dBA. This change is unnoticeable to the human ear. The contribution of all container terminal truck traffic from the three terminals at forecast capacity to overall traffic noise levels would be up to 3.2 dBA during some night time hours.

The higher number of train movements along the Botany Freight Rail Line would not increase maximum noise levels associated with the operations. More train movements would increase the overall L_{Aeq} noise levels (calculated over a 24 hour period) adjacent to the rail line by a maximum of 2 dBA (**Chapter 22 Noise**).

Noise and vibration across the metropolitan rail network, including the Botany Freight Rail Line which connects to Port Botany, is being addressed through a whole of government approach coordinated by the Office of Coordinator General of Rail (OCGR). In particular, OCGR is working closely with RIC (the rail track owner and manager) and the NSW EPA (the regulatory authority for noise) on this matter.

Further details on the assessment of noise impacts are presented in **Chapter 22 Noise**.

Air Quality

The potential for adverse air quality impacts from the operation of the proposed new terminal, combined with the P&O Ports and Patrick Stevedores terminals, when at capacity, would be minimal. There are expected to be only marginal increases in the concentration of the following air pollutants in surrounding areas due to the Port Botany Expansion:

- PM₁₀ (particulate matter less than 10 µm) which are inhalable and can penetrate the upper respiratory tract;
- NO₂ (nitrogen dioxide, whose reactive nature can result in damage to the mechanisms that protect the human respiratory tract);
- SO₂ (sulphur dioxide which has a range of health effects and emissions have the potential to mix with water vapour to form acids); and
- CO (carbon monoxide).

Modelling results showed no exceedences of the site criteria for the above pollutants within residential areas or at sensitive receivers (i.e. schools, hospitals, and the young, elderly and those with respiratory ailments within residential areas). Further details on the assessment of air quality impacts are presented in **Chapter 23 Air Quality**.

Surface Water and Groundwater

Hydrologic and hydraulic modelling showed that the proposed development would not have any adverse impact on local flood behaviour in the catchments surrounding Port Botany for events up to the 200 year annual recurrence interval (ARI) flood, and would not cause an increase in flood levels within Penrhyn Estuary. In the Probable Maximum Flood, the average recurrence interval of which is in the order of 1 in 10,000 years to 1 in 1,000,000 years, there would be a minimal increase in the order of 0.06 - 0.12 m in Bay water level near the outlets of Drains 1 and 2 (Outer Penrhyn Estuary), and 0.02 m in levels upstream of Foreshore Road in the Floodvale Drain catchment. The latter change in level is at the limit of the model's ability to predict change.

Reduced tidal flushing in Penrhyn Estuary would likely result in increased siltation rates and nutrient and faecal coliform concentrations in both transient and ambient conditions as well as slight changes in temperatures and dissolved oxygen concentrations. (Transient conditions refer to wet weather events. Ambient conditions refer to day to day delivery of low flows from the catchment in dry weather.) Water quality would, however, be within guideline values during ambient conditions.

The new terminal's stormwater management system would minimise contaminated runoff discharging into Botany Bay through a first flush system. Further details on the assessment of hydrology and water quality impacts are presented in **Chapter 16 Hydrology and Water Quality**.

The proposed terminal reclamation would have no effect on groundwater levels on the landward side of the present shoreline, or on the rate or direction of groundwater flow or the natural migration of contaminants already present in the groundwater north of the site. The reclamation for the new boat ramp and the planned realignment of sections of Foreshore Beach would result in minor localised increases in groundwater levels near residential areas to the north of the new terminal, in Sir Joseph Banks Park and at the western end of the Foreshore Beach. The habitat enhancement works within Penrhyn Estuary would result in minor localised decreases in groundwater levels beneath Botany Golf Course and south of Foreshore Road adjacent to Penrhyn Estuary. The anticipated changes in groundwater levels are small in the context of natural variations that occur in groundwater levels within the Botany Sands aquifer due to rainfall variability, tidal influence and variations in groundwater abstraction. Such changes are therefore insignificant. Further details on the assessment of groundwater impacts are presented in **Chapter 17 Groundwater**.

14.5.2 Road Traffic

On average, approximately 1,457 trucks currently visit Port Botany each day. By 2011, when the proposed new terminal is expected to have commenced operations, this figure would have increased only marginally to approximately 1,550 trucks per day. This marginal increase in overall truck visits is primarily due to improvements in rail utilisation expected to occur at Port Botany between now and 2011.

The numbers of trucks visiting Port Botany would slowly increase in line with the actual growth in container trade, and by 2021, the total number of truck visits to all terminals at Port Botany is expected to be approximately 2,350 per day. The proposed new terminal would generate about 40% of the total number of truck visits (i.e. approximately 940 per day) once it was fully developed.

The highest volumes of port related traffic would be on Foreshore Road, Botany Road (between Penrhyn Road and Bumborah Point Road) and Bumborah Point Road. Port trucks would make up a relatively small proportion of the total future traffic on routes further from the port area.

Port related traffic would not result in the deterioration of intersection performance and the level of service of major intersections in the Port Botany precinct. The cumulative traffic analysis which includes major proposed and ongoing development in the subregion showed that the contribution of Port Botany to forecast peak traffic flows in 2021 would be less than 2%. Details of the impacts of the proposed Port Botany Expansion on traffic and landside transport is summarised in **Chapter 21 Traffic and Transportation**.

An increase in the use of rail to move container freight, to at least 40% of container throughput, and improvements in truck efficiencies would be promoted by Sydney Ports Corporation to help reduce road traffic volumes. The proposed Port Botany Expansion would also provide adequate truck parking space to prevent truck queuing outside the port boundary.

14.5.3 Rail Traffic

The projected increase in rail mode share in moving container freight and growth in container trade volumes would result in an increase of daily train visits to the new and existing port terminals and the P&O Trans Australia depot from the current 15 to up to 54. Train trips to and from the new terminal would account for about 35% of the projected total.

The increased number of train trips would result in the following potential land use impacts.

Capacity of the Rail Network

The existing Enfield to Port Botany dedicated freight rail line can service 96 movements per day, sufficient to handle the current levels of train movements. With the forecast container trade growth and the target increase in rail mode share, the rail capacity analysis shows that the capacity of the freight line would be reached by between 2011 and 2016 (**Chapter 21 Traffic and Transportation**).

However, once the duplication of the line has been completed, it would be able to accommodate the forecast rail transport demand associated with the proposed Port Botany Expansion. The section that remains to be duplicated is between Cooks River and the Botany Yard. RIC (the line owners and managers) have commenced the approvals process for this duplication.

A broader rail related issue with regard to future growth in container rail freight would be the impact on the shared metropolitan network of increased traffic in intermodal terminals (**Chapter 21** *Traffic and Transportation*). Based on the projected number of train paths that would be required to meet future container volumes from the entire port, there would be a number of sections of the network where train numbers would increase significantly. One such area of concern is the Main Western Line, in particular the section between Clyde and Lidcombe. Capacity constraints would be alleviated by increased train lengths from intermodal terminals and decreased spacing between trains, or by the construction of additional dedicated freight lines.

14.5.4 Hazard and Risk

The Preliminary Hazard Analysis undertaken as part of this EIS (summarised in **Chapter 28** *Preliminary Hazard Analysis*) assessed the risks arising from the handling, transport and storage of dangerous goods at the new terminal, including external impacts due to events arising from an aircraft crash on the terminal and incidents at neighbouring hazardous facilities. The assessment concluded that the individual, societal, biophysical environment and transportation risks posed by the proposed development would be acceptable and would satisfy PlanningNSW risk criteria and the recommendations of the *Port Botany Land Use Safety Study* (DUAP 1996).

14.5.5 Adjoining Land

The operation of the new terminal could affect the operations of Sydney Airport through impacts on radar, navigation systems, light spill and bird strike hazards. These impacts would be mitigated through a combination of airport system tuning and site operation adjustments, maintaining minimum distances and height restrictions, alternative technologies, properly designed lighting, and minimising bird attraction to the new terminal and boat ramp.

These mitigation measures would ensure that the Port Botany Expansion would not restrict airport operations. These measures are described in more detail in **Chapter 29** *Bird Hazard* and **Chapter 30** *Operational Aviation Issues*.

The increase in the size and number of ships expected at Port Botany during the operation of the new terminal would not damage the fuel pipelines located beneath Botany Bay. The operation of the new terminal would also have no impact on the Sydney to Newcastle pipeline near Foreshore Road.

14.5.6 Changes in Demand for Different Land Uses

The proposed Port Botany Expansion would consolidate Port Botany's role as the major container port in NSW.

This development may result in competing demand for available land for the following:

- landside area for container yards;
- commercial and industrial space for port related business like cargo forwarding and freight brokering, and for other businesses which may be encouraged by increased trade to establish in the area; and
- residential area for increased port related employment.

Industrial Land

Property analysts have noted that the proximity of Botany (and South Sydney) to Port Botany and Sydney Airport has provided a steady demand for industrial space (Knight Frank 2002), particularly from the transport and storage sector. This is despite competitive pressures from residential and commercial developments, and the availability of less expensive land or space in the southwestern suburbs which have been made more accessible with the completion of the M5 East Motorway.

Knight Frank (2002) estimated the potential demand for industrial space over the next ten years to be about 300,000 m², with the transport and storage sector projected to account for almost half (47%) of the volume. A significant portion of the demand would have to be met by new developments as existing facilities would not be able to absorb the increase.

In the Botany LGA, there are only 9.5 ha of industrial land available for development. The balance would have to be supplied by the redevelopment of older secondary sites in the long term. The paucity in available land could result in a major upward shift in rents, land values and prices.

Residential and Commercial Land

Demand for residential property in the Botany area has been strong, as seen in the growth in median unit prices for Botany LGA. The Real Estate Institute of NSW reported this growth to be 128% from 1993 to 2000 (Colliers Jardine 2001). Demand is and would continue to be fueled mainly by the area's proximity to Sydney's CBD and the eastern beaches and the availability of public infrastructure. The paucity of available land is expected to keep residential property prices strong.

The operation of the new terminal is predicted to generate 2,823 full-time equivalent direct and flow-on jobs during 2009/10, increasing to 9,106 in 2024/25. It is anticipated that a proportion of the workers filling these employment opportunities would contribute to the demand for residential accommodation in the area.

The City of Botany Bay and Randwick Councils are responding to conflicting demands through their planning controls which recognise port related special land uses and provide for higher density residential development.

Demand from commercial occupiers is expected to be sustained by cheaper rents of commercial space compared to the Sydney CBD. Commercial space is often provided in new large mixed developments which incorporate retail and other facilities into new residential developments to create self serviced communities.

14.5.7 Changes to Access Arrangements to Public Recreation Areas

A summary of the changes in access arrangements to public recreation areas arising from the construction and operation of the proposed Port Botany Expansion is shown in **Table 14.1**.

The proposal would enable the continued use of the public open space corridor between Penrhyn Road and the Mill Stream outlet, including Foreshore Beach and Penrhyn Estuary. A recreational boating channel would always be maintained to allow access to Botany Bay.

Access to certain areas would be permanently restricted due to port operational and environmental protection requirements. Habitat enhancement works at Penrhyn Estuary would limit pedestrian access to the Estuary to a boardwalk and viewing platform to protect wildlife in this area. The operation of the new

terminal would result in access restrictions to the channel between Foreshore Beach and the new terminal, and to the ship approach channels and turning basins.

Improvements on Foreshore Beach would enhance access arrangements and public recreation opportunities along the foreshore. Sydney Ports Corporation would construct a pedestrian overpass over Foreshore Road to provide pedestrian access from Sir Joseph Banks Park to Foreshore Beach and the replacement boat ramp.

Pedestrian foreshore/ beach linkages would be enhanced with the construction of a pedestrian path/cycleway between Mill Stream and Penrhyn Road. The path/cycleway could later link to any proposed cycleway around Botany Bay. An underpass would be provided for bicycles and pedestrians beneath the new road and rail bridges.

Table 14.1 Changes in Access Arrangements to Public Recreation Areas

| LOCATION | PROPOSED WORKS | COMMENTS |
|--------------------------|--|---|
| Foreshore Road | Intersection with main terminal access road | Creation of turning lanes, installation of signals. |
| | Intersection with boat ramp access road | Creation of turning lanes. |
| Penrhyn Estuary | Rail line extension | Access from Foreshore Road to Penrhyn Estuary across rail line corridor to be restricted by safety fencing. |
| | Intertidal flats, ecological habitat enhancement | The Estuary would be fenced and access would be restricted to a boardwalk at the western end which would connect to a viewing platform to be constructed west of the Government Pier remains. The viewing platform would allow observation of wildlife within the Estuary area. |
| Penrhyn Road | Construction of grade separation | Road/rail intersection waiting would be removed and would reduce likelihood of trucks queuing outside the port area. |
| | Construction of Inter-Terminal Access Road | Existing boat ramp to be relocated to new site off Foreshore Road. |
| Foreshore Beach (East) | Road and rail bridges | Public access would be maintained under both the road and rail bridges. |
| | New terminal | Restriction to swimming and recreational boating access for public safety and operational reasons in the channel to be created between the new terminal and Foreshore Beach. |
| Foreshore Beach (Middle) | Tug berth, boat ramp, car park and amenities | Minor reduction in beach length. Access to beach and boat ramp enhanced. Parking space provided for users. |
| Foreshore Beach (West) | Beach enhancement | Beach profiled and enhanced to provide greater public amenity. |
| Foreshore | Cycleway/Pathway | Enhanced foreshore access and recreational opportunities. |
| Sir Joseph Banks Park | Pedestrian overpass | Enhanced access to and from Foreshore Beach. |
| Botany Bay | New Terminal | Recreational boating would be restricted to a channel between the Parallel Runway and the new terminal. The new terminal and associated navigation channels would represent a loss of area in Botany Bay for recreational fishing. |

14.6 Mitigation Measures

The impacts of construction and operation to surrounding land uses would be minimised through the implementation of a comprehensive set of mitigation measures which are summarised in **Chapter 37** *Compilation of Mitigation Measures*.

Sydney Ports Corporation would assist planning authorities in addressing issues of allocation of available land by participating in and providing inputs to local and regional development planning.

14.7 Conclusion

The proposed Port Botany Expansion would consolidate Port Botany's position as NSW's main container port and help maintain Botany Bay's importance as a regionally significant transport hub and employment base. The proposal is compatible with industrial development and transport infrastructure already existing in the area.

The construction of the new terminal would affect the biophysical environment, mainly through noise and increases in traffic in certain areas. The implementation of environmental mitigation measures would minimise impacts to surrounding land uses.

Measures to address potential impacts of the new terminal on the operations of Sydney Airport have been identified to minimise potential conflicts.

The proposal would enable the continued use of the public open space corridor between Penrhyn Road and the Mill Stream outlet, including Foreshore Beach and Penrhyn Estuary. Improvements on Foreshore Beach would enhance access arrangements and public recreation opportunities along the foreshore. A recreational boating channel would always be maintained to allow access to Botany Bay.

Access to certain areas would be restricted temporarily due to construction activities and permanently for operational and environmental reasons. Habitat enhancement works at Penrhyn Estuary would limit pedestrian access to the Estuary to a boardwalk and viewing platform to protect wildlife in this area. The operation of the new terminal would result in access restrictions to the channel between Foreshore Beach and the new terminal, and to the ship approach channels and turning basins.

The projected increase in container trade would create demand for industrial space for port related business, although this demand would be moderated by increased freight movement by rail. Port related employment would also contribute to demand for residential accommodation. Sydney Ports Corporation would assist planning authorities in addressing the conflicting demands for allocation of available land to industrial and residential land uses by participating in and providing inputs to the local and regional development planning process.