B9 Project - New Paper Mill – Revised Modification #2

ENVIRONMENTAL ASSESSMENT REPORT

- Subdivision and Site Layout
- Final
- 16 February 2010

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Sinclair Knight Merz
ABN 37 001 024 095
100 Christie Street
PO Box 164
St Leonards NSW
Australia 1590
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.skmconsulting.com

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Executive Summary

Project approval for Amcor Packaging (Australia) Pty Ltd ("AMCOR") New Paper Mill ("B9 Project") was granted by the Minister for Planning on 20 July 2007 (Application No: 05_120). Since then detailed design of the New Paper Mill has progressed significantly and as a result there are a number of modifications to the layout and operational characteristics which are required to ensure that the New Paper Mill operates efficiently, safely and with minimal additional environmental impact. AMCOR is also seeking a modification to allow the subdivision of one of the lots of land at the New Paper Mill site to enable excess land to be sold to fund the further development of the New Paper Mill. In the following sections each of the proposed modifications to the Approved Project are described and their environmental impact summarised.

Relocation of the Engineering Store vehicle access further south along McCauley Street to opposite Raymond Avenue

Overall this proposed modification would have a positive impact as the access would be moved further away from residential receivers (approximately 100 m further away) – resulting in lower potential noise and traffic impacts. Road safety would also be improved in locating the access opposite an existing side road, forming a four way intersection.

An additional B-Double vehicle exit only access on McCauley Street for Finished Product vehicles

Overall this proposed modification would have a positive impact as the access would be moved further away from residential receivers (approximately 250m from the nearest residential area)– resulting in lower potential noise and traffic impacts. Finished Product vehicles are also the most likely vehicles to be leaving the site via McCauley Street at night time.

Use of the accesses on McCauley Street for the exit southbound only of heavy vehicles including B-Doubles from AMCOR's operations

There would be increased traffic, especially heavy vehicles, on McCauley Street as a result of this modification. During the AM peak, the number of southbound vehicles would almost double from 96 to 176 vehicle movements per hour. However during the PM peak, the increase would be less significant, namely from 134 to 169 vehicle movements per hour. The intersection of McCauley Street and Botany Road was modelled to determine whether the intersection would operate at an acceptable level of service with the increased traffic from AMCOR and the McCauley Street precinct. The results of the modelling indicate that there would no change in the level of service at the intersection (ie. would remain level B) with the predicted increased traffic – and this level of service would be acceptable to the Council and RTA.

While there would be traffic and noise impacts from increased traffic on McCauley Street, these impacts would be mitigated by:

- The relocation of site exits (as described above) further away from residential areas. Road noise guidelines would not be exceeded in any residential area due to the increased traffic;
- All AMCOR traffic would enter the site via the Botany Road entrance and no AMCOR traffic would use McCauley Street to enter the site (ie. travel northbound). It should be noted that vehicles accessing the McCauley Street precinct would use McCauley Street to access the development precinct;
- All heavy vehicles would be required to exit the site southbound (ie. towards Botany Road and away from residential areas). This would be achieved through physical traffic management measures (eg. signage, barriers, kerbs etc), contractual requirements for transport subcontractors and driver education;
- The majority of heavy vehicle movements from AMCOR's operations would be during the day. Generally heavy vehicles exiting into McCauley Street at night time would be Finished Product vehicles, whose proposed exit point on to McCauley Street is 250m away from the nearest residential area;
- Approval is only being sought for southbound B-Double use on McCauley Street between Raymond Avenue and Botany Road;
- McCauley Street would be upgraded to provide a safe modern road for the increased traffic.

The upgrade of McCauley Street from Botany Road to Raymond Avenue to make it suitable for B-Double use (southbound only) as well as use by other heavy vehicles

McCauley Street would be upgraded to meet Council's requirements for B-Double and heavy vehicle use. This would have a positive impact on parking, safety and visual amenity as:

- Parallel parking lanes would be provided on both sides of McCauley Street, improving the currently unregulated parking on the eastern side of McCauley Street;
- The road corridor would be increased by about 2m width as AMCOR would dedicate land along its boundary to enable the upgrade to occur;
- A generous 3m verge and footpath would be provided between the eastern kerb and AMCOR's boundary to allow safe pedestrian movements;
- The McCauley Street corridor would have an improved visual appearance with a modern road and additional landscaping.

There would be additional impacts during the construction of the upgraded road including noise, traffic and access impacts. However these impacts would be temporary and appropriate

consultation and planning with affected businesses and residents as well as Council would be undertaken to minimise these impacts to acceptable levels.

Changes in the site layout as a result of further development of the design

Approval for a number of changes in the site layout is being sought. Generally most of the changes result in components of the New Paper Mill being located further away from residential areas. There are no new facilities or activities proposed as part of this modification. Overall the impact of the changes in site layout would be negligible.

An increase in size of the Finished Product Store

It is proposed that the Finished Product Store is doubled in size from about 5,000m^2 to 10,000m^2. Most of the increase in size would be accommodated by extending the store to the east, however there would be increased frontage of the store along McCauley Street. The height of the store would not change and there would be increased landscaping within the AMCOR site along McCauley Street to minimise visual impacts. There would be no increase in traffic with the larger Finished Product Store as the capacity of the New Paper Mill would be the same. Also a larger Finished Product Store would allow the loading of Finished Product vehicles within the store building.

Subdivision of Lot 1 DP772737 to allow the sale of excess land, to fund the development of the New Paper Mill

The subdivision of Lot 1 DP772737 would create two new development precincts, the McCauley Street Precinct and the Botany Road precinct. Traffic entering and exiting the McCauley Street Precinct would use a shared access on McCauley Street, and traffic entering and exiting the Botany Road Precinct would use the shared access on Botany Road. The new development precincts would provide additional industrial zoned land in the Port Botany employment area and their sale is required to fund the development of the New Paper Mill. While the sale of the new development precincts may occur in the near future, development of the new precincts would not occur until at least 2011, when AMCOR has no further use for the land. Any development in the new precincts would be subject to separate development application and approval processes.

The dust, noise and odour impacts from the New Paper Mill on the new development precincts would be acceptable for industrial zoned land- and no additional mitigation measures would be required.

Modification of operational noise limits.

Operational noise modelling was undertaken to include new detailed design information, the changes proposed in this modification and the removal of all buildings and other structures between the proposed new AMCOR site boundary and residential receivers. The removal of all buildings

and other structures between the proposed new AMCOR site boundary and residential receivers and the changes in site traffic movements due to restrictions in the capacity of the Botany Road access resulted in predicted noise levels exceeding the approved noise limits at many of the residential receivers – even after reasonable and feasible noise mitigation measures were included.. Therefore AMCOR is seeking a modification to the approved noise limits as:

- The noise levels generated by the New Paper Mill would still be lower than the approved noise levels for the existing operations. The Existing Paper Mill generates very few noise complaints and these are generally associated with one-off activities and/or events (eg. emergency alarms). With the modern New Paper Mill, these one off events would occur less frequently and measures would be included to minimise the impact of these events (eg. internal rather than external alarms);
- The original noise assessment did not include the assessment of the removal of the No: 7 and No: 8 Paper Machine buildings and other structures;
- AMCOR's proposal to change the phasing of the traffic lights at the Botany/Bomborah Point Road intersection has been rejected resulting in increased traffic exiting the site via McCauley Street and increased noise impacts on residential areas north west of the site;
- There is likely to be further noise mitigation once the development of the new precincts occurs. Minor works such as an additional sheet metal fence along the boundary of the new development precincts with the residential areas, for example, would result in substantial noise reductions in residential areas. However, as the type of development in the new development precincts cannot be assumed for noise modelling purposes, this cannot be included in the assessment;
- The number of residences exposed to the higher noise levels would be low and would be predominately the first row of residences nearest to the New Paper Mill. Noise levels from the New Paper Mill would comply with the currently Approved Project noise limits at residences further away from the boundary;
- The existing sleep disturbance criteria at night would be met in all residential areas; and
- Reasonable and feasible noise mitigation measures have been implemented to minimise noise impacts where possible. Although it is recognised that other noise mitigation measures could be implemented these are likely to impose unreasonable operational restrictions or financial costs to the project.

1. Introduction

Project approval for Amcor Packaging (Australia) Pty Ltd ("AMCOR") New Paper Mill ("B9 Project") was granted by the Minister for Planning on 20 July 2007 (Application No: 05_120). Since then detailed design of the New Paper Mill has progressed significantly and as a result there are a number of modifications to the layout and operational characteristics which are required to ensure that the New Paper Mill operates efficiently, safely and with minimal additional environmental impact. AMCOR is also seeking a modification to allow the subdivision of one of the lots of land at the New Paper Mill site to enable excess land to be sold to fund the further development of the New Paper Mill. The modifications to the approved project being sought are:

- Relocation of the Engineering Store vehicle access further south along McCauley Street to opposite Raymond Avenue;
- An additional B-Double vehicle exit only access on McCauley Street for Finished Product vehicles;
- Use of the accesses on McCauley Street for the exit southbound only of heavy vehicles including B-Doubles from AMCOR's operations;
- The upgrade of McCauley Street from Botany Road to Raymond Avenue to make it suitable for B-Double use (southbound only) as well as use by other heavy vehicles;
- Changes in the site layout as a result of further development of the design;
- An increase in size of the Finished Product Store;
- Subdivision of Lot 1 DP772737 to allow the sale of excess land, to fund the development of the New Paper Mill; and
- Modification of operational noise limits.

An Environmental Assessment Report for similar modifications to the Approved Project was exhibited in May 2009. Based on the submissions received during the exhibition period, the proposed modifications have been revised and this version of Environmental Assessment Report has been prepared to replace the previous May 2009 Environmental Assessment Report.

This Environmental Assessment Report contains the following sections:

- **Introduction** – This chapter contains an introduction to the proposed modifications and the Environmental Assessment Report;
- **Existing and Approved Project** – This chapter describes the existing operations and the Approved Project (based on the project approval received in 2007);
- **Consultation** – this chapter describes the community and government stakeholder consultation that was undertaken in preparing this report;
- **Description of the proposed modifications** – This chapter describes in detail the proposed modifications to the Approved Project that AMCOR is seeking approval for;
- **Key issues – impact assessment** – This chapter assesses the impact of the proposed modification on key environmental aspects as determined by the Director-General's requirements;
- **Conclusion** – This chapter provides an overall summary of the key impacts and assesses the proposed modifications against the objects of the Environmental Planning and Assessment Act, 1979; and
- **Appendices** – The Appendices contain the detailed technical reports to support the impact assessment chapter.

2. Existing and Approved Project

2.1. Historical operations

Paper making at AMCOR's Botany site commenced in 1901 with Federal Paper Mills' construction of No. 1 Machine. A further seven paper making machines were constructed progressively during the next 70 years, accompanied by various building expansion works and decommissioning of older machines. AMCOR Packaging now operates the paper making facility at Botany, where the majority of paper making activities occurs towards the north eastern end of the site at the No. 7 and No. 8 paper making machines.

2.2. Existing operations

AMCOR currently operates two paper machines at the Botany site (Machine No: 7 and 8). These paper machines are 30-40 years old and are inefficient in terms of energy and water use in comparison to more modern paper machines. These paper machines process approximately 270,000 tonnes of waste paper per year to make 250,000 tonnes of recycled paper per year. The recycled paper is sold to other companies or used by other AMCOR facilities to make cardboard for packaging.

Supporting the two paper machines on site is other associated infrastructure such as:

- Waste Paper Storage Yard – this area stores baled and loose waste paper before it is processed.
- Waste Paper Plant – this facility processes the raw waste paper to produce pulp suitable for paper making (and waste products that cannot be used in paper manufacture). The process for producing pulp is relatively benign and basically involves slashing the paper in water and removing any unsuitable materials. Because the waste paper has already been processed, the production of pulp is not as energy intensive or does not use toxic chemicals as are used for the production of pulp from trees;
- Reel Stores– there are several locations for the temporary storage of finished product (ie. recycled paper) before it is despatched to its end users;
- Engineering stores – these buildings contains machinery, equipment and workshops that support the operation of the site;
- Office – an office consisting of demountable buildings is located near the Botany Road entrance;
- Utility services infrastructure – this includes substations, potable and non-potable water tanks, gas, sewer and stormwater pipelines and other similar facilities;
- Other services infrastructure – this includes the wastewater treatment plant, weighbridges, chemical storages and other onsite infrastructure (eg. internal roads).

The Botany site also contains a significant quantity of redundant infrastructure such as disused buildings and services infrastructure (eg. tanks). Most of this redundant infrastructure has been (or will be) demolished as part of the New Paper Mill development.

2.3. Approved Project

In 2006, an Environmental Assessment (EA) for a New Paper Mill was prepared and exhibited. After exhibition of the EA, a Submissions Report was prepared and submitted to the Department of Planning (DoP) in early 2007. Project approval for Amcor Packaging (Australia) Pty Ltd ("AMCOR") New Paper Mill ("B9 Project") was granted by the Minister for Planning on 20 July 2007 (Application No: 05_120).

The Approved Project consists of:

- Demolition of existing redundant buildings and infrastructure;
- Construction and operation of a New Paper Mill with a nominal capacity to produce 345,000 tonnes of finished product a year;
- Construction and operation of a Finished Products Warehouse;
- Construction and operation of an Engineering Store;
- Construction and operation of auxiliary infrastructure such as roads, services etc;
- Refurbishment of some existing infrastructure such as the Waste Paper Plant, Waste Paper Storage Yard; and
- Decommissioning of the Machine No:7 and No:8 once the New Paper Mill is operational.

Figure 1 shows the site layout of the currently Approved Project (ie. without the proposed modifications described in this document). A description of the approval documents and previous modifications to the Approved Project is presented in **Table 1**.

- **Table 1: Description of approvals and modifications for the New Paper Mill project**

Description	Status
Environmental Assessment	Exhibited in 2006
Submissions Report	Prepared and submitted in early 2007
Project Approval	July 2007
Modification #1 – Additional demolition of redundant infrastructure	Approved in 2008 by Department of Planning
Modification #2 – Changes in site layout and subdivision	Exhibited in May 2009 – was not approved
Revised Modification #2 - Changes in site layout and subdivision	This document

Director-General Requirements (DGRs) for Modification #2 have been issued and are included in **Appendix A**. The Approved Project is described below for the key issues identified in the DGRs for Modification #2.

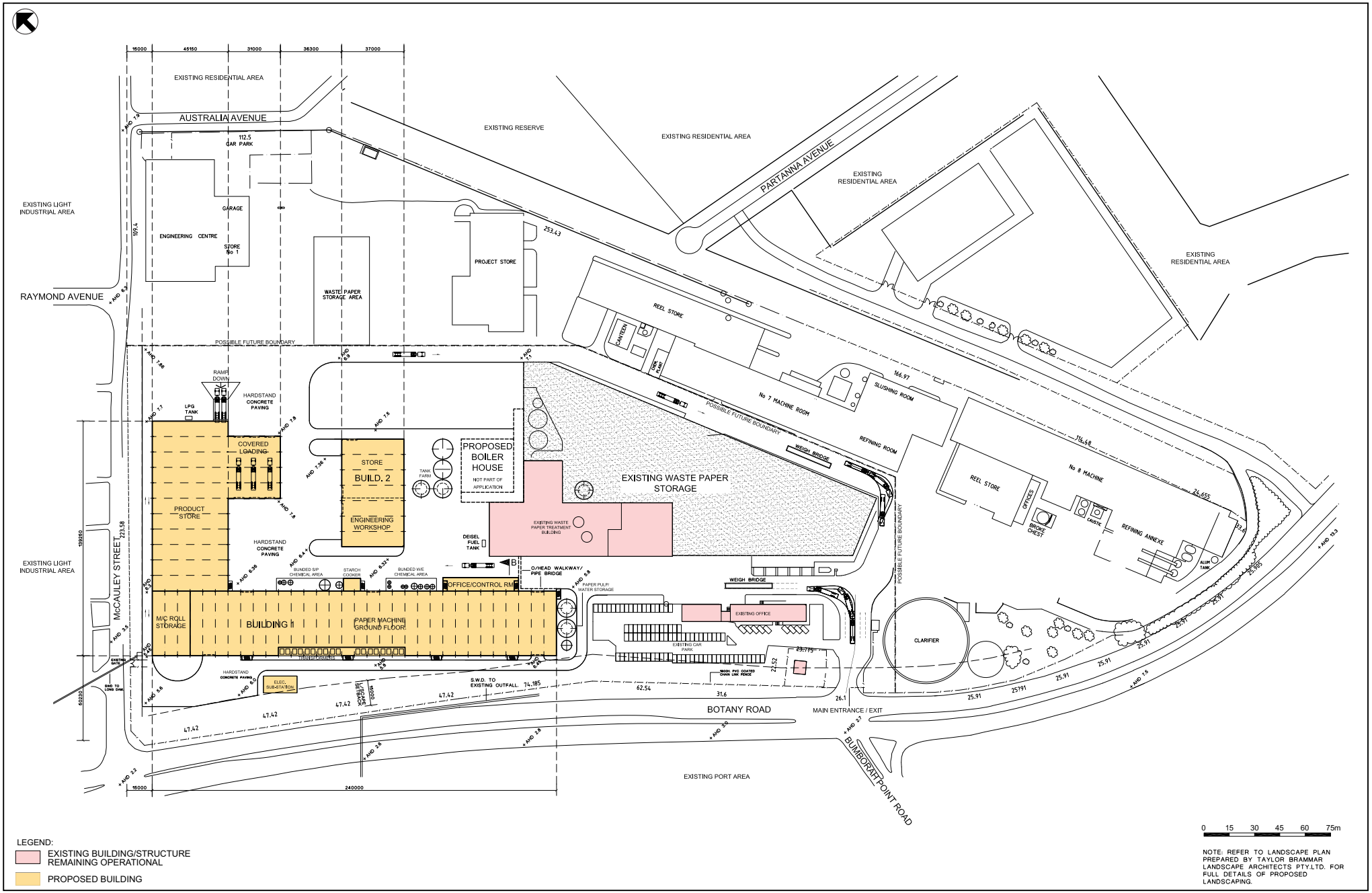


Figure 1: Plan of Approved Project

2.3.1. Transport

Access and transport arrangements for the Approved Project include:

- All vehicles (apart from those accessing the Engineering Store) would access and exit the site using the Botany Road access;
- A small number of light commercial vehicles and 6 tonne trucks would continue to access the Engineering Store via an existing access near the corner of McCauley Street and Australia Avenue.

2.3.2. Noise

Noise modelling was undertaken for the New Paper Mill and noise limits at the nearest residential receivers (based on the modelling and the Industrial Noise Policy) are contained in the MCoA (and presented in **Table 2**). The noise modelling that these limits are based on is contained in the Submissions Report (SKM 2007).

- **Table 2: Operational noise limits**

Location	Daytime Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)	Evening Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)	Night Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)
Cnr McCauley Street and Australia Avenue	46	39	39
Australia Avenue	47	40	40
Murrabin Avenue	45	39	38
Patranna Avenue	44	39	36
Moorina Avenue	35	35	35

There were no specific noise limits established for the new development precincts. Based on the noise modelling in the Submissions Report, predicted noise levels in the new development precincts have been determined and are presented in **Table 3**.

- **Table 3: Predicted noise levels at excess land (From 2007 Submissions Report)**

Location	Daytime Noise Levels ($L_{Aeq\ 15\ min}$)	Night time Noise Levels with FEL+ Truck ($L_{Aeq\ 15\ min}$)	Night time Noise Levels without FEL+ Truck ($L_{Aeq\ 15\ min}$)
McCauley Street Precinct	47-52 dB(A)	35 -40 dB(A)	35 -40 dB(A)
Botany Road Precinct	45-60 dB(A)	45-50 dB(A)	40-45 dB(A)

2.3.3. Odour

Odour modelling was undertaken for New Paper Mill during the Environmental Assessment. It was recognised at the time that the odour modelling was very conservative as there were insufficient detailed design data and odour emissions data to accurately model the odour levels. Also most of the odour complaints occur when there are problems in the existing water management system due to its age and inherent design issues (eg. dead zones in the water management system which allow the build-up of odour casing micro-organisms). The water management system for the New Paper Mill would eliminate most of the existing problems and therefore is likely to significantly reduce complaints.

Odour levels at the nearest residential receivers were predicted to be between 3 and 5 OU/m^3. A previous study undertaken to assess the effectiveness of an odour Pollution Reduction Program required by the EPA, indicated that odour levels of 6 OU/m^3 would not result in an offensive odour to the general public.

In relation to the new development precincts, odour levels were predicted to be in the range of 5 to 6 OU/m^3.

2.3.4. Air quality

The Environmental Assessment identified that there is some dust generated from the handling of waste paper in the Waste Paper Storage Yard. However there have been no complaints regarding dust from the Paper Mill. AMCOR also monitors dust deposition at a number of perimeter locations and the vast majority of results are below appropriate criteria.

2.3.5. Soil and water

2.3.5.1. Sewerage and stormwater

The Environmental Assessment and Submissions Report contained some details on stormwater and sewerage systems on site. Figure 6.4 in the Environmental Assessment detailed stormwater arrangements for the site and divided the site into 4 zones.

- Zone 1 - The area draining to the process water system (and eventually the sewer) would be substantially reduced in size and only include at a maximum the Waste Paper Storage Area and surrounding roads (decrease from 8.6 ha to less than 3 ha). AMCOR is currently investigating removing all stormwater discharges to the process water system;
- Zone 2 - Stormwater from this area would be directed to Long Dam or Bunnerong Canal;
- Zone 3 - Stormwater from trafficked areas in the New Paper Mill would drain to a Gross Pollutant Trap (GPT) and Oil Separator to remove any suspended particles and oils before discharge into Long Dam or Bunnerong Canal; and
- Zone 4 - Stormwater collected from the New Paper Mill building roof would be discharged without treatment into Long Dam or Bunnerong Canal.

Any stormwater that collects in chemical unloading and storage areas would be directed to the internal process water system. Within the New Paper Mill, a floor drainage system would be installed, however this would not be connected to the external stormwater system. All spills and leaks would be contained within the New Paper Mill building and directed to the process water system.

AMCOR has a privately owned sewer line that connects the site directly to the South Western Ocean Outfall Sewer (SWSOOS). This sewer line transfers process water and contaminated stormwater to the SWSOOS. The New Paper Mill would continue to use this private sewer line for its process water discharges. There is also another sewer located along Botany Road which collects discharges from domestic sources on-site (eg. toilets, shower, basins etc)

Since project approval Sydney Water has agreed to allow AMCOR to discharge all process water and a reduced volume of contaminated stormwater into the SWSOOS in dry and wet weather. Currently the Existing Paper Mill is not permitted to discharge into the SWSOOS after significant wet weather events and has to discharge into Botany Bay.

2.3.5.2. Contamination

The Environmental Assessment presented information on the contamination status of soils and groundwater at the site including the McCauley Street Precinct. Although no significant widespread contamination has been discovered, pockets of soils with levels of copper, lead or petroleum hydrocarbons that exceed the adopted site assessment criteria have been detected. Also asbestos has been found in fill material on the site.

Since completion of the Environmental Assessment significantly more sampling has been undertaken both in the New Paper Mill and new development precincts. A Remediation Action Plan has been developed for the New Paper Mill area – and areas that were previously inaccessible due to presence of buildings have now been sampled and remediation where required in these areas has commenced.

2.3.6. Hazards

A Preliminary Hazard Assessment (PHA) was prepared for the New Paper Mill in the 2007 Submissions Report. The quantities of chemicals to be stored on site are presented in **Table 4**. Only Class 8 chemicals (Corrosive) exceeded the SEPP33 screening level thresholds.

- **Table 4: Summary of dangerous goods during operation of New Paper Mill**

Dangerous Good Class and type	Packing Class	Maximum quantity for New Paper Mill Operation	SEPP 33 Screening Level	Above SEPP 33 Screening Level
2.1 (LPG)	N/A	6,775L	16,000 L	No
2.1 (Acetylene)	N/A	1,000kg	1000 m^3	No
2.2	N/A	100 L	Not Hazardous by SEPP33	No
3	III	1,600 L	> 1,000,000 L	No
6.1 (b)	III	80 kg	2500 L	No
8	II	105,000 L	25 000 L	Yes
C1	N/A	40,000 L	None	No
C2	N/A	100,000 L	None	No

2.4. Current status

The development of the New Paper Mill has commenced. As of January 2010:

- Detailed design of the New Paper Mill and auxiliary infrastructure is approximately 70% complete;
- Demolition of existing redundant buildings and infrastructure in the western area of the site has been completed;
- A substation and three new process water tanks have been constructed and commissioned;
- Remediation of the soils in the western area has been partially completed;
- A revised Remediation Action Plan has been developed for the southern area of the site; and
- Above ground demolition has commenced in the southern area of the site.

3. Consultation

As required by the DGRs, AMCOR undertook consultation with the nominated government stakeholders and the community during the preparation of the original Modification #2 Environmental Assessment Report in May 2009. Also as a result of the exhibition of the May 2009 Modification #2 Environmental Assessment Report, a number of submissions were received from the community and from government agencies. Responses from specific organisations and individuals are included in **Appendix A** and summarised in **Table 5**.

During the preparation of this revised Modification #2 Environmental Assessment Report, additional consultation has been undertaken with Randwick City Council, DoP and the NSW Roads and Traffic Authority (RTA) as most of the issues from the original Modification #2 Environmental Assessment Report related to traffic and access. Additional consultation with DECCW has also been undertaken in relation to the modification of operational noise limits.

3.1. Community consultation

A newsletter containing a description of the proposed modification and contact details to register concerns or issues to be considered in the Environmental Assessment Report was distributed to households and businesses in the area potentially impacted by the modifications in December 2008.

Three community members contacted SKM to register their concern about the proposed modification during the preparation of the original Modification #2 Environmental Assessment Report. There were 5 individual submissions and a petition signed by about 20 local residents submitted to DoP as a result of the exhibition of the original Modification #2 Environmental Assessment Report. All concerns were related to the proposed increase in heavy vehicle traffic on McCauley Street and specifically the use of B-Doubles on McCauley Street.

3.2. Government stakeholder consultation

The DGRs require that AMCOR consult with a number of Government stakeholders during the preparation of the Modification Application. The Government stakeholders consulted during the preparation of the original and revised Modification #2 Environmental Assessment Reports and the outcomes of the consultations are presented in **Table 5**.

- **Table 5: Summary of consultation**

Government stakeholder	May 2009 consultation	Submissions from May 2009 exhibition	Additional consultation for 2010 modification application
Department of Environment, Climate Change and Water (DECCW)	Letter sent to DECC describing proposed modification, copy of the DGRs and studies to be undertaken. DECC response included in Appendix A. No additional requirements identified.	Traffic noise assessment required for McCauley Street	Meeting held to discuss operational noise limits. Detailed noise impact assessment required to support any changes in operational noise limits
Department of Water & Energy (DWE)	Letter sent to DWE (Dec 2008) describing proposed modification, copy of the DGRs and studies to be undertaken. Follow up phone calls also made. No formal response from DWE to date. Note: the modification would not impact on groundwater quality or groundwater use.	No additional requirements identified	None required as modification would not impact on groundwater
Sydney Ports Corporation (SPC)	Letter sent to SPC describing proposed modification, copy of the DGRs and studies to be undertaken. SPC response included in Appendix A. No additional requirements identified.	No additional requirements identified	None – additional consultation during exhibition
Roads & Traffic Authority (RTA)	RTA provided detailed requirements for the DGRs. Follow up phone call made and no further requirements at this stage. RTA want to review Modification Report when available	RTA were not prepared to support change in phasing of traffic lights at Botany Rd Access Additional information on traffic impacts requested	Consultation with RTA occurred during the preparation of this document including meeting, phone calls and emails. Main topic was the upgrade and use of McCauley Street and impacts on Botany Road.

Government stakeholder	May 2009 consultation	Submissions from May 2009 exhibition	Additional consultation for 2010 modification application
Randwick City Council (RCC)	RCC provided detailed requirements for the DGRs. Two meetings, emails and phone calls made during the preparation of the Modification Application. Main topics of discussion in relation to modification application: - Upgrade of McCauley Street – RCC requested that McCauley Street be upgraded. Upgrade to consist of 2 x 2.3m parking lanes, 2 x 3.5m traffic lanes and 3m verge. Based upon existing western kerb alignment this would require AMCOR to give up approximately 1.5m of land along the length of McCauley Street which is unacceptable to AMCOR. No agreement was reached with RCC. - Contamination – Consideration of RCC's Contaminated Land Management Policy - Development of a Masterplan for the site - Other minor issues relating to traffic and access	Requested: 1) Additional information on traffic impacts 2) Additional information on contamination 3) Additional information on noise, odour & air quality 4) Additional information on flooding and stormwater	Consultation with Council occurred during the preparation of this document including meetings, phone calls and emails. Main topic was the upgrade and use of McCauley Street.

4. Description of proposed modifications

Presented in the following sections are detailed descriptions of the proposed modifications (Modification #2) to the Approved Project.

4.1. Relocation of the Engineering Store vehicle access

Currently the approved Engineering Store access is from McCauley Street, near the corner of McCauley Street and Australia Avenue. With the sale of the excess land this access would no longer be available to AMCOR. It is proposed that the access point be relocated to immediately opposite Raymond Avenue (See **Figure 2**) and used as a shared access by AMCOR and the McCauley St Precinct. This matches the proposed new boundary of the subdivided site and would be the safest location in terms of traffic movements and sight distances. This access would be used by:

- All vehicles entering and exiting the McCauley St Precinct; and
- All AMCOR commercial and heavy vehicles exiting the Botany site (except Finished Product vehicles). All AMCOR vehicles would be required to turn left out of the site (ie. southbound)

4.2. Finished Product vehicle exit on McCauley Street

An additional access would be constructed approximately 70m south of the Raymond Avenue intersection (See **Figure 2**). Finished Product vehicles (including B-Doubles) would enter the site via the Botany Road access, drive into the Finished Product Store where they would be loaded. They then would exit the site from the new access on McCauley Street and turn left only to access Botany Road.

Up to 10 heavy vehicles an hour would exit the site from this new access, however, the average number of heavy vehicles using the new access would be less than 3 an hour. Heavy vehicles would exit the site 24 hours a day, 7 days a week.

4.3. Use of McCauley Street by AMCOR heavy and commercial vehicles exiting the site

All AMCOR vehicles (including light and heavy vehicles) would enter the site via the Botany Road access. All AMCOR heavy and light commercial vehicles would then exit the site via McCauley Street. All AMCOR employee, visitor and contractor vehicles would continue to exit the site via the Botany Road access. Most of the vehicles exiting the site via McCauley Street (except Finished Product vehicles) would do so between 7am and 7pm.

This change in vehicle movement patterns is required as the RTA has indicated that it would not allow a change in phasing of the traffic lights at the Botany Road access to accommodate vehicles exiting the Botany site. In recent months the RTA has introduced another phase in the traffic lights at the Botany Road access which further disadvantages vehicles exiting the Botany site. Without this change in traffic movement patterns the level of service at the Botany Road intersection (Level F) would be unacceptable to the RTA.

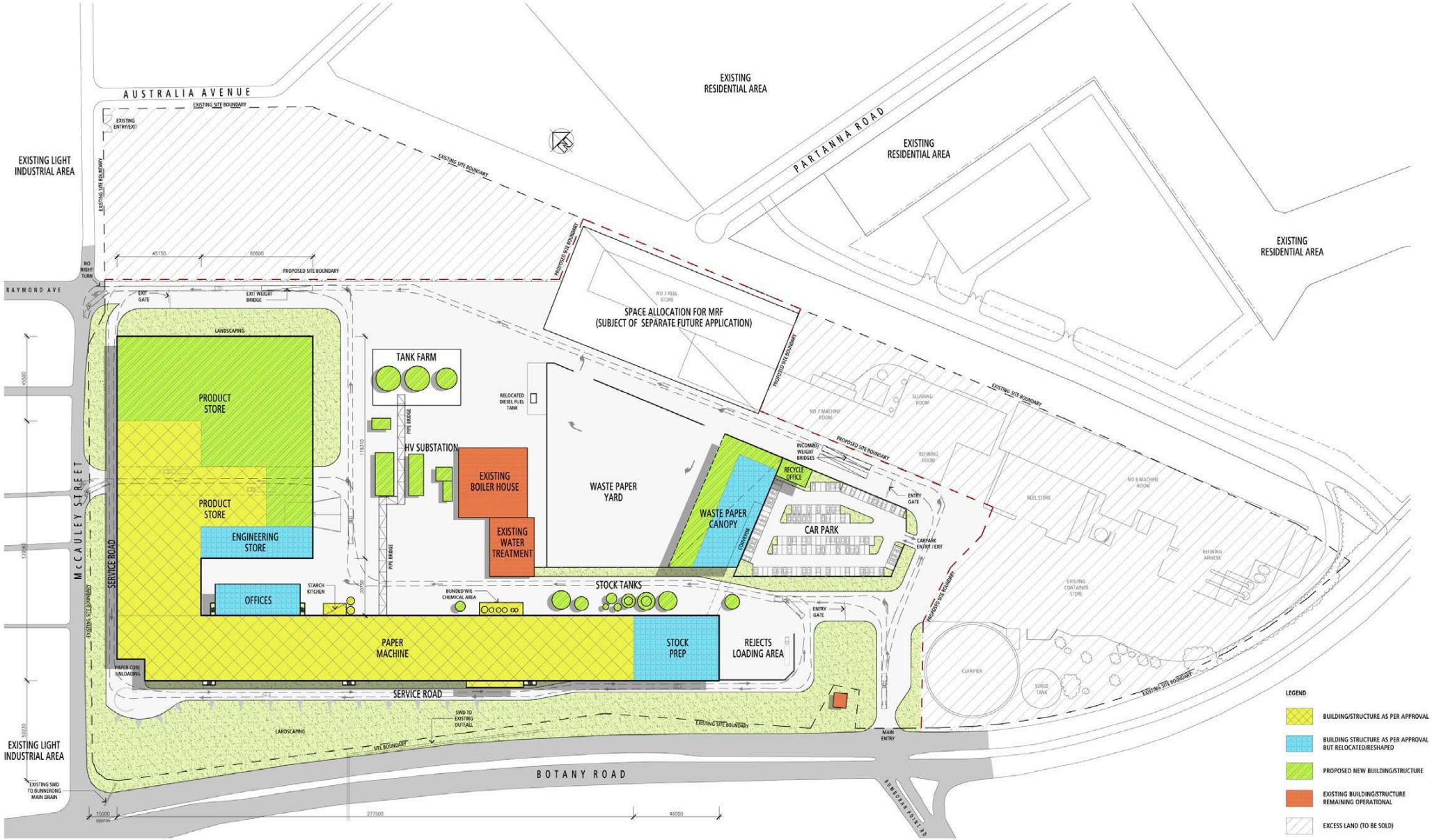
There are a number of other advantages including:

- Reduction of on-site internal traffic congestion;
- Separation of wastepaper vehicle movements from Finished Product vehicle movements to improve efficiency and safety on site;
- Provision of viable shared access options for the sale and development of excess land; and
- Acceptable level of services at both the Botany Road access and the McCauley Street/ Botany Road intersection.

4.4. Upgrade of McCauley Street

McCauley Street would be upgraded to cater for the increased traffic from AMCOR's operations and from the McCauley Street Precinct (See **Figure 3**). Randwick City Council was consulted to determine its requirements for the road upgrade – which were:

- Parallel parking on both sides of McCauley St with a parking lane width of 2.3m;
- Traffic lane width of 3.5m; and
- Verge width between the eastern kerb of McCauley Street and AMCOR's fence of 3m.



AMCOR _ MODIFICATION TO APPROVED DA LAYOUT

CNR BOTANY ROAD & McCAULEY STREET, MATRAVILLE NSW

JOB NO: 09117 TP01c

DATE: OCT '09
DRAWN BY: GP
SCALE @ A1: 1:1000
SCALE @ A3: 1:2000

Figure 2: Modified site layout

AMCOR

NOTE:
DIMENSIONS APPROXIMATE ONLY,
INCLUDING 10,000m² PRODUCT STORE LAYOUT

NO.	DATE:	REVISION:	BY	CHK
P1	28-10-09	PRELIMINARY ISSUE	KB	AY
	30-10-09	ISSUE TO CLIENT	GP	AY
A	06-11-09	REVISIONS AS PER CLIENT	GP	AY
B	09-11-09	REVISIONS AS PER CLIENT	GP	AY
C	09-11-11	REVISIONS AS PER CLIENT	GP	AY

WATSONYOUNG ARCHITECTS//INTERIORS
8 gratton street prahran victoria 3181 australia acn: 111 398 700
t: 03 9516 8555 f: 03 9516 8500 w: www.watsonyoung.com.au

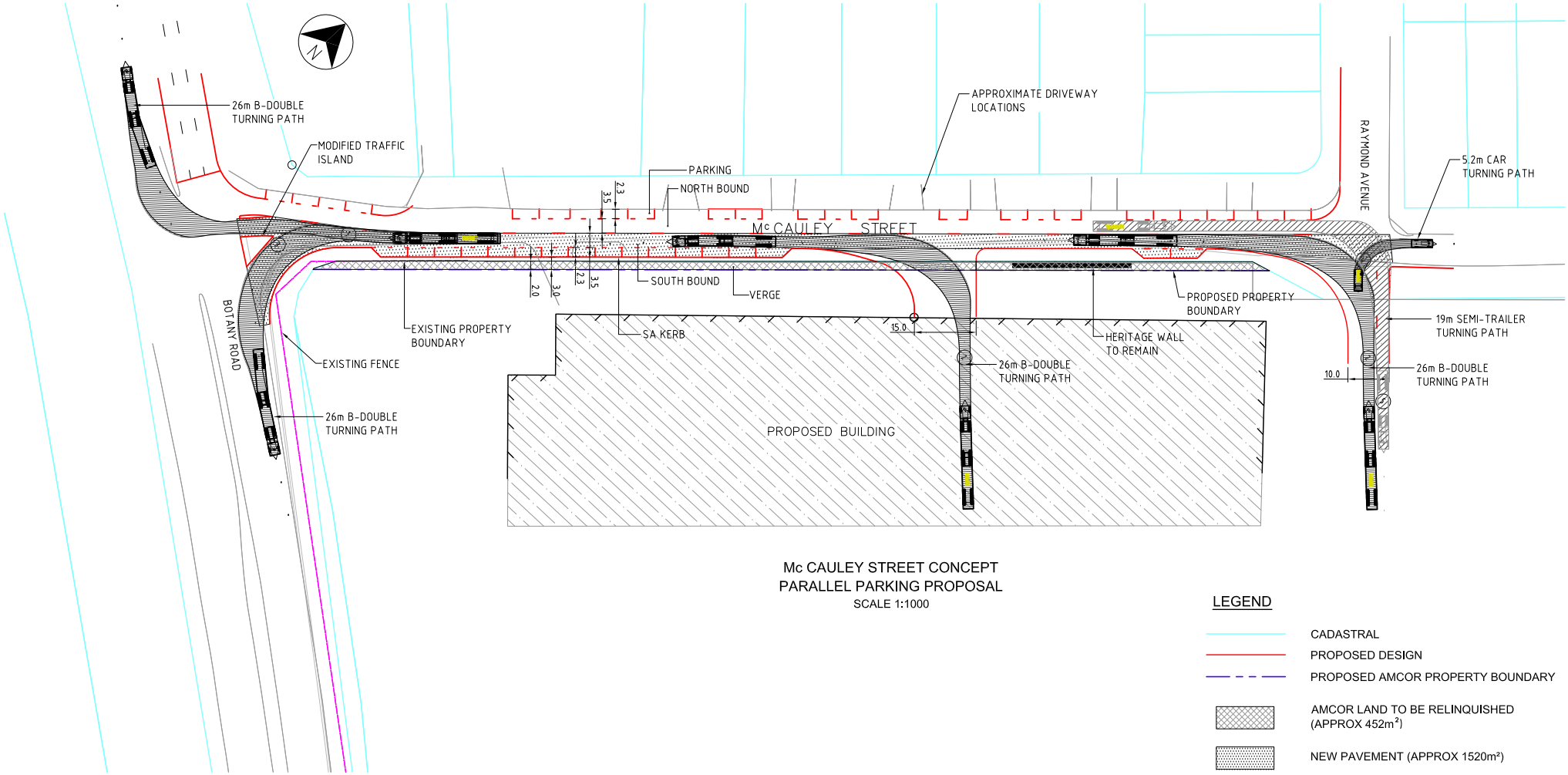


Figure 3: Upgrade of McCauley Street

SCALE 1:1000 10 0 10 20 AT A3

PRELIMINARY

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
D	18.12.09	C.T.	C.T.	J.B.	J.M.	19.0m VEHICLE ACCESS PATH ADDED
C	04.12.09	C.T.	C.T.	J.B.	J.M.	PAVEMENT WIDTH REVISED
B	20.11.09	E.W.	D.H.	J.B.	J.M.	LAYOUT REVISED
A	11.11.09	E.W.	D.H.	J.B.	J.M.	CONCEPT ISSUE

No	DRAWING NUMBER	REFERENCE DRAWING TITLE

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: AMCOR
PROJECT: BOTANY MILL B9 PROJECT

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
S.T.	E.W.	J.B.	J.M.
DESIGNED	DESIGN REVIEW		
E.W.	D.H.		

TITLE: Mc CAULEY STREET PROPOSED UPGRADE PLAN

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:1000	EN02732	EN02732-SK007	D

McCauley Street would be upgraded from Raymond Avenue to Botany Road, which would include reconstruction of the southbound pavement to centreline of the new road. The northbound pavement would be scabbled and a new 40mm asphalt seal would be provided. The new southbound pavement type would be suitable for B-Double use. Other components of the upgrade would include:

- reconfiguration of some of the traffic islands and kerbs at the McCauley Street/Botany Road intersection;
- construction of a new kerb and footpath along the eastern side of McCauley Street;
- line marking and traffic signs;
- stormwater drainage for the eastern side of McCauley Street;
- service relocations to allow the road construction.

The existing road reserve of McCauley Street is 20m wide, however the western kerb is 8m in from the western boundary of the road reserve because of the slope of the land and presence of heritage listed palms in the western verge. Relocating the western kerb is not considered feasible due to cost, access impacts on commercial premises and the palms. To meet Council's requirements AMCOR would surrender up to 2m of land along their boundary with McCauley Street (See **Figure 4**). There is insufficient space to provide parking adjacent to the 20m section of heritage-listed wall retained on the AMCOR site.

Traffic management measures would be installed to ensure that vehicles exiting the site turn left on to McCauley Street and exit the local area via Botany Road, rather than local streets.

The final design of the McCauley Street upgrade would be developed in consultation with Randwick City Council and the RTA.

The upgrade of McCauley Street would occur before the New Paper Mill is operational.

4.5. Changes in site layout

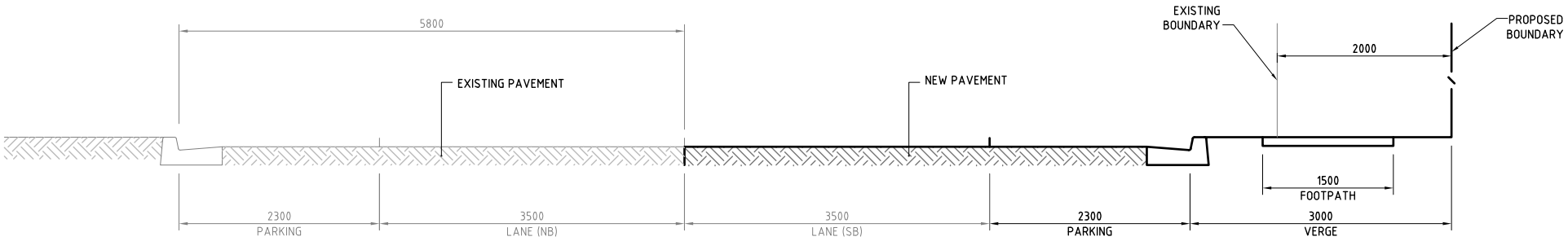
A summary of the proposed changes in site layout are described below and in the **Figure 2**.

- Extend the Paper Machine building by 45m to the east to house the Stock Prep plant and locate the Rejects Loading area at the eastern end of Stock Prep plant. (The existing car park will no longer be available);
- Construct a new car park at the eastern end of the existing Waste Paper Yard;
- Demolish the existing Stock Prep plant except for a small section at the western end that houses the existing Water Treatment Plant (to be retained). Repave the area and use as the Waste Paper Yard. (No significant change to area of storage.);
- A section of the Waste Paper Yard adjacent to the waste paper conveyor is to be roofed;
- Relocate M/C Roll Store to the western end of the Paper Machine building;
- Construct a fully enclosed annexe on the south side of the Paper Machine building to house the vacuum blowers;
- Relocate the Control Room / Offices / Maintenance area complex further west on the northern side of the Paper Machine building;
- Relocate various large stock and process water tanks to the eastern end of the Paper Machine building north wall;
- Re-arrange the product truck loading area within a larger Finished Product Store (See Sec.4.6); and
- Relocate the Engineering Store to a location adjacent to the Product Store.

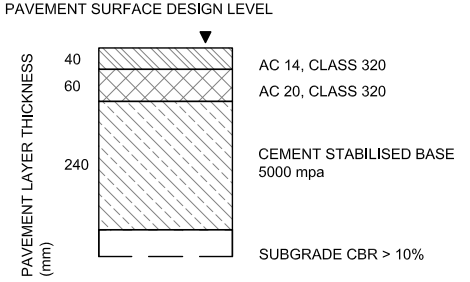
The scale and activities undertaken at the facilities described above are consistent with those described in the 2007 Environmental Assessment – it is only the location of the facilities that has changed. However, it recognised that these changes in location may result in different noise, odour and visual impacts on surrounding sensitive receivers. These potential changes in impact are assessed in the following sections.

4.6. Increase in the size of the Finished Product Store

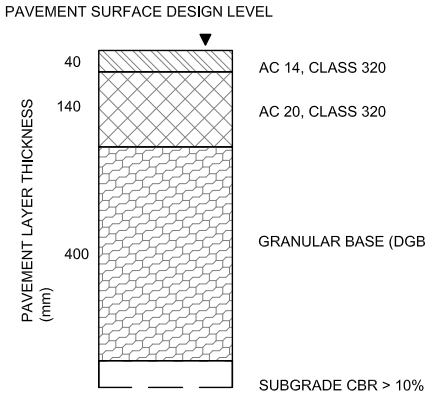
In the 2006 Environmental Assessment, the Finished Product Store was described as approximately 5,000 m^3 in area (**Figure 1**), with an eave height of 12m and extended along McCauley Street from the paper machine building to about 75m south of Raymond Avenue. It is proposed that the size of the Finished Product store be doubled to 10,000 m^3. The eave height of the Finished Product store



McCAULEY STREET SECTION
PROPOSED PARALLEL PARKING
SCALE 1:50



PAVEMENT OPTION 1
SCALE 10:1



PAVEMENT OPTION 2
SCALE 10:1

NOTES

1. PAVEMENT DESIGN BASED ON AUSTROADS PAVEMENT DESIGN MANUAL.
2. DESIGN ESA OF 1.7x 10^7
3. UNITS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.

Figure 4: Cross section McCauley Street

SCALE 1:50 0.5 0 0.5 1 AT A3

PRELIMINARY

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
F	11.02.10	S.G	C.T	J.B.	J.M	NEW PAVEMENT WIDTH REVISED
E	04.12.09	C.T.	C.T.	J.B.	J.M.	PAVEMENT WIDTH REVISED
D	30.11.09	E.W.	B.C.	J.B.	J.M.	PAVEMENT OPTION 2
C	26.11.09	E.W.	B.C.	J.B.	J.M.	PAVEMENT LAYOUT
B	20.11.09	E.W.	B.C.	J.B.	J.M.	BOUNDARY LOCATION
A	09.11.09	E.W.	B.C.	J.B.	J.M.	CONCEPT ISSUE

No	DRAWING NUMBER	REFERENCE DRAWING TITLE

SKM A.C.N. 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: AMCOR
PROJECT: BOTANY MILL B9 PROJECT

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
S.T.	E.W.	J.B.	J.M.
DESIGNED	DESIGN REVIEW		
D.H.	B.C		

TITLE: Mc CAULEY STREET PROPOSED UPGRADE SECTIONS

SCALE	SKM PROJECT No	DRAWING No	AMDT
VARIABLE	EN02732	EN02732-SK008	F

A2 PBS IV WORK ORDER No.

DO NOT SCALE DRAWING

DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED

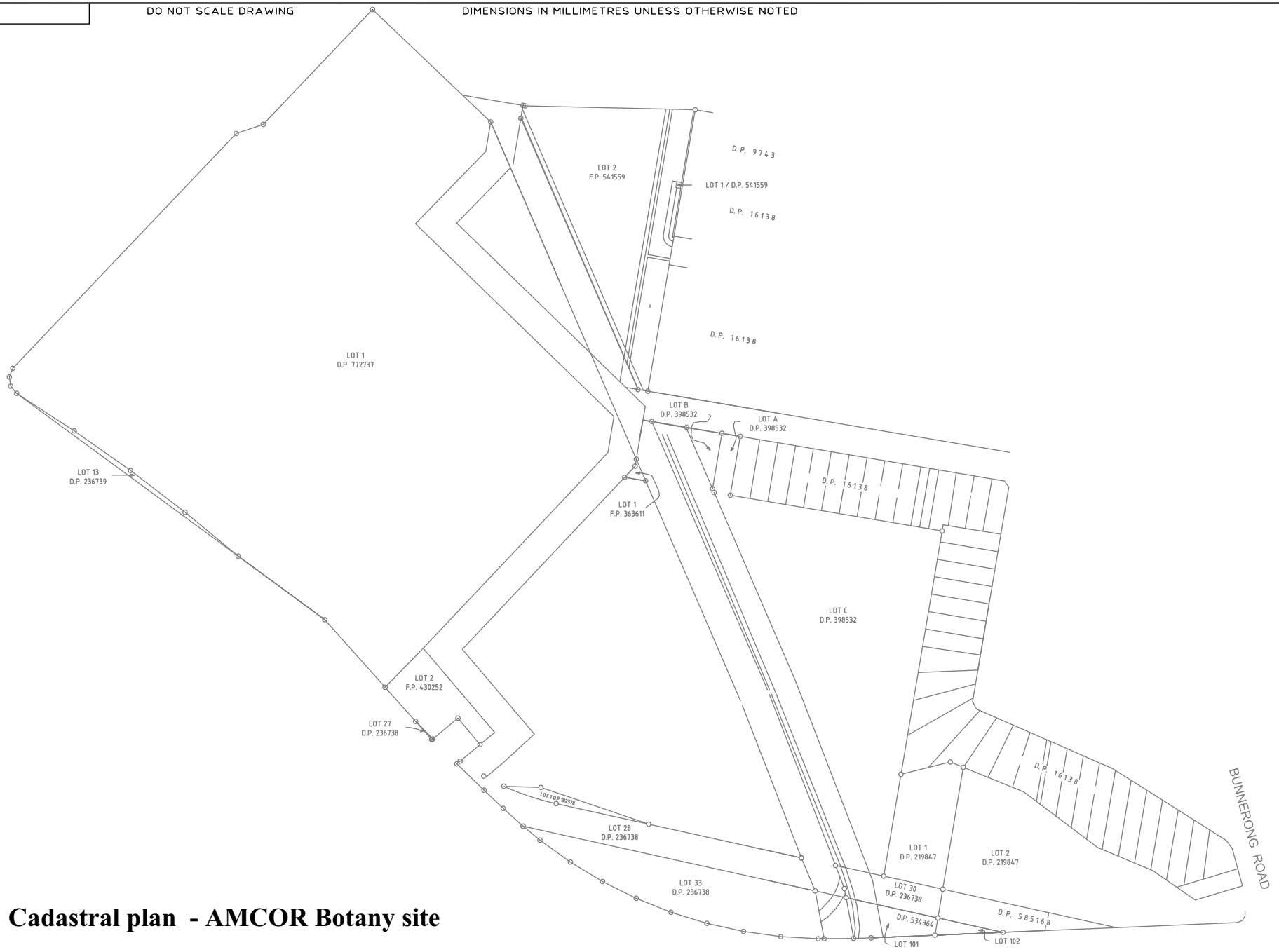


Figure 5: Cadastral plan - AMCOR Botany site

REV.	REVISION	SIGNED	DATE	REV.	REVISION	SIGNED	DATE

DIMENSION TOLERANCES EXCEPT AS NOTED

	MACHINED SURFACES	FABRICATION
FRACTIONAL :	± 0.5mm/M	± 1.5mm/M
ANGULAR :	± 0.5°	± 1°

3RD ANGLE PROJECTION

AMCOR BOTANY MILL

BOTANY MILL
NEW PAPER MILL
CADASTRE PLAN

SCALE	N.T.S
COMPUTER FILE No.	G:PROJECTS\AP\PLANS\S23064
DRAWN	
AREA	MILL
CHECKED	
DRAWING No.	S23065
REV No.	A
APPROVED	
DATE	04.06.08
FILE	
INDEX	
JOB No.	

would remain the same and the building would be extended along McCauley Street to about 20m south of McCauley Street and east into the site (See **Figure 2**).

There would be no increased traffic movements associated with the increase in the size of the Finished Product Store as the overall capacity of the New Paper Mill would remain the same. Also heavy vehicles transporting Finished Products from the site would be loaded inside the Finished Product store, after which they would exit the site via a new access on McCauley Street.

The construction of the Finished Product Store may be staged. If construction is staged the initial size of the Finished Product Store size would be the same as presented in the 2006 Environmental Assessment.

4.7. Subdivision of Lot 1 DP772737

4.7.1. Introduction

AMCOR's Botany Paper Mill site consists of 15 separate lots all owned by AMCOR (See **Figure 5**). This does not include the lot currently leased to Randwick City Council as the park immediately north of the site. Once the New Paper Mill becomes operational and existing paper machines No: 7 & 8 are able to decommissioned, there would be land excess to AMCOR's requirements. AMCOR intends to sell this excess land to fund the New Paper Mill development. If the land was not able to be sold, the New Paper Mill development would not proceed. To allow the orderly and strategic development of the site, AMCOR needs to subdivide the largest lot (Lot 1 DP772737). If the subdivision was not approved it would likely result in:

- poor planning outcomes as development would be piecemeal and uncoordinated;
- loss of valuable industrial land in the Botany region as some areas of excess land would be unable to be sold for development and would be excess to AMCOR's requirements; and
- significant risks to the financial viability of the New Paper Mill development – especially given alternative financing options are limited due the current financial crisis.

It should be noted that the subdivision and sale of excess land was identified in the 2006 Environmental Assessment. However, approval was not sought at the time of the development application.

It should also be noted that the land east of the Energy Australia easement is not part of this Modification Application as the land already has separate titles and a separate access to Botany Road.

4.7.2. Subdivision description

As noted above, AMCOR is seeking to subdivide Lot 1 DP772737. The proposed subdivision boundaries are presented in **Figure 6**. The subdivision includes AMCOR retaining land for the proposed Materials Recycling Facility which is subject to a separate development application.

The subdivision would create three new separate areas on site:

- McCauley Street Precinct – 1.99 ha (New lot - subdivision required) – Note: Proposed Lot 1 on **Figure 6**;
- Botany Road Precinct – 3.15 ha (New lot+ 2 existing lots - subdivision required) - Note: Proposed Lot 3 on **Figure 6**; and
- New Paper Mill & MRF Precinct (1 existing lot - subdivision required) - Note: AMCOR B9 project on **Figure 6.**

To provide a basis for estimating traffic generation from the new development precincts, a concept layout has been prepared for the site (See **Figure 7**). The concept layout is based on the development of warehouses and associated offices in the new precincts. This type of development has been identified as the most likely use as:

1) This is the typical type of development in the local area over the past 5 years. Examples include the western side of McCauley Street, the area near the corner of Beauchamp Road and Botany Road and the extension of the Discovery Cove Industrial Estate on McPherson Street.
2) The close proximity of residences to the east and north of the site would reduce the likelihood that a use that has high impacts (eg noise, air quality) would be approved in the future; and
3) With the development of the intermodal terminals at Ingleburn and Enfield, the demand for container storage and handling in the local area would decrease.

It should be noted that:

- AMCOR is not seeking development approval for the uses of the excess land as shown in the concept layout. Any development of the land would require additional development applications to be lodged and approved by the appropriate approval and regulatory authorities;
- The Botany Road and McCauley Street precincts would not be available for use until 2011 – when the New Paper Mill is constructed and operational and the existing Machine No: 7 and No: 8 are decommissioned.

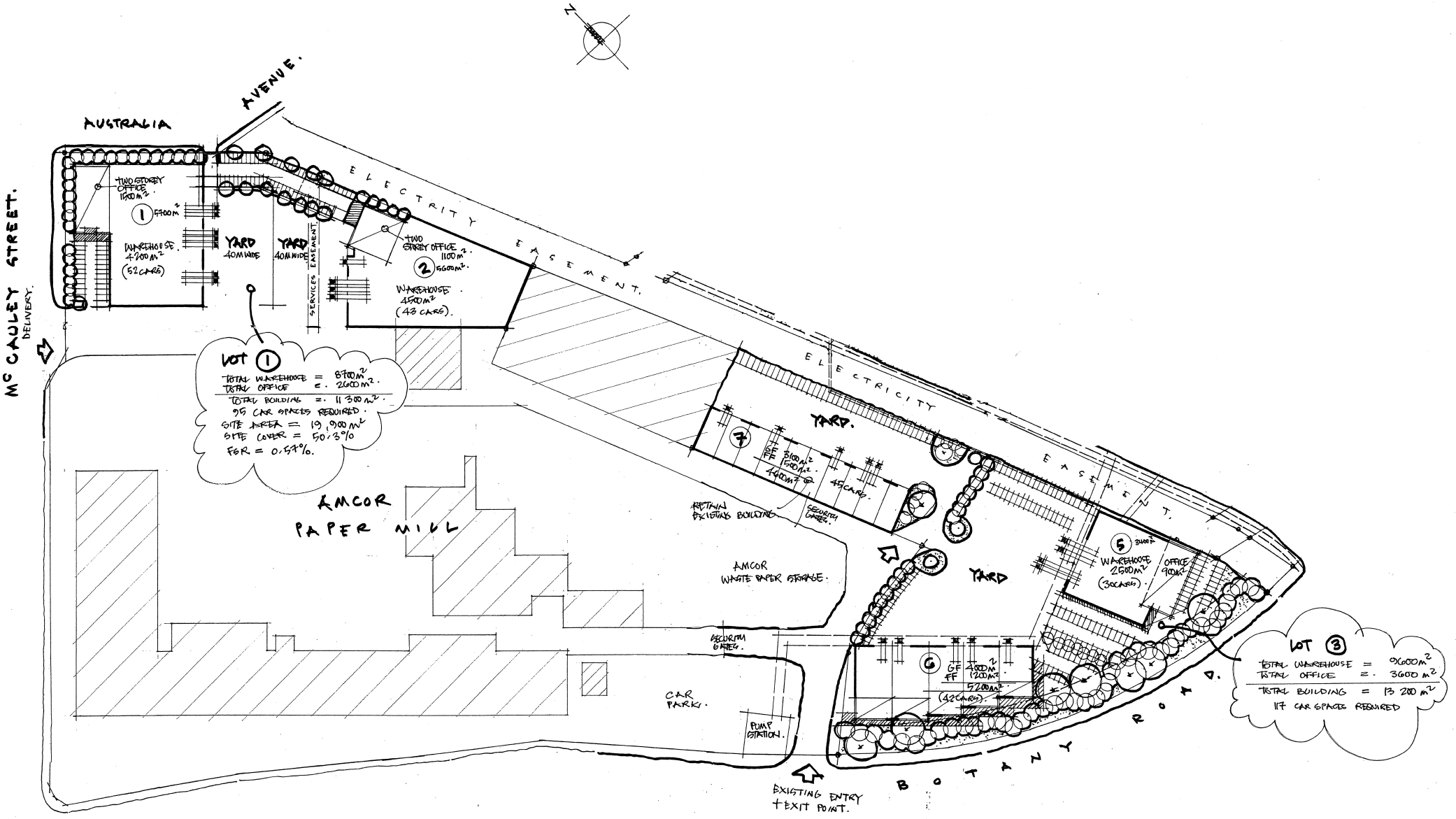
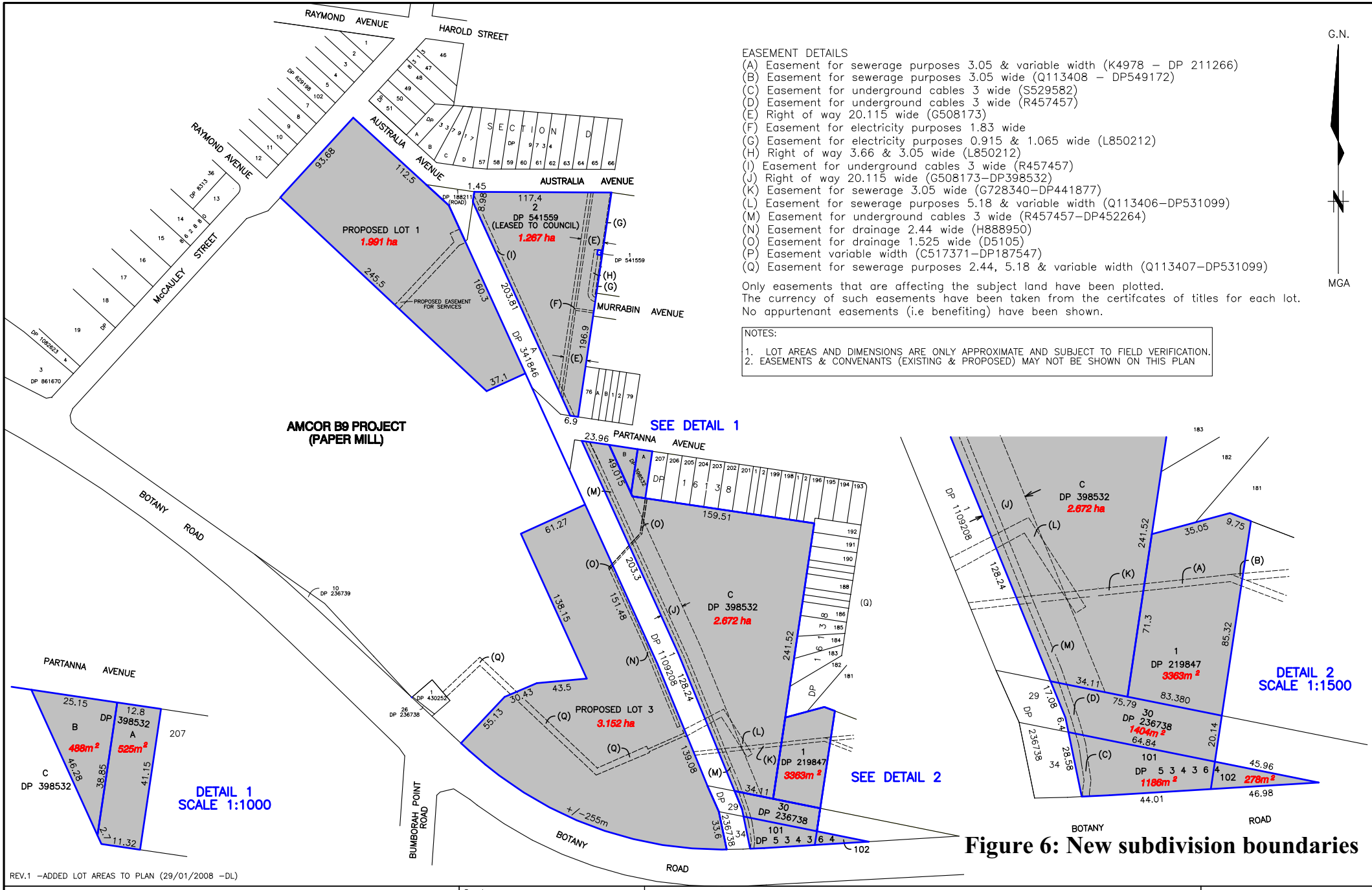


Figure 7: Concept layout of possible new development



EASEMENT DETAILS

(A) Easement for sewerage purposes 3.05 & variable width (K4978 – DP 211266)
(B) Easement for sewerage purposes 3.05 wide (Q113408 – DP549172)
(C) Easement for underground cables 3 wide (S529582)
(D) Easement for underground cables 3 wide (R457457)
(E) Right of way 20.115 wide (G508173)
(F) Easement for electricity purposes 1.83 wide
(G) Easement for electricity purposes 0.915 & 1.065 wide (L850212)
(H) Right of way 3.66 & 3.05 wide (L850212)
(I) Easement for underground cables 3 wide (R457457)
(J) Right of way 20.115 wide (G508173–DP398532)
(K) Easement for sewerage 3.05 wide (G728340–DP441877)
(L) Easement for sewerage purposes 5.18 & variable width (Q113406–DP531099)
(M) Easement for underground cables 3 wide (R457457–DP452264)
(N) Easement for drainage 2.44 wide (H888950)
(O) Easement for drainage 1.525 wide (D5105)
(P) Easement variable width (C517371–DP187547)
(Q) Easement for sewerage purposes 2.44, 5.18 & variable width (Q113407–DP531099)

Only easements that are affecting the subject land have been plotted.
The currency of such easements have been taken from the certifcates of titles for each lot.
No appurtenant easements (i.e benefiting) have been shown.

NOTES:

1. LOT AREAS AND DIMENSIONS ARE ONLY APPROXIMATE AND SUBJECT TO FIELD VERIFICATION.
2. EASEMENTS & CONVENANTS (EXISTING & PROPOSED) MAY NOT BE SHOWN ON THIS PLAN

Figure 6: New subdivision boundaries

REV.1 –ADDED LOT AREAS TO PLAN (29/01/2008 –DL)

AAMHatch
7 Warabrook Boulevard, Warabrook 2304
P.O. Box 5000, Hunter Region Mail Centre 2310
Telephone:(02) 4968 6868 Fax:(02) 4968 6800

Scale	1 : 3000 (A3)		
Drn	DOL	Re JCV	Appv JCV
Date	08/12/2008		

SKETCH PLAN SHOWING AMCOR OWNED PROPERTIES AT THE PORT BOTANY PAPER MILL SITE

Survey Sketch No.
3853/1

4.7.3. Access arrangements

Vehicle access to the site (and the new development precincts) has been nominated as a key issue in the Director-General's requirements. The following access arrangements are proposed:

- McCauley Street Precinct – a new shared access (with AMCOR) on McCauley Street opposite Raymond Avenue would be developed. All vehicles entering and exiting the precinct would use this access;
- Botany Road Precinct – the existing Botany Road access would be upgraded (and shared with AMCOR) to accommodate vehicles from this precinct. All vehicles entering and exiting the precinct would use this access;

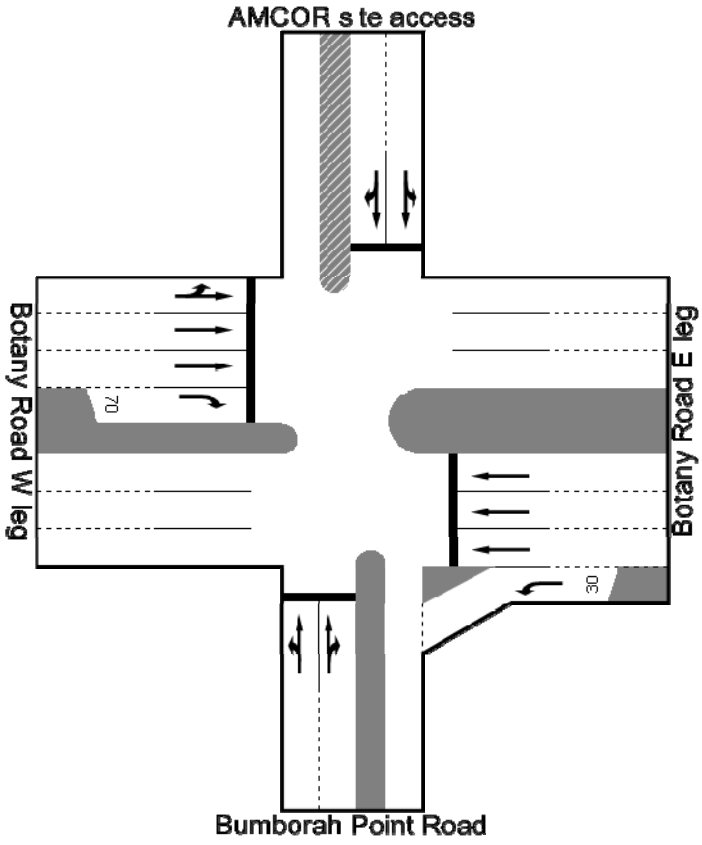
The shared upgraded Botany Road access would involve removing the current weighbridge system and relocating the incoming weighbridges on the internal road just north of the Waste Paper Storage Area. The outgoing weighbridge would be located close to the McCauley Street exit.

To enter the site there would be a single large left turn in lane from Botany Road which would increase to two lanes after entering the site boundary (See **Figure 8**). The left entrance lane would be for AMCOR vehicles only (both New Paper Mill and MRF) and would provide sufficient road length to allow vehicles to queue on-site before the incoming weighbridges. The median entrance lane would service traffic accessing the Botany Road Precinct.

Exiting the site there would be two traffic lanes, allowing left, right and straight ahead traffic movements. A third merging lane would be provided in the median of the Botany Road exit, to provide safe exit for vehicles leaving the car park.

The new shared entrance on McCauley Street would be two lanes in width and would have substantial sealed shoulders to allow vehicles to pass each other. The access would be constructed to allow heavy and light vehicle access to the McCauley Street Precinct and to allow for AMCOR vehicles to exit the site. Randwick City Council has indicated that it would be seeking an upgrade of McCauley Street to cater for the increased traffic generation from the McCauley Street Precinct.

- **Figure 8: Botany Road/Bumborah Point Road intersection**



4.7.4. Zoning

In July 2009, the whole of the Botany site was rezoned as IN1– General Industrial under the Three Ports State Significant Sites Proposal.

AMCOR is not seeking a change to the zoning of land subject to this modification application.

4.8. Modification of operational noise limits

AMCOR is seeking to modify its currently approved operational noise limits. The proposed new project specific noise limits are presented in **Table 6**. The new noise limits are required due to changes in on-site traffic movements and the removal of Paper Machine No's:7 and 8 buildings.

- **Table 6: Proposed new project specific noise limits**

Residential Location	Day Time dB(A)	Evening dB(A)	Night Time dB(A)
R1	46	45	45
R2	45	45	44.5
R3	45.5	45	45
R4	42	41	41
R5	42	42	39
R6	43	42.5	39

5. Key issues - impact assessment

5.1. Introduction

The DGRs for the Environmental Assessment Report for this modification application nominated a number of key issues for assessment. These are detailed in **Table 7** and a more detailed assessment of each of the key issues is contained in the following sections.

- **Table 7: Key issues from the DGRs**

Key Issue	Requirement
Transport	Including details of new and revised site accesses to service the existing project and new subdivision, internal roads and parking; details of traffic types and volumes to be generated; predicted impacts on road safety and capacity of road network
Noise	Including impacts of construction, operational and road traffic noise from the project on the proposed subdivision
Odour	Including odour impacts from the project on the proposed subdivision
Air quality	Including dust impacts from the project on the proposed subdivision
Soil & water	Including details of sewerage and stormwater systems to service the site, soil contamination levels and remediation requirements
Hazards	The PHA must be updated to reflect the proposed modification
Visual	Including landscaping, design set-backs signage and lighting in particular regard to the revised site layout.

5.2. Traffic

A full traffic and access assessment was undertaken to meet government agency requirements (See **Appendix B**). The outcomes of this assessment are summarised below.

5.2.1. Introduction

An initial Environmental Assessment Report for Modification #2 was lodged with the DoP in May 2009. The proposed modifications to the Approved Project in the initial Environmental Assessment Report for Modification #2 were similar to those described in this report including subdivision and limited use of McCauley Street for AMCOR vehicles. Submissions from Randwick City Council and the RTA on the proposed changes were received and most of the issues raised in the submissions related to traffic management and impacts of the modifications on external roads to the New Paper Mill. The major issue raised in the submissions was that RTA was not supportive of the proposed changes to the phasing of the traffic lights at the Botany Road/Bumborah Point intersection to facilitate vehicles exiting the AMCOR site at Botany Road – due to potential impacts on port traffic. Without this change in phasing of the traffic lights, the level of service at the intersection would be unacceptable to RTA (ie. level of service F), AMCOR and other road users. This as well as other issues required AMCOR to reconsider its proposed traffic arrangements for the site.

The revised modifications to the approved project (relevant to traffic) being sought are:

- Relocation of the Engineering Store vehicle access further south along McCauley Street to opposite Raymond Avenue;
- An additional heavy vehicle exit only access on McCauley Street for Finished Product vehicles (including B-Doubles);
- Use of the accesses on McCauley Street for the exit southbound only of commercial heavy vehicles from AMCOR's operations (including B-Doubles);
- The upgrade of McCauley Street from Botany Road to Raymond Avenue to make it suitable for B-Doubles use (southbound only) as well as use by other heavy vehicles;
- Changes in the site layout as a result of further development of the design;
- An increase in the size of the Finished Product Store; and
- Subdivision of Lot 1 DP772737 to allow the sale of excess land, to fund the development of the New Paper Mill.

5.2.2. Existing conditions

The AMCOR paper mill site (the site) is conveniently located adjacent to main road, rail and port transportation networks. The site's main access on Botany Road provides direct access to the regional main road network., The site is bounded to the south and east by Botany Road and the electricity easement, to the north by Australian Avenue and to the west by McCauley Street.

Offices and warehouses are located opposite the site on the north-west side of McCauley Street between Botany Road and Raymond Avenue. Port Botany is opposite the site on the southern side, with two direct accesses onto Botany Road (Gate B1 & Gate B2). North of the site are predominantly residential properties and a small recreational park (Purcell Park).

5.2.2.1. Surrounding road network conditions

The main traffic access to the site is via a signal controlled intersection on Botany Road at Bumborah Point Road.

Botany Road is a major arterial road serving the Port Botany area and industrial land uses. It connects to Foreshore Road and thence to General Holmes Drive, Southern Cross Drive and the M5 Motorway, an important link in the local, regional and state road network. These roads are RTA approved B-double routes. In the vicinity of the site, Botany Road is a six-lane two-way road with slip lanes and right-turn bays provided at major intersections. A median island is also provided, dividing Botany Road into two carriageways.

McCauley Street, which adjoins the western boundary of the site, is a local road, providing access to commercial and residential areas. McCauley Street carries a low amount of traffic, although a report by Masson and Wilson (1997) indicated that there was a through traffic movement from the north to the south with drivers wishing to access Botany Road. The intersection of McCauley Street and Botany Road is controlled by traffic signals. There are two site access points on McCauley Street; the northernmost being the car park access and the southernmost connecting to the internal access road on site. This access is currently not in use for operational traffic.

A summary of existing traffic volumes along the surrounding road network is provided in Table 8.

- **Table 8: Existing daily traffic volumes**

Road	Location	AADT	Source (Year)
Botany Road	West of Beauchamp Rd	35,826	RTA (2002)
	East of Beauchamp Rd	20,331	RTA (2002)
	South of Mill Pond Rd	27,237	RTA (2002)
Bunnerong Road	North Beauchamp	19,582	RTA (2002)
Beauchamp Road	North of Botany Rd	17,164	RTA (2002)
	West of Bunnerong Rd	8,759	RTA (1999)
Foreshore Road	East of General Holmes Dr	29,851	RTA (2002)
Southern Cross Drive	West of Wentworth Ave	85,163	RTA (2002)
General Holmes Drive	At runway tunnel	133,393	RTA (2002)
McCauley Street	-	1,700	Randwick Council (1997)

5.2.2.2. Parking

Site observations indicate that there is a demand for on-street parking in McCauley Street due to local residential and commercial activities. Unregulated parking occurs on vacant land adjoining the site. Observations also indicate that the highest demand for on street parking spaces in McCauley Street is close to Botany Road. This demand gradually decreases towards the north into the residential area. **Figure 9** shows on street parking on the southern end of McCauley Street.

Parking is prohibited along Botany Road near the site due to the operation of “No Stopping” restrictions.

On-street parking spaces are also available in Australia Avenue and other local streets such as Moorina Avenue and Partanna Avenue. They are typical local residential streets with average to low demand for on-street parking.

- **Figure 9: On-street parking on McCauley Street, looking south towards Botany Road.**

The site has one internal car park providing approximately 100 parking spaces on site. The car park is located next to the existing office building, and is accessed from the main access on Botany Road.

5.2.3. Proposed modified access arrangements

The proposed access arrangements are summarised in Table 9.

- **Table 9: Proposed access arrangements**

Location/Activity	Vehicle Type	Enter Site	Exit Site
Botany Road Precinct	All vehicles	Botany Rd/ Bumborah Point Rd	Botany Rd/ Bumborah Point Rd
New Paper Mill & Materials Recycling Facility	Employee and visitor light vehicles	Botany Rd/ Bumborah Point Rd	Botany Rd/ Bumborah Point Rd
New Paper Mill & Materials Recycling Facility	Heavy vehicles and commercial vehicles	Botany Rd/ Bumborah Point Rd	McCauley St
McCauley Street Precinct	All vehicles	McCauley St	McCauley St

Apart from vehicles accessing the McCauley Street Precinct all other vehicles would enter the site through the Botany Road/Bumborah Point Road intersection. While there would be one left turn lane into the site from Botany Road a section of 4-lane internal road (2 in and 2 out) would be

constructed between the existing Botany Road intersection and the proposed subdivision site access. Access to the AMCOR site will be via the left lane of this new road, while access to the Botany Road Precinct will be via the right lane. The existing incoming weighbridge will be removed and replaced by two new weighbridges located inside the AMCOR site, at a position approximately 170m from the intersection of Bumborah Point Road and Botany Road. All light and heavy vehicles from the Botany Road Precinct and all AMCOR's employee and visitor light vehicles would exit the site via the Botany Road/Bumborah Point Road intersection. All heavy and commercial vehicles would exit the site via the proposed McCauley Street accesses.

Access to the McCauley Street Precinct would be via a new access on McCauley Street directly opposite Raymond Avenue, forming a four legged intersection. Apart from Finished Product vehicles, all of AMCOR's heavy and commercial vehicles would also use this intersection to exit the site, with all vehicles required to exit the site to the south. Finished Product vehicles would use another proposed exit further south along McCauley Street.

Emergency vehicles would access the site through both the Botany Road and McCauley Street accesses. Both accesses would be designed in accordance with Austroads requirements for B-Doubles to ensure that larger vehicles can safely access the site should the need arise.

McCauley Street, south of Raymond Avenue will comprise two 3.5 metre lanes in order to safely accommodate the turning movements of B-Doubles.

Additional mitigation measures to ensure that vehicles exiting the site into McCauley Street turn left (ie. southbound) away from residential areas include:

- Appropriate signage – including no left turn signs if required;
- Kerbs, traffic islands and other physical measures developed in consultation with Randwick City Council;
- Driver education for all vehicles utilising the site; and
- Visual monitoring of traffic leaving the site.

5.2.4. General traffic movements

Presented in the following tables is general information on the average total number of AMCOR vehicles predicted to be accessing the site (See **Table 10**) and predicted peak traffic movements (number and time period) for specific types of vehicles associated with Project B9 and the MRF (See **Table 11** and **Table 12**).

- **Table 10: Total average weekday vehicles[1]**

Type of Vehicle	AAWDT[2]		
	B9	MRF	B9 + MRF
Waste Paper Deliveries:			
B-Doubles	4		4
Semi Trailers	31		26
Rigids (Compactors, Tippers, Tray Trucks - 2 to 15 tonne load).	147	85	213
Starch / Chemicals Deliveries:			
Semi Trailers	2		2
Finished Product Despatch:			
B-Doubles	16		16
Semi Trailers	31		31
Solid Waste Removal:			
Truck and Dog Trailer	6		6
Recyclables:			
Semi Trailers		8	8
General Waste:			
Rigids (Front loading hook bins etc.)	1		1
General Traffic (Staff, Contractors, Visitors, Couriers, Deliveries).			
Light Vehicles (Cars, Vans, Utilities etc)	150	25	175
Total	**388**	**118**	**482**

[1] The numbers in this table represent the number of vehicles accessing the site. Each vehicle generates 1 in movement and 1 out movement.

[2] Annual Average Week Day Traffic - i.e. the number of vehicles that access the site during an average week day.

- **Table 11: Project B9 vehicles – peak hourly traffic**

Predicted B9 traffic movements (i.e. in and out)	Peak traffic (Hourly)	Peak traffic hours
Compactors, Self tippers, etc.	34	Between 7am and10am
Semi trailers	16	Between 6am and 8am Between 2 pm and 3 pm
B-Doubles	8	Between 2 pm and 3 pm
General traffic (cars, utes etc)	40 40	Between 6.30am and 7.30am Between 3pm and 4 pm
Other semi trailers (starch and chemicals)	6	These deliveries will be planned to occur outside of peak periods

- **Table 12: Material Recycling Facility vehicles - peak hourly traffic**

Material Recycling Facility traffic movements (i.e. in and out)	Peak traffic (Hourly)	Timing of peak
Compactor trucks, tippers and semi-trailers	36 36 36	Between 8:30am -9:30am Between 11am -12pm Between 1:30pm- 2:30pm
General traffic (staff cars)	20	Between 1.30pm and 2.30pm

The total number of vehicles in 2018 utilising both McCauley Street and the Botany Road entrance (including background, B9, MRF and subdivision traffic) are shown in **Table 13**. In total, approximately 199 vehicles are expected to utilise the Botany Road entrance in the AM peak, while 378 vehicles would utilise McCauley Street. In the PM peak, approximately 204 vehicles would utilise the Botany Road entrance, with 339 utilising McCauley Street. Details of how these traffic estimates were derived are presented in **Appendix B**.

- **Table 13: Total traffic volumes in 2018, including background, Project B9, MRF and subdivision traffic**

		2018 base		2018 with B9 & MRF		2018 with B9 & MRF & subdivision	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
Botany Road Entrance	In	34	6	86	41	153	61
	Out	24	36	6	41	46	143
	Total	**58**	**42**	**92**	**82**	**199**	**204**
McCauley Street	In	118	73	118	73	171	89
	Out	96	134	176	169	207	250
	Total	**213**	**208**	**293**	**243**	**378**	**339**

5.2.5. Traffic Impacts

The cumulative impacts of existing traffic, Project B9 traffic, MRF traffic and the proposed subdivision traffic were assessed, focusing on the impacts of the additional traffic on the nearby intersections of Botany Road / Bumborah Point Road and Botany Road / McCauley Street.

Vehicle turning movement counts were undertaken at both these intersections in 2007. These counts have been taken as the base case scenario. A traffic growth rate of 3.5% per annum has been used to project traffic volumes at the intersections in 2018.

5.2.5.1. Intersection analysis

The intersections were analysed using the Sidra Intersection modelling software. It calculates the amount of delay experienced by vehicles using an intersection, and gives a Level of Service (LoS) rating which indicates the relative performance of that intersection with regard to the average delay (in seconds per vehicle) experienced by vehicles at the intersection. At signalised intersections, overall intersection delay and Level of Service is taken as the average delay reported for all movements. The Sidra Intersection analysis of the operating conditions can be compared to the performance criteria set out in **Table 14**.

- **Table 14: Level of service criteria**

Level of service	Average delay per vehicle (sec/veh)	Traffic signals and roundabouts	Give Way and Stop Signs
A	Less than 15	Good Operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause delays. Roundabouts require other control mode	At capacity, requires other control mode
F	Over 70	Extra capacity required	Extreme delay, traffic signal or other major treatment required.

Source: RTA *Guide to Traffic Generating Developments*, version 2.2-2002

An intersection operating at Level of Service E or F is operating at or above capacity, with vehicles at these intersections experiencing substantial delays. Level of Service of D or better is generally considered acceptable in peak periods when future traffic is not taken into account, while Level of Service C is considered acceptable for future designs.

The intersections of Botany Road with Bumborah Point Road and McCauley Street were analysed using SIDRA Intersection for both the base case (existing AMCOR) and for future conditions (2018) with B9 and MRF (See **Table 15** and **Table 16** respectively). The latest traffic light phasing data from the RTA was used to undertake the analysis.

- **Table 15: Existing intersection operation, base case 2007 (as surveyed)**

Intersection	AM peak		PM peak	
	LoS	Average delay (Seconds)	LoS	Average delay (Seconds)
Botany Road / Bumborah Point Road	B	16	B	20
Botany Road / McCauley Street	B	15	B	16

- **Table 16: Future intersection operation, 2018 with Project B9 & MRF Traffic**

Intersection	AM peak		PM peak	
	LoS	Average delay (Seconds)	LoS	Average delay (Seconds)
Botany Road / Bumborah Point Road	A	13	B	22
Botany Road / McCauley Street	B	19	B	17

The intersections were also analysed for future conditions (2018) with B9, MRF and Precinct traffic included (See **Table 17**).

- **Table 17: Future intersection operation, 2018 with Project B9, MRF & Subdivision Traffic**

Intersection	AM peak		PM peak	
	LoS	Average delay (Seconds)	LoS	Average delay (Seconds)
Botany Road / Bumborah Point Road	B	15	B	26
Botany Road / McCauley Street	B	21	B	19

The results of the Sidra Intersection analysis show that the existing intersections in the vicinity of the proposed development would continue to comfortably accommodate traffic volumes from future network traffic growth and the additional traffic generated by the proposed development. Therefore there would be no significant impact on the intersections from the proposed development.

A detailed review of the Bomborah Point/ Botany Road intersection analysis results for the eastbound shared left turn and through lane was undertaken in order to ascertain whether a dedicated left turn lane would be required to reduce the impact of left turning traffic on through traffic. The delay for this lane was found to be 2.9 seconds in the AM peak and 5.5 seconds in the PM peak with the subdivision in place. The anticipated arrival rate of left turning vehicles is 144 vehicles in the AM (including 105 heavy vehicles) and 14 vehicles in the PM (0 heavy vehicles), resulting in an arrival rate of 2.4 vehicles per minute during the AM peak and 0.2 vehicles per

minute during the PM peak. Given the anticipated low impact of the left turn on through traffic in the lane, a dedicated turn lane is not warranted.

5.2.6. Parking

Due to efficiencies in production associated with the new paper mill, the overall demand for parking at the AMCOR site will decrease. However, the number of spaces within the AMCOR site is not expected to change as a result of the New Paper Mill and would be about 100 spaces.

Parking requirements for the new development precincts would be determined by the type of development approved.

Improved parking opportunities on McCauley Street would be provided including a new parallel parking lane along southbound McCauley Street.

5.2.7. Construction impacts

There would be impacts on traffic during the upgrade of McCauley Street including temporary partial road closures and temporary changes in access arrangements for commercial premises on McCauley Street.

A detailed Construction Traffic Management Plan would be prepared in consultation with Randwick City Council, the RTA and affected businesses to identify appropriate measures to be implemented to minimise impacts during construction.

5.3. Noise

5.3.1. Operational noise impacts

The full noise impact assessment for the operation of the New Paper Mill is presented in **Appendix C** and summarised below.

5.3.1.1. Original operational noise impact assessment

Noise modelling was undertaken for the New Paper Mill for the 2007 Submissions Report (SKM 2007) and based on the modelling and the Industrial Noise Policy, noise limits at the nearest residential receivers where included in the MCoA (**Table 18**). The modelling and noise limits were based on the operational characteristics and site layout of the Approved Project – and more significantly assumed that Paper Machine No's:7 and 8 buildings were retained.

- **Table 18: Operational noise limits**

Location	Daytime Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)	Evening Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)	Night Noise Limits ($L_{Aeq\ 15\ min}$) dB(A)
Cnr McCauley Street and Australia Avenue	46	39	39
Australia Avenue	47	40	40
Murrabin Avenue	45	39	38
Patranna Avenue	44	39	36
Moorina Avenue	35	35	35

There were no specific noise limits established for the new development precincts.

5.3.1.2. Changes in new operational noise impact assessment

The new noise impact assessment of the operation of the New Paper Mill including the following changes:

- *Availability of detailed design information* – The design of the New Paper Mill has progressed significantly since the original noise assessment and there was more detailed information on the location and type of noise sources (eg. fans, stacks) which was included in the new operational noise impact assessment. The new detailed design information has not resulted in significant changes in the overall noise generation from the New Paper Mill;
- *changes in site layout* – A number of the changes in site layout have resulted in a change of the location of some noise sources. The major change is the relocation of the Stock Prep Plant to the end of the New Paper Mill building. While the Stock Prep Plant is further away from residential areas, some of the activities such as the operation of a payloader in the rejects area

no longer have shielding from existing buildings. However, the changes in site layout have not resulted in any significant increases in the noise impacts in residential areas;

- *changes in the traffic movements on site* – With the proposed modification, AMCOR heavy and commercial vehicles would enter the site via the Botany Road access and exit the site via McCauley Street. This would result in some residences, especially in Australia Avenue, experiencing a higher level of on-site traffic noise. This would result in an increase in noise impacts at affected residences;
- *removal of the No: 7 and No: 8 Paper Machine buildings and site sheet metal fence*– The original noise impact assessment assumed that the No: 7 and No: 8 Paper Machine buildings and a sheet metal fence would be retained and provide substantial noise mitigation for residential areas. As the excess land would be subdivided from the AMCOR site and sold for new developments, it has been assumed for the purposes of the revised modelling that all existing structures would be removed in the new development precincts including the existing site boundary fence. While buildings, fences and other structures would be constructed in the new development precincts, the number, size, type and location of these new structures at this stage is unknown and therefore were not considered in the modelling. This loss of the noise mitigation from the existing (or future) structures results in significant increases in noise levels in residential areas.

5.3.1.3. New operational noise impact assessment

An initial noise impact scenario was modelled including the changes detailed in the section above and assuming that no additional noise mitigation measures were implemented. This initial noise impact scenario resulted in significant exceedences of the current operational noise limits contained in **Table 18**.

A second noise impact scenario was modelled including the changes detailed in the section above and including reasonable and feasible noise mitigation measures such as:

- 5m high “Colorbond” noise barriers along the boundary shared with the adjoining new development precincts;
- High noise barriers of concrete and Colorbond around the waste storage yard;
- Placement of the ventilation system fans on decks located on the south side of the mill building;
- Engineering controls on specific fans and blowers to achieve 85dB(A) at 1m from the outlets;
- The ground floor level wall of the paper machine building facing residential areas would be of concrete and a double clad metal system;

- The machine floor level wall of the paper machine building facing residential areas would be a double steel cladding system;
- The internal roadway system and therefore the traffic flow has been designed to prevent the sleep disturbance criteria from being exceeded; and
- The Finished Product Store has been redesigned so that trucks will be loaded inside the building and exit the site at a location removed from nearest residences.

Based on the implementation of the reasonable and feasible noise mitigation measures detailed above, the second scenario noise modelling estimated the noise levels at the nearest residential receivers for night time (**Table 19**), evening (**Table 20**) and day time (**Table 21**) and compared them against the existing approved operational noise limits.

At night time the estimated noise levels would exceed the existing approved noise limits at all locations by between 3 and 7 dB(A). This is primarily because of the removal of all buildings and structures in the new development precincts and the new on-site traffic movement patterns. The greatest exceedances generally occurred in residential areas north west of the site.

In the evening the estimated noise levels would exceed the existing approved noise limits at all locations by between 2 and 7.5 dB(A). This is primarily because of the removal of all buildings and structures in the new development precincts and the new on-site traffic movement patterns. The greatest exceedances generally occurred in residential areas north west of the site.

In the day time the estimated noise levels would exceed the existing approved noise limits at two locations, however at one of these locations the exceedance would only be 0.5 dB(A). At location R6, the predicted exceedance would be 8 dB(A), primarily because of the removal of all buildings and structures in the new development precincts.

- **Table 19: Night time noise impact assessment results**

Reference Locations	Current approved operational noise limits at night time	Night time predicted noise Level dB(A)	Satisfies original consent conditions	Exceedances dB(A)
R1	39dB(A)	45 dB(A)	No	6
R2	40dB(A)	44.5 dB(A)	No	4.5
R3	38dB(A)	45 dB(A)	No	7
R4	36dB(A)	41 dB(A)	No	5
R5	36dB(A)	39 dB(A)	No	3
R6	35dB(A)	39 dB(A)	No	4

- **Table 20: Evening noise impact assessment results**

Reference Locations	Current approved operational noise limits in the evening	Evening Predicted Noise Level dB(A)	Satisfies original consent conditions	Exceedances dB(A)
R1	39dB(A)	45	No	6
R2	40dB(A)	45	No	5
R3	39dB(A)	45	No	6
R4	39dB(A)	41	No	2
R5	39dB(A)	42	No	3
R6	35dB(A)	42.5	No	7.5

- **Table 21: Daytime noise impact assessment results**

Reference Locations	Current approved operational noise limits in the daytime	Day time predicted noise Level dB(A)	Satisfies original consent conditions	Exceedances dB(A)
R1	46dB(A)	46	Yes	Nil
R2	47dB(A)	45	Yes	Nil
R3	45dB(A)	45.5	No	0.5
R4	44dB(A)	42	Yes	Nil
R5	44dB(A)	42	Yes	Nil
R6	35dB(A)	43	No	8

Based on the above assessment and other considerations, AMCOR is seeking a modification to its operational noise limits as:

- The noise levels generated by the New Paper Mill would still be lower than the approved noise levels for the existing operations. The Existing Paper Mill generates very few noise complaints and these are generally associated with one-off activities and/or events (eg. emergency alarms). With the modern New Paper Mill, these one off events would occur less frequently and measures would be included to minimise the impact of these events (eg. internal rather than external alarms);
- The original noise assessment did not include the assessment of the removal of the No: 7 and No: 8 Paper Machine buildings and other structures;

- AMCOR's proposal to change the phasing of the traffic lights at the Botany/Bomborah Point Road intersection has been rejected resulting in increased traffic exiting the site via McCauley Street and increased noise impacts on residential areas north west of the site;
- There is likely to be further noise mitigation once the development of the new precincts occurs. Minor works such as an additional sheet metal fence along the boundary of the new development precincts with the residential areas, for example, would result in substantial noise reductions in residential areas. However, as the type of development in the new development precincts cannot be assumed for noise modelling purposes, this cannot be included in the assessment;
- The number of residences exposed to the higher noise levels would be low and would be predominately the first row of residences nearest to the New Paper Mill. Noise levels from the New Paper Mill would comply with the currently Approved Project noise limits at residences further away from the boundary;
- The existing sleep disturbance criteria at night would be met in all residential areas; and
- Reasonable and feasible noise mitigation measures have been implemented to minimise noise impacts where possible. Although it is recognised that other noise mitigation measures could be implemented these are likely to impose unreasonable operational restrictions or financial costs to the project.

The proposed new project specific noise limits are presented in **Table 22**.

- **Table 22: Proposed new project specific noise limits**

Residential Location	Day Time dB(A)	Evening dB(A)	Night Time dB(A)
R1	46	45	45
R2	45	45	44.5
R3	45.5	45	45
R4	42	41	41
R5	42	42	39
R6	43	42.5	39

5.3.1.4. Impacts on the new development precincts

Day time noise levels in the new development precincts from the modified New Paper Mill would be:

- McCauley Street Precinct – 40 to 45 dB(A) in about 20% of the precinct and 45 to 50 dB(A) in the remainder of the precinct; and
- Botany Road Precinct – 55 to 60 dB(A) in about 10% of the precinct, 50 to 55 dB(A) in about 20% of the precinct and 45 to 50 dB(A) in the remainder of the precinct.

These noise levels are typical of levels experienced in industrial zoned land and would not present a constraint to the development of the precincts.

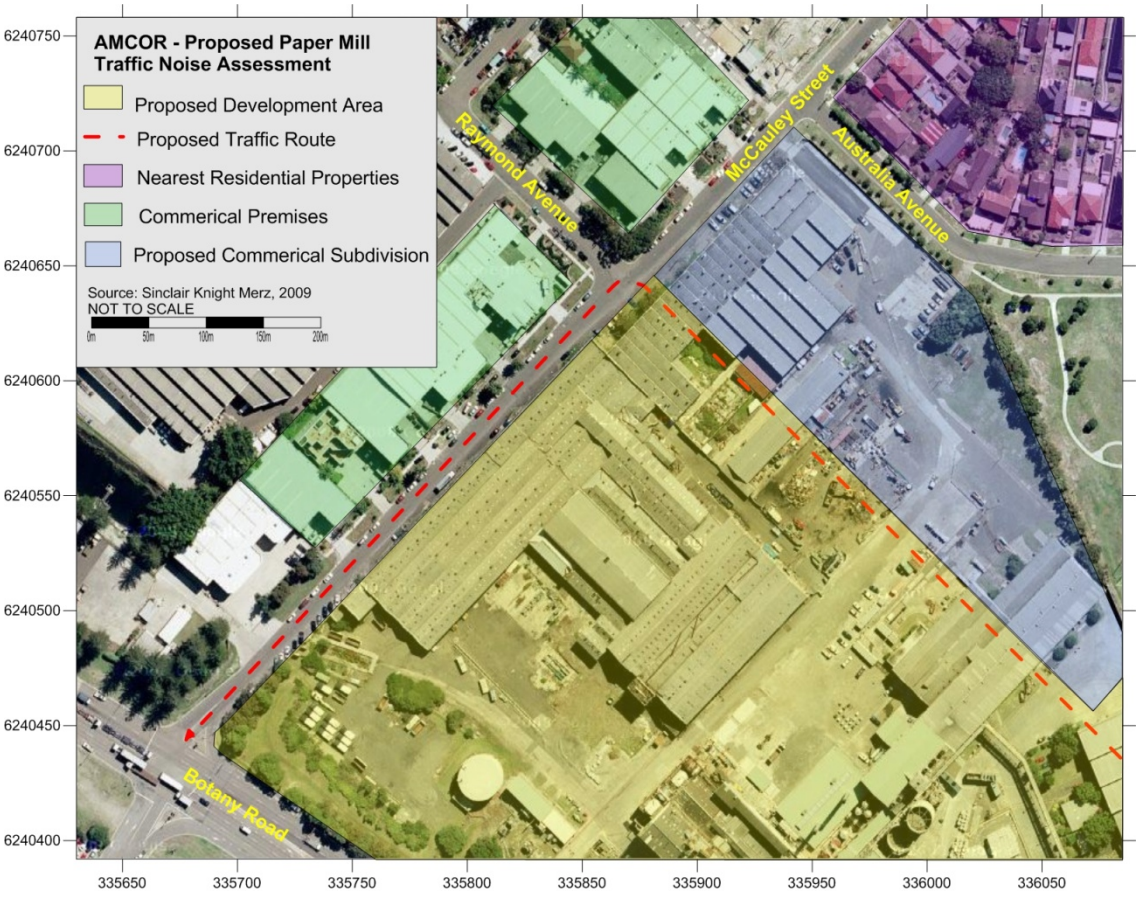
5.3.2. Operational traffic noise assessment

The percentage increase in traffic on Botany Road from the modification to the Approved Project would be negligible and consequently no further assessment was undertaken for increases in traffic on Botany Road. Assessment for this report focussed on operational traffic noise assessment for residences potentially impacted by increased AMCOR traffic on McCauley Street. The assessment, described in the following sections and detailed in **Appendix D**, included:

- A description of the existing noise environment in the area surrounding the site;
- Consideration of legislation and noise limits as contained in the Environmental Criteria for Road and Traffic Noise (ECTRN);
- Assessment of likely operational traffic noise levels at nearby residential receivers; and
- Recommendations for noise mitigation where required.

A plan showing the McCauley Street and nearby receivers is included as **Figure 10**.

- **Figure 10: Site plan**



5.3.2.1. Noise criteria

The EPA's *Environmental Criteria for Road Traffic Noise* (ECRTN) establishes criteria that define acceptable traffic noise levels for different types of developments. McCauley Street has been identified as a collector road in accordance with this guideline. In this instance, the following criterion from the ECRTN would apply for *'Landuse developments with the potential to create additional traffic on collector roads'* (EPA, 1999):

- Day 7:00 - 22:00 L_{Aeq}(1hr) 60 dB(A)
- Night 22:00 – 7:00 L_{Aeq}(1hr) 55 dB(A)

Where feasible and reasonable, noise levels should be reduced to meet the noise criteria via judicious design and construction of the development.

5.3.2.2. Road traffic noise assessment

Road traffic noise calculations were completed using the UK's Department of Environment, *Calculation of Road Traffic Noise* (CORTN) algorithms; both the DECCW and RTA support this procedure.

The modelled scenario assesses the potential noise impacts as vehicles accelerate out of the proposed exit located opposite Raymond Avenue as this is where maximum noise impacts associated with the project may occur. A conservative estimation of noise impacts was carried out by assuming that all AMCOR traffic will exit through the Raymond Avenue exit, although it is anticipated that a proportion of this traffic will exit the site via the Finished Product Store exit. It should be noted that the assessment does not include consideration of any traffic from the McCauley Road precinct as the type and pattern of traffic movements from the precinct are impossible to predict with any accuracy to allow assessment – and any additional mitigation measures would be the responsibility of the developer of the precinct.

In addition no new development has been assumed along the northern boundary of the site. In future as the subdivision of this zone proceeds, it is likely that the area will be occupied by a large buildings which would provide substantial mitigation between the exit location and the nearest receivers through the screening of traffic and site noise.

Table 23 lists the key input parameters used in the model to predict the night-time emissions for a number of scenarios.

- **Table 23: Summary of modelling inputs**

Input variable	Data source notes
Traffic mix and volumes	Peak hour counts for McCauley Street; Estimates of vehicle movements generated by AMCOR
Topography	Not included
Ground surface type	Hard
Height of Sources	1m (Light Vehicle engines) and 4.0m (Heavy Vehicle exhausts)
Height of receivers	1.5 m above ground terrain
Traffic Speed	20km/hr (Light Vehicles), 10km/hr (Heavy Vehicles)
Attenuation due to building structures	Not included
Facade Reflection	Not included
Modelled Situation	All vehicles accelerating out of exit opposite Raymond Avenue
Sound Power Levels	98dB(A) Light Vehicles, 106dB(A) Heavy Vehicles*

* Sourced from internal SKM database and based on previous measurements

Road traffic noise levels have been predicted at the nearest residential receiver located at the intersection of McCauley Street and Australia Avenue. These results are presented in **Table 24**.

- **Table 24: Modelled traffic noise – no mitigation**

Location		Daytime noise levels – L_{Aeq}(1hr) dB(A)		Nighttime noise levels – L_{Aeq}(1hr) dB(A)	
	Distance (m)	ECTRN criterion	Predicted noise levels	ECTRN criterion	Predicted noise levels
Residential	130	60	**53**	55	**51**

Examination of the results shows that without consideration of the expected future screening effects of proposed on site structures, day and night-time road traffic noise impacts are expected to comply with the ECTRN criteria during day and night time hours at the nearest residential location.

No additional noise mitigation for residences due to operational traffic movements on McCauley Street would be required.

5.3.2.3. Construction noise impacts

Construction noise impacts would be consistent with those predicted in the 2006 Environmental Assessment. The only difference would be construction noise impacts associated with the upgrade of McCauley Street. While these works where not assessed in the 2006 Environmental Assessment, they are unlikely to result in significantly greater impacts as the impacts would be short in duration and would be relatively distant from residential receivers. Construction of the New Paper Mill would be complete by the time any new development in the precincts occurs.

More detailed construction noise impact assessments would be undertaken for the Construction Noise Management Plan as required under the existing Minister's Conditions of Approval.

5.4. Odour

The DGRs require that odours impacts on the new development precincts from the New Paper Mill be assessed.

A detailed odour impact assessment was prepared for the 2006 Environmental Assessment. For the 2006 study odour generation, emission locations, stack heights and rates of emissions (ie. airflow) were based on preliminary design information. Since 2006 the design of the New Paper Mill has been further developed (although not yet completed) and more up-to-date information on the parameters for the odour study were available. Remodelling of odour emissions and dispersion was undertaken to ensure that the predicted odour levels from original assessment in 2006 were still valid (**Appendix E**) and included consideration of changes in site layout. It should be noted that once the detailed design is completed, a fully updated odour impact assessment would be completed.

The revised modelling indicates that in the McCauley Street Precinct odour levels would be in the range of 4 to 6 Odour Units/m^3 (OU/m^3), while in the Botany Road Precinct odour levels would be in the range of 5 to 8 OU/m^3. These levels are appropriate for industrial zoned land and as with the previous odour assessment, these levels are conservative as:

- The odour generation rates have been based on odour data collected from the existing Paper Mill and scaled up to account for increased production. The existing Paper Machines are over
- 40 years old (technology has improved since then) and there are design issues in the auxiliary processes (eg. the wastewater management system has many “dead zones” in the piping which allow bacterial growth which causes the odour). The New Paper Mill would incorporate the latest technology and the design issues which impacted the odour performance of the Existing Paper Mill would be addressed;
- There are no other sources of comparable odour data in the world which could be used to more accurately predict odour generation rates. This is because:
  - There are different standards for odour measurement in different countries that make data collected in other countries unsuitable,
  - odour is not considered an issue for this type of paper production and therefore is not measured; or
  - the feed stock and/or paper machines are substantially different at other facilities.
- Historically the vast majority of odour complaints occur when there is a failure in the process or when non-standard operational conditions occur (eg. starting up the paper machines after a period of inactivity). The occurrence of failures in the process and non-standard operational conditions would decrease with the new paper machine and auxiliary infrastructure.

Overall the odour impacts on the new development precincts from the New Paper Mill would be similar to the impacts predicted at the nearest residential receivers, albeit the odour levels would be slightly higher as the new development precincts would be closer to odour sources. However, it should be noted that AMCOR is not seeking any modification to existing project approval regarding odour and would still be required to meet the relevant Minister's Condition of Approval which is:

The Proponent shall ensure that the project complies with Section 129 of the Protection of Environment Operations Act 1997.
Note: Section 129 of the Protection of Environment Operations Act 1997 provides that the Proponent shall not cause or permit the emission of any offensive odour from the site, but provides a defence if the emissions is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with a condition of licence.

5.5. Air quality

Dust may be generated by the handling of the wastepaper in the Waste Paper Storage Yard. AMCOR monitors dust deposition at gauges around the perimeter of the site. Generally, monitoring results indicate that dust deposition levels are acceptable and below relevant maximum levels. Exceedances are usually associated with unusual regional events (eg. bush fires and dust storms) rather than on-site activities. With the partial covering of the Waste Paper Storage Yard, dust generation and potential impacts on surrounding land uses is expected to decrease. Therefore excessive dust generation would not be expected to impact on the new development precincts.

5.6. Soil and water

5.6.1. Stormwater

From the McCauley Street Precinct, stormwater would flow generally to the south. As part of the New Paper Mill development, a new stormwater pipeline near the boundary of the New Paper Mill site and the McCauley Street Precinct would be constructed. This pipeline drains into Long Dam where the stormwater is either pumped back to the New Paper Mill for use as process water or flows into Botany Bay if the volume exceeds the requirements for process water. Sufficient capacity in the new pipeline on the boundary would be provided to handle stormwater flows from the McCauley Street Precinct.

Detailed stormwater management plans for the Botany Road Precinct have not been developed as the final use of the land would determine the type of stormwater management systems required.

However, some general comments about the stormwater systems are provided. For the Botany Road Precinct there is an existing stormwater pipeline system which can be modified to accommodate any new development. This includes:

- The existing general service water system which would be disconnected from the New Paper Mill water system. This system contains a number of pipelines generally 600mm in diameter which traverse the precinct and could be converted to stormwater;
- A 600mm stormwater pipeline near the Botany Road entrance which drains underneath Botany Road and connects to Bunnerong Canal east of Bumborah Point Road;
- Two stormwater pipelines (one 300mm in diameter and the other 840mm in diameter) which discharge into Bunnerong Creek (which is located in an enclosed channel underneath the site) and drain the area around the existing paper machine buildings.

The combined capacity of these existing pipelines would be sufficient to handle the stormwater generated from the Botany Road Precinct.

Based on studies undertaken for the New Paper Mill, stormwater detention (to minimise potential flooding downstream) would not be required as the site is located in the lower part of the catchment near Botany Bay and there is sufficient capacity in the downstream waterways to manage peak stormwater flows without localised flooding. Also Bunnerong Creek and Canal have sufficient capacity to manage stormwater flows from the site without any further augmentation.

Stormwater treatment may be required depending on the final use of the new development precincts. Stormwater from areas which are subject to significant traffic movements are likely to require treatment devices (eg. gross pollutant traps and/or oil and grease removal), whereas stormwater from building roofs are unlikely to require treatment.

upstream catchments. The location and size of buildings in all the new development precincts would have to be assessed and appropriate measures are in place and/or augmented to ensure overland flow paths are maintained.

5.6.2. Sewerage systems

The existing Paper Mill has two connections to the sewerage system – a 2km private sewer line which connects directly to the South Western Suburbs Ocean Outfall Sewer (SWSOOS) for the disposal of process water and a connection to the existing reticulated sewer network for the disposal of domestic sewage (eg. water from toilets, showers, kitchens etc). There is also a Sewage Pumping Station (SPS) adjacent to the Botany Road entrance which collects sewage from the local area and a sewer main along McCauley Street. The new developments in the precincts are not likely to generate significant volumes of sewage and therefore the existing system is likely to be able to accommodate the small increased flows. The location of a SPS on the boundary of the site provides an easy and accessible option for the augmentation of the sewage system if required.

5.6.3. Additional mitigation measures

- Stormwater management plans would be prepared for the new precincts as part of the development approval process for the final land use of the areas; and
- Additional flooding assessments would be undertaken for the new precincts as part of the development approval process for the final land use of the areas to ensure that that any new development does not impact significantly on overland flow paths.

5.7. Hazards

The DGRs required that the Preliminary Hazard Analysis (PHA) "must be updated to reflect the proposed modification". The PHA for the New Paper Mill was prepared as part of the Submissions Report for the New Paper Mill, with the overall conclusions that the risk posed by the New Paper Mill was within acceptable limits. Although large quantities of dangerous goods are stored on-site, these are predominately Class 8- Corrosive substances – which do not pose significant off-site risks. The major risk off-site risk was from the storage of a relatively small quantity of LPG on-site.

The PHA has been updated to consider:

- Any changes in the types, quantities and locations of dangerous goods stored on site since the detailed design has been completed; and
- The risk to new development precincts.

Additional consultation with the Hazards and Risks Unit at DoP was undertaken to refine the format and content of the updated PHA. The updated PHA is contained in **Appendix F** and is summarised below.

In comparison to the quantities of dangerous goods presented in the original PHA, the quantities of some dangerous goods (specifically Class 8- Corrosive and Diesel) have decreased now that the detailed design has been completed (See **Table 25**). For other dangerous goods there has been no change or a minor increase in the proposed quantity to be stored on site (eg. LPG and Class 2.2- Compressed Gases). The storage locations for some dangerous goods have changed, however the changes are relatively minor. There are no new dangerous goods that have been identified during the detailed design process.

- **Table 25: Comparison of quantities of dangerous goods between original PHA and revised PHA**

Name of good	Class	Maximum quantity from original PHA	Maximum quantity from revised PHA
Petroleum Gases, Liquefied	2.1	6775 L	6,775 L
Acetylene, Dissolved Petroleum Gas, Liquefied	2.1 2.1	1000 kg	642 L
Oxygen, Compressed Nitrogen/" Argon, compressed Argoshield, Stainshield	2.2 (5.1) 2.2 2.2 2.2	100 L	1,300 L

Name of good	Class	Maximum quantity from original PHA	Maximum quantity from revised PHA
Flammable Liquid, Corrosive Nos BWT 8235 (Morpholine)	3 (8)	1600 L	800 L
Sodium or Potassium Hydroxide Solution and Hypochlorite	8	105,000 L	47,500 L
Combustible Liquid (Diesel Fuel)	C1	40,000 L	15,000 L
Oils and Greases	C2	100,000 L	100,000 L
Pesticides	6(1) b	80 kg	None

In the original PHA, only one incident was identified to have potential consequences on off site areas exceeding published criteria (Ref. 11 – HIPAP 4). This was a BLEVE (Boiling Liquid Expanding Vapour Explosion) at the LPG storage tank located about 30m from the site boundary. For the revised PHA, a BLEVE at the LPG storage tank is again the only incident which has been identified as having potential off site impacts.

The consequence analysis identified that a BLEVE fireball with a radius of 46m (ie. about 15m offsite into McCauley Street) would occur. Fatalities would occur if there were any people at the site boundary on McCauley Street within the radius of the fireball. It should be noted that the boundary of the McCauley Street Precinct and the New Paper Mill is approximately 80m from the LPG tank – and therefore is outside the radius of the potential fireball.

The fatality risk for the BLEVE scenario has been estimated to be 0.016 chances in a million per year (pmpy).

For residential land uses the risk criterion is 1 pmpy, for office land use is 5 pmpy and for industrial land uses (which is appropriate for the McCauley Street Precinct as it will be zoned IN1 – General Industrial) the risk criterion is 50 pmpy. The assessed fatality risk for the BLEVE scenario is significantly below these risk criteria and therefore the New Paper Mill does not pose an unacceptable risk to surrounding land uses.

An assessment against the NSW DoP Port Botany Risk Assessment Study was also undertaken. This assessment concluded that there would be no long term impact on the Cumulative Risk Contours as described in the NSW DoP Port Botany Risk Assessment Study (Ref 12).

5.8. Contamination

A number of contamination assessments have been undertaken at the Paper Mill site. The studies relevant to the McCauley Street and Botany Road precincts include:

- Preliminary Soil and Groundwater Investigation of the Western Part of Botany Mill (Woodward Clyde 1999)
- Phase 2 Environmental Site Assessment Amcor Matraville facility, 1891 Botany Road, Matraville, NSW (Parsons Brinkerhoff 2008)

The 1999 Woodward Clyde study involved a limited assessment of soil and groundwater contamination in the McCauley Street Precinct. The results of this assessment were presented in the 2006 Environmental Assessment. Contamination levels in the soil samples from McCauley Street Precinct were all below respective guideline levels. There was evidence of elevated levels of lead, zinc, nitrogen and phosphorus in groundwater, however, the report concluded that these were likely to originate from off site sources or reflect the natural chemistry of the aquifer.

More detailed discussion of the latest 2008 Parson Brinkerhoff study is presented below.

It should be noted that other contamination assessments have been undertaken on the area where the New Paper Mill is to be located. This includes more detailed sampling and the preparation of a Remediation Action Plan. The results of the contamination assessments in the New Paper Mill area are not presented in this document. The general findings from the more detailed studies on the New Paper Mill area indicate that there may be localised areas of soil contamination, however, there does not appear to be widespread soil contamination with heavy metals and organic pollutants. The most common soil contaminant found during sampling was asbestos – probably brought to site as part of fill for previous developments.

Because the site is still operational, not all areas are able to be accessed to allow soil and groundwater sampling. The buildings housing the currently operating paper machines No:7 and No:8 are particularly difficult to access because of safety issues around an operational paper machine and the substantial foundations required to support the paper machines.

5.8.1. Contamination assessment – 2007

Parsons Brinkerhoff (PB) was engaged specifically to undertake a preliminary Phase 2 contamination assessment of the new development precincts. The locations sampled and the rationale for sampling is presented in **Table 26**.

- **Table 26: Location and rationale for sampling**

Area - Borehole ID	Rationale for Selection
McCauley Street Precinct	
PB_BH1 (monitoring well)	A number of USTs were formerly present in this area,downgradient of adjacent industries and General coverage
PB_BH2	Adjacent to the former Oil Store, Engineering Centre, and No 6 Electrical Substation & General coverage
PB_BH3	Adjacent to Project Store, downgradient to the former USTs and General coverage
PB_BH4	General coverage
PB_BH7	Adjacent to 'Project Store' & General coverage
PB_BH17	Hydraulically upgradient & General Coverage
Botany Road Precinct	
PB_BH8	Downgradient of 'B7 Machine Room' & General coverage
PB_BH9 (monitoring well)	Downgradient of 'B7 Machine Room' & General coverage
PB_BH10	Adjacent to 'B7 Machine Room' & General coverage
PB_BH11	Downgradient of 'B7 Machine Room' and 'No 10 Electrical Substation' & General coverage
PB_BH12 (monitoring well)	Adjacent to 'B7 Machine Room' & In the area used to unload acids, where spillages have been Reported & General coverage
PB_BH13	Downgradient of 'B8 Machine Room' and 'No 13 Electrical Substation' & General coverage
PB_BH14 (monitoring well)	Downgradient of 'B8 Machine Room' & Adjacent to 'No 12 and No 15 Electrical Substations' & General coverage
PB_BH15	Downgradient of 'B8 Machine Room' and 'No 12 Electrical Substation' & General coverage

5.8.1.1. Guidelines

Soils

To assess the presence and extent of soil contamination, the NSW EPA (2006) *Guidelines for the NSW Site Auditor Scheme (2nd edition)* and the NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)* were used. For contaminants not included in these documents, reference was made to other commonly used international guidelines such as the Environmental Quality Objectives from the Netherlands (Dutch Guidelines), or in US EPA (Region IX), where available.

Groundwater

As the groundwater on site eventually discharges into Botany Bay the threshold concentrations presented in the ANZECC (2000) *Fresh and Marine Waters Quality Guidelines* are considered applicable for the protection of aquatic ecosystems of the receiving waters. It should be noted that it is generally conservative to apply these to groundwater discharging to receiving waters. The marine trigger values were used as the receiving waters (Botany Bay) is a marine environment. The exception was for TPH where the Dutch intervention value (600 ug/L) has been adopted as investigation criteria to assess TPH contamination in groundwater

5.8.1.2. Results

McCauley Street Precinct

At the 6 locations investigated in this area, fill, up to 0.45 m thick, was encountered underneath the concrete at 3 locations; this fill was found to contain ash at 2 locations. This fill layer was placed on natural sand.

Botany Road Precinct

At the 6 locations investigated in the western side of the precinct, fill containing ash, up to 0.9 m thick, was encountered underneath the concrete at 3 locations. This ash layer was placed on natural sand. At the three locations investigated in the eastern side of the precinct, natural sand was encountered immediately underneath the concrete / bitumen layer.

Presented in **Table 27** is a summary of the results of the soil sampling – indicating that although some areas of fill with ash were found, soil contamination guidelines were not exceeded at any of the sampled locations in the McCauley Street and Botany Road precincts.

Table 27: Summary of soil analytical results

No. of primary samples	Analyte	Sample locations in the McCauley Street and Botany Road precincts exceeding site assessment criteria
35	TPH C6–C9	None
35	TPH C10-C36	None
35	Benzene	None
35	Toluene	None
35	Ethyl benzene	None
35	Total xylenes	None
24	Benzo(a)pyrene	None

No. of primary samples	Analyte	Sample locations in the McCauley Street and Botany Road precincts exceeding site assessment criteria
24	Total PAHs	None
Heavy Metals		
48	Arsenic	None
48	Cadmium	None
48	Chromium	None
48	Copper	None
48	Lead	None
48	Nickel	None
48	Zinc	None
48	Mercury	None
15	OCPs/ OPPs	None
13	PCBs	None
2	VOCs	None
21	Asbestos	None

Groundwater

The number of groundwater samples collected, analytes tested for, minimum/maximum constituent concentrations and those samples that exceeded the adopted investigation levels are presented in Table 28. Concentrations of a number of hydrocarbon pollutants exceeded guideline levels at bores in the Botany Road Precinct, however, it should be noted that the guideline levels used to assess these pollutants are extremely conservative and only indicative guidelines. Concentrations of zinc and copper exceeded guideline levels at the bore in the McCauley Street precinct, however the exceedances were minor and these may be due to natural aquifer background concentrations rather than pollution.

- **Table 28: Summary of groundwater analytical results**

No. of primary samples	Analyte	Max. Conc. (mg/L)	Sample locations exceeding investigation levels
Hydrocarbons			
5	TPH C_6–C_9	nd	none
5	TPH C_{10}-C_{36}	277	none
5	Benzene	nd	none
5	Toluene	nd	none
5	Ethyl benzene	nd	none
5	Total xylenes	nd	none
5	Naphthalene	2.5	none
5	Phenanthrene	4.8	PB_BH9
5	Anthracene	1.6	PB_BH9
5	Fluoranthene	0.9	none
5	Benzo(a)pyrene	0.2	PB_BH14
5	Total PAHs	24	PB_BH9
Heavy Metals			
5	Arsenic	7.9	none
5	Cadmium	<0.1	none
5	Chromium	1.4	none
5	Copper	2	PB_BH1
5	Lead	<1	none
5	Nickel	20	none
5	Zinc	70	PB_BH1
5	Mercury	nd	none
5	pH	5.9 -7.2	No criteria
2	VOC	nd	none
2	VHC	nd	none

nd – not detected

5.8.2. Additional Mitigation Measures

The following additional mitigation measures are proposed:

- More detailed soil and groundwater sampling would be undertaken in accordance with relevant guidelines to confirm that the McCauley Street and Botany Roads precincts are suitable for the intended land use.

5.9. Visual

Based on the current design, plan, elevation and landscape drawings and a 3D view of the New Paper Mill (from the corner of McCauley Street and Botany Road) have been prepared (See **Figure 2**, **Figure 11**, **Figure 12** and **Figure 13**).

The 3D view (Figure 11) shows the New Paper Mill from the location where most of the passing traffic would see the New Paper Mill. The New Paper Mill would be constructed of modern materials such as coloured sheet metal and concrete. The frontage along Botany Road would consist of a 35m metre high building with a mezzanine level. The mezzanine level results in a reduction of the bulk and visual size of the building and different colour materials further reduce the visual impact of the structure. Landscaping (**Figure 13**) would also be provided along the Botany Road frontage including Norfolk Pines (which grow up to 30m in height and Port Jackson Figs (which group up to 20m in height.

Along the McCauley Street frontage, the building facade would be more uniform in appearance, however, would only be 12m high for the majority of the building length (ie. for the Finished Product Store). Also there would be at least a 12m buffer from the site boundary to any building. Appropriate landscaping (ie. large trees and shrubs – See **Figure 13**) and fencing would be provided in the buffer zone to minimise the visual impact of the building along McCauley Street.

The existing appearance of McCauley Street would be improved considerably with the upgrade of the road and verge areas.

Figure 12 shows the elevation plan of the New Paper Mill from six different viewpoints, also reflecting the changes in site layout.

The visual impact of the modified New Paper Mill is consistent with the Approved Project.

Figure 11: 3D view from McCauley Street/Botany Road intersection

AMCOR _ MODIFICATIONS TO APPROVED DA 3D VIEW CORNER McCAULEY STREET & BOTANY ROAD

JOB NO. 09117 TP05d

CNR BOTANY ROAD & McCAULEY STREET, MATRAVILLE NSW

DATE: OCT '09
DRAWN BY: GP
SCALE @ A1: 1:500
SCALE @ A3: 1:1000

NOTE:
EXIT DOORS AND STAIRS ARE INDICATIVE ONLY.

NO.	DATE:	REVISION:	BY	CHK
	30-10-09	ISSUE TO CLIENT	GP	AY
A	06-11-09	REVISIONS AS PER CLIENT	GP	AY
B	09-11-09	REVISIONS AS PER CLIENT	GP	AY
D	23-11-09	REVISIONS AS PER CLIENT	GP	AY

WATSONYOUNG
ARCHITECTS//INTERIORS
8 grafton street prahran victoria 3181 australia acn: 111 398 700
t: 03 9516 8555 f: 03 9516 8500 w: www.watsonyoung.com.au

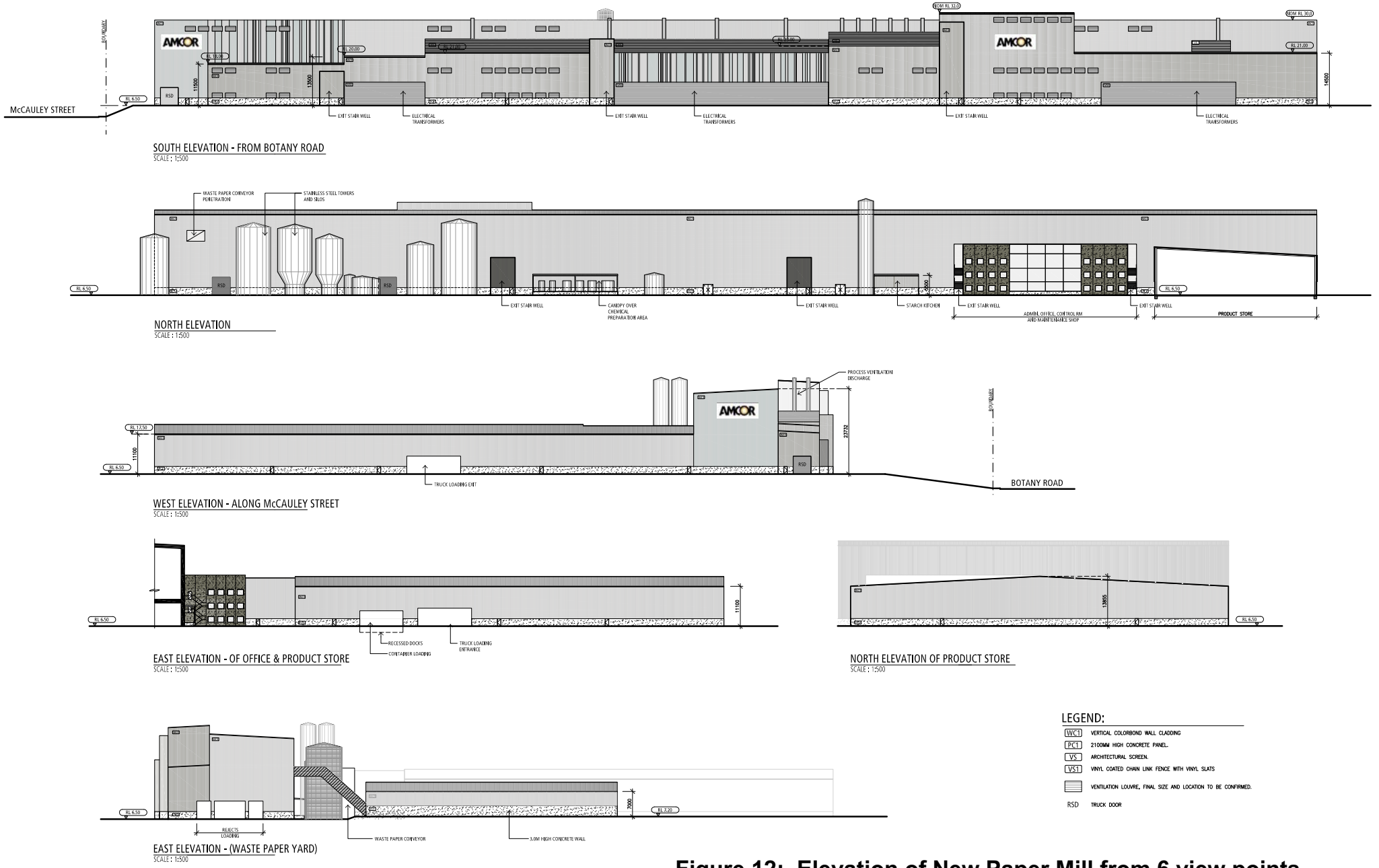


Figure 12: Elevation of New Paper Mill from 6 view points

AMCOR _ MODIFICATION TO APPROVED DA ELEVATIONS

CNR BOTANY ROAD & McCAULEY STREET, MATRAVILLE NSW

JOB NO: 09117 rev d

DATE: OCT '09
DRAWN BY: GP
SCALE @ A1: 1:500
SCALE @ A3: 1:1000

NOTE:
EXIT DOORS AND STAIRS ARE INDICATIVE ONLY.

NO.	DATE:	REVISION:	BY	CHK
-	30-10-09	ISSUE TO CLIENT	GP	AY
A	06-11-09	REVISIONS AS PER CLIENT	GP	AY
B	09-11-09	REVISIONS AS PER CLIENT	GP	AY
C	11-11-09	REVISIONS AS PER CLIENT	GP	AY
D	23-11-09	REVISIONS AS PER CLIENT	GP	AY

WATSONYOUNG ARCHITECTS//INTERIORS
8 grattan street prahran victoria 3181 australia acn: 111 398 700
t: 03 9516 8555 f: 03 9516 8500 w: www.watsonyoung.com.au

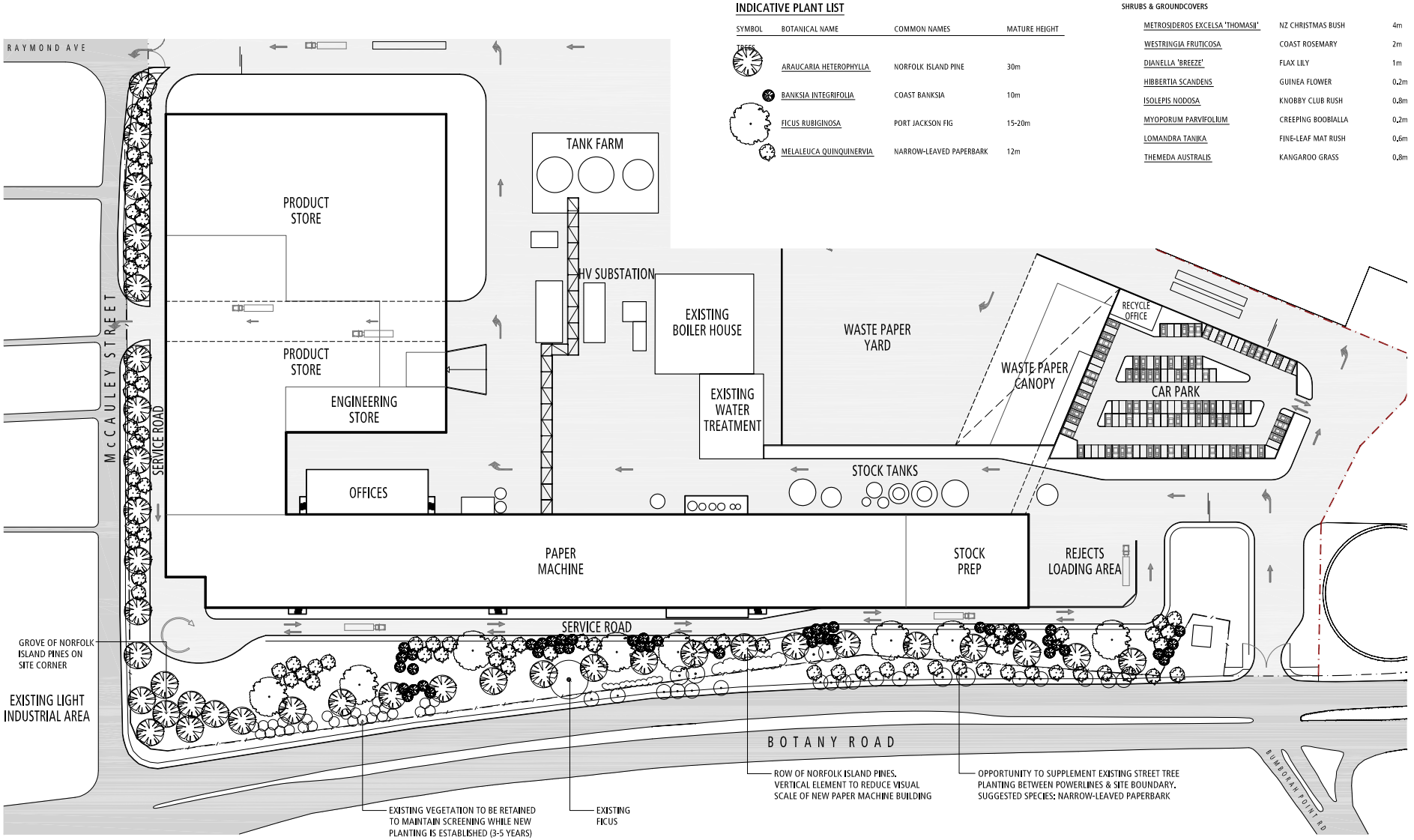


Figure 13: Landscaping plan

AMCOR _ MODIFICATION TO APPROVED DA LANDSCAPE PLAN

JOB NO: 09117 TP03d

CNR BOTANY ROAD & McCAULEY STREET, MATRAVILLE NSW

DATE: OCT '09
DRAWN BY: GP
SCALE @ A1: 1:750
SCALE @ A3: NTS

AMCOR

NOTE:
DIMENSIONS APPROXIMATE ONLY,
INCLUDING 10,000m² PRODUCT STORE LAYOUT

NO.	DATE:	REVISION:	BY	CHK
A	06-11-09	REVISIONS AS PER CLIENT	GP	AY
B	09-11-09	REVISIONS AS PER CLIENT	GP	AY
C	11-11-09	REVISIONS AS PER CLIENT	GP	AY
D	23-11-09	REVISIONS AS PER CLIENT	GP	AY

WATSONYOUNG ARCHITECTS//INTERIORS
8 grattan street prahran victoria 3181 australia acn: 111 398 700
t: 03 9516 8555 f: 03 9516 8500 w: www.watsonyoung.com.au

6. Additional Statement of Commitments

Presented below are additional Statements of Commitments to those already developed for the 2006 Environmental Assessment.

- AMCOR would review its current dust deposition monitoring program and potentially relocate dust gauges to better reflect potential impacts on new development areas.
- Stormwater management plans would be prepared for the new precincts as part of the development approval process for the final land use of the areas.
- Additional flooding assessments would be undertaken for the new precincts as part of the development approval process for the final land use of the areas to ensure that that any new development does not impact significantly on overland flow paths.
- More detailed soil and groundwater sampling would be undertaken in accordance with relevant guidelines to confirm that the McCauley Street and Botany Roads precincts are suitable for the intended land use.
- Randwick City Council would be consulted and approve the design of the new shared access opposite Raymond Avenue on McCauley Street. The new access would be designed in accordance with relevant standards.
- RTA would be consulted and approve the design of the new shared access on Botany Road. The new access would be designed in accordance with relevant standards.
- The RTA and Randwick City Council would be consulted during the detailed design of McCauley Street and during the development of a Construction Traffic Management Plan for the upgrade of McCauley Street.
- AMCOR would dedicate up to 2m of land along McCauley Street to allow the widening and upgrade of McCauley Street.
- Noise monitoring would be undertaken to confirm the operational traffic noise assessment predictions.

7. Conclusions

In the preceding sections, the impacts of the proposed modification to the existing project approval for AMCOR's New Paper Mill development at Botany have been described and assessed.

Overall, the noise, odour, air quality, hazards and soil and water impacts from the New Paper Mill on the proposed new precincts would be acceptable and would not pose significant constraints to future development of these areas based on its current IN1 zoning.

The major change as a result of this modification to the Project Approval would be increased traffic on McCauley Street. To cater for the increased traffic movements, McCauley Street would be upgraded to meet Randwick City Council's requirements. Assessment of the Botany Road/ Bumborah Point Road and McCauley Street/Botany Road intersections indicates that these intersections would operate at a satisfactory level of service to service the site and future background traffic. Noise from increased traffic on McCauley Street would not result in any exceedance of relevant guidelines.

7.1. Objects of the EP&A Act

Presented in **Table 29** is an assessment of the proposed modification against the objects of the Environmental Planning and Assessment Act 1979 (EP&A Act).

- **Table 29: Objects of the EP&A Act**

The objectives of the EP&A Act are to:	Response
(a) to encourage: (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,	The proposed modification will allow the proper management and development of essential industrial land in a recognised State significant port zone. The economic benefits to the community will include increased local employment opportunities and an improved McCauley Street. A better environment would be achieved through the construction of the New Paper Mill, which will result in the reduction of noise and odour impacts.
(ii) the promotion and co-ordination of the orderly and economic use and development of land,	The modifications to the approved project are specifically aimed at meeting this objective, namely allowing the orderly development of economically important industrial land in a State significant port zone.
(iii) the protection, provision and co-ordination of communication and utility services,	Not relevant
(iv) the provision of land for public purposes	AMCOR would dedicate up to 600 square metres of land to Council for the upgrade of McCauley Street

The objectives of the EP&A Act are to:	Response
(v) the provision and co-ordination of community services and facilities, and	Not relevant
(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats,	No flora, fauna or threatened species would be impacted by the proposed modifications.
(vii) ecologically sustainable development	The proposed modifications are located in a State significant port zone, which has been identified as a location to centralise development of this type.
(viii) the provision and maintenance of affordable housing	Not relevant
(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State	While DoP is the approval authority for the development, Randwick City Council has been consulted during the preparation of the Modification Report.
c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.	The surrounding community was consulted during the preparation of the Modification Report. This Modification Report will also go on public exhibition.

7.2. Certification of the Author of the Modification Report

This Modification Report has been prepared by Jonas Ball from Sinclair Knight Merz, 100 Christie Street St Leonards NSW. To the best of his knowledge, this Modification Report does not contain information that is false or misleading:

Signature:  18 January 2010

Appendix A Community and Stakeholder Submissions

NSW GOVERNMENT
Department of Planning

Major Project Assessment
Industry & Mining
Phone: (02) 9228 6338
Fax: (02) 9228 6466
Email: Jacqueline.Ingham@planning.nsw.gov.au

23-33 Bridge Street
GPO Box 39
SYDNEY NSW 2001

Our ref: S00/00481

Mr Jonas Ball
Senior Environmental Scientist
Sinclair Knight Merz
PO Box 164
ST LEONARDS NSW 1590

Dear Mr Ball

Amcor Paper Mill (05_0120 MOD 2)
Director-General's Requirements

I refer to your request to modify the Minister's approval for the Amcor Paper Mill at Botany under Section 75W of the *Environmental Planning and Assessment Act, 1979* (EP&A Act).

I have attached a copy of the Director-General's requirements for the proposed modification. These requirements have been prepared in consultation with the relevant agencies, and are based on the information you have provided to date. I have also attached a copy of the agencies comments for your information.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit your finalised modification application. This will enable the Department to determine the:

- the applicable fees;
- the consultation requirements; and
- the number of copies of the modification application.

If you have any enquiries about these requirements, please contact Jacqueline Ingham on 9228 6338 or jacqueline.ingham@planning.nsw.gov.au.

Yours sincerely

21.11.07

Chris Wilson
Executive Director
Major Project Assessment
As delegate for the Director-General

Director-General's Requirements

Section 75W of the *Environmental Planning and Assessment Act 1979*

Modification	Modification of the project approval to allow subdivision of the site, upgrades to access roads and minor changes to the site layout.
Site	1891 Botany Road, Matraville (Lot 1 DP 772737 and Lot 1 DP 363611)
Proponent	AMCOR (Australasia) Pty Ltd
Date of Issue	20 November 2008

General Requirements	The Environmental Assessment (EA) must include:
	• an executive summary;
	• a detailed description of the following on site:
	  ▪ historical operations/activities;
	  ▪ existing and approved operations/facilities, including any statutory approvals that apply to these operations and facilities; and
	  ▪ the existing environmental management and monitoring regime;
	• a detailed description of the modification including the:
	  ▪ need for the modification;
	  ▪ alternatives considered; and
	  ▪ plans for the new subdivision, roads and site layout;
	• a general overview of the environmental impacts of the modification, identifying the key issues for further assessment;
	• a detailed assessment of the key issues specified below, and any other significant issues identified in the general overview of environmental impacts of the modification (see above), which includes:
	  ▪ a description of the existing environment, using sufficient baseline data;
	  ▪ an assessment of the potential impacts of the modification, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions (see below);
	  ▪ a description of the measures that would be implemented to avoid, minimise, mitigate, and/or offset the impacts of the modification;
	• a Statement of Commitments, outlining the proposed environmental management, mitigation and monitoring measures;
	• a conclusion justifying the modification, taking into consideration whether the project is consistent with the objects of the *Environmental Planning and Assessment Act 1979*;and
	• a signed statement from the author of the EA certifying that the information contained in the report is neither false nor misleading.

Key Issues	• **Transport** – including details of new and revised site accesses to service the existing project and new subdivision, internal roads and parking; details of traffic types and volumes to be generated; predicted impacts on road safety and capacity of road network; • **Noise** – including impact of construction, operational and road traffic noise from the project on the proposed subdivision; • **Odour** – including odour impacts from the project on the proposed subdivision; • **Air Quality**– including dust impacts from the project on the proposed subdivision; • **Soil and Water**– including details of sewerage and stormwater systems to service the site, soil contamination levels and remediation requirements; • **Hazards** – the PHA must be updated to reflect the proposed modification; and • **Visual** – including landscaping, design, set-backs, signage and lighting with particular regard to revised site layout.

References	The Environmental Assessment must take into account relevant State government technical and policy guidelines. While not exhaustive, guidelines which may be relevant to the project are included in the attached list.
Consultation	During the preparation of the modification application, you should consult with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. In particular you must consult with: • Department of Environmental and Climate Change; • Department of Water and Energy • Sydney Ports Corporation; • Roads and Traffic Authority; and • Randwick City Council. The consultation process and the issues raised must be described in the Environmental Assessment.
Deemed Refusal Period	60 days

Policies, Guidelines & Plans

Aspect	Policy /Methodology
Risk Assessment	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203:2006 Environmental Risk Management – Principles & Process (Standards Australia)
Transport	
	State Environmental Planning Policy (Infrastructure)
	Guide to Traffic Generating Development (RTA)
	Road Design Guide (RTA)
Noise	
	NSW Industrial Noise Policy (DECC)
	Environmental Criteria for Road Traffic Noise (NSW EPA)
	Environmental Noise Control Manual (DECC)
Odour	
Odour	Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2002
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
Hazards and Risk	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Applying Sepp 33: Hazardous And Offensive Development Application Guidelines (DUAP)
	Hazardous Industry Planning Advisory Paper No. 6 (HIPAP No 6): *Guidelines for Hazardous Analysis*, (DUAP)
	Multi-Level Risk Assessment (DUAP)
Visual	
	Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, AS 4282)

Administrative Centre
30 Frances St
Randwick 2031
Tel: 02 9399 0999 or
1300 722 542 (Randwick local area)
Fax: 02 9319 1510
general.manager@randwick.nsw.gov.au
ABN: 77 362 844 121

RANDWICK CITY COUNCIL
a sense of community

INCORPORATED
AS A MUNICIPALITY
22 FEBRUARY 1859
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~~Our Ref: 2006/00713~~
~~27 October 2008~~

Director General
Department of Planning
Major Development Assessments
GPO Box 39
SYDNEY NSW 2000

Attention: Jacqueline Ingham

Dear Ms Ingham,

Director General's requirements
Proposed modifications to approved paper mill
1891 Botany Road, Matraville

Thankyou for your email of 9th October 2008 inviting Council to comment on the AMCOR proposals for 1891 Botany Road, Matraville. In summary, we request the Department to include the following matters in the Director General's requirements:

- a comprehensive masterplan for the site
- a traffic study and preliminary design work for McCauley Street.
- heavy vehicle access to the excised lots
- contamination investigations for the excised lots
- updated technical reports for the proposed paper mill
- elevations and plans for new building work

We have also made comments about:

- licensing under the Protection of the Environment Operations Act 1997
- Application of section 75B(3) of the Act.

Master-planning

Council have previously commented on the lack of whole-of-site planning. The current proposal appears to be an ad-hoc evolution of the approved development and there are planning inadequacies as a result. Vehicular access and site remediation, in particular, require a more comprehensive planned solution. The proponent appears to imply that future land-uses are unknown and so cannot be planned for. Council do not share this view.

Use of McCauley Street for heavy vehicle access

Council object to the use of McCauley Street for heavy vehicles and are not prepared to incur greater maintenance costs as a result of the increased truck movements.

Heavy vehicle access in McCauley Street may be considered only where it is part of a holistic plan to accommodate potential future uses over the whole of the site. In this case, McCauley Street will require a major upgrade. The application must

include a traffic study and specifications and preliminary design work for the upgrade. Council will consult with the Regional Development Committee on the whole-of-site plan and application once it is lodged with the Department of Planning.

Access to the excised lots

The proposal does not include vehicular access to the eastern lot; deferring the provision of access until the final use of the land is determined. This arrangement lacks the necessary finality for the creation of a new lot. The application must include a proposal for access to the new lot as part of the subdivision.

Site remediation

Council have previously raised an issue about the creation of a new lot without adequate contamination remedial work. Ordinarily, where the intended uses of new lots are not specified, a site audit would need to specify that the land is suited to a range or class of uses.

Nevertheless, SEPP 55 requires a consent authority to be satisfied that a site is suitable or can be remediate for its intended use before granting consent. The application should be accompanied by a preliminary investigation carried out in accordance with the contaminated land planning guidelines.

Technical reports

All technical reports for the major project application must be updated to reflect the revised proposal.

Minor changes to the layout.

The application should include elevations of the new buildings. The new enclosures on the southern side of 'building 1' must fully conceal the transformers.

Noise, odour, waste water and air quality

We note that the paper-mill is scheduled premises under the Protection of the Environment Operations Act and requires a license to operate from the Department of Environment and Climate Change.

Please feel welcome to telephone me on 9399 0162 if you have any questions.

Yours faithfully,

David Mooney
Senior Environmental Planning Officer

ID 08M 1462

Director, Strategic Assessments
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Jacqueline Ingham

PROPOSED MODIFICATION TO AMCOR PAPER MILL, BOTANY – DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Dear Sir/Madam

I refer to your email of 9 October 2008, regarding the subject proposal and the Department's request for key issues and environmental assessment requirements.

The RTA has reviewed the proposed modification and the proposed sub-division and requests the following issues be addressed in the transport and traffic impact assessment:

1. Daily and peak traffic movements likely to be generated by the proposed modified development and the subdivided lot including the impact on nearby intersections and the need for funding of upgrading or road improvement works (if required).

2. Details of the proposed accesses and parking provisions associated with the proposed modifications and sub-divided lot including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc).

3. Proposed number of car parking spaces and compliance with the appropriate parking codes.

4. Details of service vehicle movements (including emergency and articulated vehicles), approximate times of arrival and departure and provisions for entry and exit driveways and loading docks.

5. Intersection analysis (such as SIDRA) shall be submitted to determine the impact of the additional traffic movements generated by the proposed modification and the future sub-divided land on the intersections in proximity to the subject site.

6. Identify any necessary road network infrastructure upgrades that are required to maintain existing levels of service on both the local and classified road network. However, it should be noted that any identified road infrastructure upgrades will need to be to the satisfaction of Council/RTA.

7. The swept path of the longest vehicle entering and exiting the modified Paper Mill development and the subdivided land shall be in accordance with Austroads requirement. In this regard, a swept path plan shall be submitted illustrating compliance with this requirement.

Any inquiry in relation to this development application can be directed to Stan Mack by phone 88492584, or facsimile 8849 2107.

Yours sincerely,

James Hall
A/Senior Land Use Planner
Transport Planning Section
Sydney Region

16 October 2008

Your reference: ENO1893 - Modification #2 Letter #1 DECC.doc
Our reference: DOC09/1938
Contact: Bob Marr, 9995 6825

Mr Jonas Ball
Senior Environmental Scientist
Sinclair Knight Merz Pty Ltd
PO Box 164
ST LEONARDS NSW 1590

Dear Mr Ball

Re: Modification to New Paper Mill Project Approval – Amcor Packaging (Australia)

I refer to your letter dated 19 December 2008 and to the appended report titled *New Recycled Paper Mill (B9 Project) Final 30 September 2008* and associated documents regarding the above matter.

The Department of Environment and Climate Change (DECC) has reviewed the information contained in these documents and notes your advice that the Department of Planning (DoP) requires Amcor to consult with DECC about any additional requirements during the preparation of the Modification Report. DECC notes also your advice that the modifications will not increase odour emissions and noise, and the modification will not have any adverse impacts in relation to flora and fauna, water or indigenous heritage.

Notwithstanding the above, there appears to be a level of uncertainty in relation to possible soil contamination due to restricted sampling access. Consequently, DECC suggests that once the operating paper machines are removed then Amcor needs to complete the soil sampling and if necessary implement the Remedial Action Plan for the relevant area.

In summary, on the basis of the information supplied in your letter, the DECC has no additional comments in relation to the Modification, other than the General Terms of Approval for the original upgrade proposal sent to the DoP on 11 May 2007.

If you wish to discuss this matter please contact Bob Marr on 99956825.

Yours sincerely

pp. ISRAEL 30/01/09

NICOLAS ISRAEL
Acting Head Sydney Industry
Environment Protection and Regulation

PO Box 668 Parramatta NSW 2124
Level 7, 79 George Street Parramatta NSW
Tel: (02) 9995 5000 Fax: (02) 9995 6900
ABN 30 841 387 271
www.environment.nsw.gov.au

Ball, Jonas E (SKM)

From: David Mooney [David.Mooney@randwick.nsw.gov.au]
Sent: Thursday, 5 March 2009 9:55 AM
To: Ball, Jonas E (SKM)
Subject: RE: McCauley Street upgrades

Yes, the minimum lane width specifications are for b-doubles and semi-trailers. No, we would not consider a reduction in the verge width (except in that part of the site adjacent to the heritage wall).

Faithfully,

David Mooney | Senior Urban Planner | Randwick City Council
Administration Centre, 30 Frances Street, Randwick NSW 2031
T +61 2 9399 0612 | **F** +61 2 9319 1510 | **W** www.randwick.nsw.gov.au

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From: Ball, Jonas E (SKM) [mailto:JBall@skm.com.au]
Sent: Thursday, 5 March 2009 9:53 AM
To: David Mooney
Subject: RE: McCauley Street upgrades

David

Thanks for that. Just a few point to clarify:

> The minimum lane widths are for both scenarios ie. semi-trailers only and B-Doubles and semitrailers
> Council is not prepared to consider a reduction in the verge width?

Thanks
Jonas Ball
Senior Environmental Scientist
PO Box 164 St Leonards 1590
Tel: 02 9928 2225
Fax: 02 9928 2502
Mobile: 0419 297 436
Email: jball@skm.com.au

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For further information, visit our website www.skmconsulting.com
From: David Mooney [mailto:David.Mooney@randwick.nsw.gov.au]
Sent: Thursday, 5 March 2009 9:48 AM
To: Ball, Jonas E (SKM)
Subject: McCauley Street upgrades

Hello Jonas,

Our lane width specifications are the minimum specifications for any upgrade work in McCauley Street. We would expect land dedication from AMCOR to achieve the necessary upgrades. Alternately, you may wish to investigate realignment of the road closer to the western boundary.

Please email or telephone me if you have any questions.

Faithfully,

David Mooney|Senior Urban Planner|Randwick City Council
Administration Centre, 30 Frances Street, Randwick NSW 2031
T +61 2 9399 0612|**F** +61 2 9319 1510|**W** www.randwick.nsw.gov.au

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"Please come and visit us at www.randwick.nsw.gov.au "

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Ball, Jonas E (SKM)

From: John Flanigan [John.Flanigan@randwick.nsw.gov.au]
Sent: Friday, 13 February 2009 5:47 AM
To: Ball, Jonas E (SKM)
Subject: McCauley Street

Hi Jonas

sorry about the delay in getting information to you, Manager Integrated Transport is on leave.

Council's absolute minimums for the parking lanes and travel lanes would be as follows:

- *2.3 metre wide parking lanes on both sides, (measured from the face of kerb).*
- *3.5 metre wide travel lanes.*
- *The total carriageway width should therefore be a minimum of 11.6 metres, (face of kerb to face of kerb).*

The verge on the Amcor development site of McCauley Street should be a minimum of 3 metres in width, (i.e. from face of kerb to site boundary).

I am out of the office this morning however I will phone you after 1pm to discuss.

regards

John Flanigan

Ball, Jonas E (SKM)

From: James Burford [JBurford@sydneyports.com.au]
Sent: Wednesday, 11 February 2009 9:43 AM
To: Ball, Jonas E (SKM)
Subject: SPC Comment - Modification Report for AMCOR Paper Mill Project
Attachments: image001.gif; image002.jpg

Dear Jonas

Thank you for allowing Sydney Ports the opportunity to comment on the Modification Report for the AMCOR Paper Mill Project (your reference: *EN01893 #2 Letter #1 - SPC*).

Sydney Ports has reviewed the documentation and confirm we have no further comment to make at this time.

Should you require any further information or detail, please contact me on the number below.

Regards,

James Burford
Environmental Planner

Sydney Ports Corporation
Level 9, 207 Kent Street | Sydney NSW 2000 Australia
PO Box 25, Millers Point | NSW 2000 Australia

E: JBurford@sydneyports.com.au
T: +61 2 9296 4672 | **F:** +61 2 9296 4655
www.sydneyports.com.au

SYDNEY PORTS

Ball, Jonas E (SKM)

From: scott [atkins71@optusnet.com.au]
Sent: Tuesday, 20 January 2009 11:11 PM
To: Ball, Jonas E (SKM)
Subject: AMCOR

To Mr Jonas Ball,

This is a follow up re phone conversation we had on 19/01/09.

We are residents of McCauley Street matraville and we appose any incease, or change of condition for heavy vechials in Mccauley Street.

At the present time it is illegal for B-Doubles to travel any length of McCauley Street, and we would like this to remain.

In AMCOR'S community handout re: Mill upgrade in doesn't state anywhere that B-Doubles will not use the entire length of McCauley Street. It does, however state that there will be B-Doubles and small trucks, 6 an hour, thats 144 trucks a day exiting the AMCOR site onto McCauley Street. What route will the smaller trucks travel?

If there is any increase in traffic in McCauley Street it will defiently have an impact on the residents, a negative impact. There would be increased noise, increased pollution , and increased traffic hazards to pedestrians and other road users.

I am skeptical of any information given to me other then that in writting with a signature.

Thank you for your time.

Mrs Leanne Fuller and Mr Scott Atkins.

Ball, Jonas E (SKM)

From: Sally Lambley [Sally.Lambley@bendigobank.com.au]
Sent: Tuesday, 20 January 2009 12:37 PM
To: Ball, Jonas E (SKM)
Subject: RE: Botany Paper Mill Upgrade

Hi Jonas
Thankyou for this information and taking the time to speak with me a couple of weeks ago.

B-Double trucks are currently not permitted to use McCauley Street for numerous reasons mentioned in the Impact Statement Checklist and Audit of McCauley Street in 2002.

As you may be aware, B-Double trucks already illegally access McCauley Street on a daily basis.

If the classification of McCauley Street is changed to allow B-Double trucks the increased traffic would not only include the "maximum of 6 vehicles per hour" (which equates to 144 vehicles per day) from Amcor but also the immeasurable amount of trucks which could then legally access McCauley Street.

You can't begin to measure the amount of noise and disruption this change would bring to our homes because you are only taking into consideration the Amcor vehicles which would be using the street.

We are one of the many families that live in McCauley Street and the surrounding area with children who ride their bikes and play in the area. I have actually witnessed a B-Double truck do a u-turn at the intersection of McCauley Street and Raymond Avenue.

By bringing these enormous trucks into our street you are in turn jeopardising our well being and the safety of our children.

Your site has direct access to Botany Road where there are no residential properties therefore I don't know why Amcor would want to use a street where homes and families would be affected.

We believe the effect of not using McCauley Street for Amcor would be minimal compared to the massive effect the changes you are proposing would have on the families of both McCauley Street and the surrounding areas.

It has also come to our attention that not all homes were provided with a copy of your "Modification to Project Approval" notice which we received.

We have since spoken to a large number of people in the area, provided them with a copy of the notice and have expressed our objections through a petition directly to Randwick Council and the Department of Planning.

It would be greatly appreciated if you could ensure that our objections are noted in any reports that you may need to supply to Council.

Regards
Sally Lambley

From: Ball, Jonas E (SKM) [mailto:JBall@skm.com.au]
Sent: Monday, 5 January 2009 9:28 AM
To: Sally Lambley
Subject: RE: Botany Paper Mill Upgrade

Hi Sally

Thanks for your enquiries. I will respond below – however if you wish to give me a call please feel free to.

- What section of McCauley Street is expected to be used by the product vehicles?

AMCOR Finished Product vehicles would use the section of McCauley St between Raymond Ave and Botany Rd only. It should be noted that it is also expected that any new development of the subdivided land is expected to use the same section of McCauley St – however – the new development would be subject to a separate development application sometime in the future.

- Will these vehicles be using the Public Weigh Bridge located on McCauley Street?

AMCOR Finished Product vehicles would **not** use the Public Weighbridge. It is unknown whether trucks associated with any new development of the subdivided land would use the Public Weighbridge– however – the new development would be subject to a separate development application sometime in the future – and you would have the opportunity to comment on this development.

- Will these vehicles be using the Perry Street exit of McCauley Street?

AMCOR Finished Product vehicles would **not** be using the Perry St exit. It is unknown whether vehicles associated with any new development of the subdivided land would use the Perry St exit – however – the new development would be subject to a separate development application sometime in the future – and you would have the opportunity to comment on this development.

- It is estimated that a maximum of 6 vehicles per hour would be using the McCauley Street access:
  - Is this in addition to the vehicles already using McCauley Street?
  - Between what hours will these vehicles be using McCauley Street?

This would be in addition to the vehicles already using McCauley St – it should be noted that this is a maximum number – the average number would around 2-3 vehicles per hour. AMCOR are also consulting Randwick Council and the RTA to determine whether an upgrade of McCauley St is required. Vehicles would be able to use McCauley St 24 hours a day seven days a week – however – most vehicle movements would be within normal working hours. Whether or not approval is provided to use McCauley St, there would be vehicle movements 24 hours a day seven days a week on site.

Hope this answers some of your questions.

Jonas Ball
Senior Environmental Scientist
PO Box 164 St Leonards 1590
Tel: 02 9928 2225
Fax: 02 9928 2502
Mobile: 0419 297 436
Email: jball@skm.com.au

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From: Sally Lambley [mailto:Sally.Lambley@bendigobank.com.au]
Sent: Tuesday, 30 December 2008 12:01 PM
To: Ball, Jonas E (SKM)
Subject: Botany Paper Mill Upgrade

Good Afternoon Jonas
I refer to the attached notice which was delivered to our home last week.

It would be greatly appreciated if you could clarify a few things relating to the use of McCauley Street by finished product vehicles.

- What section of McCauley Street is expected to be used by the product vehicles?
- Will these vehicles be using the Public Weigh Bridge located on McCauley Street?
- Will these vehicles be using the Perry Street exit of McCauley Street?
- It is estimated that a maximum of 6 vehicles per hour would be using the McCauley Street access:
  - Is this in addition to the vehicles already using McCauley Street?
  - Between what hours will these vehicles be using McCauley Street?

I look forward to your response to enable me to make more informed comments in relation to these proposed modifications.

Regards
Sally Lambley

NSW GOVERNMENT
Department of Planning

Major Development Assessment

Phone: (02) 9228 6413
Fax: (02) 9228 6466
Email: deana.burn@planning.nsw.gov.au

Level 3
23-33 Bridge Street
GPO Box 39
SYDNEY NSW 2001

Mr Jonas Ball
Project Manager
Sinclair Knight Merz
PO Box 164
ST. LEONARDS 1590

Dear Jonas

AMCOR New Paper Mill, Matraville
Modification for Subdivision & Access Relocation (05_0120 MOD 2)

During the public exhibition of the proposed modification, the Department received six submissions, including two from government agencies and four from the general public. A copy of all submissions is attached.

The Department also requests some clarifications as outlined in Attachment 1. Please provide a response to the submissions to assist the Department in its assessment of the modification application. You may choose to revise the Modification Report in response to the submissions. If so, can you please make clear where changes have been made to the report.

If you have any further questions please contact me on 9228 6413 or Deana Burn.

Yours sincerely

Deana Burn

for: Chris Ritchie
Manager – Industry
Major Development Assessment

As delegate of the Director-General

ATTACHMENT 1
COMMENTS ON AMCOR MODIFICATION REPORT

General

- Clarify the current status of the proposed Materials Recycling Facility;
- Advise the current status of the paper mill project, completed components (i.e. demolition) and expected timeframe for other key components, such as new building and paper machine;
- State clearly the intention regarding existing structures on the Botany Road precinct, i.e. propose to subdivide/sell the sites with decommissioned paper machine buildings remaining, i.e. no demolition.

Figures

- Figure 1 of traffic report – please provide in A3 size;
- Figure 2 of main report – please provide in A3 size and to scale; Please annotate figure showing McCauley Street and Botany Road Precincts, and the lots not subject to subdivision;
- Include a figure showing the approved vehicle accesses, so this can be compared to the proposed (Figure 1 of traffic report);

Contamination

- Provide further detail on the process for identifying and remediating any contamination in the new development precincts. Would a RAP be prepared by Amcor and the sites remediated prior to sale?

Traffic - General

- Provide justification for the proposed use of McCauley St, particularly heavy vehicle use. Explain why the existing Botany Rd access can not be used with internal site access for heavy vehicles?
- If the McCauley St access is required (or the existing Botany Rd access can't be used), what upgrade treatment of McCauley St is proposed?
- How will the subdivided McCauley Street Precinct gain access to the external road network? Can heavy vehicles from the subdivided site use the existing Botany Rd access via an internal road network with light vehicles (ie. cars) gaining access off McCauley St / Raymond Ave? If heavy vehicles need access via McCauley St, then what upgrade treatment of McCauley St is proposed?
- If the McCauley St access is required, how will Amcor ensure that heavy vehicles in particular will not travel north of the proposed Raymond Ave site access through residential areas to access Perry St?
- McCauley St is not a designated B-double route but Amcor have inferred that B-doubles may use the McCauley St access in the future - clarification is required.
- If upgrade works are to be undertaken, clarify when these would occur. Will they occur prior to Amcor site operations? This could be contained within a Statement of Committments.
- Clarify what form the proposed dedicated left-turn lane into the Botany Rd access will take. Will this be an additional deceleration lane or will it be part of the existing three eastbound lanes along Botany Rd?
- What is Amcor's view on apportionment of costs for the upgrade of McCauley St, if required?

Traffic – Technical clarifications

- Clarification is required of the traffic generation from B9 and MRF and how the total traffic volumes were derived, particularly for future 2018 forecasts:
    - 4% background growth seems high and is not required for the Botany Rd site access (northern leg into Amcor site), because traffic generation will be controlled by Amcor's on-site development.
    - Provide peak hourly and daily traffic volumes for 2018 background traffic along Botany Rd, McCauley St and site entry points / intersections, including traffic distribution (turn movements) at intersections.
    - Provide peak hourly and daily traffic volumes for 2018 traffic generation from B9 and MRF, including vehicle classification (light or heavy vehicles), traffic distribution (peak periods) onto surrounding road network, ie. turn movements.

- Provide peak hourly and daily traffic volumes for 2018 traffic generation from subdivision sites, including vehicle classification (light or heavy vehicles), traffic distribution (peak periods) onto surrounding road network, ie. turn movements. In particular, any heavy vehicles that may be generated - it appears that only employee vehicle generation (ie. cars) has been considered.
- Provide peak hourly and daily traffic volumes for 2018 for total traffic (background + B9 + MRF + subdivision sites) along Botany Rd, McCauley St and site entry points / intersections, including vehicle classification (light or heavy vehicles), traffic distribution (turn movements) at intersections.

- Several Tables in the EA and Traffic Report do not correlate (eg. Table 8 in main document doesn't match Table 4.11 in Traffic Report);
- In Traffic Report, it is unclear how volumes in Table 4.4 were derived - please clarify;
- In Traffic Report, why are Table 4.6 volumes (total of background + B9 / MRF traffic generation) less than Table 4.5 volumes (B9 / MRF traffic generation only)?
- Assumed developable areas used in Table 4.7 of Traffic Report do not add up to 50,000 m2 - please clarify.

Noise

- A quantitative assessment of noise impacts is required. The assessment should include an analysis of impacts from the proposed use of McCauley Street by Amcor vehicles and potential impacts from the subdivided lots (with the assumed industrial land use). Please refer to attached comments from DECC.

Randwick City Council
30 Frances Street
Randwick NSW 2031
ABN: 77 362 844 121

Phone (02) 9399 0999
Fax (02) 9319 1510
www.randwick.nsw.gov.au

Celebrating 150 YEARS
RANDWICK CITY COUNCIL

F2006/00713

29 May 2009

Department of Planning
22-32 Bridge Street
SYDNEY NSW 2000

Attention: Deana Burn, Major Assessments

Dear Madam,

Section 75W Modification, AMCOR Packaging Pty Ltd
1891 Botany Road, Matraville

Thankyou for inviting Council's comments on the proposed modifications to AMCOR's major project approval. We acknowledge and appreciate your ongoing efforts to involve Council in planning and approvals for this site. We would like to raise several issues with the proposal.

In summary, we believe the application does not adequately deal with many environmental impacts and we would like to see:

- additional information in the traffic study including:
  - justification for using McCauley St to service the new paper mill and lot 1
  - correct traffic generation projections showing truck-trips for the new lots
  - pavement specifications for McCauley St upgrades
  - a proposal for rights of way where necessary
  - a work schedule showing driveway construction and road pavement upgrade before subdivision

- additional information on contamination including:
  - a complete preliminary investigation of proposed lot 3
  - a remedial action plan for contamination
  - a work schedule showing remediation auditing before subdivision

- additional information on noise, odour and air quality including:
  - revised noise and odour dispersion modeling for the new lots
  - appropriate limits for noise and odour levels for the new lots
  - a noise impact assessment of truck traffic in McCauley St
  - noise and odour impact projections from the future recycling facility

- additional information on stormwater and flooding including:
  - capacity planning for infrastructure
  - location of overflow paths on all lots
  - a proposal for easements where necessary
  - a work schedule showing trunk infrastructure upgrades before subdivision

- a properly detailed masterplan projecting likely impacts for future uses and dealing with infrastructure needs. Where future uses are not known the masterplan should accommodate a range of permissible future uses.

Traffic study

AMCOR's traffic assessment is incomplete:

- AMCOR do not support their claim that separating the delivery and dispatch traffic is important for safety. Managing heavy-vehicle access in a single driveway off Botany Rd appears to be achievable without utilising McCauley St and consequently bringing heavy vehicle traffic closer to residential homes

- AMCOR do not show how many extra trucks will be in connection with the future development of the subdivided land. Only additional employee traffic is estimated, and in any case, there is little discussion to support the projected figures. These omissions undermine AMCOR's traffic impact predictions

- There is no detail on the timing for driveway construction. AMCOR propose relocation of the McCauley St driveway even if there is no agreement on whether the finished product dispatch trucks can use McCauley St. AMCOR say this would continue to allow subdivision of Lot 1. Similarly, AMCOR propose the creation of proposed lot 3 without constructing the access driveway effectively land-locking the new lot. Council has the view that new industrial lots should be created with heavy-vehicle access

- McCauley St is not presently constructed to a heavy vehicle standard. AMCOR have lodged their modification application with the Department of Planning without specifying any upgrade to the pavement

Contamination

The most recent contamination reports are absent from the environmental assessment making it difficult to verify AMCOR's claims. While AMCOR propose to carry out more testing, the timing and details are also absent from the proposal. Council is concerned that the State Government may allow the creation and sale of the new industrial lots without a proper contamination investigation. This would be contrary to State Environmental Planning Policy 55, which requires a detailed investigation before consenting to a change of use. It would also violate several well established principles of ecologically sustainable development.

The *improved valuation* principle requires the environment to be factored into the valuation of assets. The price of the proposed development lots should reflect a known cost for remediation. The principle also requires the polluter to pay. That is, those who generate pollution should bear the cost of cleaning it up. Clearly, allowing AMCOR to sell the land without a proper assessment would prohibit any future recourse to the company if contaminants are found on so-far untested parts of the site.

Noise, air and odour

We acknowledge that the paper mill is a scheduled premises under Protection of the Environment Operations Act and that the Department of Environment and Climate Change are responsible for noise, odour and air quality issues. However, we would like to mention that:

- the revised noise and odour dispersion modeling is absent from AMCOR's environmental assessment making it difficult to verify the accuracy of modeling methods

- the environmental assessment does not establish appropriate limits for noise and odour levels on the subdivided lots

- the environmental assessment fails to examine the likely noise impact that would result from more trucks using McCauley St

- The proposed driveway and subdivision arrangements are tailored around a future recycling facility but the environmental assessment does not examine the likelihood of

more noise, odour and dust problems from the facility. This is important because the facility would be just 40 m from the nearest residence.

Stormwater

AMCOR do not propose to construct any stormwater infrastructure to service the proposed lots and say that further assessment and stormwater management plans would be prepared for the new lots by a future developer. Council has the view that the new lots should be created with trunk infrastructure in place. Further analysis of stormwater is also needed to determine overland flow routes and flooding protection measures for the new lots before they are created.

Masterplanning

We reiterate our previous advice about masterplanning. Many of the issues in this letter are not new and have arisen again because of AMCOR's failure to properly plan for its land-use needs. The Randwick LEP 1998 and Draft LEP 2009 require masterplanning of large sites for this reason.

I have enclosed a copy of our memo to Randwick Councillors on the proposed modification. The memo may explain our objections in more detail.

Should you require any further information please telephone David Mooney on 9399 0612.

Yours faithfully,

Sima Truuvert

Sima Truuvert
Director, City Planning

encl

MEMORANDUM

Date: 28 May 2009

To: All Councillors

From: Sima Truuvert – Director, City Planning

Folder No.: F2006/00713

Introduction

The purpose of this memo is to advise Council that AMCOR Packaging have proposed modifications to their State Government approved paper-mill re-development. The modifications mainly involve subdividing surplus industrial land and constructing a new heavy-vehicle driveway off McCauley St.

The Department of Planning exhibited the proposed modifications for 14 days until 27 May 2009. The timing of the exhibition period prevented a report to Council on the matter. A submission to the Department of Planning on behalf of Council is attached to this bulletin.

History

Previously reported to Council in February 2007, AMCOR Packaging has development approval from the State Government for a major re-development of their recycled-paper mill at 1891 Botany Rd, Matraville. The approved re-development involves replacing the 2 older paper mills with a single modern machine that produces higher quality packaging and uses less energy and water. Paper production would increase from 270,000 tonnes per year to 345,000 tonnes per year. The estimated capital value of the re-development is in the order of $285M.

AMCOR have recently obtained the Director General's requirements for a recycling facility co-located with the paper-mill. This would allow AMCOR to better manage the quality of waste-paper entering the paper mill. Other recyclables would be transported elsewhere. AMCOR may lodge an application for the facility with the State Government in the future.

The proposed modification

The proposed subdivision creates 3 new lots.

- Lot 1 is approximately 1.99ha in the north of the site (McCauley St Precinct)
- Lot 2 would contain the approved re-development and a possible future recycling facility (New Mill Site)
- Lot 3 is approximately 3.15ha in the south-east of the site (Botany Rd Precinct)

The new heavy-vehicle driveway in McCauley St would service Lot 1, and finished-product dispatch vehicles and light traffic from the new mill. Lot 3 would be serviced by a proposed upgrade to the approved heavy-vehicle driveway from Botany Rd, also shared with the new mill.

Both driveways would be designed to accommodate B-double trucks, but the application does not seek approval for B-doubles in McCauley St.

An aerial photograph of the site and surrounds is shown in **figure 1**. A diagram of the proposed modifications is shown in **figure 2**. The new lots are shown outlined in pink. The diagram also shows the approved paper mill outlined in light-blue and a possible location for a future recycling facility outlined in dark-blue.

Figure 1 – An aerial photograph of the site and surrounds

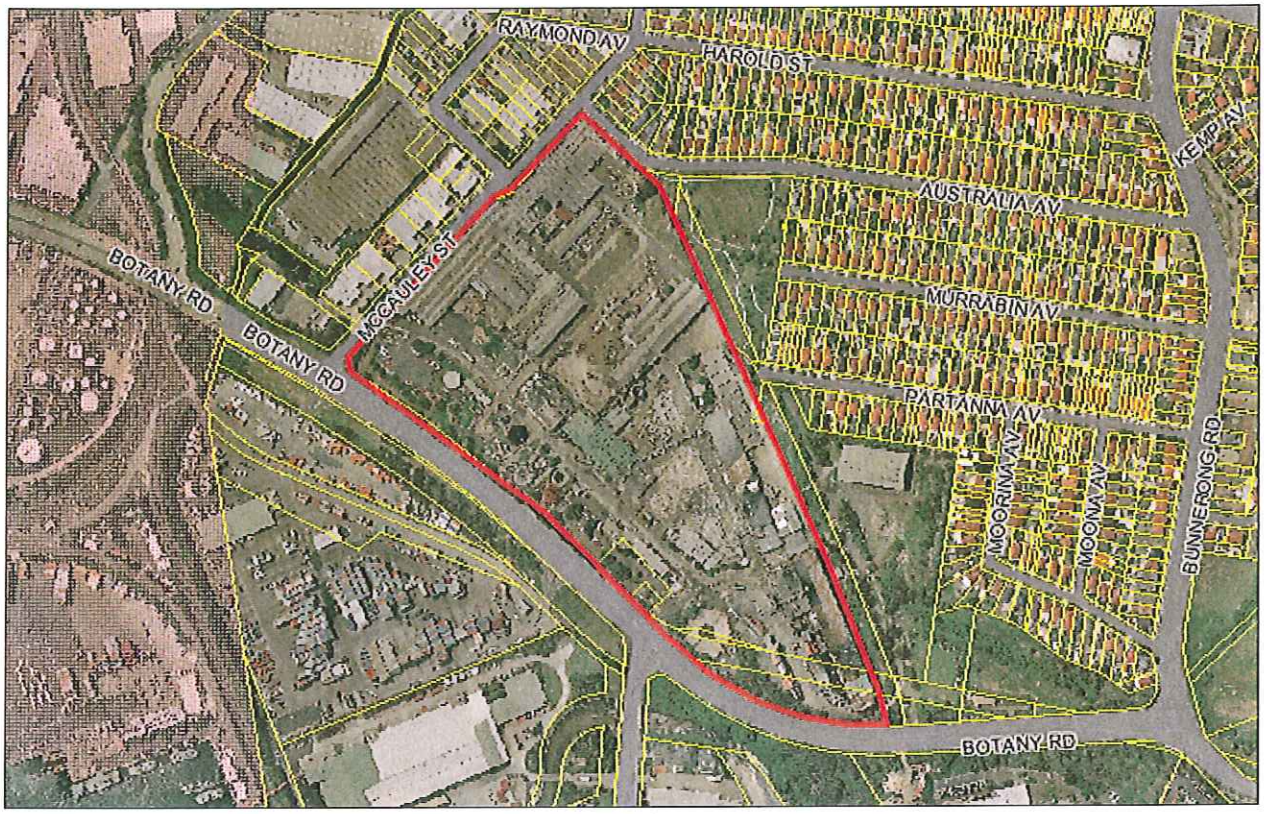
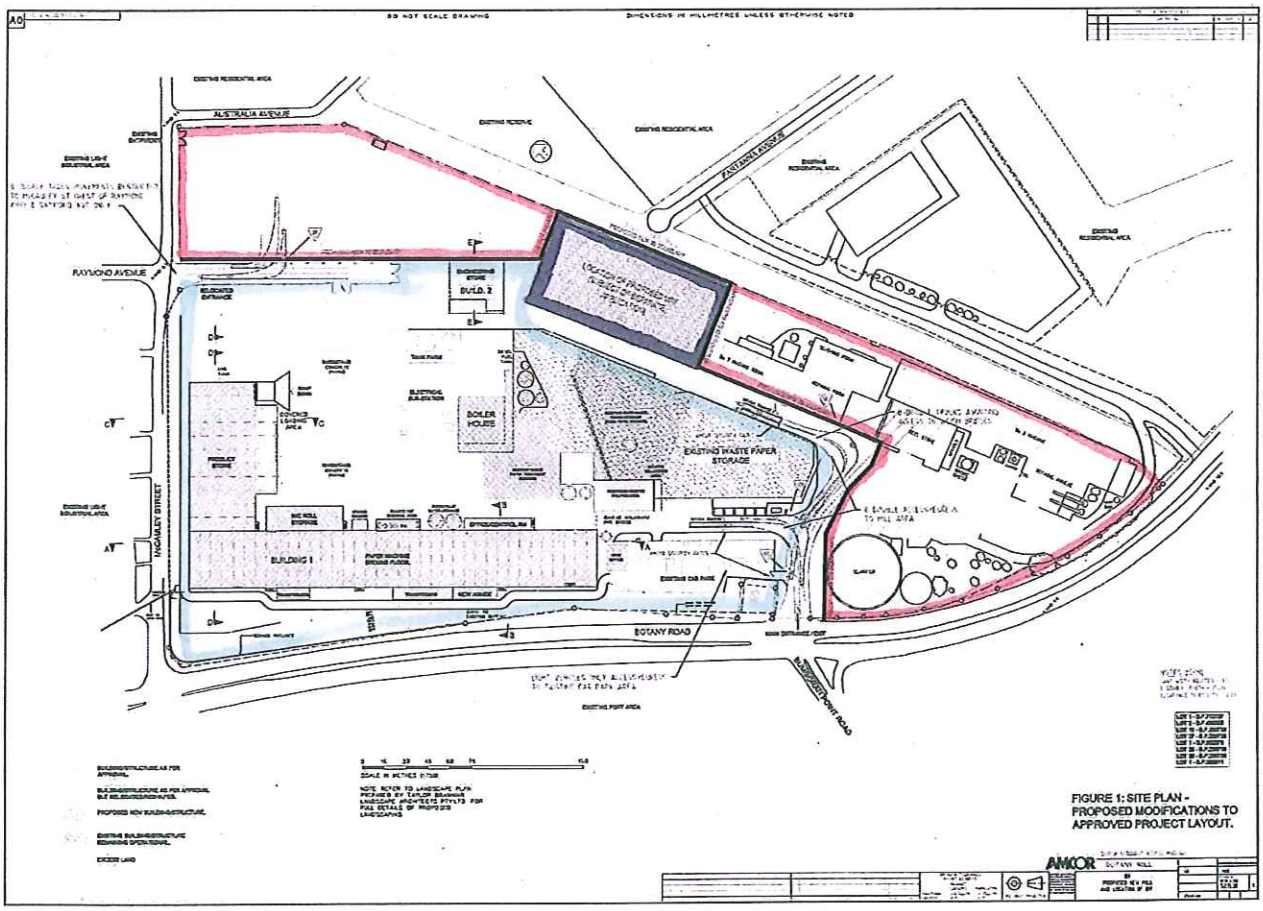


Figure 2 – Site plan showing proposed modifications.



Environmental assessment

The modification application was accompanied by the requisite environmental assessment dealing with a range of environmental issues.

Traffic and transport

The main driveway for the approved re-development is off a signalized intersection on Botany Rd, opposite Bumborah Point Rd. There is also a secondary light-vehicle driveway off McCauley St. The proposed modification:

- relocates and upgrades the McCauley St driveway for heavy vehicles. This allows a shared driveway with proposed lot 1. AMCOR would use this driveway for finished product dispatch trucks and other light-vehicles; separating them from the waste paper delivery trucks in the Botany Rd driveway for safety. The driveway would be designed for B-double trucks but AMCOR do not seek approval for such use

- upgrades the Botany Rd driveway and internal road to 4 lanes. This allows a shared driveway with proposed lot 3. AMCOR would use this driveway for waste paper delivery trucks. The driveway and intersection would also be designed for B-double trucks

AMCOR provide a projected estimate of traffic for the proposed modification for 2018. The estimates include a possible future materials recycling facility sharing the driveway with the paper mill off Botany Rd. The traffic estimates show a 1.5 fold increase in traffic above the approved development and recommends adjustments to the traffic light phasing at the affected intersections to retain an acceptable 'level of service' rating.

The Assessing Officer has the view that AMCOR's traffic assessment is incomplete:

- AMCOR do not support their claim that separating the delivery and dispatch traffic is important for safety. Managing heavy-vehicle access in a single driveway off Botany Rd appears to be achievable without utilising McCauley St and consequently bringing heavy vehicle traffic closer to residential homes

- AMCOR do not show how many extra trucks will be in connection with the future development of the subdivided land. Only additional employee traffic is estimated, and in any case, there is little discussion to support the projected figures. These omissions undermine AMCOR's traffic impact predictions

- There is no detail on timing for driveway construction. AMCOR propose relocation of the McCauley St driveway even if there is no agreement on whether the finished product dispatch trucks can use McCauley St. AMCOR say this would continue to allow subdivision of Lot 1. Similarly, AMCOR propose the creation of proposed lot 3 without constructing the access driveway effectively land-locking the new lot. The Assessing Officer has the view that new industrial lots should be created with heavy-vehicle access

- McCauley St is not presently constructed to a heavy vehicle standard. AMCOR have lodged their modification application with the Department of Planning without specifying any upgrade to the pavement

Noise, odour and dust

The Department of Environment and Climate Change are responsible for noise, odour and air quality issues because the paper mill is a scheduled premises. Nevertheless, it is useful to note that AMCOR claim in their environmental assessment:

- revised noise modeling show noise levels for the subdivided lots are at acceptable industrial level although new office buildings may require acoustic protection.

- revised odour modeling show odour levels for the subdivided lots would be slightly higher than for nearby homes (because the new lots are closer to the paper mill) but are still within acceptable limits.

- dust generation is expected to decrease with the approved partial covering of waste paper storage. Dust would not excessively impact on the new development lots.

The Assessing Officer notes:

- the revised noise and odour dispersion modeling is absent from AMCOR's environmental assessment making it difficult to verify the accuracy of modeling methods

- the environmental assessment does not establish limits for noise and odour levels on the subdivided lots

- the environmental assessment fails to examine the likely noise impact that would result from more trucks using McCauley St

- The proposed driveway and subdivision arrangements are tailored around a future recycling facility but the environmental assessment does not examine the likelihood of more noise, odour and dust problems from such a facility. This is important because the facility would be just 40 m from the nearest residence.

Contamination

AMCOR have carried out several contamination investigations of the site and claim:

- a brief assessment of proposed lot 1 found soil contamination to be below relevant guidelines, except for elevated levels of lead, zinc, copper, nitrogen and phosphorus in the groundwater. AMCOR claim these elevated levels are either normal groundwater conditions or from somewhere else

- there is an action plan in place to remediate the site of the new paper mill

- a partial assessment of proposed lot 3 found soil contamination to be below relevant guidelines, except for hydrocarbons. AMCOR claim that the hydrocarbon guidelines are conservative and only indicative. Many areas of proposed lot 3 were not tested because the existing paper mill is still operational

The most recent contamination reports are absent from the environmental assessment making it difficult to verify AMCOR's claims. While AMCOR propose to carry out more testing, the timing and details are absent from the proposal. The Assessing Officer is concerned that the State Government may allow the creation and sale of the new industrial lots without a proper contamination investigation. This would be contrary to State Environmental Planning Policy 55, which requires a detailed investigation before consenting to a change of use. It would also violate well established principles of ecologically sustainable development.[1]

The *improved valuation* principle requires the environment to be factored into the valuation of assets. The price of the proposed development lots should reflect a known cost for remediation. The principle also requires the polluter to pay. That is, those who generate pollution should bear the cost of cleaning it up. Clearly, allowing AMCOR to sell the land without a proper assessment would prohibit any future recourse to the company if contaminants are found on so-far untested parts of the site.

Stormwater

[1] The modern principles of ecologically sustainable development originated in the 1987 World Commission on Environment and Development (The Brundtland Commission). A 1992 intergovernmental agreement committed all Australian Governments to the concept of ecologically sustainable development and the principles are now referred to in many state legislatures including the NSW Environmental Planning and Assessment Act 1979.

AMCOR's flooding studies show stormwater detention would not be required because the site is low in the catchment and a short distance from Botany Bay. There is overland flow during major storms when rainfall exceeds the capacity of the upstream piped network. The overland flows would affect the location and size of buildings on the proposed lots. AMCOR note that:

- a new pipeline would be required to drain proposed lot 1 to Botany Bay via long dam
- there is existing infrastructure that could be adapted to drain proposed lot 3

AMCOR do not propose to construct any infrastructure to service the proposed lots and say that further assessment and stormwater management plans would be prepared for the new lots by a future developer. The Assessing Officer has the view that the new lots should be created with trunk infrastructure in place. Further analysis of stormwater is also needed to determine overland flow routes and flooding protection measures for the new lots before they are created.

Other issues

Sewer – There is an existing pumping station adjacent the existing Botany Rd driveway that could be upgraded to service the proposed lots. Sydney Water is responsible with

Heritage – The environmental assessment does not mention heritage. Nevertheless, the proposed modifications do not affect the remaining parts of the heritage listed wall on the western boundary of the site. If necessary, the McCauley St upgrade specifications can be adjusted slightly to accommodate the wall.

Hazards – The environmental assessment includes a preliminary hazard analysis that finds the proposed subdivision and chemical storage locations will not change the findings of the original analysis. There would be no additional impact on the Cumulative Risk Contours in the SNW Port Botany Risk Assessment Study.

Community consultation

AMCOR conducted its own consultation with nearby households and businesses by distributing a newsletter in December 2008. AMCOR report that 3 people made contact and raised issue with heavy vehicles and especially B-double trucks on McCauley Street.

The Department of Planning exhibited the proposed modification for 14 days to 27 May 2009.

At least one submission to the Department was forwarded to Council. It is a petition of 24 signatures from the occupiers of nearby land. It is reproduced here:

Petition from nearby land occupiers

As a resident of McCauley Street in Matraville we would like to lodge our objections to the following proposed modifications to the Amcor Paper Mill:

- *relocation of vehicle access to the engineering store further south along McCauley Street opposite Raymond Avenue*
- *use of the access on McCauley Street for finished product vehicles: and*
- *Subdivision of the main site into 3 separate lots to allow the sale of excess land.*

The relocation of vehicle access to McCauley Street would mean the reclassification of the street to 'legally' allow B-Double trucks access to a residential street.

Amcor are proposing to add an additional six vehicles per hour (one hundred and forty four per day) to a street which houses residential properties.

We believe Amcor are not taking into consideration the impact on traffic noise these changes will have on McCauley Street and Australia Avenue, by excluding from their

assessment, the immeasurable amount of non Amcor B-Double trucks which will legally be allowed to use the street once these changes have been made.

The increase to the constant noise and vibration would not only be detrimental to the safety, health and well being of the residents but would increase the chances of structural damage to the resident's homes.

Furthermore, the safety of the children who currently use Purcell Park and surrounding areas should not be compromised to accommodate unnecessary changes to a site which has direct access to Botany Road where no residential properties would be affected.

The heavy vehicles, including B-Double trucks which currently use McCauley Street illegally, present a real danger to the safety on the residents due to their inability to negotiate the narrow road and their total disregard for traffic laws. This ranges from driving at an unacceptable speed, driving on the wrong side of the road into oncoming traffic, turning into McCauley Street from Perry Street by driving over the top of the traffic island, to the extreme of performing u-turns at the intersection of McCauley Street and Harold Streets. To add an additional one hundred and forty four vehicles to this existing safety issue would be nothing short of criminal.

To allow the subdivision of the land into three separate lots is going to increase all of the above mentioned issues threefold.

Please see attached signatures from other residents who share the same objections.

We ask that you take into consideration our concerns and reject the proposed changes to McCauley Street and look forward to your response.

Conclusion

The purpose of this memo is to advise Council that AMCOR Packaging have proposed a modification to their previously approved paper-mill re-development. The modification mainly involves subdividing surplus industrial land and constructing a new heavy-vehicle driveway off McCauley St.

The Department of Planning exhibited the proposed modifications for 14 days until 27 May 2009. The timing of the exhibition period prevented a report to Council on the matter. A submission to the Department of Planning on behalf of Council is attached to this memo.

If you require further information please contact Kerry Kyriacou on 9399 0894.

Sima Truuvert

Sima Truuvert
Director, City Planning

Your reference S00/00481
Our reference : LICENCE 1594 – DOC09/22231
Contact : Bob Marr (02) 9995 6825

Mr Chris Ritchie
Manager – Major Development Assessment
Department of Planning
23-33 Bridge St
Sydney NSW 2001

Attention: Deana Burn

Dear Mr Ritchie

Request to modify Consent - Amcor Packaging Australia Ltd
New Paper Mill (05_0120 Mod 2)

I refer to your letter dated 7 May 2009, seeking a submission from the Department of Environment and Climate Change ("DECC") on the above proposal. I refer also to the appended Modification Report ("the Report") titled *Project B9 – New Paper Mill* prepared by Sinclair Knight Merz ("SKM"). I understand that Amcor Packaging Australia ("Amcor") is seeking to modify its consent to allow for modifications to its new mill, which includes the construction of a new access point at the site from McCauley Street to permit the ingress and egress of trucks carrying finished product.

The DECC has considered the consent modification proposal in light of:

- SKM's preliminary advice about the modification to DECC dated 19 December 2008;
- DECC's response to that advice;
- Additional information included in the report; and
- Submissions from McCauley Street residents on the proposal.

DECC is generally satisfied with the contents of the report and subject to the suggestion in the paragraphs below, has no objection to the consent modification. Of course DECC will require Amcor to comply with all proposed licence conditions which DECC set out in its General Terms of Approval for the original upgrade proposal sent to the Department of Planning ("DoP") on 11 May 2007.

As mentioned above, in light of the residents' concerns about the proposed upgrade of McCauley Street and the uncertainty regarding traffic noise impacts (last paragraph on page 18 in the report) and future road uses, DECC strongly suggests the following:

PO Box 668, Parramatta NSW 2124
Level 7, 79 George St, Parramatta NSW
Tel: (02) 9995 5000 Fax: (02) 9995 6900
ABN 30 841 387 271
www.environment.nsw.gov.au

Amcor should conduct a traffic noise assessment in accordance with the DECC's publication titled *Environmental Criteria for Road Traffic Noise*. The upgrades to McCauley Street will need to be classified according to the functional categories applied by the RTA. Furthermore, the traffic noise assessment should compare predicted noise impacts to the existing amenity and if the DECC's criteria are exceeded; the assessment should propose appropriate mitigation.

DECC will be happy to review the above traffic noise assessment and provide further comments to the DoP.

If you have any queries regarding this matter please contact Bob Marr on 9995 6825.

Yours sincerely

21/05/09

David Gathercole
Acting Head Sydney Industry
Environment Protection and Regulation

Ball, Jonas E (SKM)

From: Deana Burn [Deana.Burn@planning.nsw.gov.au]
Sent: Wednesday, 3 June 2009 10:50 AM
To: Ball, Jonas E (SKM)
Subject: Fwd: AMCOR New Paper Mill (05_120 Mod 2)

Hi Jonas

Submission from Sydney Ports, as they discussed on the phone, no issues.

Cheers,
Deana.

>>> James Burford <JBurford@sydneyports.com.au> 03/06/2009 10:34 >>>

Deana,

Thank you for referring the above AMCOR modification for Sydney Ports' review and comment. Apologies for the length of time this response has taken.

As discussed by phone (27 May 2009), Sydney Ports has no objection to the proposed modification.

Sydney Ports' submission on the original application (20 October 2008) requested that matters relating to Traffic and Stormwater be addressed in the Environmental Assessment. We are currently satisfied with manner in which these matters have been addressed and believe the proposed amendment will result in minimal change to them.

Should you wish to discuss this matter further, please contact the undersigned.

Regards

James Burford
Environmental Planner

Sydney Ports Corporation

Level 9, 207 Kent Street | Sydney NSW 2000 Australia

PO Box 25, Millers Point | NSW 2000 Australia

E: JBurford@sydneyports.com.au

T: +61 2 9296 4672 | **F:** +61 2 9296 4655

www.sydneyports.com.au

Your Reference:	S00/00481
Our Reference:	ID 08M1462
Contact:	Dianne Rees
Telephone	(02) 8849 2237

RTA

Manager - Industry
Major Development Assessment
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

Attention: Ms Deana Burn

PROPOSED MODIFICATION TO PROJECT APPROVAL FOR AMCOR PAPER MILL AT 1891 BOTANY ROAD, MATRAVILLE

Dear Sir/Madam

I refer to your email of 7 May 2009, regarding the public exhibition of the Environmental Assessment (EA) for modifications to the project approval for the Amcor Paper Mill, which was forwarded to the Roads and Traffic Authority (RTA) for comments.

The RTA has reviewed the information provided and it is noted that the subject modification proposes vehicular access off McCauley Street for use by heavy vehicles up to a length of 25 metres (B-double vehicles), however, vehicles over 6 metres in length are currently prohibited in McCauley Street. The developer is required to obtain Council approval for vehicles exceeding 6 metres in length accessing the subject site via McCauley Street. Further, given that the subject development is being designed for B-double access via McCauley Street, an application for McCauley Street to be gazetted for use by B-doubles would need to be lodged and determined by Council. In this regard, the application for gazettal would need to be lodged in accordance with the RTA's Route Assessment Guidelines for Restricted Access Vehicles. This publication can be found on the RTA's website at www.rta.nsw.gov.au/heavyvehicles. The main issues to be addressed, but not be limited to, in the application are the swept paths of B-double vehicles turning in and out of McCauley Street at the existing signalised intersection with Botany Road, swept paths along McCauley Street, road pavement, loss of on-street parking along McCauley Street, and road noise.

Given that the subject modification relies on heavy vehicles (vehicles longer than 6 metres) on McCauley Street, the Department should consider requesting the applicant have this issue addressed to Council's satisfaction prior to the determination of the modification. At a minimum, this heavy vehicle restriction needs to be addressed to Council's satisfaction, prior to the release of any Construction Certificate.

Further to the above it is noted that the submitted traffic report states that the existing intersection of Botany Road, Bumborah Point Road and the Amcor Paper Mill access road will become oversaturated as a direct result of the cumulative traffic impact of the proposed modification including the subdivision. The applicant proposes to address this issue by changing the signal phasing of the intersection which is unacceptable to the RTA as it will result in longer delays for traffic in Botany Road and Bumborah Point Road.

Given that the RTA will not support the proposed changes to the signal phasing of the above-mentioned intersection, the RTA requests that the applicant investigate alternative measures to mitigate traffic generated by the proposed modification on the intersection. The proposed alternative measures are to be submitted to the RTA, for review and comment prior to the determination of the modification. The documentation submitted shall include an electronic copy of the intersection analysis.

Subject to the above issues being satisfactorily addressed and supported by the RTA, then the RTA will have no objection to the proposed modification and the following requirements should then be included in the Department of Planning's Conditions of Consent for the modification:

1. Detailed road and signal design plans for the proposed construction of the four lane internal road at the signalised intersection with Botany Road are to be submitted to the RTA for approval prior to the commencement of any road works.

   The developer will be required to enter into a Works Authorisation Deed (WAD) for the above-mentioned works. Please note that the Works Authorisation Deed will need to be executed prior to the RTA's assessment of the detailed design plans.

2. The swept path of the longest vehicle (including garbage trucks) entering and exiting the subject site, as well as manoeuvrability through the site, shall be in accordance with AUSTROADS. In this regard, a swept path plan shall be submitted to the RTA with the detailed design plans of the four lane internal road connection at the existing signalised intersection of Botany Road and Bumborah Point Road which shows that the proposed development complies with this requirement.

   Should Council approve heavy vehicle access into the subject site via McCauley Street, the swept path (for the longest vehicle approved by Council) at the intersection of McCauley Street and Botany Road shall be submitted to the RTA showing that the development complies with AUSTROADS requirements.

3. A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control should be submitted to Council prior to the issue of a Construction Certificate.

4. The developer shall be responsible for all public utility adjustment/relocation works, necessitated by the above work and as required by the various public utility authorities and/or their agents.

5. All roadworks/regulatory signposting associated with the proposal shall be at no cost to the RTA.

In addition to the above, the RTA provides the following advisory comments to the Department of Planning for consideration in the determination of the modification:

6. All demolition and construction vehicles are to be contained wholly within the site and vehicles must enter the site before stopping. A construction zone will not be permitted on Botany Road.

7. Any queuing of incoming and outgoing trucks serving the subject site via the Botany Road intersection shall be managed internally. No queuing shall occur on Botany Road.

8. Any further development of Lot 1 and Lot 3 should be referred to the RTA for assessment in accordance with State Environmental Planning Policy (Infrastructure) 2007.

9. The proposed McCauley Street access, opposite Raymond Avenue, is to be designed and constructed to enable entry and exit of the largest vehicle approved by Council.

10. All vehicles are to enter and leave the site in a forward direction.

11. The layout of the proposed car parking areas associated with both AMCOR site and the subdivided lots (including, driveways, grades, turn paths, sight distance requirements, aisle widths, aisle lengths; and parking bay dimensions) should be in accordance with AS 2890.1-2004 and AS 2890.2 – 2002 for heavy vehicle usage.

Any future development of the proposed subdivided lots shall be subject to separate development applications and the RTA may require roadworks to be constructed as part of this future development.

Any inquiry in relation to this development application can be directed to Dianne Rees by phone (02) 8849 2237, or facsimile (02) 8849 2107.

Yours sincerely

James Hall
A/Senior Land Use Planner
Transport Planning Section, Sydney Region

23 June 2009

NAME	SIGNATURE	ADDRESS
(Please print name)	(Petitioner must sign his/her name)	(Please write full address)
MATTHEW PENNY		5 McCAULEY ST, MATRAVILLE
SALLY LAMBLEY		5 McCAULEY ST, MATRAVILLE.
Leanne Fuller		3 McCAULEY ST, MATRAVILLE
MARY SWEET		7 McCAULEY ST, MATRAVILLE
KAY MURRAY		9 Mc Cauley St Matraville
Neville Welch		9 Mc Cauley St, Matraville
WOLFGANG SAKOWSKY		11 HC CAULEY STR
11 H O TESORIERO		13 McCAULEY ST MATRAVILLE
MARIA TESORIERO		13 McCAULEY ST MATRAVILLE
LUCY CAMILLERI		92 AUSTRALIA AVE. MATRAVILLE
HERB CAMILLERI		92 AUSTRALIA AVE MATRAVILLE
MELISSA CAMILLERI		92 AUSTRALIA AVE. MATRAVILLE
BRUCE COLLIER		15 McCAULEY ST. MATRAVILLE
MONICA LIZAMA		15 McCAULEY ST. MATRAVILLE
Matthew Camilleri		66 Harold st Matraville.
Kristina Barnes		90 Australia ave
ANGELINA IERARDO		86 AUSTRALIA AVE MATRAVILLE.
TONY IERARDO		86 AUSTRALIA AVE MATRAVILLE
CORRADO PALAZZO		8 AUSTRALIA AVE MATRAVILLE
Agatha Donnelly		78 Australia Ave. Matraville
Dianne Liddiard		14 Harold St Matraville

NAME	SIGNATURE	ADDRESS
(Please print name)	(Petitioner must sign his/her name)	(Please write full address)
SUSAN PARKER	S. Parker	61 Perry St, Matravilla
VERA MALOUF	V. Malouf	61 Perry St, Matravilla
ROSS PARKER	R. Rossparker	61 Perry St, Matravilla

Ball, Jonas E (SKM)

From: Herbert Camilleri [herbie47@optusnet.com.au]
Sent: Thursday, 21 May 2009 7:30 PM
To: plan_comment@planning.nsw.gov.au
Subject: Amcor New Paper Mill (05_0120 Mod 2)

Refererence No. (05_0120 MOD 2)

Herbert and Lucy Camilleri of 92 Australia Avenue, Matraville wish to lodge an objection in regard to the proposed modification of the Amcor New Paper Mill.

- The subdivision of the main site into 3 lots for sale of excess land is of great concern for if we have driveways in Australia Avenue, we are opposite this lot and it will be a danger to residents living in Australia Avenue as well as to the number of children who use Purcell Park regularly. We look after our grandchildren of pre school age and we are concerned the added heavy traffic and noise will be a danger to the young children in the area.

- The reclassification of McCauley Street to allow access to B-Double trucks will not be acceptable to the residents of the area as the added traffic will be an unwelcome intrusion.

- We totally object to reclassification of McCauley Street where there is residential houses and also Australia Avenue and Harold Street because of the added noise level and danger caused to residents walking in the area.

Thanking you,

Herbert & Lucy Camilleri

AMCOR – MODIFICATION – McCAULEY ST + SUBDIVISION

Submission – Resident

Phone call 18/05/09

Herbert Camilleri
92 Australia Avenue
Matraville
Phone: 93454453 or 0405316036

Wants to make sure there won't be any driveways from subdivided lot into Australia Avenue. It is a residential street with children playing in it and the adjacent park. It would be dangerous to allow trucks to access the subdivided lot from Australia Avenue.

61 Perry St
MATRAVILLE NSW 2036

Ref (05_0120 MOD 2)

We strongly object to the Amcor Paper Mill proposal for the following reasons:

We live on the corner of McCauley Street and Perry Street ie, the northern end of McCauley Street. Despite large signs in Perry Street and a traffic island designating no turning from Perry Street into McCauley Street for vehicles over 6 metres, this deters nobody. Large trucks turn left and right, illegally, from Perry Street into McCauley Street at all hours of the day and night, including Randwick Council vehicles. Why is this not mentioned in the traffic report prepared by Sinclair Knight Mertz? This report states *"McCauley Street carries a low amount of traffic."* Really? I guess compared to Botany Road or the Sydney Harbour Bridge, it does. However, the fact that McCauley Street carries "a low amount of traffic" compared to Botany Road is not a good enough reason to encourage any more traffic to use it. It is not a wide road, it is not a straight road, it is a two lane suburban road in poor condition, with a big curve in it, with people living on it, people with kids and dogs and driveways. It's a road that is not supposed to have vehicles over 6 metres turning into it from Perry Street in order to access Botany Road.

"McCauley Street carries a low amount of traffic although a report by Masson and Wilson (1997) indicated that there was a through traffic movement from the north to the south with drivers wishing to access Botany Road."

No kidding! And a lot of these drivers are driving heavy vehicles. Dangerously. With no regard for road rules. They come careening around the corner, they hit the traffic island, they hit the sign on the traffic island, we fear it won't be long before one of them ends up in our living room. They come around this corner constantly despite the fact that they are not supposed to travel from north to south in order to access Botany Road. Why does the traffic report by Sinclair Knight Mertz not mention this? It's like McCauley Street is just sitting here underutilized, waiting for more trucks, instead of the reality that there are already too many trucks using it, ILLEGALLY and DANGEROUSLY. It simply isn't wide enough.

We fear that increased use of heavy vehicles in McCauley Street will also mean they will be queuing along the street when stopped at traffic lights, or waiting to access Amcor. We have enough problems with diesel fumes as it is without inviting more.

Also we currently experience truck drivers parking outside our house in order to sleep for a few hours, before urinating in the street and revving their trucks up and noisily moving off at 3am. More heavy vehicles will mean more instances of this.

Amcor currently has two direct access points on Botany Road. Why can't it make a third access point for itself on some of its "*excess land"* and leave McCauley Street alone? Amcor could have all it's trucks enter from Botany Road which has been designed for trucks and leave McCauley Street out of the equation, which hasn't been designed for trucks.

We don't see why industry and development can't be encouraged in a socially and environmentally responsible way instead of just riding rough shod over residents.

Suzy Malouf
Mrs Vera Malouf
Ross Parker

From: "mpsl" <mpsl@optusnet.com.au>
To: <plan_comment@planning.nsw.gov.au>
CC: <mayor@randwick.nsw.gov.au>, <robert.belleli@randwick.nsw.gov.au>, <offi...
Date: 20/05/2009 11:55
Subject: 05_0120 MOD 2 Amcor Proposed Modification
Attachments: Signature 1.JPG; Signature.JPG

To Whom It May Concern

cc: Mayor Bruce Notley-Smith, Councillor Robert Belleli, The Hon. Michael Daley, Deana Burn, Mr Kerry Kyriacou, Mr David Mooney

As a resident of McCauley Street in Matraville we would like to lodge our objections to the following proposed modifications to the Amcor Paper Mill:

a.. relocation of vehicle access to the engineering store further south along McCauley Street opposite Raymond Avenue
b.. use of the access on McCauley Street for finished product vehicles: and
c.. Subdivision of the main site into 3 separate lots to allow the sale of excess land.

The relocation of vehicle access to McCauley Street would mean the reclassification of the street to 'legally' allow B-Double trucks access to a residential street.

Amcor are proposing to add an additional six vehicles per hour (one hundred and forty four per day) to a street which houses residential properties.

We believe Amcor are not taking into consideration the impact on traffic noise these changes will have on McCauley Street and Australia Avenue, by excluding from their assessment, the immeasurable amount of non Amcor B-Double trucks which will legally be allowed to use the street once these changes have been made.

The increase to the constant noise and vibration would not only be detrimental to the safety, health and well being of the residents but would increase the chances of structural damage to the resident's homes.

Furthermore, the safety of the children who currently use Purcell Park and surrounding areas should not be compromised to accommodate unnecessary changes to a site which has direct access to Botany Road where no residential properties would be affected.

The heavy vehicles, including B-Double trucks which currently use McCauley Street illegally, present a real danger to the safety on the residents due to their inability to negotiate the narrow road and their total disregard for traffic laws. This ranges from driving at an unacceptable speed, driving on the wrong side of the road into oncoming traffic, turning into McCauley Street from Perry Street by driving over the top of the traffic island, to the extreme of performing u-turns at the intersection of McCauley Street and Harold Streets. To add an additional one hundred and forty four vehicles to this existing safety issue would be nothing short of criminal.

To allow the subdivision of the land into three separate lots is going to increase all of the above mentioned issues threefold.

Please see attached signatures from other residents who share the same objections.

We ask that you take into consideration our concerns and reject the proposed changes to McCauley Street and look forward to your response.

Regards

Matthew Penny & Sally Lambley

5 McCauley Street

Matraville NSW 2036

Email: mpsl@optusnet.com.au

Ph: 0418 278 309 Sally

0409 172 584 Matthew

Appendix B Traffic and Access Assessment

New Paper Mill – Project B9 Modification No.2

TRAFFIC AND ACCESS ASSESSMENT

- Final
- February 2010

New Paper Mill – Project B9 Modification No.2

TRAFFIC AND ACCESS ASSESSMENT

- Final
- February 2010

Sinclair Knight Merz
ABN 37 001 024 095
100 Christie Street
PO Box 164
St Leonards NSW
Australia 1590
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.skmconsulting.com

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1. Introduction

1.1. Background

AMCOR Packaging (Australia) Pty Ltd's ("AMCOR") paper recycling facility at Botany currently receives and processes approximately 40% of the waste paper collected in NSW. Waste paper and cardboard is processed to make a brown paper suitable for the production of boxes and other containers. The finished product is used locally as well as exported interstate and overseas. All paper entering and leaving the site does so via road, with some transferred to rail or shipping outside the site.

1.2. Previous Approval

Project approval for AMCOR's New Paper Mill (the "B9 Project") was granted by the Minister for Planning on 20 July 2007 (Application No. 05_120). This approval covered the construction and operation of a new paper making facility, including the replacement of two existing paper machines at their Botany site. These works will result in an increase in production capacity from 250,000 to 345,000 tonnes per year.

1.3. Modification Submission

Since the approval of the B9 Project in 2007, detailed design of the New Paper Mill has progressed significantly. As a result, a number of modifications are required to ensure the New Paper Mill will operate safely, efficiently and with minimal environmental impact.

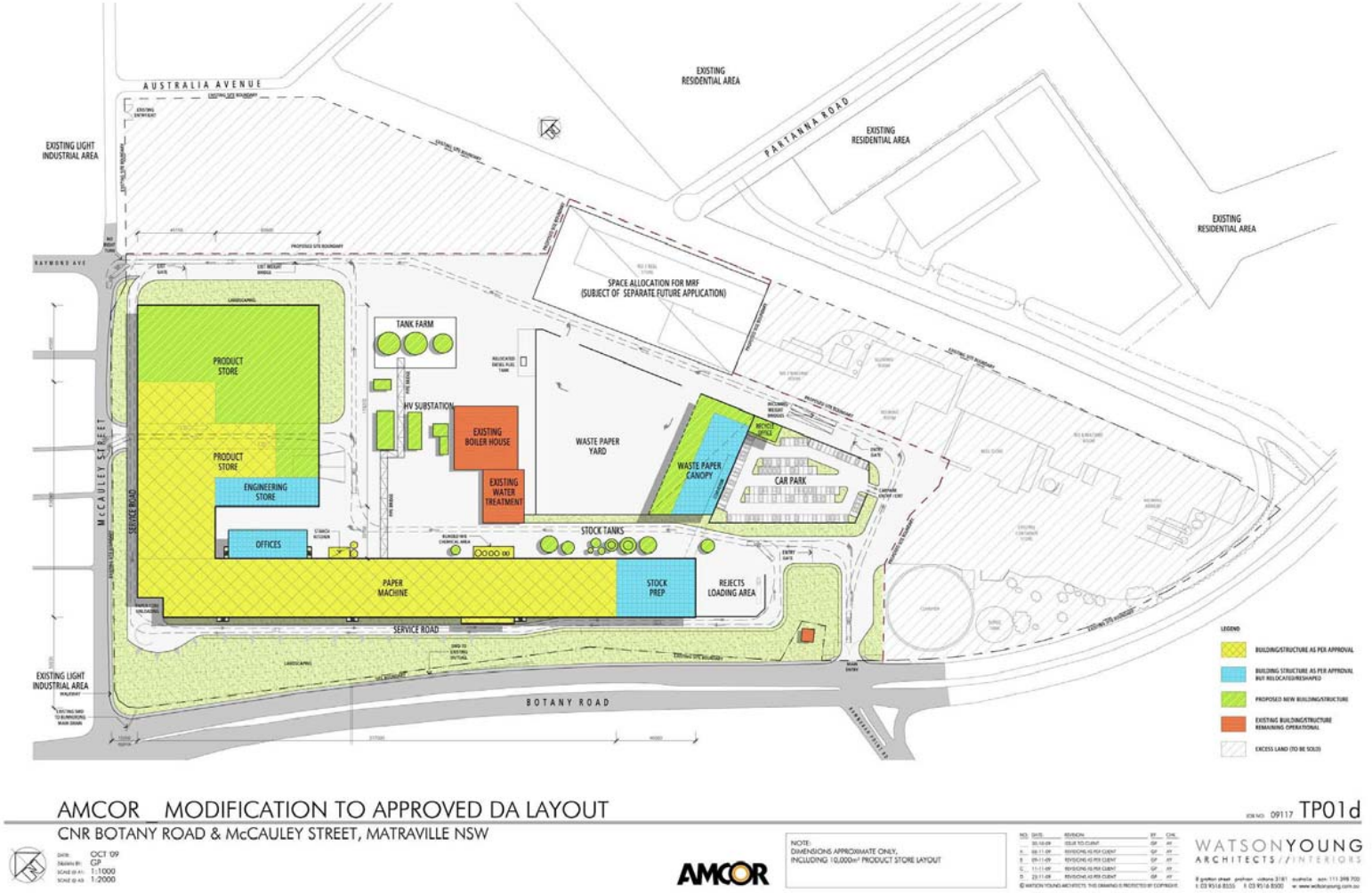
An initial Modification Report was lodged with the Department of Planning in May 2009. The proposed modifications to the Approved Project in May 2009 were similar to those described below including subdivision and limited use of McCauley Street for AMCOR vehicles. Submissions from Randwick City Council and the RTA on the proposed changes were received and many of the issues raised in the submissions related to traffic management and impacts of the modifications on external roads to the New Paper Mill. The major issue raised in the submissions was that RTA was not prepared to support the proposed changes to the phasing of the traffic lights at the Botany Road/Bumborah Point intersection to facilitate vehicles exiting the AMCOR site at Botany Road. Without this change in phasing of the traffic lights, the level of service at the intersection would be unacceptable to RTA, AMCOR and other road users. This as well as other issues required AMCOR to reconsider it's proposed traffic arrangements for the site. This report contains information on the proposed revised traffic arrangements and assesses their impact.

The modifications to the approved project (relevant to traffic) being sought are:

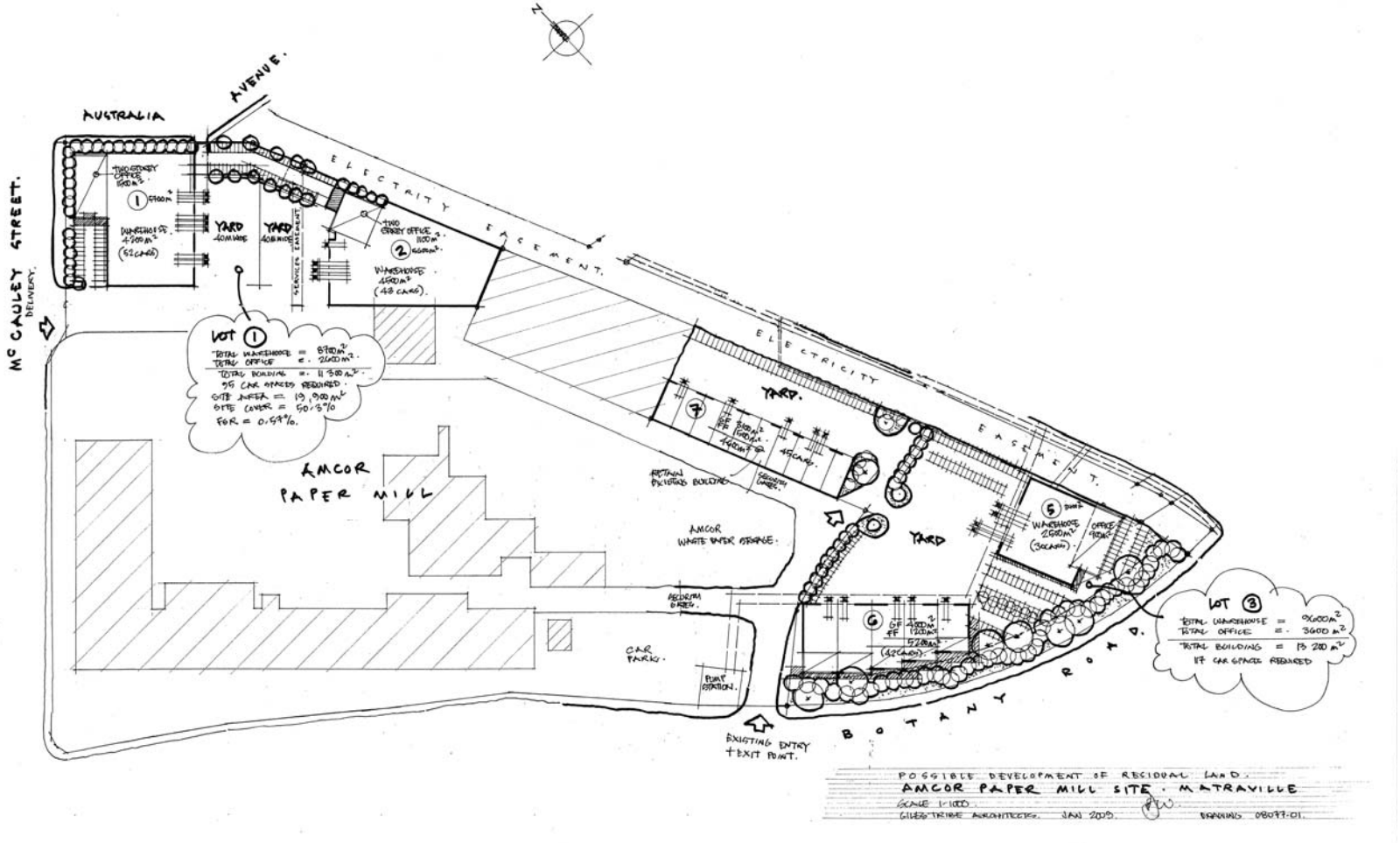
- Relocation of the existing Engineering Store vehicle access further south along McCauley Street to opposite Raymond Avenue;
- An additional vehicle exit only access on McCauley Street for Finished Product vehicles (including B-Doubles);
- Use of the accesses on McCauley Street for the exit of heavy vehicles from AMCOR's operations (including B-Doubles);
- The upgrade of McCauley Street from Botany Road to Raymond Avenue to make it suitable for B-Double use as well as use by other heavy vehicles;
- Changes in the site layout as a result of further development of the design;
- An increase in the size of the Finished Product store; and
- Subdivision of Lot 1 DP772737 to allow the sale of excess land, to fund the development of the New Paper Mill.

The overall concept design for the changes in site layout and traffic movements is shown in **Figure 1-1**, while a proposed potential concept plan showing how the subdivided land is likely to be developed is shown in **Figure 1-2**.

- **Figure 1-1 Proposed Modification**



- **Figure 1-2 Concept Plan for Subdivided Land**



1.4. Director General's requirements

In response to the requested modification to the approved application, the Director General outlined Conditions of Approval for the proposed modification. Those conditions relevant to this traffic and access assessment are outlined below:

- A detailed description of transport issues, including:
  - A description of the existing environment, using sufficient baseline data;
  - An assessment of the potential impacts of the modification, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions;
  - A description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the impacts of the modification; and
- Key Issues: Transport – including details of new and revised site access to service the existing project and new subdivision, internal roads and parking; details of traffic types and volumes to be generated; predicted impacts on road safety and capacity of the road network.

In addition, the RTA and Randwick City Council required additional information, as summarised below:

- The amount of traffic to be generated by the development;
- Details of parking and access (for both AMCOR and the subdivided lots), and compliance with relevant codes and standards;
- Details of service vehicle movements;
- Intersection analysis;
- Identification of any road network infrastructure requirements required to maintain existing levels of service; and
- Swept path analysis of the longest vehicle exiting and entering AMCOR and the subdivided lots.

This Traffic and Transport Assessment addresses the Director General's requirements, and addresses the concerns raised by the RTA and Randwick City Council from the exhibition of the original modification report.

2. Existing Situation

The AMCOR paper mill site (the site) is conveniently located adjacent to main road, rail and port transportation networks. The site's main access on Botany Road provides direct access to the regional main road network., The site is bounded to the south and east by Botany Road and the electricity easement, to the north by Australian Avenue and to the west by McCauley Street.

Offices and warehouses are located opposite the site on the north-west side of McCauley Street between Botany Road and Raymond Avenue. Port Botany is opposite the site on the southern side, with two direct accesses onto Botany Road (Gate B1 & Gate B2). North of the site are predominantly residential properties and a small recreational park (Purcell Park). A location map is presented in **Figure 2-1.**

2.1. Surrounding Road Network Conditions

The main traffic access to the AMCOR site is via a signal controlled intersection on Botany Road at Bumborah Point Road.

Botany Road is a major arterial road serving the Port Botany area and industrial land uses. It connects to Foreshore Road and thence to General Holmes Drive, Southern Cross Drive and the M5 Motorway, an important link in the local, regional and state road network. These roads are RTA approved B-double routes. In the vicinity of the site, Botany Road is a six-lane two-way road with slip lanes and right-turn bays provided at major intersections. A median island is also provided, dividing Botany Road into two carriageways.

McCauley Street, which adjoins the western boundary of the site, is a local road, providing access to commercial and residential areas. McCauley Street carries a low amount of traffic, although a report by Masson and Wilson (1997) indicated that there was a through traffic movement from the north to the south with drivers wishing to access Botany Road. The intersection of McCauley Street and Botany Road is controlled by traffic signals. There are two site access points on McCauley Street; the northernmost being the car park access and the southernmost connecting to the internal access road on site. This access is currently not in use.

Beauchamp Road is a local collector road and carries a significant proportion of heavy vehicle traffic. However, Randwick City Council has indicated that they are attempting to discourage further heavy vehicle use of Beauchamp Road. Bunnerong Road intersects with Botany Road and provides main road access to the site from the eastern suburbs.

A summary of existing traffic volumes along the surrounding road network is provided in **Table 2-1**.

- **Figure 2-1 Site**

- **Table 2-1 Existing Daily Traffic Volumes**

Road	Location	AADT	Source (Year)
Botany Road	West of Beauchamp Rd	35,826	RTA (2002)
	East of Beauchamp Rd	20,331	RTA (2002)
	South of Mill Pond Rd	27,237	RTA (2002)
Bunnerong Road	North Beauchamp	19,582	RTA (2002)
Beauchamp Road	North of Botany Rd	17,164	RTA (2002)
	West of Bunnerong Rd	8,759	RTA (1999)
Foreshore Road	East of General Holmes Dr	29,851	RTA (2002)
Southern Cross Drive	West of Wentworth Ave	85,163	RTA (2002)
General Holmes Drive	At runway tunnel	133,393	RTA (2002)
McCauley Street	-	1,700	Randwick Council (1997)

Intersection counts were undertaken at the McCauley Street / Botany Road intersection in May 2007 as part of the *Project B9 Construction Traffic Management Plan* (SKM 2007). The surveys revealed that approximately 150 vehicles utilise McCauley Street during both the AM and PM peak periods.

2.2. Public Transport

A designated bus zone is provided on the northern side of Botany Road between the site's main access and McCauley Street. The bus zone location is shown on **Figure 2-1**, while the bus stop is shown in **Figure 2-2**. Buses are operated by the State Transit Authority. Bus routes L09 and 309 travel on Botany Road in an eastbound direction. Botany Road is one of the major bus routes to the bus depot in Bumborah Point Road.

Currently, only bus route 309 provides a full day service on this route. The bus service L09 (an express service) only operates during the PM peak on weekdays and does not operate on weekends. The bus frequency during the AM and PM peak period is approximately 15 minutes, with a 1 hour frequency during off-peak periods[1].

No patrons were observed at the bus stop during visits to site. Currently, no footpath or bus shelter is provided at the bus stop.

No passenger train service is provided near the site.

[1] The AM peak period of the bus service is 5:00 – 6:00am and the PM peak period is 3:00 – 6:00pm. Source: Sydney Buses Timetable - Port Botany / Eastgardens to City.

- **Figure 2-2: Bus Stop on Botany Road (Eastbound)**

2.3. Parking

2.3.1. On-street Parking

Site observations indicate that there is a demand for on-street parking in McCauley Street due to local residential and commercial activities. Unregulated parking occurs on vacant land adjoining the site. Site observations also indicate that the highest demand for on street parking spaces in McCauley Street is close to Botany Road. This demand gradually decreases towards the north into the residential area. **Figure 2-3** shows on street parking on the southern end of McCauley Street.

Parking is prohibited along Botany Road near the site due to the operation of “No Stopping” restrictions.

On-street parking spaces are also available in Australia Avenue and other local streets such as Moorina Avenue and Partanna Avenue. They are typical local residential streets with average to low demand for on street parking.

- **Figure 2-3: On-street parking on McCauley Street, looking south towards Botany Road.**

2.3.2. Off-street Parking

The AMCOR paper mill site has one internal car park providing approximately 100 parking spaces on site. The car park is located next to the existing office building, and is accessed from the main access on Botany Road.

2.4. Cyclist

There is no designated cycle route near the site and no cyclists were observed during site observations.

2.5. Pedestrians

Site observations indicate that pedestrian movements surrounding the site are low. There is no footpath provided on either side of Botany Road in the vicinity of the site. All three surveyed signalised intersections along Botany Road had no designated signal phasing for pedestrians. No waiting patrons were observed at the bus stop during site visits. Based on these observations, it is anticipated that pedestrian movement on Botany Road is low.

McCauley Street has relatively higher pedestrian movements due to the adjoining commercial and residential activities. A footpath is provided on the north-western side of McCauley Street to provide access for pedestrians. There is no footpath on the south-eastern side of McCauley Street.

It is proposed, as part of the approval for the New Paper Mill, that footpaths would be constructed along the south eastern side of McCauley Street and along the Botany Road frontage of the site.

3. Proposed Access Arrangements

The proposed access arrangements are summarised in the table below.

- **Table 3-1: Proposed access arrangements**

Location/Activity	Vehicle Type	Enter Site	Exit Site
Botany Road Precinct	All vehicles	Botany Rd/ Bumborah Point Rd	Botany Rd/ Bumborah Point Rd
New Paper Mill & Materials Recycling Facility	Employee and visitor light vehicles	Botany Rd/ Bumborah Point Rd	Botany Rd/ Bumborah Point Rd
New Paper Mill & Materials Recycling Facility	Heavy vehicles and commercial vehicles	Botany Rd/ Bumborah Point Rd	McCauley St
McCauley Street Precinct	All vehicles	McCauley St	McCauley St

Apart from vehicles accessing the McCauley Street Precinct all other vehicles would enter the site through the Botany Road/Bumborah Point Road intersection. While there would be one left turn lane into the site from Botany Road a section of 4-lane internal road (2 in and 2 out) would be constructed between the existing Botany Road intersection and the proposed subdivision site access. Access to the AMCOR site will be via the left lane of this new road, while access to the Botany Road Precinct will be via the right lane. The existing incoming weighbridge will be removed and replaced by two new weighbridges located inside the AMCOR site, at a position approximately 170m from the intersection of Bumborah Point Road and Botany Road. All light and heavy vehicles from the Botany Road Precinct and all AMCOR's employee and visitor light vehicles would exit the site via the Botany Road/Bumborah Point Road intersection. All heavy and commercial vehicles would exit the site via the proposed McCauley Street accesses.

Access to the McCauley Street Precinct would be via a new access on McCauley Street directly opposite Raymond Avenue, forming a four legged intersection. Apart from Finished Product vehicles, all of AMCOR's heavy and commercial vehicles would also use this intersection to exit the site, with all vehicles required to exit the site to the south. Finished Product vehicles would use another proposed exit further south along McCauley Street. The proposed shared access arrangements are shown in **Figure 1-1**. Emergency vehicles would access the site through both the Botany Road and McCauley Street accesses. Both accesses would be designed in accordance with Austroads requirements for B-Doubles to ensure that larger vehicles can safely access the site should the need arise.

McCauley Street, south of Raymond Avenue will comprise two 3.5 metre lanes in order to safely accommodate the turning movements of B-Doubles, as discussed in detail in **Section 7.1**.

4. Trip Generation and Distribution

Trip generation and distributions were determined for the following:

- The Existing Paper Mill;
- The New Paper Mill;
- The Materials Recycling Facility ("MRF"), which will be the subject of a separate Part 3A Environmental Assessment; and
- The new development precincts (based upon a likely land use).

4.1. Existing Paper Mill

Surveys were undertaken in May 2007 as part of the *Project B9 Construction Traffic Management Plan* (SKM 2007) at the intersection of Botany Road / Bumborah Point Road and the main AMCOR access and the intersection of Botany Road / McCauley Street. This survey information was used to identify the times in the AM and PM periods when peak traffic movements occurred. At the Botany Road / Bumborah Point Road intersection, the AM peak period was between 8 and 9AM, while at the Botany Road / McCauley Street intersection the AM peak period was earlier, between 7 and 8AM. The PM peak period at both intersections was between 3 and 4pm.

A total of 58 vehicles were observed accessing the site from the Botany Road entrance during the AM peak, with a total of 42 observed during the PM peak (See **Table 4-1**). A total of 154 and 150 vehicles were observed accessing McCauley Street from Botany Road during the AM and PM peaks respectively.

The 2007 traffic counts were used to forecast future (2018) traffic volumes at the McCauley Street/ Botany Road intersection (See **Table 4-2**). At the request of the Roads and Traffic Authority and Council, a growth rate of 3.5% was used, being the growth rate generally adopted for the Port Botany precinct. This rate is similar to the 4% growth rate derived by comparing the 2007 counts and counts collected at the same intersections in 2005 for the *Project B9 EIS* (SKM, 2005). It should be noted that when the new Paper Mill (Project B9) is operational the existing Paper Mill will be decommissioned. The number of vehicles accessing the site once the B9 Project is operational is based on the maximum capacity of the New Paper Mill and therefore a zero growth rate factor has been applied as no additional traffic will be generated in the future.

- **Table 4-1 2007 traffic volumes**

		2007 Survey	
Location	**Direction**	**Hourly AM Peak**	**Hourly PM Peak**
Botany Road Entrance	In	34	6
	Out	24	36
	Total	**58**	**42**
McCauley Street	In	85	53
	Out	69	97
	Total	**154**	**150**

- **Table 4-2 Predicted 2018 traffic volumes**

		Predicted 2018	
Location	**Direction**	**Hourly AM Peak**	**Hourly PM Peak**
McCauley Street	In	118	73
	Out	96	134
	Total	**213**	**208**

4.2. Project B9 / Materials Recycling Facility

4.2.1. General Traffic Movements

Presented in the following tables is general information on the average total number of AMCOR vehicles predicted to be accessing the site (See **Table 4-3**) and predicted peak traffic movements (number and time period) for specific types of vehicles associated with Project B9 and the MRF (See **Table 4-4 and 4-5**).

- **Table 4-3: Total average weekday vehicles[1]**

Type of Vehicle	AAWDT[2]		
	B9	MRF	B9 + MRF
Waste Paper Deliveries:			
B-Doubles	4		4
Semi Trailers	31		26
Rigids (Compactors, Tippers, Tray Trucks - 2 to 15 tonne load).	147	85	213
Starch / Chemicals Deliveries:			
Semi Trailers	2		2
Finished Product Despatch:			
B-Doubles	16		16
Semi Trailers	31		31
Solid Waste Removal:			
Truck and Dog Trailer	6		6
Recyclables:			
Semi Trailers		8	8
General Waste:			
Rigids (Front loading hook bins etc.)	1		1
General Traffic (Staff, Contractors, Visitors, Couriers, Deliveries).			
Light Vehicles (Cars, Vans, Utilities etc)	150	25	175
Total	**388**	**118**	**482**

[1] The numbers in this table represent the number of vehicles accessing the site. Each vehicle generates 1 in movement and 1 out movement.

[2] Annual Average Week Day Traffic - i.e. the number of vehicles that access the site during an average week day.

- **Table 4-4 Project B9 vehicles – Peak Hourly traffic**

Predicted B9 traffic movements (i.e. in and out)	Peak Traffic (Hourly)	Peak Traffic Hours
Compactors, Self tippers, etc.	34	Between 7am and10am
Semi trailers	16	Between 6am and 8am Between 2 pm and 3 pm
B-Doubles	8	Between 2 pm and 3 pm
General traffic (cars, utes etc)	40 40	Between 6.30am and 7.30am Between3pm and 4 pm
Other semi trailers (starch and chemicals)	6	These deliveries will be planned to occur outside of peak periods

Table 4-5 Material Recycling Facility vehicles - Peak Hourly traffic

Material Recycling Facility traffic movements (i.e. in and out)	Peak Traffic (Hourly)	Timing of peak
Compactor trucks, tippers and semi-trailers	36 36 36	Between 8:30am -9:30am Between 11:00am -12:00pm Between 1:30pm- 2:30pm
General traffic (staff cars)	20	Between 1.30pm and 2.30pm

4.2.2. Traffic movements during peak periods

As discussed in Section 4.1, at the Botany Road / Bumborah Point Road intersection the AM peak period was between 8 and 9AM, while at the Botany Road / McCauley Street intersection the AM peak period was earlier, between 7 and 8AM. The PM peak period at both intersections was between 3 and 4pm. AMCOR vehicles using McCauley Street and the Botany Road access during these peak periods was estimated. The anticipated traffic, as advised by AMCOR, from Project B9 is shown in **Table 4-6**, for the MRF in **Table 4-7** and for employee traffic in **Table 4-8**.

- **Table 4-6 Split of peak hour Project B9 traffic**

Access	Peak	In	Out
Botany Road	AM	62	0
	PM	32	0
McCauley Street	AM	0	62
	PM	0	32

- **Table 4-7: Split of peak hour MRF traffic**

Access	Peak	In	Out
Botany Road	AM	18	0
	PM	3	0
McCauley Street	AM	0	18
	PM	0	3

- **Table 4-8: Split of peak hour Employee traffic**

Access	Peak	In	Out
Botany Road	AM	6	6
	PM	6	41
McCauley Street	AM	0	0
	PM	0	0

The total number of AMCOR vehicles utilising the Botany Road access and accessing Botany Road via McCauley Street in the AM and PM peaks is shown in **Table 4-9**. Approximately 92 and 82 vehicles are estimated to access the site via the Botany Road access during the AM and PM peaks respectively.

- **Table 4-9: Total vehicles in 2018 associated with Project B9 and MRF**

Location	Direction	AM	PM
Botany Road Entrance	In	86	41
	Out	6	41
	Total	**92**	**82**
McCauley Street	In	0	0
	Out	80	35
	Total	**80**	**35**

The total number of vehicles utilising both McCauley Street and the Botany Road entrance in 2018 (including background and MRF) are shown in **Table 4-10**. In total, approximately 92 vehicles are expected to utilise the Botany Road entrance in the AM peak, while 293 vehicles would utilise McCauley Street. In the PM peak, approximately 82 vehicles would utilise the Botany Road entrance, with 243 utilising McCauley Street.

- **Table 4-10: Total vehicles in 2018, including background and Project B9 and MRF traffic**

Location	Direction	AM	PM
Botany Road Entrance	In	86	41
	Out	6	41
	Total	**92**	**82**
McCauley Street	In	118	73
	Out	176	169
	Total	**293**	**243**

4.3. Subdivided Lots

The gross area of the proposed subdivision sites is approximately 50,000 m^2. As indicated by **Figure 1-2**, it is likely that gross 6,200 m^2 will be developed as office buildings and gross 18,800 m^2 will be developed as warehouse space. Indicative land uses are shown in **Table 4-11** for each area of subdivided land.

- **Table 4-11: Subdivided Land Distribution**

Land Parcel	Area (m²)	Site coverage	Warehouse area (m²)	Office area (m²)
McCauley Street Precinct	23,600	50%	9,200	2,600
Botany Road Precinct	26,400	50%	9,600	3,600
Total	**50,000**	-	**18,800**	**6,200**

Based upon typical employment rates for the likely land use in the new precincts, employment generation will be approximately 1 person per 15 m^2 of the office area and 1 person per 100 m^2 of warehouse space. Based on trip rates identified in the RTA Guide to Traffic Generating Developments (0.318 AM peak vehicle trips and 0.365 PM peak vehicle trips per employee for Employment land uses (Guide to Traffic Generating Developments v2.2, NSW RTA, 2002), the number of trips the subdivided sites would be expected to generate were estimated. These estimates include both employee vehicles movements as well as heavy and commercial vehicle movements associated with the subdivision. The resulting employee distribution and AM and PM trip numbers are shown in **Table 4-12**. In total, the subdivisions are expected to generate approximately 601 additional employees, resulting in an additional 191 trips in the AM peak and 219 trips in the PM peak.

- **Table 4-12 Subdivision Trip Generation**

Land Parcel	Jobs			AM Peak Vehicle Trips	PM Peak Vehicle Trips
	Office	Warehouse	Total		
McCauley Street Precinct	173	92	265	84	97
Botany Road Precinct	240	96	336	107	123
Total	**413**	**188**	**601**	**191**	**219**

Traffic from the McCauley Street Precinct was assumed to access the site via McCauley Street, while traffic from the Botany Road Precinct was assumed to access the site via the Botany Road/ Bumborah Point Road intersection. It was assumed that directional splits would not differ from those of the existing AMCOR facility. As such, existing directional splits at the intersection were utilised to determine future movement volumes. The additional traffic resulting from the subdivision is shown in **Table 4-13**.

- **Table 4-13 Additional traffic volumes in 2018 associated with the subdivision**

Location	Direction	AM	PM
Botany Road Entrance	In	67	20
	Out	40	102
	Total	**107**	**122**
McCauley Street	In	53	16
	Out	32	80
	Total	**84**	**96**

The total number of vehicles utilising both McCauley Street and the Botany Road entrance (including background, B9, MRF and subdivision traffic) are shown in **Table 4-14**. In total, approximately 199 vehicles are expected to utilise the Botany Road entrance in the AM peak, while 378 vehicles would utilise McCauley Street. In the PM peak, approximately 204 vehicles would utilise the Botany Road entrance, with 339 utilising McCauley Street.

- **Table 4-14 Total traffic volumes in 2018, including background, Project B9, MRF and subdivision traffic**

Location	Direction	AM	PM
Botany Road Entrance	In	153	61
	Out	46	143
	Total	**199**	**204**
McCauley Street	In	171	89
	Out	207	250
	Total	**378**	**339**

4.4. Scenario Comparison

As can be seen in **Table 4-15**, in the 2018 scenario with the additional vehicles associated with the subdivision, substantially more vehicles will be accessing the site, with the majority of additional vehicles utilising the Botany Road access.

- **Table 4-15 Scenario Comparison – Traffic Generation**

		2018 base		2018 with B9 & MRF		2018 with B9 & MRF & subdivision	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
Botany Road Entrance	In	34	6	86	41	153	61
	Out	24	36	6	41	46	143
	Total	**58**	**42**	**92**	**82**	**199**	**204**
McCauley Street	In	118	73	118	73	171	89
	Out	96	134	176	169	207	250
	Total	**213**	**208**	**293**	**243**	**378**	**339**

4.5. Trip Allocation

Turning movements for these trips at the two analysed intersections were allocated according to current patterns, as it was assumed that these patterns would not change substantially.

5. Traffic Impacts

The cumulative impacts of existing traffic, Project B9 traffic, MRF traffic and the proposed subdivision traffic were assessed, focusing on the impacts of the additional traffic on the nearby intersections of Botany Road / Bumborah Point Road and Botany Road / McCauley Street.

Vehicle turning movement counts were undertaken at both these intersections in 2007 as part of the Project B9 Construction Traffic Management Plan. These counts have been taken as the base case scenario. The anticipated traffic growth rates were estimated by comparing the survey results from July 2005 and May 2007, collected as part of project B9 EIS and project B9 CTMP respectively. A traffic growth rate of 3.5% per annum has been estimated in Botany Road west of Bumborah Point Road. This growth rate has been used to project traffic volumes at the intersections in 2018.

5.1. Intersection Analysis

The intersections were analysed using the Sidra Intersection modelling software. It calculates the amount of delay experienced by vehicles using an intersection, and gives a Level of Service (LoS) rating which indicates the relative performance of that intersection with regard to the average delay (in seconds per vehicle) experienced by vehicles at the intersection. At signalised intersections, overall intersection delay and Level of Service is taken as the average delay reported for all movements. The Sidra Intersection analysis of the operating conditions can be compared to the performance criteria set out in **Table 5-1**.

- **Table 5-1: Level of Service Criteria**

Level of Service	Average Delay per Vehicle (sec/veh)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good Operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause delays. Roundabouts require other control mode	At capacity, requires other control mode
F	Over 70	Extra capacity required	Extreme delay, traffic signal or other major treatment required.

Source: RTA *Guide to Traffic Generating Developments*, version 2.2-2002

An intersection operating at Level of Service E or F is operating at or above capacity, with vehicles at these intersections experiencing substantial delays. Level of Service of D or better is generally

considered acceptable in peak periods when future traffic is not taken into account, while Level of Service C is considered acceptable for future designs.

The intersections of Botany Road with Bumborah Point Road and McCauley Street were analysed using SIDRA Intersection for both the base case (existing AMCOR) and for future conditions (2018) with B9 and MRF (See **Table 5-2** and **Table 5-3** respectively). The latest traffic light phasing data from the RTA was used to undertake the analysis.

- **Table 5-2 Existing Intersection Operation, Base Case 2007 (as surveyed)**

Intersection	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Botany Road / Bumborah Point Road	B	16	B	20
Botany Road / McCauley Street	B	15	B	16

- **Table 5-3 Future Intersection Operation, 2018 with Project B9 & MRF Traffic**

Intersection	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Botany Road / Bumborah Point Road	A	13	B	22
Botany Road / McCauley Street	B	19	B	17

The intersections were also analysed for future conditions (2018) with B9, MRF and and Precinct traffic included (See **Table 5-4**).

- **Table 5-4 Future Intersection Operation, 2018 with Project B9, MRF & Subdivision Traffic**

Intersection	AM Peak		PM Peak	
	LoS	Average Delay (Seconds)	LoS	Average Delay (Seconds)
Botany Road / Bumborah Point Road	B	15	B	26
Botany Road / McCauley Street	B	21	B	19

The results of the Sidra Intersection analysis show that the existing intersections in the vicinity of the proposed development would continue to comfortably accommodate traffic volumes from future network traffic growth and the additional traffic generated by the proposed development. Therefore there would be no significant impact on the intersections from the proposed development.

A detailed review of the Botany Road / Bumborah Point Road intersection analysis results for the eastbound shared left turn and through lane was undertaken in order to ascertain whether a

dedicated left turn lane would be required to reduce the impact of left turning traffic on through traffic. The delay for this lane was found to be 2.9 seconds in the AM peak and 5.5 seconds in the PM peak with the subdivision in place. The anticipated arrival rate of left turning vehicles is 144 vehicles in the AM (including 105 heavy vehicles) and 14 vehicles in the PM (0 heavy vehicles), resulting in an arrival rate of 2.4 vehicles per minute during the AM peak and 0.2 vehicles per minute during the PM peak. Given the anticipated low impact of the left turn on through traffic in the lane, a dedicated turn lane is not warranted.

5.2. Weighbridge Queuing

Incoming weighbridges would be located near the Waste Paper Yard. Based on preliminary analyses, off-site queuing of vehicles on Botany Road would not occur.

6. Parking Impacts

6.1. Parking

Parking requirements were assessed for both the proposed AMCOR operations and new precinicts

Currently there are approximately 100 parking spaces on site, located in the main car park at the Botany Road entrance.

6.1.1. B9 Project

Due to efficiencies in production associated with the new paper mill, the overall demand for parking at the AMCOR site will decrease. However, the number of spaces within the AMCOR site is not expected to change as a result of the B9 Project.

6.1.2. Under the Modification

Under the proposed modification, the number of spaces provided will not change, with the car park layout altering slightly from the existing in association with the relocation of the office building. Of the 100 spaces provided, two will be dedicated to use by persons with a disability. These two spaces will be conveniently located.

The proposed car park layout will likely consist of 2 aisles with 90^{o} parking on both sides. The spaces and aisles will be designed in accordance with AS/NZS 2980.2:2004 *Parking Facilities Part 1: Off-Street Car Parking*, which require the following minimum dimensions for 90^{0} angled employee (User type 1 parking):

- Parking space dimensions: 2.4m width x 5.4m length;
- Aisle width: 6.2m (plus 300mm where spaces are provided on one side only);
- Driveway width (Access Class 1): 3.0 to 5.5m (combined); and
- Disabled space dimensions (from *AS2890.1-1993*, Figure 2.2, page 10): 3.2m width x 5.4m length.

The preliminary designs for the car park layout meet these requirements.

6.2. Subdivided Lots

As the nature of the usage of those lots which are to be redeveloped cannot be confirmed until after their sale, comment cannot be made on the adequacy of parking provision at these sites. Despite this, indicative estimates of parking requirements can be provided based on similar land uses within the area and estimated warehouse and office space to be developed.

Estimated parking requirements at the three lots are shown in **Table 6-1**, based on the land being used for both office and warehousing purposes. In total, approximately 218 spaces will be required across the various lots.

Table 6-1 Estimated Parking Requirements for Excess Land

Land Parcel	Estimated number of spaces required			
	Office	Warehouse	Total	Rounded Total
PARKING RATE[1]	1 space per 40m^2 GFA	1 space per 300m^2 GFA	-	-
McCauley Street Precinct	65	31	96	**96**
Botany Road Precinct	90	32	122	122
TOTAL	155	63	217.7	**218**

[1] RTA *Guide to Traffic Generating Developments* (2002), and Randwick City Council *Development Control Plan* (1998).

6.3. Summary

The number of spaces provided for use by AMCOR staff and visitors (100 spaces) will not change under the modification, although overall parking demand is expected to decrease. The layout of the car park is likely to change as a result of the relocation of the office building. The redesigned car park facility would comply with Council and RTA requirements.

Based on estimates of land uses for the excess land, it is likely that approximately 96 spaces will be required for the McCauley Street Precinct and 122 spaces for the Botany Road precinct.

7. McCauley Street and Botany Road Access

7.1. Upgrade of McCauley Street

It is likely that an upgrade of McCauley Street would be required to accommodate the additional traffic from AMCOR's operations and the McCauley Street Precinct. Consultation with Randwick Council has been undertaken to establish their requirements for the upgrade of McCauley Street and they have confirmed the following:

- Parallel parking on both sides of McCauley St with a parking lane width of 2.3m;
- Traffic lane width of 3.5m; and
- Verge width between the eastern kerb of McCauley Street and AMCOR's fence of 3m.

A concept layout has been prepared for McCauley Street including parking and consideration of sweep paths from the two new accesses on McCauley Street. This is attached in Appendix A. It has been assumed that McCauley Street will require rebuilding to the centre line of the existing road.

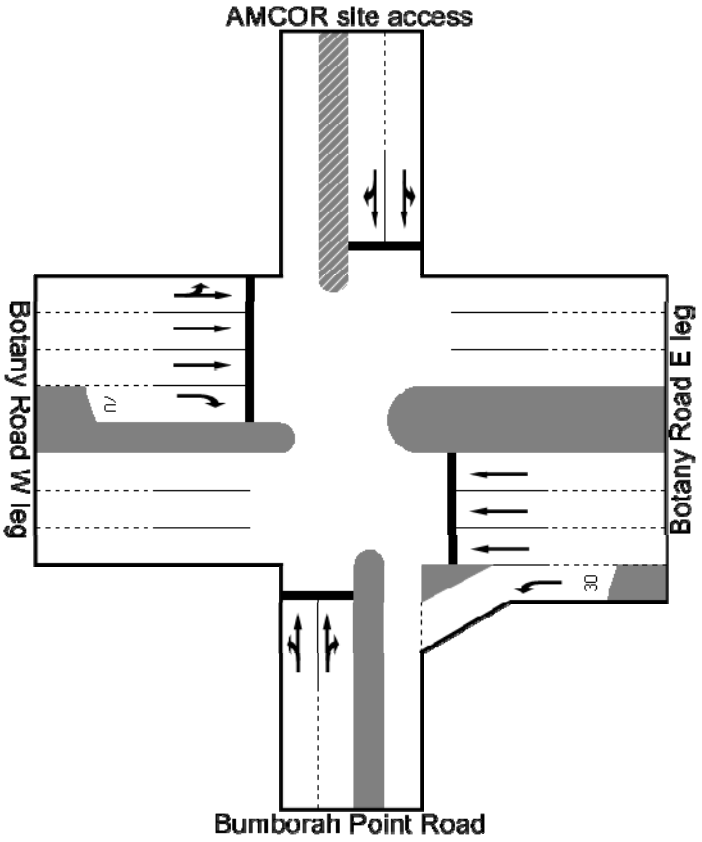
It should be noted that AMCOR is only applying for approval for B-Doubles to use the southbound lane of McCauley Street.

Minor modifications of the kerb and traffic islands at the McCauley Street/ Botany Road intersection would be required.

7.2. Botany Road Access

Presented in **Figure 7-1** is the proposed lane arrangement at the Botany Road access. As noted in previous sections the road would increase to four lanes within the site to separate AMCOR and Botany Road Precinct vehicles.

- **Figures 7-1 Botany Road Access**



8. Summary and Conclusion

8.1. Potential Impacts

It is expected that the subdivision of the excess land at AMCOR's site would generate additional traffic at the McCauley Street / Botany Road and Bumborah Point Road / Botany Road intersections. The impact of the additional vehicles on the operation of these intersections is not sufficient to cause undue delay to other road users, with both intersections expected to continue operating at an acceptable level of service in 2018.

8.2. Proposed Mitigation Measures

The proposal includes the provision of an upgrade access on McCauley Street directly opposite Raymond Avenue, forming a four legged intersection and the provision of an additional exit only access for Finished Product vehicles south of Raymond Avenue on McCauley Street.

All parking and access facilities for both the AMCOR site and the subdivided lots would be designed in accordance with the appropriate codes and standards.

Additional mitigation measures to ensure that vehicles exiting the site into McCauley Street turn left (ie southbound) away from residential areas include:

- Appropriate signage – including no left turn signs if required;
- Kerbs, traffic islands and other physical measures developed in consultation with Randwick City Council;
- Driver education for all vehicles utilising the site; and
- Visual monitoring of traffic leaving the site.

8.3. Conclusion

The additional vehicles anticipated to utilise the McCauley Street intersection are not sufficient to cause undue delay to other vehicles at the intersection, as the additional vehicle volume is within the design constraints of the McCauley Street intersection.

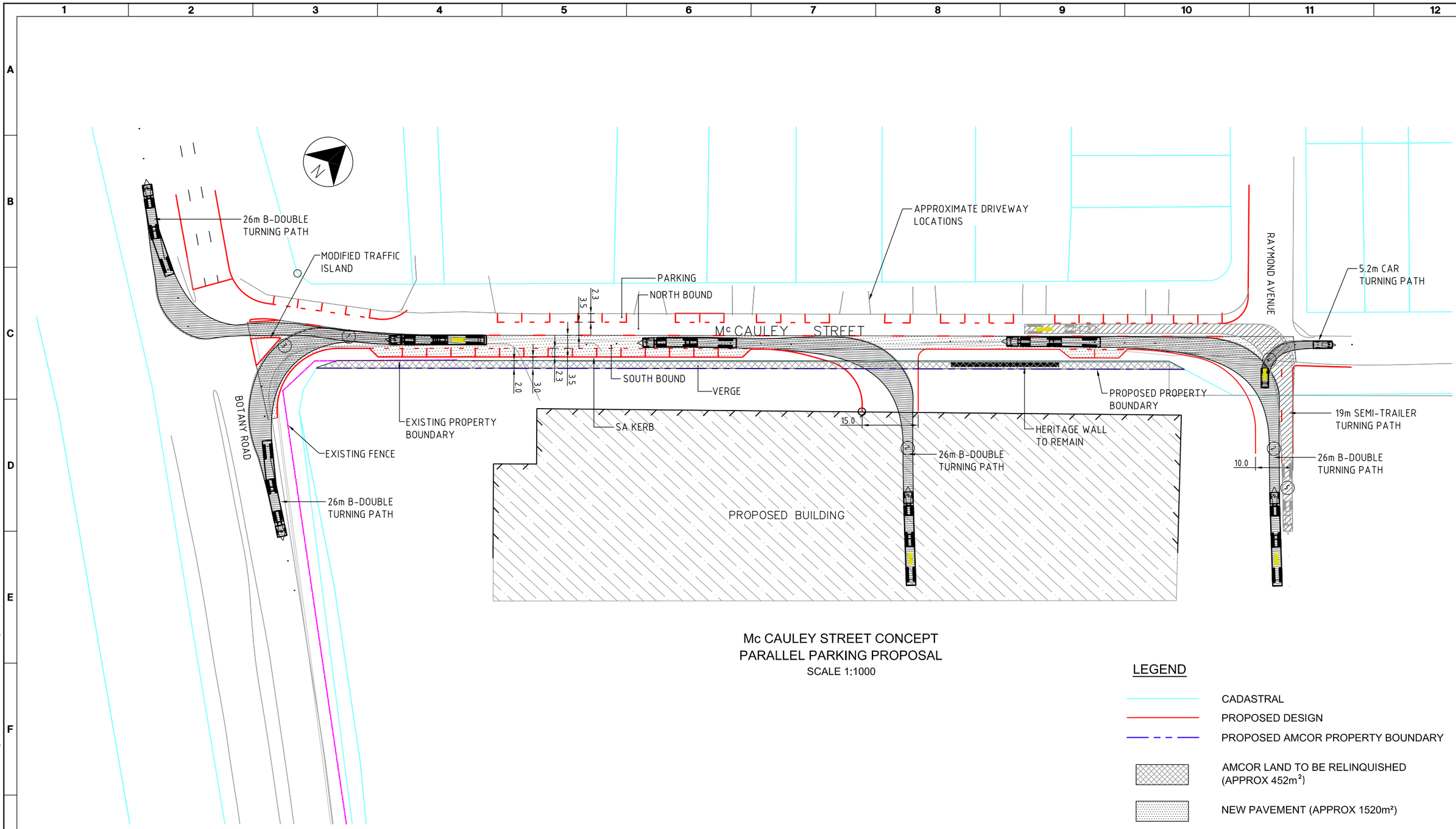
The Level of service of operation at the Botany Road / Bumborah Point Road and the Botany Road / McCauley Street intersections are acceptable with the proposed development traffic and background growth.

The additional vehicles generated by the proposed modification will not have a detrimental effect on road safety at either intersection.

All parking and access facilities for both the AMCOR site and the subdivided lots would be designed in accordance with the appropriate codes and standards.

This assessment has found that the proposed modification has a minimal impact on road network operations, and its approval is recommended on traffic grounds.

Appendix A – Concept Design McCauley Street



Mc CAULEY STREET CONCEPT
PARALLEL PARKING PROPOSAL
SCALE 1:1000

LEGEND

- CADASTRAL
- PROPOSED DESIGN
- PROPOSED AMCOR PROPERTY BOUNDARY
- AMCOR LAND TO BE RELINQUISHED (APPROX 452m²)
- NEW PAVEMENT (APPROX 1520m²)
- PROPOSED BUILDING

SCALE 1:1000 10 0 10 20 AT A3

PRELIMINARY

No	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
D	18.12.09	C.T.	C.T.	J.B.	J.M.	19.0m VEHICLE ACCESS PATH ADDED
C	04.12.09	C.T.	C.T.	J.B.	J.M.	PAVEMENT WIDTH REVISED
B	20.11.09	E.W.	D.H.	J.B.	J.M.	LAYOUT REVISED
A	11.11.09	E.W.	D.H.	J.B.	J.M.	CONCEPT ISSUE

No	DRAWING NUMBER	REFERENCE DRAWING TITLE

SKM A.C.N 001 024 098
Sinclair Knight Merz Pty. Ltd
100 Christie Street
St Leonards
NSW 2065 Australia
Telephone: 02 9928 2100
Facsimile: 02 9928 2500

CLIENT: AMCOR
PROJECT: BOTANY MILL B9 PROJECT

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
S.T.	E.W.	J.B.	J.M.
DESIGNED	DESIGN REVIEW		
E.W.	D.H.		

TITLE: Mc CAULEY STREET PROPOSED UPGRADE PLAN

SCALE	SKM PROJECT No	DRAWING No	AMDT
1:1000	EN02732	EN02732-SK007	D

Plot Date: 18 Dec 2009 @ 14:15:43 Login Name: rdew Cad File: I:\NBP\Projects\NB11000\Deliverables\Drawings\Civil\Sketches\IN90491-C-SK007.dwg

Appendix C Operational Noise Assessment

NOISE IMPACT ASSESSMENT
REVISED B9 PROJECT
AMCOR PAPER PTY LIMITED
BOTANY ROAD, MATRAVILLE SITE

Prepared for: Brian Batchelor, Process and Technology Engineer, AMCOR Paper Pty Ltd

Prepared by: Anita Joh, Acoustical Engineer
Brandon Burrell, Acoustical Engineer
Peter Eisenhuth, Senior Technical Officer
R T Benbow, Principal Consultant
BENBOW ENVIRONMENTAL

Report No: 109169_Final_Report_Version 6
January 2010
(Released: 19 January 2010)

Benbow
ENVIRONMENTAL

Engineering a Sustainable Future for Our Environment

13 Daking Street North Parramatta NSW 2151 AUSTRALIA
Tel: 61 2 9890 5099 Fax: 61 2 9890 5399
Email: admin@benbowenviro.com.au
Visit our website at: www.benbowenviro.com.au

EXECUTIVE SUMMARY

The B9 Project has been revised to take benefit of the operational and environmental improvements in the site layout that have been recognised by the Project Design Team.

These changes have affected the location of the stock preparation plant, the waste paper yard operations, and the location of the exhaust fans that ventilate the process and the building, in addition a significant change to the operation and design of the finished product store has been devised.

The B9 Project would replace the existing older paper mills and finished product storage activities. The noise impact assessment has been prepared on the basis of the B7 and B8 paper machine buildings being demolished by a future owner of this land. The finished product (reel) store servicing these mills would be retained and in the future be developed into a 24/7 operated Materials Recycling Facility (MRF) to service local government and the CBD of Sydney.

The noise impact assessment has found that the Project Specific Noise Limits approved in the original development are no longer technically achievable, and will prevent the AMCOR site from being able to expand. The growth of the site will be sterilised and prevent sustainability projects from being added to the paper recycling processes in the future. This is a significant disadvantage to the B9 Project. The current industrial noise levels at the nearest residences are a steady state noise from the AMCOR site and will be able to be maintained between the amenity criteria for an urban area at 45dB(A) and below the urban/industrial interface amenity level of 50dB(A) during night time.

Night time is the critical period that has influenced the design of the B9 Project and the need for a noise management plan that would be developed for the site.

The noise modelling with the new site layout – with the removal of the B7 and B8 paper machine buildings – will fail the previous Revised Project Specific Noise Limits set for residences to the immediate north and east of the site.

The detailed noise modelling of the revised project has found that the existing steady state noise levels generated by the existing AMCOR site would not be exceeded. The noise modelling has also shown that INP based Revised Project Specific Noise Limits (PSNL) using an urban land use would be exceeded for evening and night time periods.

Careful and detailed design has been able to generate a noise environment that will use the steady state nature of the processes to mask the intermittent noise levels generated by truck and mobile equipment movements. Detailed consideration is also being given to ensuring there is an absence of irritating characteristics such as undulating noise levels, impacts and tones.

A set of noise controls have been designed into the revised B9 Project and in summary include the following:

- High "Colorbond" noise barriers along the boundary shared with the adjoining new development precincts (i.e. subdivided land);
- High noise barriers of concrete and "Colorbond" around the waste storage yard;
- Placement of the ventilation system fans on decks located on the south side of the mill building;
- Engineering controls on specific fans and blowers to achieve 85dB(A) at 1m from the outlets;
- The ground floor level wall facing residential areas would be of concrete and a double clad metal system;
- The machine level floor cladding facing residential areas would be a double steel cladding system;
- The internal roadway system and therefore the traffic flow has been designed to prevent the sleep disturbance criteria from being exceeded and this will be satisfied; and
- The finished goods store has been redesigned so that trucks will be loaded inside the building and exit the site at a location removed from the nearest residences.

The premise on which the original B9 Project Revised Project Specific Noise Limits were set is no longer applicable. Detailed noise modelling has shown that the original predicted noise levels will not be able to be met at all residential locations.

A set of Project Specific Noise Limits are recommended that provide a reasonable balance between the technical and feasible limits that can be achieved and maintaining the AMCOR contribution below the current contribution from their site.

The management of AMCOR are unable to restrict the preservation of the buildings that currently house paper mill plants B7 and B8. As this land is divested it is assumed that future owners would demolish these buildings and the perimeter brick wall.

The revised design of the B9 Project has included a 5 metre high acoustic wall and this is considered to be the limit on the height of the wall that is able to be provided.

The revised B9 Project would provide operational noise levels from the re-consolidated site that would be lower than the existing contributions made by the current AMCOR operations. This is considered to be a beneficial outcome.

R T Benbow
Principal Consultant

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FIGURES PAGE

ATTACHMENTS

1. INTRODUCTION

This report provides the findings of a noise impact assessment for the revised site layout of the B9 Project at the AMCOR Matraville site.

Benbow Environmental was commissioned by AMCOR to undertake the noise impact assessment following changes to the site layout. In undertaking the noise impact assessment Benbow Environmental has adopted the Revised Project Specific Noise Limits recommended by SKM in their noise impact studies prepared for the Environmental Assessment (EA).

The EA was approved by the Department of Planning in July 2007. The B9 Project is a Major Project under the Major Projects SEPP. The Revised Project Specific Noise Limits recommended by SKM in the original EA were not adopted by DECCW and DoP.

The Revised B9 Project is unable to satisfy the Revised Project Specific Noise Limits applied by DECCW and DoP due to the technical limitations on the predicted noise levels that are achievable. The revised B9 Project is able to achieve a reduction in the existing AMCOR site's current contributions to the ambient acoustic environment.

Separate discussions have been held with DECCW and DoP to clarify the basis of the limitations in being able to satisfy the original conditions of consent relating to noise for the Revised B9 Project. The noise assessment report establishes a reasonable set of Project Specific Noise Limits that will be technically achievable and be lower than the existing contribution from the AMCOR site.

The INP derived night time Project Specific Noise Limits applied by DECCW to the original B9 Project are unable to be satisfied due to the technical and feasible limitations.

The matter of what is technically feasible to achieve is complex. The revised noise assessment therefore has focussed on predicting operational noise levels and the report concludes with recommending acceptance of the predicted noise levels as the Project Specific Noise Limits for the Revised B9 Project.

1.1 SCOPE OF THE NOISE ASSESSMENT

The noise impact assessment has followed the following scope.

- Predict operational noise levels for day, evening and night time for noise sources from the activities of the B9 Project;
- Establish the project specific noise limits;
- Recommend noise controls that would be needed to satisfy project specific noise limits;
- Outline the need for a noise management plan; and
- Compile this report.

1.2 BACKGROUND TO THE NOISE ASSESSMENT

Detailed noise studies had previously been completed by SKM as part of the EA development approval process.

The SKM study derived a set of Revised Project Specific Noise Limits. These were presented in SKM Report titled AMCOR Botany Mill Upgrade Noise Assessment Rev 1 dated 2 April 2007.

The SKM report recommended the following Revised Project Specific Noise Limits:

Day	46dB(A)
Evening	39dB(A)
Night	38dB(A)

The predicted noise levels were modelled by SKM on the basis of the noise reduction provided by B7 and B8 mill buildings being available. The management of AMCOR have indicated that this is unable to be the basis of the predicted noise levels as it is not feasible for the reconsolidation of the site to proceed on this basis and be viable.

The conditions of consent for the revised B9 Project were based on a combination of the revised INP derived Project Specific Noise Limits and the predicted noise levels. The INP has established that where predicted noise levels are less than the Project Specific Noise Limits then the predicted levels are used as the recommended limits for the consent.

A site location map presented below shows the location of the site and the surrounding residential streets (See Figure 1-1).

Figure 1-1: Site Location

These same street locations have been used in the detailed noise modelling undertaken for the revised site layout.

The noise modelling presented in Section 3 of the report uses six reference locations R1 to R6. Their relationship to the street locations is shown in the following Table 1-1.

Table 1-1: Derivation of Revised Project Specific Noise Limits – Neutral Meteorological Conditions

Location	Condition	Daytime	Evening	Night
Australia Avenue Residential Reference Locations R1 and R2.	B'G L_{A90}			43, 45
	Mill on			39-45
	Predicted SKM			
	Neutral	45-47	45	39
	Revised SKM	46	39	38
	PSL's			
	Consent	47	40	40
Murrabin Avenue Residential Reference Location R3.	B'G L_{A90}			43, 45
	Mill on			44-48
	Predicted SKM			
	Neutral	45	45	40
	Revised SKM	46	39	38
	PSL's			
	Consent	45	39	38
Partanna Avenue Residential Reference Locations R4 and R5.	B'G L_{A90}			39, 41
	Mill on			53-55
	Predicted SKM			
	Neutral	44	44	36
	Revised SKM	46	39	38
	PSL's			
	Consent	44	39	36
Moorina Avenue Residential Reference Location R6.	B'G L_{A90}			40, 43
	Mill on			36-45
	Predicted SKM			
	Neutral	31	31	30
	Revised SKM	46	39	38
	PSL's			
	Consent	35	35	35

Note: [1] R1 is at the corner of McCauley St and Australia Ave. The consent values are 46, 39 and 39 for Day, evening and night respectively.

The revised SKM PSL's were derived on the basis that the existing noise levels from industry would not be reduced in the future. The noise limits adopted in the consent are generally either the revised PSL's or the predicted noise levels, which ever is the lower.

Discussion

Recent operational noise monitoring undertaken by the Acoustic Group have found similar operational noise levels to those referred to in the SKM Noise Assessment from April 2007.

The results from the 2009 Acoustic Group monitoring are summarised below.

The L_{A90} levels are presented as the industrial noise levels are expected to have minor changes from L_{A90} and L_{Aeq} – typically expected to be <1-2 dB(A).

Table 1-2: Results of Noise Monitoring – Night time

Location	L_{A90} Noise Levels dB(A)	
Date: 21 January 2009		
Australia Avenue	44.5	AMCOR and Port
Murrabin Avenue	46.5	AMCOR, Port and traffic
Partanna Avenue	49	AMCOR
Moorina Avenue	40.5	Substation and traffic
Date: 9 April 2009		
Australia Avenue	48.5	Port
Murrabin Avenue	46.5	Port
Partanna Avenue	54	AMCOR
Moorina Avenue	43	AMCOR
Date: 7 June 2009		
Australia Avenue	47	Port
Murrabin Avenue	46	Port
Partanna Avenue	52	AMCOR
Moorina Avenue	45	Port
Date: 10 July 2009		
Australia Avenue	46	Port
Murrabin Avenue	47.5	Port
Partanna Avenue	52.5	AMCOR
Moorina Avenue	41.5	AMCOR and Port
Date: 1 September 2009		
Australia Avenue	51.5	Port
Murrabin Avenue	50	Port
Partanna Avenue	51.5	AMCOR and Port
Moorina Avenue	46.5	AMCOR and Port
Date: 15 October 2009		
Australia Avenue	46	Port
Murrabin Avenue	48.5	Port
Partanna Avenue	52.5	AMCOR and Port
Moorina Avenue	46.5	Port

The noise environment is currently being shared between the Port and AMCOR.

Inspections of the residential area have found in our opinion that the noise emissions from the existing AMCOR operations have a quality free of intrusive characteristics.

A review of complaint history over the past two years has been made.

There were four complaints, three from the same residential location, one complaint related to night time noise:

- 27 September 2007* 3.50pm Steam noise – cause fixed immediately.
- 25 October 2007* 6.00pm Hissing noise – cause located and fixed immediately.
- 31 May 2008 6.00pm Bulk tanker operating.
- 14 February 2008* 12.15am Emergency alarm sounded for 15-20 minutes.

This same philosophy in engineering, a steady state noise emission that masks fluctuating noise emissions, has been adopted for the revised B9 Project. To achieve this objective, it has been necessary to propose an extensive system of high and very high noise barriers.

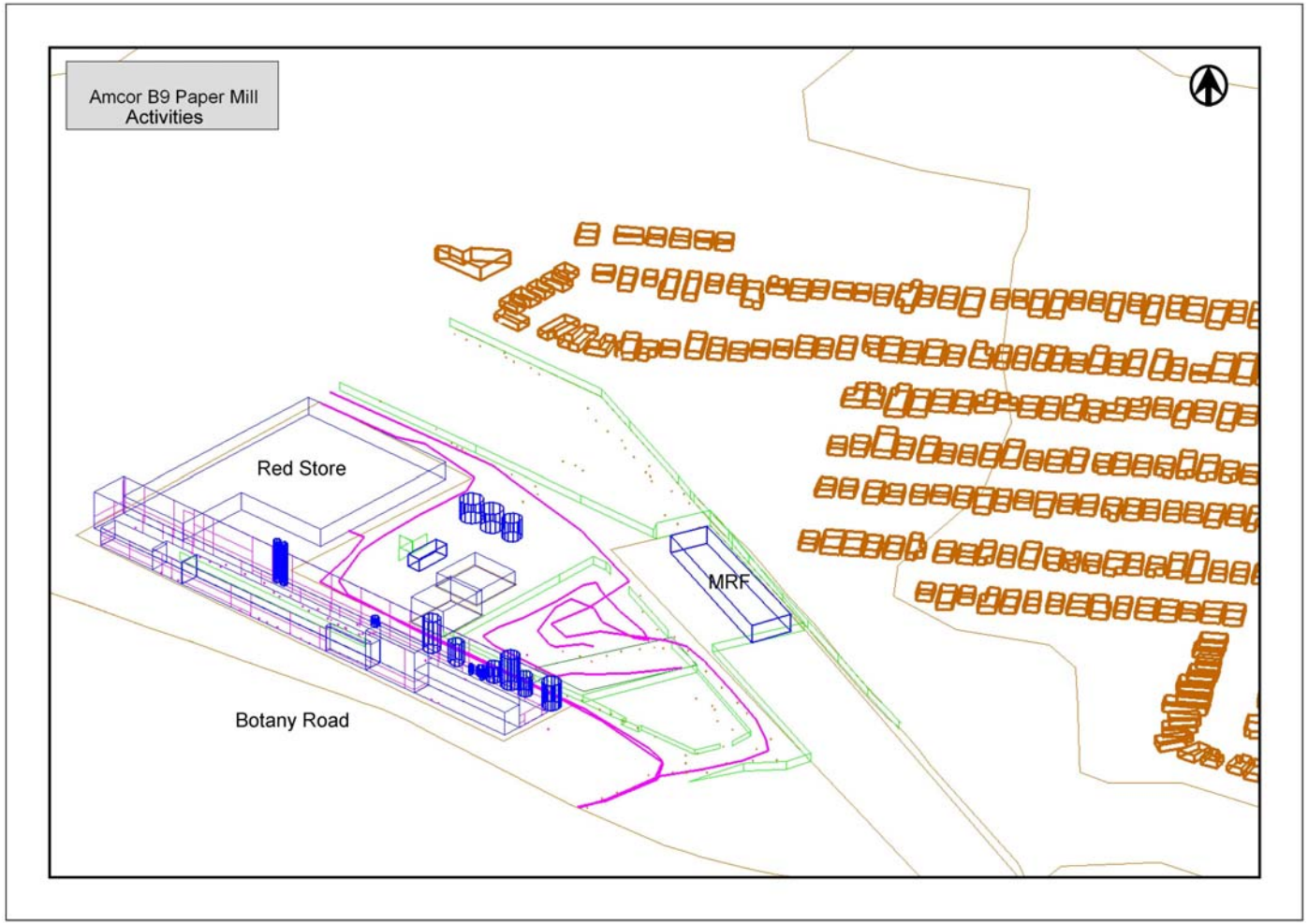
1.3 B9 PROJECT CHANGES

As the result of a recent review of the project, the proposed site layout has been significantly improved with environmental management advantages to AMCOR and the residential community.

Reference is made to a three-dimensioned view of the proposed layout, which is shown as Figure 1-2.

* - Same residential location

Figure 1-2: Three Dimensional View of the Proposed Layout



Shown in a green outline is the extent of the site that would be retained by AMCOR after the sale of excess land. To recap from previous reports, the land to the north that is now vacant of buildings and structures would be sold.

The land to the east currently occupied by the B7 and B8 paper mills would also be sold. Shown along this eastern boundary is the outline of the proposed Material Recovery Facility (MRF). The MRF would either utilise the existing No.7 Reel Store building or occupy a new building replacing the reel store. In either case, the building would have different openings (facing south and north-west). The MRF would be subject to a separate noise assessment and derivation of PSNL.

The B9 mill building is shown along the southern end of the site fronting Botany Road. This part of the site layout has been changed in two main respects.

- The stock preparation building has been relocated to the eastern end of the B9 mill building. This reduces the capital cost, and reduces the number of openings and external pipe bridges. It also relocates the rejects area. The rejects area needs clearing by the Payloader (large front end loader) at least once per night shift and there is limited opportunity for placement of effective noise barriers. As a consequence night time noise levels of 35dB(A) will be exceeded.

- The exhaust fans, blowers and vacuum pump air outlets provide a large number of noise sources external to the building. A series of decks on the southern side of the mill building are proposed which will enable the building facade to provide very effective noise reduction for the residential areas.

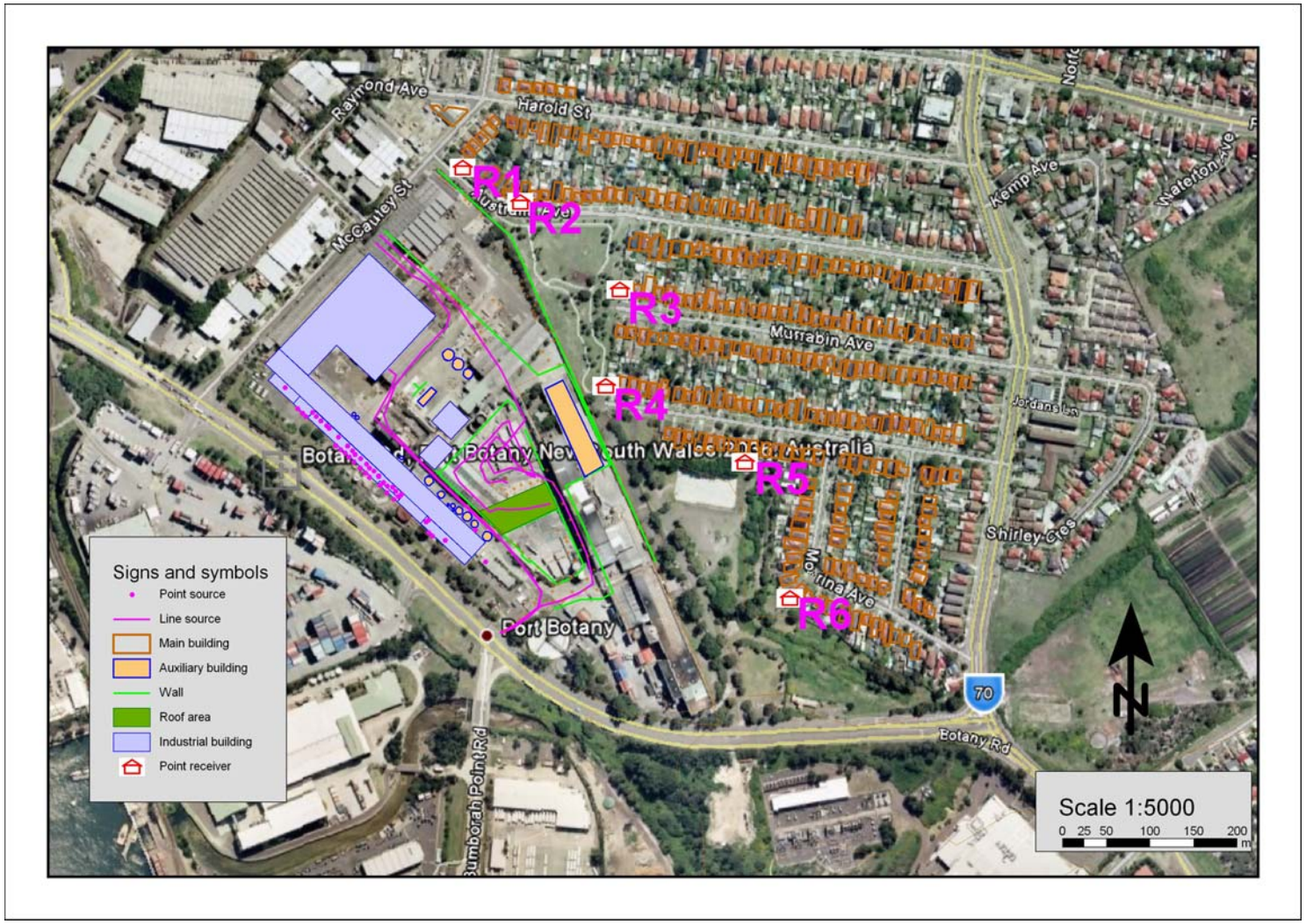
In addition, the ventilation fan outlets will be tilted by 20° to the south to provide a useful degree of noise reduction due to diffraction.

The Finished Product Store has been redesigned. This is the large area of building in the north-west portion of the site. Loading of trucks will be able to occur within the building. This is a significant environmental improvement.

Figure 1-3 shows an aerial impression of the revised site layout. Also shown on this figure are the residential reference points R1 – R6 used in the point to point noise modelling.

For the purposes of noise modelling it has been assumed that the areas proposed for subdivision have no structures, buildings or fences i.e. bare ground. While the future owners of the land will obviously erect some buildings or other structures no allowance, in terms of noise mitigation for future development, has been made.

Figure 1-3: Site Layout – Aerial View



2. OPERATIONS

This section of the report provides operational details and discusses the noise sources included in the modelling. The noise prediction model SoundPLAN (Version 6.5) was then used to determine the noise levels for the large number of noise sources that exist at a paper recycling plant.

The details of the noise modelling are presented in the Section 3 of the report. The operations of a paper recycling plant essentially involve the following unit operations:

- Waste paper yard;
- Stock preparation;
- Paper machine;
- Winder;
- Finished product store;
- Rejects handling area; and
- Associated facilities:
  Certain of these are currently existing – wastewater treatment plant and boiler house. New transformers have been included as a noise source.

The noise sources were grouped into five separate groups for the purpose of designing noise controls. These are presented in the model runs as:

- B9 building – the two floor level paper machine operations including stock preparation, the paper machine and the winder, the mezzanine which includes noise emitted from the wall and roof of the structures along the south side of the main Paper Machine building.
- Loaders – mobile equipment as it operates at the waste paper yard and at the Rejects Area. Sleep disturbance is also assessed as this mobile equipment will operate at night time.
- Trucks – the movement of trucks on site is required to be included in the assessment of the continuous noise emissions and in addition for night time the assessment of sleep disturbance.
- Fans – there are a large number of fans and a smaller number of blowers. The fans have been placed on mezzanine levels located on the southern side of the stock preparation and paper machine building described as B9 in the text of this report. The noise emission from the fans and blowers and their duct outlets. These are located above the mezzanine levels and the exhaust outlets have been pointed to the south by tilting the ends of the ducts by 20^0 off vertical to take advantage of diffraction effects.
- Transformers.

The trucks will be present at several areas. These areas are shown on Figure 2-3 and will be discussed in detail.

2.1 STEADY STATE NOISE SOURCES

The steady state noise sources are located in two areas:

Area 1

Fans and fan and blower discharge vents are positioned on the mezzanine levels on the south side of the B9 mill building.

Figure 2-1 shows the location of the fans, discharge vents and transformers and these can be seen as circles with dots on this plan – along the southern side of the paper machine building. The transformers are at ground level within the building and are exposed to the south.

Figure 2-2 then shows an elevation and plan with the fan and blower locations shown again as circles with dots. A number of fans are located on mezzanine levels. Blowers are mainly on the operating floor within the building. The process/storage tanks are the structures shown as columns in blue.

This design approach prevents the fans and blowers causing vibration of the roof structure and significantly reduces the propagation of noise from fan and blower bodies contributing significantly to the residential noise.

Noise reduction provided by diffraction is utilised by directing the stack outlets towards the south.

To achieve the noise contribution needed from the fans and blowers, certain fans and blowers will be provided with additional noise control to achieve a duct outlet noise level of 85 dB(A) at 1 metre.

The details of these controls would be developed into a Noise Management Plan to assist the Project Design Team in the construction of the B9 Project.

Fan sound power data was either obtained from the supplier or predicted using algorithms provided in Woods reference text on noise.

The algorithms in Woods use the operating conditions of the fans to be able to determine the sound power. Corrections are provided for impellor type to enable the one-one octave band data to be calculated. A typical spectrum is provided in Figure 2-4.

Area 2

The processing equipment in buildings.

The processing equipment that converts the waste board and paper into finished paper is located in the B9 building and Figure 2-1 shows the process areas described as:

- Stock preparation; and
- Paper machine.

The stock preparation receives the waste cardboard and paper from a floor mounted conveyor that starts in the covered area of the waste yard and raises these materials to feed these into a large cylindrical tank that breaks these materials down using hot water and mechanical agitation (a pulper).

This process continues using various screening and cleaning steps again using hot water and mechanical processes to convert the board and paper into high quality pulp – the fibre that is placed onto the forming section at the start of the paper machine to commence the conversion of the fibre into paper.

Stock preparation equipment noise levels were sourced from the equipment suppliers.

The stock preparation equipment will be located within a building that uses concrete precast panels at ground for a height that will typically be 2m-2.2m. Above this and to the underside of the roof the building will be clad in a double metal cladding system.

This will consist of steel formed sections with 0.47mm base metal thickness on the inside of the walls and 0.7mm base metal thickness on the outside. An air gap provided by the structure of the wall will aid noise reduction. Acoustic infill is not required. Internal treatment of reverberation is also not required.

The paper machine will extend over two levels:

- The basement; and
- The machine floor level.

From previous experiences in this industry, the basement will be where the highest noise levels are located. This is supported by data provided by the paper machine suppliers.

One third octave band spectra were used. The noise emission data is a text file from SoundPLAN and is presented in Attachment 1. Any further clarification required can be provided.

The basement will have walls constructed from precast concrete to a height of 2m – 2.2m and then the double steel cladding system adopted for the stock preparation area. This wall construction will be provided along the east and north facing walls. Elsewhere, the construction materials will be concrete for the first 2m-2.2m and then single steel cladding.

The vacuum blowers are located on the operating floor level in a separate room with concrete masonry walls.

The roof of the basement level is the concrete floor of the machine floor level. The basement is therefore highly reverberant and this increases the overall noise levels.

This has been allowed for in the measured levels being from similar noise environments.

The noise from the paper machine is directed through from the floor above adding to the noise levels in the basement – and included in the sound power levels that are used in the model.

As noted above, the machine floor level will have a reinforced concrete floor. The paper machine has an environmental enclosure to maintain the humidity and temperature conditions to facilitate the speed of the machine in being able to make paper at a high speed. The machine floor noise levels are reduced as a result.

The ventilation system of the stock preparation and the paper making processes, require large volumes of air to be circulated and exhausted. Heat is recovered from the air removed from the paper machine enclosure.

Steam for the paper machine will be supplied by the existing boiler house. This has been included in the modelled noise levels.

The western end of the paper machine building houses the winder. The winder splits the large paper rolls produced by the paper machine into several smaller reels of paper (i.e. Finished Product). These reels are then transferred through an opening into the Finished Product store (also called a reel store). Large forklifts with reel grabs are used to transport the finished product by placing it into storage stacks and subsequent loading onto trucks for delivery to customers.

Figure 2-1: Site Plan

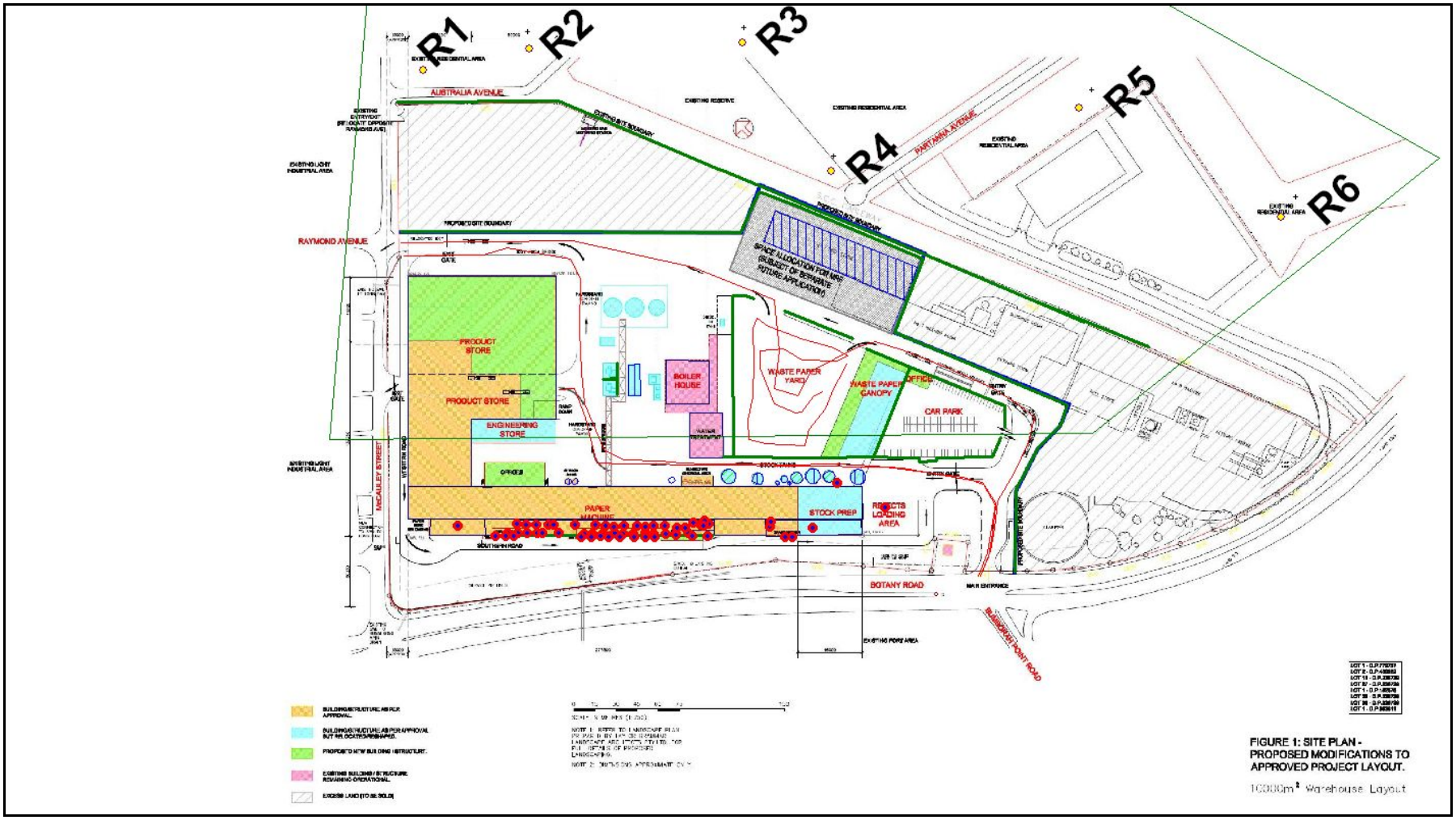
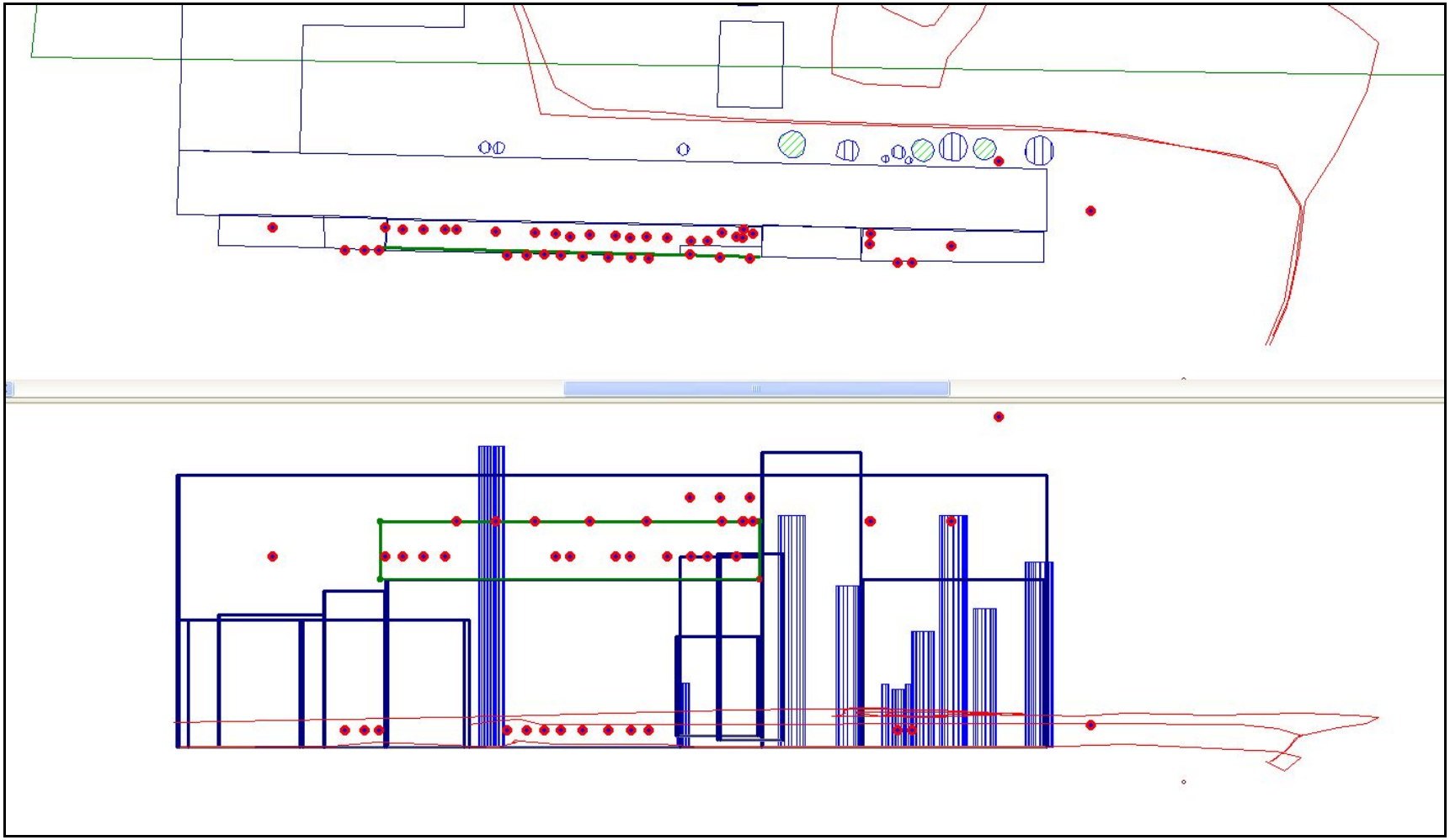


Figure 2-2: Elevations and Fans



2.2 INTERMITTENT AND IMPULSIVE NOISE SOURCES

There are two groups of noise sources in this group.

These are trucks and mobile equipment. Trucks are discussed first; refer to Figure 2-3.

2.2.1 Trucks

There are three types of truck movements and these will use different routes on site.

- Trucks delivering waste cardboard and paper to the waste yard;
- General deliveries for chemicals and the engineering stores/workshop; and
- Finished product semi trailers and B-doubles.

2.2.1.1 Waste Trucks

The waste trucks will operate 24/7 with a reduced number of trucks during night time. Night time access is critical. These activities occur at night time due to traffic congestion at other times. The waste trucks will either bring the cardboard and paper in bales or compacted. Some trucks with compacted loads need to reverse and brake to dislodge their loads. These truck movements would also be associated with a future MRF at the existing finished product (reel) store of B7.

All trucks regardless of type will enter the site through one entry only – off Botany Road.

The waste trucks travel around the outside of the car park where on Figure 2-3 an internal roadway is shown. Shown in a heavy blue line is the boundary perimeter of the site and along this line a 5m high noise barrier will be needed, constructed of 'Colorbond' steel cladding or similar, typical thickness is 0.47mm base metal thickness.

The waste trucks continue along this roadway at a forced minimum speed. The roadway needs to be free of sharp speed bumps. Any speed control devices need to have gradual slopes to prevent impacts occurring. Surveillance cameras with one focussed on licence plates are needed so that 'drive neighbourly' habits can be forced onto the truck drivers. These details would be provided in a Noise Management Plan for the site prior to operations commencing.

These trucks enter the waste paper yard through openings in a wall on the north east side of the waste paper yard. The trucks empty their load, board and paper absorbs impacts so this part of the activity of the waste paper yard is relatively free of impacts.

The arrows on Figure 2-3 show how these trucks then travel around the inside of the northern perimeter acoustic wall – 5m in height.

These trucks exit the site at the north-west corner into McCauley Street.

2.2.1.2 General Deliveries Trucks

Trucks with general deliveries travel along the south side of the car park and along the immediate northern side of the paper machine building. Chemical deliveries are made at tanks shown or for the engineering store, an unloading area is provided in the area between the store and the offices – in this general area. These deliveries are usually day time only.

These trucks then exit the site by travelling to the north along the eastern side of the product store and exit at the north west corner into McCauley Street.

2.2.1.3 Trucks Delivering Finished Products

Trucks to deliver finished product travel along the same internal route but would go past the engineering store and enter into a wide opening that enables the trucks to park within the product store. Figure 2-3 shows two trucks within the product store where these would be loaded by the grab forklifts.

This provides an under cover loading bay that would be able to load out finished products 24/7.

2.2.2 Mobile Equipment

Mobile equipment operates in three areas:

- The waste paper yard;
- The waste paper canopy; and
- Rejects loading area at the eastern end of the stock preparation part of the paper machine building.

The mobile equipment operates in the waste paper yard during day time and evening with limited movements at night time.

The waste paper canopy is a roofed area with acoustically designed walls extending to the roof along the north east and east side, as this area is continuously operated to feed material into the stock preparation building. There is a technical limit on the noise reduction achievable because the north-west wall is open to allow paper to be placed inside the canopy.

These restrictions on the building cause limitations to the noise levels that can be achieved.

It will be shown in the next section of the report that the mobile equipment at location R5 and R6 when combined with the other B9 Project noise level is unable to be reduced below 39dB(A).

Calculations during the development of the noise control scenarios showed that the mobile equipment alone at R6 would generate 36dB(A), whereas the current consent for the project limits the allowable noise to 35dB(A). This would essentially cause the project to be abandoned as the plant would not be able to operate. Hence, the need to maintain a balance between using the existing operational noise levels and predicted noise levels with departure from INP Acceptable Noise Levels as the new conditions of consent.

The rejects area is an open area where material that is unable to be converted into paper is discharged from the stock preparation equipment into bunkers.

The bunkers fill with reject material and need to be cleared at night to enable the processes to continue.

Due to the rejects area being open to allow semi trailers to enter during day time (to remove the material off site), noise barriers are unable to be located in this area.

The Payloader that is used is a state of the art machine and has available noise controls installed, however there are further technical limitations on this machine being able to emit less noise because of its diesel engine.

Figure 2-3: Trucks and Mobile Equipment

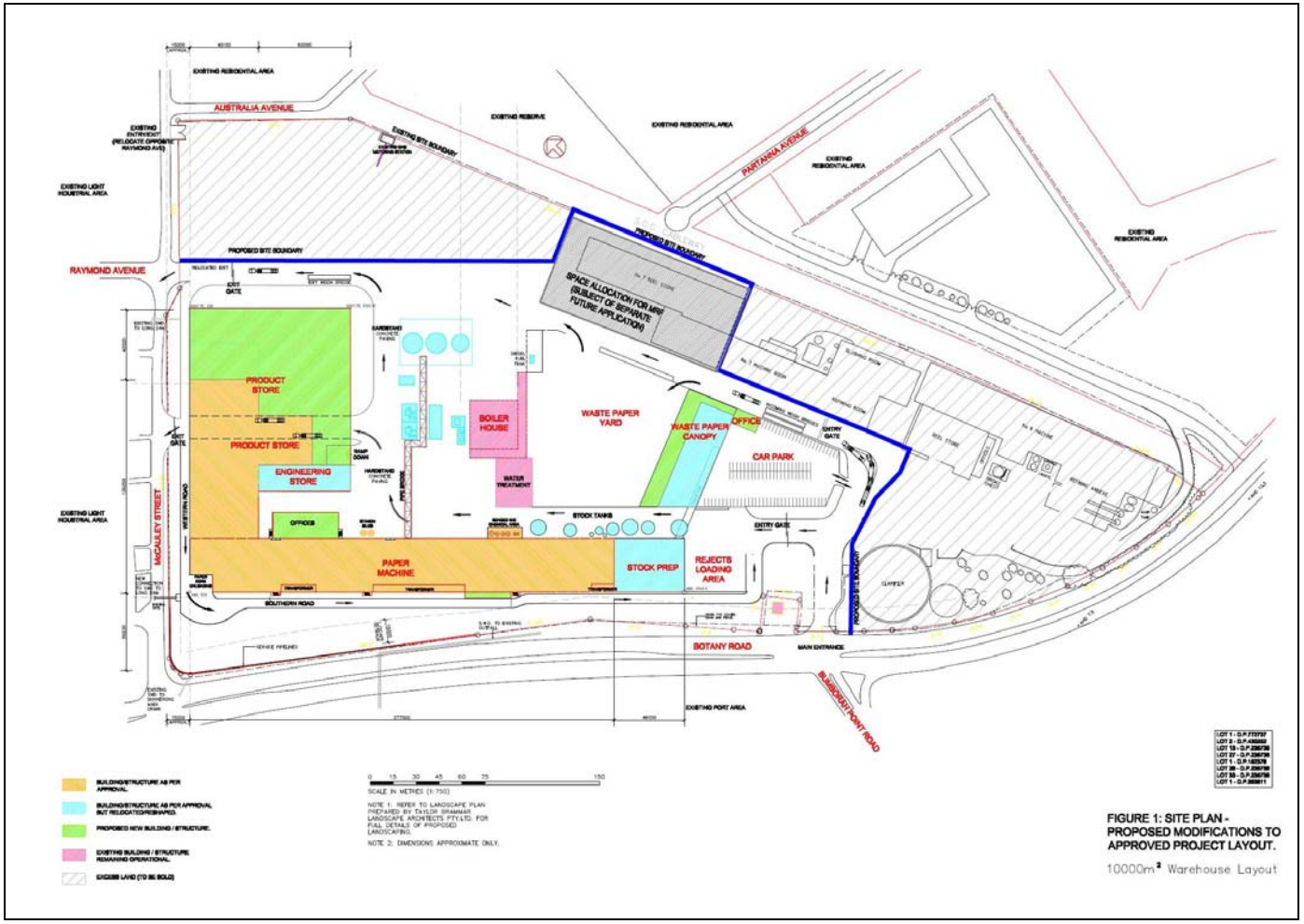
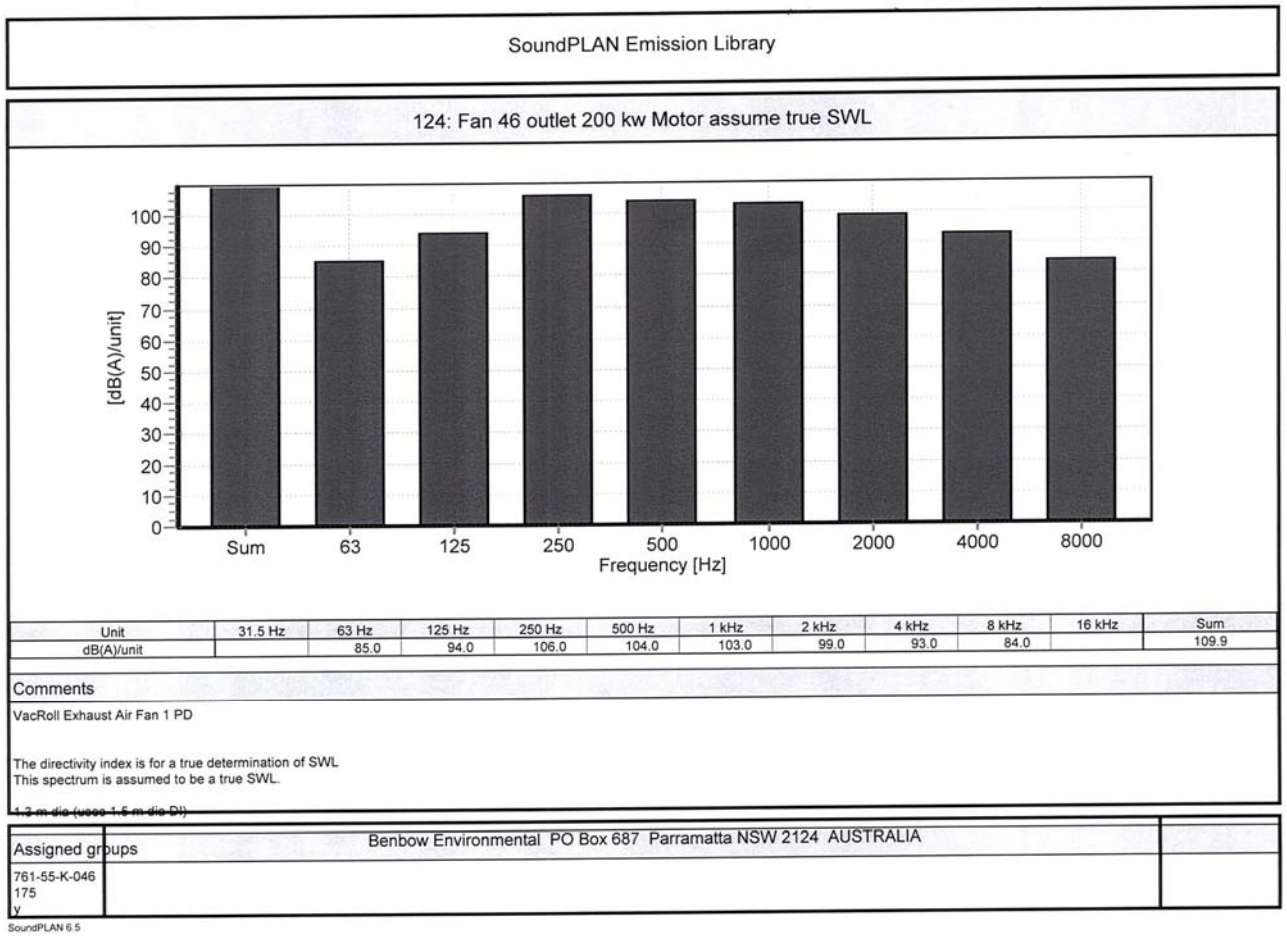


Figure 2-4: Typical Sound Power Spectrum for a Fan



3. RESULTS OF NOISE MODELLING

SoundPLAN was used to predict noise levels from the revised B9 Project.

Numerous model runs were conducted to select the set of noise controls that have been recommended.

The main limitations in being able to meet the consent conditions for the original B9 Project are truck and mobile equipment movements.

The noise modelling chose 6 reference locations, R1 to R6. These are shown on Figure 2-1, Figure 3-1 and Figure 3-2.

Figure 3-1 shows the noise contours with controls in place and with consideration of the residential dwellings included to show the effect of the noise shielding provided by the first row of dwellings. This shows that the number of residences that will be exposed to the revised noise levels is very limited. Figure 3-2 shows the same contours with a broader resolution of 5dB(A) to better show the range of noise levels.

An analysis of weather data from the Bureau of Meteorology was undertaken following INP Guidelines. A wind rose for a year's data is provided in Attachment 4.

The analysis found there to be no inversion conditions present for 30% of the time and this was expected given the location of the site near the coast.

The analysis found there were no predominant wind directions that required adverse meteorological conditions to be considered.

Regardless of these facts, control of low frequency noise sources to prevent uncontrolled emissions of low frequencies was a major aspect included in the design of the revised B9 Project.

Every attempt has been made to achieve compliance with the original project specific noise limits. The limiting factors causing these limits to be unachievable are trucks and mobile equipment.

Both trucks and mobile equipment movements at night time are essential for a paper recycling mill. All mills require these activities 24/7.

Shown in Table 3-1 are the modelling results for the mobile equipment at the six reference locations for night time. L_{Amax} results satisfy the sleep disturbance criteria with the acoustic walls in place.

Table 3-1: Mobile Equipment and Truck Night Time Noise Levels				
Residential Reference Locations consent noise levels at night time	Paper Yard Loader 7m high noise barriers dB(A)	Trucks 5 m high noise barriers dB(A)	Combined Noise, Noise Barriers 5m and 7m high dB(A)	Satisfies original consent conditions Y- Yes N- No
R1 39dB(A)	36.5	41.5	43	N
R2 40dB(A)	38	41	43	N
R3 38dB(A)	40.5	39	43	N
R4 36dB(A)	35.5	38.5	40	N
R5 36dB(A)	32	27	33	Y
R6 35dB(A)	35	27.5	36	N

The noise levels were then predicted for several scenarios and two scenarios are provided in Attachments 2 and 3 to illustrate the technical limitations on the predicted levels of noise that are realistic.

Attachment 2 All plant, no walls
Attachment 3 All plant, certain fans with silencers, acoustic walls in place, no existing walls remaining in place

The results from Attachment 3 – all plant, certain fans with silencers, acoustic walls in place, no existing walls remaining in place – are discussed below. L_{Amax} noise levels at night are satisfied with the acoustic walls in place. The modelling is for neutral meteorological conditions.

Table 3-2: Night time Combined B9 Project Predicted Noise Levels			
Residential Reference Locations consent noise levels at night time	Night time Predicted Noise Level dB(A)	Satisfies original consent conditions Y- Yes N- No	Exceedances dB(A)
R1 39dB(A)	45	N	6
R2 40dB(A)	44.5	N	4.5
R3 38dB(A)	45	N	7
R4 36dB(A)	41	N	5
R5 36dB(A)	39	N	3
R6 35dB(A)	39	N	4

Comment

The exceedances of the original consent conditions are apparent. Further options for noise reduction are limited. There were no other technically feasible means available to reduce these exceedances. The predicted noise levels are less than the existing range of noise levels contributed by the site and therefore a reasonable noise environment would be maintained.

Day and evening combined noise levels are shown in the following tables.

Table 3-3: Daytime Combined B9 Project Predicted Noise Levels

Residential Reference Locations Consent Noise Levels at Daytime	Combined Noise Level	Satisfies Original Consent Conditions	Exceedances dB(A)
R1 46dB(A)	46	Y	Nil
R2 47dB(A)	45	Y	Nil
R3 45dB(A)	45.5	N	0.5
R4 44dB(A)	42	Y	Nil
R5 44dB(A)	42	Y	Nil
R6 35dB(A)	43	N	8

Comments

There is only the one exceedance of the original consent and this is a result of the previously predicted noise levels at R6 being adopted as the noise limit. The basis of the predicted noise levels has altered with the revised B9 Project.

For evening time the results are summarised below.

Table 3-4: Evening time Combined B9 Project Predicted Noise Levels			
Residential Reference Locations Consent Noise Levels at Evening Time	Combined Noise Level	Satisfies Original Consent Conditions	Exceedances dB(A)
R1 39dB(A)	45	N	6
R2 40dB(A)	45	N	5
R3 39dB(A)	45	N	6
R4 39dB(A)	41	N	2
R5 39dB(A)	42	N	3
R6 35dB(A)	42.5	N	7.5

Comments

The exceedances of the original consent conditions are apparent. The predicted noise levels are within the range of the existing noise contributions from the site.

The recommended Project Specific Noise Limits are the following:

Table 3-5: Recommended Project Specific Noise Limits			
Residential Location	Day Time dB(A)	Evening dB(A)	Night Time dB(A)
R1	46	45	45
R2	45	45	44.5
R3	45.5	45	45
R4	42	41	41
R5	42	42	39
R6	43	42.5	39

Figure 3-1: Noise Contours

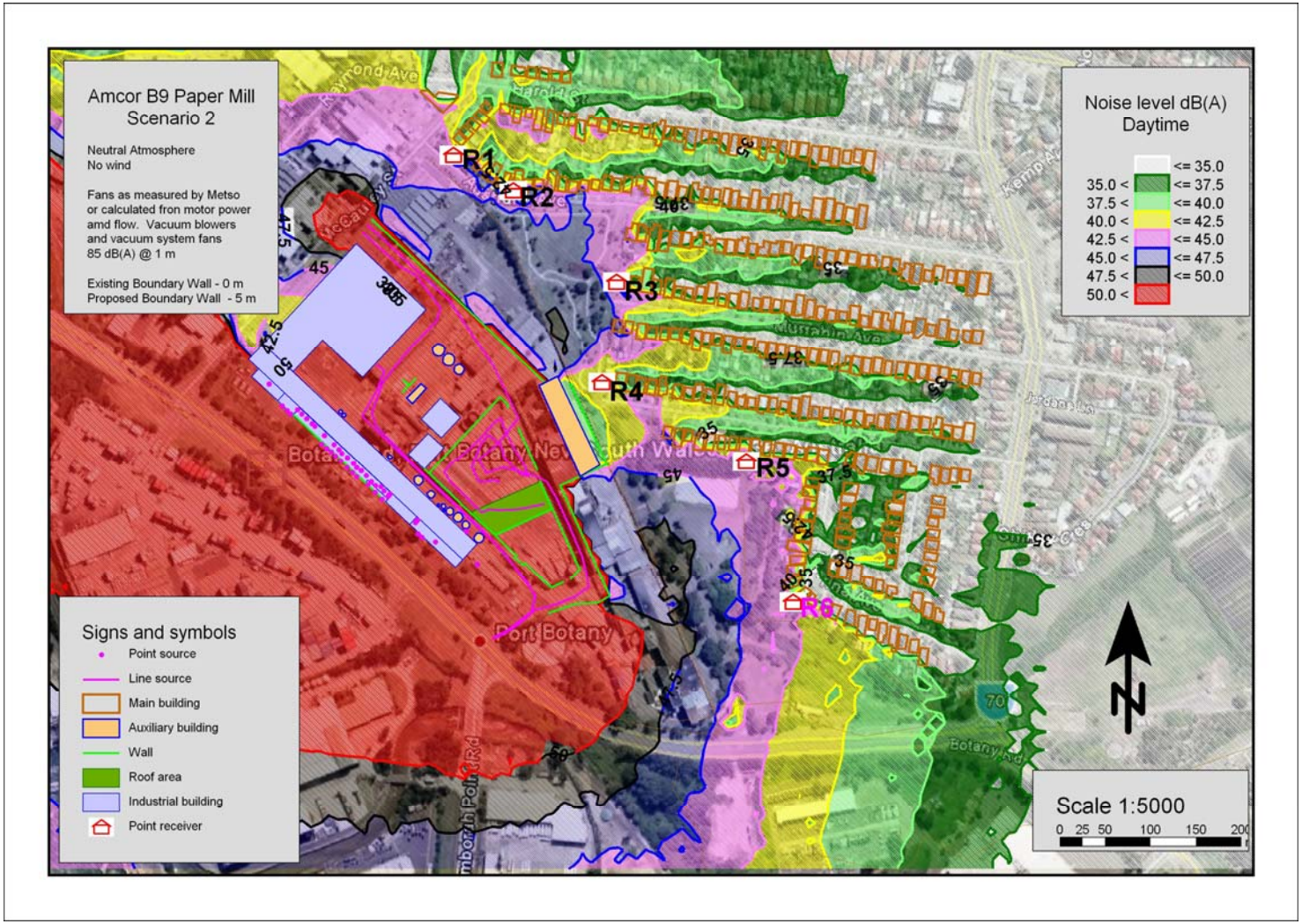
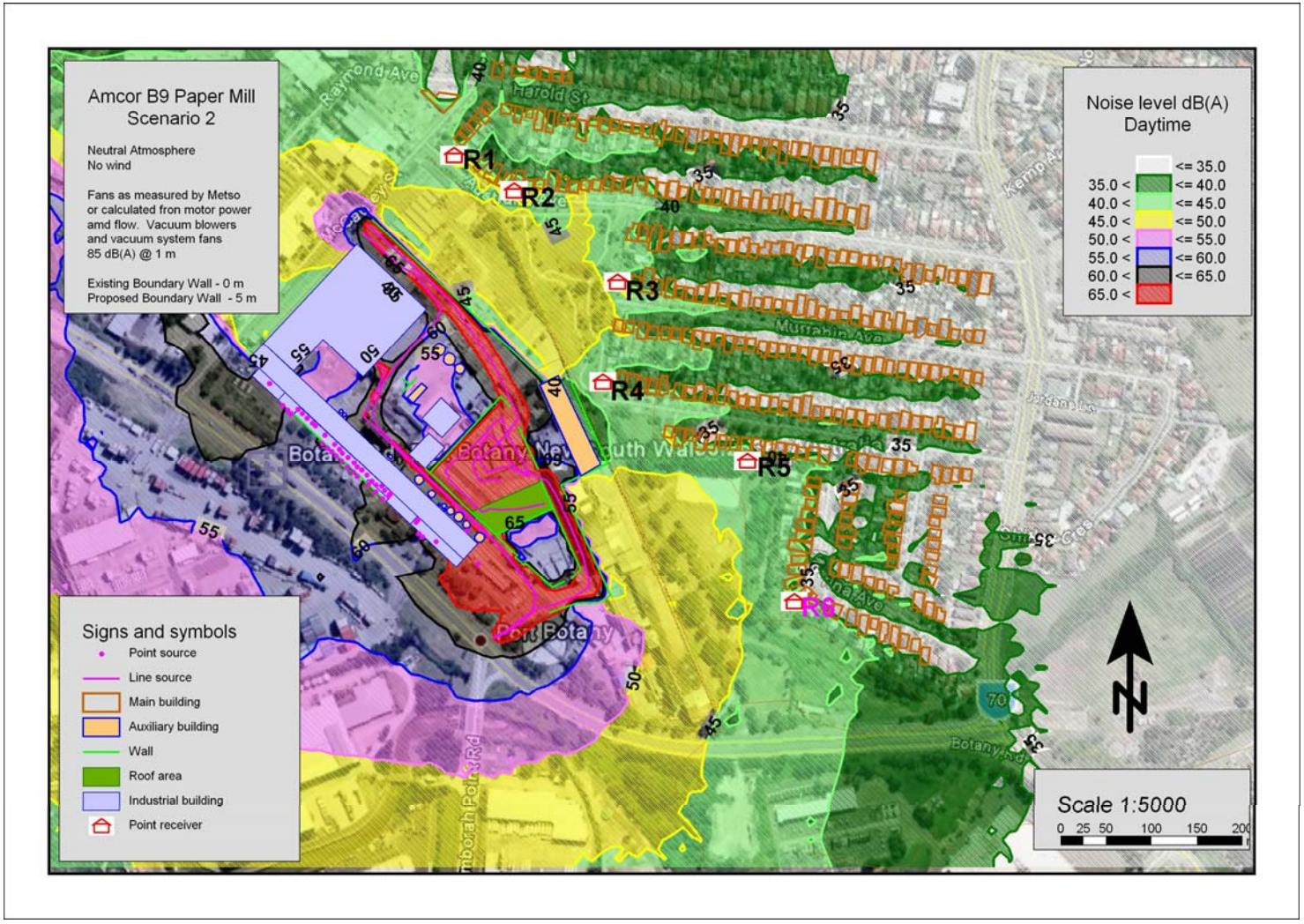


Figure 3-2: Low Resolution Noise Contours



4. NOISE MANAGEMENT PLAN

A noise management plan is proposed that would provide the guidance during construction and operation to ensure the Project Specific Noise Limits are achieved – on the assumption that the limits requested are approved. There is also a clear need to consider the long term protection of the residential amenity as the site divestment takes place.

Interim Construction Noise Guidelines have recently been released by DECCW. The document is dated July 2009. The Guidelines recommend the following hours of operation as standard hours of construction:

Monday – Friday	7.00am – 6.00pm
Saturday	8.00am – 1.00pm
Sundays or public holidays	No work

The noise level at residential areas is to satisfy a noise limit derived from the Rating Background Level (i.e. L_{A90}) +10dB(A). For hours of construction outside of the recommended hours the noise limit is to meet the Rating Background Level +5dB(A).

A construction noise management plan needs to include the following as a minimum:

- Identify nearby residences and sensitive land uses that may be affected;
- Approved hours of construction - work to be undertaken during those hours throughout the various stages of the development. The fitting out of buildings that can readily achieve compliance with the rating background level +5dB(A) would mean that evening and night time work would be permitted;
- Work practices to be applied to minimise noise;
- Community notification, and this is especially important where loud noise generating activities may be needed for short periods of time e.g. pile driving, rock breaking; and
- Community response procedure.

The noise management plan becomes a daily management tool to ensure the critical aspects of work practices that may affect noise emissions are being adhered to.

The noise management plan would contain procedures either adopted from existing procedures or be redeveloped so that noise nuisances can be avoided.

An operational noise management plan provides the following details:

- Predict construction noise once the schedule of construction is known;
- Noise reduction measures detailed to ensure the reduction needed will be achieved. This detail will finalise the materials of construction, the method of construction and the necessary inspections required by the project team;
- Noise monitoring during commissioning and operations. Noise monitoring would be undertaken at each source to compare these to the levels used in the modelling; and
- Update the noise complaints procedure and other work practice procedures that would be identified.

5. CONCLUDING REMARKS

The revisions to the B9 Project have identified that a reasonable noise environment can be shared with the residential community providing an environment similar to the existing environment but with further improvements.

The revisions to the B9 Project have identified the need for an extensive set of noise controls which would protect the amenity of the residential area.

Importantly with the removal of the B7 and B8 buildings, certain residential areas will become more exposed to truck and traffic noise along Botany Road. The erection of high noise barriers around the perimeter of the revised AMCOR site will ameliorate this potential increase.

The noise impact assessment has questioned the relevance of the original consent conditions as the basis of these is no longer achievable.

The noise environment that is proposed will provide an ongoing reasonable noise environment similar to the existing environment.

R T Benbow
Principal Consultant

Peter Eisenhuth
Senior Technical Officer

Anita Joh
Acoustical Engineer

Brandon Burrell
Acoustical Engineer

6. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use by AMCOR PAPER PTY LTD, as per our agreement for providing environmental assessment services. Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

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Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

ATTACHMENTS

SPLs

No.	Element name	Unit	31.5	63	125	250	500	1	2	4	8	16	Sum
		Hz	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	kHz		
124	Fan 46 outlet 200 kw Motor assume true SWL	dB(A)/unit											
85.0	94.0	106.0	104.0	103.0	99.0	93.0	84.0	109.9					
125	Fan 46 casing 200 kw Motor	dB(A)/unit					72.0	84.0					
98.0	97.0	98.0	95.0	89.0	81.0	103.4							
126	Fan 34 casing 75 kw motor	dB(A)/unit					68.0	79.0					
93.0	92.0	92.0	89.0	84.0	75.0	98.0							
127	Fan 32 casing 160 kW motor	dB(A)/unit					73.0	86.0					
94.0	104.0	101.0	99.0	94.0	86.0	107.1							
128	Axial-flow fan	dB(A)/unit			37.8	55.4	64.4	63.8					
62.0	63.2	60.5	56.9		70.3								
129	Fan 38 casing 132 kW motor	dB(A)/unit					73.0	85.0					
93.0	101.0	100.0	97.0	92.0	84.0	105.0							
130	Fan 68 outlet 132 hW motor assume true SWL	dB(A)/unit											
78.0	91.0	96.0	102.0	105.0	102.0	99.0	91.0	108.9					
131	Fan 24 casing 22 kW motor	dB(A)/unit					64.0	76.0					
84.0	92.0	91.0	89.0	84.0	76.0	96.3							
132	Transformer < 4 MW (GUESSED)	dB(A)/unit				12.2	31.4	43.5					
46.0	51.4	48.6	44.8	39.6	30.5	55.0							
133	Blower Room Internal	dB(A)/meter			78.0	86.0	100.0	100.0					
101.0	106.0	106.0	99.0	95.0	110.9								
134	PV14/PSP01 Pulper Exhaust Fan	dB(A)/unit				65.6	76.8	82.9					
83.4	83.8	86.0	84.2	81.0	73.9	91.8							
135	Fan 44 Casing 110 kW motor	dB(A)/unit					69.0	81.0					
88.0	103.0	94.0	91.0	86.0	78.0	104.0							
90	B9 Paper Roll Storage Ground North	dB(A)/level				1.4	49.3						
63.2	73.2	75.2	79.5	80.5	82.4	71.9	53.9	90.7					
90			1.4	56.4	68.2	75.7	76.7	78.7	79.5				
75.8	65.6												
90			1.4	62.4	67.8	74.5	81.5	81.1	80.0				
73.8	64.1												
91	B9 Reeler Ground North	dB(A)/level			0.2	48.1	62.0	72.0					
74.0	78.3	79.3	81.2	70.7	52.7	89.5							
91			0.2	55.2	67.0	74.5	75.5	77.5	78.3				
74.6	64.4												
91			0.2	61.2	66.6	73.3	80.3	79.9	78.8				
72.6	62.9												
92	B9 Size Press Ground North	dB(A)/level				8.8	56.1	68.4					
70.4	74.7	82.9	82.3	81.8	71.9	57.3	92.5						
92			8.8	61.7	72.0	75.9	80.3	81.5	80.8				
80.2	67.3												
92			56.1	69.0	71.7	76.9	81.5	83.6	81.6				
77.2	69.5												
93	B9 Pre Dryer End Ground North	dB(A)/level				9.3	56.6	68.9					
70.9	75.2	83.4	82.8	82.3	72.4	57.8	93.0						
93			9.3	62.2	72.5	76.4	80.8	82.0	81.3				
80.7	67.8												
93			56.6	69.5	72.2	77.4	82.0	84.1	82.1				
77.7	70.0												
94	B9 Pre Dryer Mid Ground North	dB(A)/level				9.6	56.9	69.2					
71.2	75.5	83.7	83.1	82.6	72.7	58.1	93.3						
94			9.6	62.5	72.8	76.7	81.1	82.3	81.6				
81.0	68.1												
94			56.9	69.8	72.5	77.7	82.3	84.4	82.4				
78.0	70.3												
95	B9 Press Ground North	dB(A)/level				11.2	60.4	69.1	73.6				
77.3	81.9	83.6	84.4	73.8	59.2	94.0							
95			11.2	64.2	71.7	81.4	81.8	83.1	82.5				
82.1	69.3												
95			58.7	69.0	73.3	77.3	81.3	85.7	83.3				
79.1	72.9												
96	B9 Paper Roll Storage Level 1 North	dB(A)/level				9.1	64.0						
73.1	78.5	81.7	82.3	82.4	80.5	76.9	65.7	93.7					
96			54.6	69.3	75.4	77.7	82.7	84.4	82.2				
79.9	73.2												

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96                          69.3    67.6    78.5    78.2    82.2    83.3    81.5
78.4    69.5
97      B9 Reeler Level 1 North dB(A)/level     7.1     62.0    71.1    76.5
79.7    80.3    80.4    78.5    74.9    63.7    91.7
97                          52.6    67.3    73.4    75.7    80.7    82.4    80.2
77.9    71.2
97                          67.3    65.6    76.5    76.2    80.2    81.3    79.5
76.4    67.5
98      B9 Size Press Level 1 North     dB(A)/level     -12.0   43.3    48.4
56.0    64.5    68.9    79.9    83.2    78.4    64.3    90.1
98                          34.3    42.3    52.5    65.8    67.3    69.0    78.6
82.8    73.8
98                          40.8    43.5    55.8    63.0    65.1    70.8    82.6
80.8    68.8
99      B9 Pre Dryer End Level 1 North  dB(A)/level     -12.0   43.3    48.4
56.0    64.5    68.9    79.9    83.2    78.4    64.3    90.1
99                          34.3    42.3    52.5    65.8    67.3    69.0    78.6
82.8    73.8
99                          40.8    43.5    55.8    63.0    65.1    70.8    82.6
80.8    68.8
100     B9 Pre Dryer Mid Level 1 North  dB(A)/level     -11.1   44.2    49.3
56.9    65.4    69.8    80.8    84.1    79.3    65.2    91.0
100                         35.2    43.2    53.4    66.7    68.2    69.9    79.5
83.7    74.7
100                         41.7    44.4    56.7    63.9    66.0    71.7    83.5
81.7    69.7
101     B9 Pre Dryer Start Level 1 North        dB(A)/level     -8.5    46.8
51.9    59.5    68.0    72.4    83.4    86.7    81.9    67.8    93.6
101                         37.8    45.8    56.0    69.3    70.8    72.5    82.1
86.3    77.3
101                         44.3    47.0    59.3    66.5    68.6    74.3    86.1
84.3    72.3
136     Fan 42 Casing 75 kW motor       dB(A)/unit              69.0    82.0
90.0    98.0    97.0    94.0    90.0    81.0            102.1
137     Fan 64 Casing 90 kW motor       dB(A)/unit              68.0    80.0
87.0    102.0   93.0    90.0    85.0    77.0            103.0
138     Fan 74 Outlet 75 kW motor assume true SWL       dB(A)/unit
85.0    94.0    100.0   113.0   103.0   99.0    93.0    85.0            113.8
139     Fan 74 casing 75 hW motor       dB(A)/unit              74.0    84.0
96.0    98.0    101.0   99.0    95.0    87.0            105.4
140     Exhaust Fan BV01-05     dB(A)/unit      72.1    83.3    89.4    89.9
90.3    92.5    90.7    87.5    80.4            98.3
141     Fan 52 Outlet 200 kW motor assume true SWL      dB(A)/unit
85.0    94.0    106.0   104.0   103.0   99.0    93.0    84.0            109.9
142     Fan 52 casing 200 kW motor      dB(A)/unit              72.0    84.0
98.0    97.0    98.0    95.0    89.0    81.0            103.4
143     Vacuum Blower Exhaust   dB(A)/unit      66.1    73.4    80.7    82.2
86.8    79.1    87.6    73.5    55.2            91.7
144     Fan 007 PV01/PM09 Optiformer 1  dB(A)/unit      79.5    90.7    96.8
97.3    97.7    99.9    98.1    94.9    87.8            105.7
145     Exhaust Fan Optiformer Fans 7,11        dB(A)/unit      79.5    90.7
96.8    97.3    97.7    99.9    98.1    94.9    87.8            105.7
146     Exhaust Fan Mist Collector Fan 15       dB(A)/unit      82.5    93.7
99.8    100.3   100.7   102.9   101.1   97.9    90.8            108.7
147     Vacuum System Fan No 1  dB/unit 111.7   111.8   114.8   114.8   120.1
122.2   135.4   127.2   116.9           136.4
102     B9 Former Level 1 North dB(A)/level     2.5     57.8    68.6    77.6
81.6    84.2    83.4    82.0    83.2    74.4    95.0
102                         2.5     55.5    76.2    77.5    82.4    83.2    81.0
84.6    82.2
102                         53.1    61.9    72.5    79.0    83.5    82.4    83.0
84.4    78.7
103     B9 Paper Roll Storage Ground South      dB(A)/level     1.4     49.3
63.2    73.2    75.2    79.5    80.5    82.4    71.9    53.9    90.7
103                         1.4     56.4    68.2    75.7    76.7    78.7    79.5
75.8    65.6
103                         1.4     62.4    67.8    74.5    81.5    81.1    80.0
73.8    64.1
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104     B9 Paper Roll Storage Level 1 South     dB(A)/level     9.3     64.2
73.3    78.7    81.9    82.5    82.6    80.7    77.1    65.9    94.0
104                     54.8    69.5    75.6    77.9    82.9    84.6    82.4
80.1    73.4
104                     69.5    67.8    78.7    78.4    82.4    83.5    81.7
78.6    69.7
105     B9 Size Press Ground South      dB(A)/level     8.6     55.9    68.2
70.2    74.5    82.7    82.1    81.6    71.7    57.1    92.2
105                     8.6     61.5    71.8    75.7    80.1    81.3    80.6
80.0    67.1
105                     55.9    68.8    71.5    76.7    81.3    83.4    81.4
77.0    69.3
106     B9 Reeler Ground South  dB(A)/level     0.2     48.1    62.0    72.0
74.0    78.3    79.3    81.2    70.7    52.7    89.5
106                     0.2     55.2    67.0    74.5    75.5    77.5    78.3
74.6    64.4
106                     0.2     61.2    66.6    73.3    80.3    79.9    78.8
72.6    62.9
107     B9 Pre Dryer End Ground South   dB(A)/level     9.2     56.5    68.8
70.8    75.1    83.3    82.7    82.2    72.3    57.7    92.9
107                     9.2     62.1    72.4    76.3    80.7    81.9    81.2
80.6    67.7
107                     56.5    69.4    72.1    77.3    81.9    84.0    82.0
77.6    69.9
108     B9 Pre Dryer Mid Ground South   dB(A)/level     9.6     56.9    69.2
71.2    75.5    83.7    83.1    82.6    72.7    58.1    93.3
108                     9.6     62.5    72.8    76.7    81.1    82.3    81.6
81.0    68.1
108                     56.9    69.8    72.5    77.7    82.3    84.4    82.4
78.0    70.3
109     B9 Pre Dryer Start Ground South dB(A)/level     9.6     56.9    69.2
71.2    75.5    83.7    83.1    82.6    72.7    58.1    93.3
109                     9.6     62.5    72.8    76.7    81.1    82.3    81.6
81.0    68.1
109                     56.9    69.8    72.5    77.7    82.3    84.4    82.4
78.0    70.3
110     B9 Former Ground South  dB(A)/level     10.2    59.4    68.1    72.6
76.3    80.9    82.6    83.4    72.8    58.2    93.0
110                     10.2    63.2    70.7    80.4    80.8    82.1    81.5
81.1    68.3
110                     57.7    68.0    72.3    76.3    80.3    84.7    82.3
78.1    71.9
122     Fan 68 casing 132 kW motor      dB(A)/unit              72.0    85.0
90.0    96.0    99.0    95.0    93.0    85.0            102.7
123     Fan 60 casing 160 kW motor      dB(A)/unit              73.0    85.0
93.0    101.0   100.0   97.0    92.0    84.0            105.0
49      No noise        dB(A)/level     -19.0   -19.0   -19.0   -19.0   -19.0
-19.0   -19.0   -19.0   -19.0   -19.0   -9.0
121     Truck Manouvering (from 15130 Ingal)    dB(A)/unit      39.2    69.8
77.5    82.1    87.2    90.1    94.4    89.8    82.7    -4.3    102.5
121                     50.4    67.2    74.9    85.9    86.8    92.9    93.1
86.7    80.4    -6.6
121                     64.8    76.4    77.7    86.6    89.9    95.0    91.7
84.8    77.0    -9.3
68      B9 Stock Prep Ground    dB(A)/level     2.0     61.3    64.4    74.9
78.7    80.4    81.6    81.3    72.3    60.2    92.0
68                      2.0     53.8    71.1    79.6    80.1    80.1    80.0
77.9    68.6
68                      55.7    61.6    70.8    77.7    81.9    82.9    80.6
75.4    72.6
52      B9 Winder Ground North  dB(A)/level     3.0     50.9    64.8    74.8
76.8    81.1    82.1    84.0    73.5    55.5    92.3
52                      3.0     58.0    69.8    77.3    78.3    80.3    81.1
77.4    67.2
52                      3.0     64.0    69.4    76.1    83.1    82.7    81.6
75.4    65.7
53      B9 After Dryer Ground North     dB(A)/level     0.6     59.9    63.0
73.5    77.3    79.0    80.2    79.9    70.9    58.8    90.6
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53                      0.6     52.4    69.7    78.2    78.7    78.7    78.6
76.5    67.2
53                      54.3    60.2    69.4    76.3    80.5    81.5    79.2
74.0    71.2
54      B9 Pre Dryer Start Ground North dB(A)/level     9.9     57.2    69.5
71.5    75.8    84.0    83.4    82.9    73.0    58.4    93.6
54                      9.9     62.8    73.1    77.0    81.4    82.6    81.9
81.3    68.4
54                      57.2    70.1    72.8    78.0    82.6    84.7    82.7
78.3    70.6
55      B9 Former Ground North  dB(A)/level     10.2    59.4    68.1    72.6
76.3    80.9    82.6    83.4    72.8    58.2    93.0
55                      10.2    63.2    70.7    80.4    80.8    82.1    81.5
81.1    68.3
55                      57.7    68.0    72.3    76.3    80.3    84.7    82.3
78.1    71.9
56      B9 Winder Ground South  dB(A)/level     3.0     50.9    64.8    74.8
76.8    81.1    82.1    84.0    73.5    55.5    92.3
56                      3.0     58.0    69.8    77.3    78.3    80.3    81.1
77.4    67.2
56                      3.0     64.0    69.4    76.1    83.1    82.7    81.6
75.4    65.7
57      B9 After Dryer Ground South     dB(A)/level     -0.7    58.6    61.7
72.2    76.0    77.7    78.9    78.6    69.6    57.5    89.3
57                      -0.7    51.1    68.4    76.9    77.4    77.4    77.3
75.2    65.9
57                      53.0    58.9    68.1    75.0    79.2    80.2    77.9
72.7    69.9
58      B9 Pre Dryer Ground South       dB(A)/level     0.0     47.3    59.6
61.6    65.9    74.1    73.5    73.0    63.1    48.5    83.7
58                      0.0     52.9    63.2    67.1    71.5    72.7    72.0
71.4    58.5
58                      47.3    60.2    62.9    68.1    72.7    74.8    72.8
68.4    60.7
59      B9 Press Ground South   dB(A)/level     11.2    60.4    69.1    73.6
77.3    81.9    83.6    84.4    73.8    59.2    94.0
59                      11.2    64.2    71.7    81.4    81.8    83.1    82.5
82.1    69.3
59                      58.7    69.0    73.3    77.3    81.3    85.7    83.3
79.1    72.9
60      B9 Winder Level 1 North dB(A)/level     11.6    66.5    75.6    81.0
84.2    84.8    84.9    83.0    79.4    68.2    96.2
60                      57.1    71.8    77.9    80.2    85.2    86.9    84.7
82.4    75.7
60                      71.8    70.1    81.0    80.7    84.7    85.8    84.0
80.9    72.0
61      B9 Winder Level 1 South dB(A)/level     11.6    66.5    75.6    81.0
84.2    84.8    84.9    83.0    79.4    68.2    96.2
61                      57.1    71.8    77.9    80.2    85.2    86.9    84.7
82.4    75.7
61                      71.8    70.1    81.0    80.7    84.7    85.8    84.0
80.9    72.0
62      B9 After Dryer Level 1 North    dB(A)/level     -11.8   43.5    48.6
56.2    64.7    69.1    80.1    83.4    78.6    64.5    90.2
62                      34.5    42.5    52.7    66.0    67.5    69.2    78.8
83.0    74.0
62                      41.0    43.7    56.0    63.2    65.3    71.0    82.8
81.0    69.0
63      B9 After Dryer Level 1 South    dB(A)/level     -10.1   45.2    50.3
57.9    66.4    70.8    81.8    85.1    80.3    66.2    91.9
63                      36.2    44.2    54.4    67.7    69.2    70.9    80.5
84.7    75.7
63                      42.7    45.4    57.7    64.9    67.0    72.7    84.5
82.7    70.7
64      B9 Pre Dryer Level 1 North      dB(A)/level     -11.1   44.2    49.3
56.9    65.4    69.8    80.8    84.1    79.3    65.2    91.0
64                      35.2    43.2    53.4    66.7    68.2    69.9    79.5
83.7    74.7
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64                      41.7    44.4    56.7    63.9    66.0    71.7    83.5
81.7    69.7
65      B9 Pre Dryer Start Level 1 South        dB(A)/level     -7.1    48.2
53.3    60.9    69.4    73.8    84.8    88.1    83.3    69.2    95.0
65                      39.2    47.2    57.4    70.7    72.2    73.9    83.5
87.7    78.7
65                      45.7    48.4    60.7    67.9    70.0    75.7    87.5
85.7    73.7
66      B9 Press Level 1 North  dB(A)/level     4.5     59.8    70.6    79.6
83.6    86.2    85.4    84.0    85.2    76.4    97.0
66                      4.5     57.5    78.2    79.5    84.4    85.2    83.0
86.6    84.2
66                      55.1    63.9    74.5    81.0    85.5    84.4    85.0
86.4    80.7
67      B9 Press Level 1 South  dB(A)/level     7.5     62.8    73.6    82.6
86.6    89.2    88.4    87.0    88.2    79.4    100.0
67                      7.5     60.5    81.2    82.5    87.4    88.2    86.0
89.6    87.2
67                      58.1    66.9    77.5    84.0    88.5    87.4    88.0
89.4    83.7
69      B9 Stock Prep Operating dB(A)/level     -2.5    52.8    63.6    72.6
76.6    79.2    78.4    77.0    78.2    69.4    90.0
69                      -2.5    50.5    71.2    72.5    77.4    78.2    76.0
79.6    77.2
69                      48.1    56.9    67.5    74.0    78.5    77.4    78.0
79.4    73.7
70      Null source (eg covered by another building)    dB(A)/level     -39.4
-99.0   -99.0   -99.0   -99.0   -99.0   -97.8   -98.0   -99.0   -99.0   -39.4
120     B9 Approach Ground south        dB(A)/unit      0.0     55.3    66.1
75.1    79.1    81.7    80.9    79.5    80.7    71.9    92.5
120                     0.0     53.0    73.7    75.0    79.9    80.7    78.5
82.1    79.7
120                     50.6    59.4    70.0    76.5    81.0    79.9    80.5
81.9    76.2
111     B9 Reeler Level 1 South dB(A)/level     8.1     63.0    72.1    77.5
80.7    81.3    81.4    79.5    75.9    64.7    92.7
111                     53.6    68.3    74.4    76.7    81.7    83.4    81.2
78.9    72.2
111                     68.3    66.6    77.5    77.2    81.2    82.3    80.5
77.4    68.5
112     B9 Size Press Level 1 South     dB(A)/level     -9.1    46.2    51.3
58.9    67.4    71.8    82.8    86.1    81.3    67.2    93.0
112                     37.2    45.2    55.4    68.7    70.2    71.9    81.5
85.7    76.7
112                     43.7    46.4    58.7    65.9    68.0    73.7    85.5
83.7    71.7
113     B9 Pre Dryer End Level 1 South  dB(A)/level     -10.1   45.2    50.3
57.9    66.4    70.8    81.8    85.1    80.3    66.2    92.0
113                     36.2    44.2    54.4    67.7    69.2    70.9    80.5
84.7    75.7
113                     42.7    45.4    57.7    64.9    67.0    72.7    84.5
82.7    70.7
114     B9 Pre Dryer Mid Level 1 South  dB(A)/level     -8.1    47.2    52.3
59.9    68.4    72.8    83.8    87.1    82.3    68.2    94.0
114                     38.2    46.2    56.4    69.7    71.2    72.9    82.5
86.7    77.7
114                     44.7    47.4    59.7    66.9    69.0    74.7    86.5
84.7    72.7
115     B9 Former Level 1 South dB(A)/level     5.5     60.8    71.6    80.6
84.6    87.2    86.4    85.0    86.2    77.4    98.0
115                     5.5     58.5    79.2    80.5    85.4    86.2    84.0
87.6    85.2
115                     56.1    64.9    75.5    82.0    86.5    85.4    86.0
87.4    81.7
116     B9 Approach Ground North        dB(A)/level     9.7     58.9    67.6
72.1    75.8    80.4    82.1    82.9    72.3    57.7    92.5
116                     9.7     62.7    70.2    79.9    80.3    81.6    81.0
80.6    67.8
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116		57.2	67.5	71.8	75.8	79.8	84.2	81.8	
77.6	71.4								
117	B9 Approach Level 1 North			dB(A)/level		0.6	55.9	66.7	
75.7	79.7	82.3	81.5	80.1	81.3	72.5	93.2		
117		0.6	53.6	74.3	75.6	80.5	81.3	79.1	
82.7	80.3								
117		51.2	60.0	70.6	77.1	81.6	80.5	81.1	
82.5	76.8								
118	B9 Approach Level 1 South			dB(A)/level		3.1	58.4	69.2	
78.2	82.2	84.8	84.0	82.6	83.8	75.0	95.6		
118		3.1	56.1	76.8	78.1	83.0	83.8	81.6	
85.2	82.8								
118		53.7	62.5	73.1	79.6	84.1	83.0	83.6	
85.0	79.3								
119	Blower room internal level			dB(A)/level		79.3	84.5	90.8	
92.5	92.5	96.2	97.1	90.5	85.8		102.0		
148	Vacuum System Fan No 2		dB(A)/unit			72.0	85.3	98.4	105.9
116.6	121.9	136.3	127.9	115.5		137.1			
149	Fan 92 casing 55 kW motor			dB(A)/unit				67.0	79.0
88.0	100.0	94.0	92.0	87.0	79.0		101.9		
150	Cat 972G Front End Loader Revving				dB(A)/unit		40.1	62.2	
82.3	97.7	87.9	93.9	97.6	90.8	88.9	80.1	105.5	
150		51.3	65.1	78.3	85.1	94.8	94.3	92.5	
89.6	87.4	71.8							
150		52.6	69.2	92.6	86.7	92.4	95.0	91.5	
88.0	84.2	60.5							
151	Fan 58 / PV10 / PM 18 Vav Roll Exhaust 3					dB(A)/unit		79.1	
90.3	96.4	91.9	96.3	96.0	6.2	94.5	87.4		102.7
152	Fan 80 Press Pulper Exhaust			dB(A)/unit		70.9	82.1	88.2	
88.7	89.1	91.3	89.5	86.3	79.2		97.1		
153	Fan 83 Sizer Pulper Exhaust			dB(A)/unit		71.1	82.3	88.4	
88.9	89.3	91.5	89.7	86.5	79.4		97.3		
154	Fan 86 Reeler Pulper Exhaust			dB(A)/unit		72.0	83.2	89.3	
89.8	90.2	92.4	90.6	87.4	80.3		98.2		
155	Fan 89 Winder Pulper Exhaust			dB(A)/unit		71.8	83.0	89.1	
89.6	90.0	92.2	90.4	87.2	80.1		98.0		

Scen 1 Fans as calc or meas, no boundary walls, neutral

Project description

Project title:	109169 Amcor Noise Model
Engineer:	Peter Eisenhuth, Anita Jo
Customer:	Balderstone for Amcor

Description:
Amcor's B9 paper machine and reorganised site

MGA coordinate system.
tecnical directory has a spreadsheet called "coordinate-transform.xls"
to convert from Amcor's coordinate system to MGA.

Run description

Calculation type:	Single Point Sound
Title:	Scen 1 Fans as calc or meas, no boundary walls, neutral
Run file:	Noname.runx
Result number:	5101
Calculation start:	9/12/2009 3:09:10 PM
Calculation end:	9/12/2009 3:10:15 PM
Calculation time:	00:08:782 [m:s:ms]
No. of points:	6
No. of calculated points:	6
Kernel version:	18/03/2008

Run parameters

Angle increment:	1.00 deg
Reflection depth:	1
Number of reflections:	1
Maximal search radius	5000
Weighting:	dB(A)

Calculation with side screening
Source side reflection precalculation enabled

Standards:

Industry:	Concawe	
Air absorption:	ISO 3891	
Limitation of screening loss:		
	single/multiple	20 dB /25 dB
Environment:		
	Air pressure	1013.25 mbar
	rel. Humidity	70 %
	Temperature	10 °C
	Pasquill Class	D
	Wind speed	0 m/s

	Wind direction	worst case (always source to receiver)
Dissection parameters:		
	Distance to diameter factor	2
	Minimal Distance [m]	1 m
	Max. Difference GND+Diffractic	1 dB
	Max. No. of Iterations	4
Assessment:	Industrial Noise Policy	

Reflection of "own" facade is suppressed

Geometry data

RDGM0001.dgm	12/11/2009 9:16:54 AM
Scen 1 - fans as calc or meas., no walls.sit	9/12/2009 3:08:46 PM
- contains:	
B9 Mezzanine Building.geo	9/12/2009 2:42:02 PM
B9.geo	9/12/2009 3:08:46 PM
Boiler House.geo	9/12/2009 2:14:26 PM
Boundary Wall - Proposed - 0m.geo	9/12/2009 2:14:26 PM
Car Park Wall.geo	9/12/2009 2:14:26 PM
Elevation Lines.geo	9/12/2009 2:14:26 PM
Exhausts for Internal Fans 70 deg calc & meas.geo	8/12/2009 2:10:46 PM
External Fans 70 deg calc & meas, blower 85@1.geo	9/12/2009 2:14:26 PM
No 7 Reel Store.geo	9/12/2009 2:14:26 PM
Off-site buildings.geo	9/12/2009 2:14:26 PM
Paper Yard Loader.geo	9/12/2009 2:14:26 PM
Product Store.geo	9/12/2009 2:14:26 PM
Product Trucks.geo	9/12/2009 2:14:26 PM
Receiver text.geo	3/12/2009 12:50:22 PM
Receivers.geo	9/12/2009 2:14:26 PM
Rejects Loader.geo	9/12/2009 2:14:26 PM
starch, cemicals & solid waste trucks.geo	9/12/2009 2:14:28 PM
Substation.geo	9/12/2009 2:14:28 PM
Tanks B9.geo	9/12/2009 2:14:28 PM
Transformers B9 South.geo	9/12/2009 2:14:28 PM
Waste Paper Trucks.geo	9/12/2009 2:14:28 PM
Waste Paper Yard Walls 5m.ge	9/12/2009 2:14:28 PM
Water Treatment.geo	9/12/2009 2:14:28 PM

Scen 1 Fans as calc or meas, no boundary walls, neutral

Group	INP Day dB(A)	INP Evenin dB(A)	INP Night dB(A)	Lmax night dB(A)	
Name R1 Day 50.0 dB(A) Evening 46.8 dB(A) Night 47.4 dB(A) Lmax night 56.3 dB(A)					
B9	37.1	37.1	37.1		
Fans	43.1	43.1	43.1		
Loaders	36.9	36.9	36.3		46.7
Trucks	48.4	42.4	43.9		56.3
Transformers	-20.1	-20.1	-20.1		
Name R2 Day 49.3 dB(A) Evening 46.3 dB(A) Night 46.8 dB(A) Lmax night 54.4 dB(A)					
B9	37.6	37.6	37.6		
Fans	42.1	42.1	42.1		
Loaders	38.5	38.5	37.9		49.6
Trucks	47.4	41.4	42.9		54.4
Transformers	-20.5	-20.5	-20.5		
Name R3 Day 48.5 dB(A) Evening 46.4 dB(A) Night 46.6 dB(A) Lmax night 54.1 dB(A)					
B9	38.0	38.0	38.0		
Fans	41.6	41.6	41.6		
Loaders	41.3	41.3	40.8		54.1
Trucks	45.6	39.6	41.2		51.8
Transformers	-20.5	-20.5	-20.5		
Name R4 Day 46.2 dB(A) Evening 42.8 dB(A) Night 43.4 dB(A) Lmax night 55.5 dB(A)					
B9	31.3	31.3	31.3		
Fans	37.7	37.7	37.7		
Loaders	36.1	36.1	35.6		44.6
Trucks	44.8	38.8	40.4		55.5
Transformers	-18.2	-18.2	-18.2		
Name R5 Day 45.2 dB(A) Evening 42.9 dB(A) Night 41.5 dB(A) Lmax night 49.7 dB(A)					
B9	29.3	29.3	29.3		
Fans	36.8	36.8	36.8		
Loaders	39.7	39.7	32.7		44.1
Trucks	42.5	36.6	38.1		49.7
Transformers	-24.9	-24.9	-24.9		
Name R6 Day 44.2 dB(A) Evening 42.9 dB(A) Night 40.1 dB(A) Lmax night 46.1 dB(A)					
B9	27.5	27.5	27.5		
Fans	34.6	34.6	34.6		
Loaders	41.4	41.4	35.4		45.5
Trucks	39.6	33.6	35.1		46.1
Transformers	-26.5	-26.5	-26.5		

109169 Amcor Noise Model
Scen 1 Fans as calc or meas, no boundary walls, neutral

Source	Group	Obj ID	l or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
Deaerator roof near former	B9	946	345.00	88.7	95.6	32.0	0	0	72.8	70.5	76.9	73.6	81.2	77.5	78.6	78.5	80.0	75.6	76.4	77.5	71.2	70.2	69.4	68.4	66.0	68.0	63.0
Deaerator roof near approach	B9	963	80.50	82.4	95.6	32.0	0	0	66.4	64.1	70.5	67.2	74.8	71.1	72.2	72.1	73.6	69.2	70.0	71.1	64.8	63.8	63.0	62.0	59.6	61.6	56.6
Deaerator south former ground	B9	364	63.00	62.1	93.0	48.0	0	0	38.3	42.1	46.9	45.0	47.6	49.2	49.5	57.3	53.2	48.2	52.7	52.2	42.8	44.0	46.6	36.5	35.4	36.2	31.4
Deaerator south former ground	B9	365	147.00	84.6	93.0	32.0	0	0	70.0	73.8	78.6	68.7	71.3	72.9	69.2	77.0	72.9	65.9	70.4	69.9	63.5	64.7	67.3	63.2	62.1	62.9	60.0
Deaerator south former level 1	B9	366	555.00	93.1	98.0	32.0	0	0	77.2	74.9	81.3	78.0	85.6	81.9	83.0	82.9	84.4	80.0	80.8	81.9	75.6	74.6	73.8	72.8	70.4	72.4	67.4
Deaerator south approach ground	B9	367	13.86	60.0	98.0	48.0	0	0	33.1	30.8	37.2	41.9	49.5	45.8	50.9	50.8	52.3	49.9	50.7	51.8	42.5	41.5	40.7	33.7	31.3	33.3	26.4
Deaerator south approach ground	B9	368	32.34	80.8	98.0	32.0	0	0	64.9	62.6	69.0	65.7	73.3	69.6	70.7	70.6	72.1	67.7	68.5	69.6	63.3	62.3	61.5	60.5	58.1	60.1	55.1
Deaerator south approach level 1	B9	369	122.10	84.2	95.6	32.0	0	0	68.3	66.0	72.4	69.1	76.7	73.0	74.1	74.0	75.5	71.1	71.9	73.0	66.7	65.7	64.9	63.9	61.5	63.5	58.5
Deaerator East dado	B9	370	24.36	56.8	92.2	48.0	0	0	30.7	36.3	43.6	41.0	44.6	44.3	43.0	48.5	49.5	42.3	47.9	49.1	40.5	39.1	41.2	31.9	30.4	31.2	25.4
Deaerator East ground sheeting	B9	371	56.84	79.8	92.2	32.0	0	0	62.4	68.0	75.3	64.7	68.3	68.0	62.7	68.2	69.2	60.0	65.6	66.8	61.2	59.8	61.9	58.6	57.1	57.9	54.1
Deaerator East level 1 sheeting	B9	372	214.60	75.7	93.0	32.0	0	0	58.5	57.5	58.7	53.6	57.7	61.0	57.2	67.0	64.2	58.7	61.5	59.3	56.1	56.2	58.0	65.1	63.8	67.8	64.4
Deaerator north top 2m	B9	945	72.00	86.3	100.0	32.0	0	0	70.3	68.0	74.4	71.1	78.7	75.0	76.1	76.0	77.5	73.1	73.9	75.0	68.7	67.7	66.9	65.9	63.5	65.5	60.5
Mezzanine Roof Pre-dryer Start	B9	964	210.00	52.6	95.0	58.0	0	0		45.4	46.6	27.5	31.6	34.9	33.1	42.9	40.1	35.6	38.4	36.2	31.0	31.1	32.9	38.0	36.7	40.7	38.3
Mezzanine Roof Pre-dryer Mid	B9	966	201.25	51.4	94.0	58.0	0	0		44.2	45.4	26.3	30.4	33.7	31.9	41.7	38.9	34.4	37.2	35.0	29.8	29.9	31.7	36.8	35.5	39.5	37.1
Mezzanine Roof Pre-dryer Start	B9	967	51.75	45.5	94.0	58.0	0	0		38.3	39.5	20.4	24.5	27.8	26.0	35.8	33.0	28.5	31.3	29.1	23.9	24.0	25.8	30.9	29.6	33.6	31.2
Mezzanine Roof Pre-dryer End	B9	968	330.00	51.6	92.0	58.0	0	0		44.4	45.6	26.5	30.6	33.9	32.1	41.9	39.1	34.6	37.4	35.2	30.0	30.1	31.9	37.0	35.7	39.7	37.3
Mezzanine Roof Size Press	B9	969	172.50	49.7	93.0	58.0	0	0		42.6	43.8	24.6	28.7	32.0	30.2	40.0	37.2	32.7	35.5	33.3	28.1	28.2	30.0	35.2	33.9	37.9	35.5
Mezzanine Roof After Dryer	B9	970	488.75	53.2	91.9	58.0	0	0		46.0	47.2	28.1	32.2	35.5	33.7	43.5	40.7	36.2	39.0	36.8	31.6	31.7	33.5	38.6	37.3	41.3	38.9
B9 Sth Dado After Dryer	B9	374	78.75	60.5	89.3	48.0	0	0	38.5	31.0	38.8	39.6	46.3	46.0	50.1	54.8	52.9	48.9	50.3	52.1	40.6	40.3	43.1	33.8	32.2	32.8	27.5
B9 Sth Ground After Dryer Sheeting	B9	375	183.75	81.4	89.3	32.0	0	0	70.2	62.7	70.5	63.3	70.0	69.7	69.8	74.5	72.6	66.6	68.0	69.8	61.3	61.0	63.8	60.5	58.9	59.5	56.2
B9 Sth Level 1 After Dryer	B9	376	281.25	75.8	91.9	32.0	0	0	58.6	57.6	58.8	53.7	57.8	61.1	57.3	67.1	64.3	58.8	61.6	59.4	56.2	56.3	58.1	65.2	63.9	67.9	64.5
B9 Sth Ground Size Press Dado	B9	377	31.50	57.9	92.2	48.0	0	0	31.8	37.4	44.7	42.1	45.7	45.4	44.1	49.6	50.6	43.4	49.0	50.2	41.6	40.2	42.3	33.0	31.5	32.3	26.5
B9 Sth Ground Size Press Sheeting	B9	378	73.50	80.9	92.2	32.0	0	0	63.5	69.1	76.4	65.8	69.4	69.1	63.8	69.3	70.3	61.1	66.7	67.9	62.3	60.9	63.0	59.7	58.2	59.0	55.2
B9 Sth Level 1 Size Press Sheeting	B9	379	112.50	70.0	90.1	32.0	0	0	52.8	51.8	53.0	47.9	52.0	55.3	51.5	61.3	58.5	53.0	55.8	53.6	50.4	50.5	52.3	59.4	58.1	62.1	58.7
B9 Sth Ground Pre-Dryer End tx	B9	380	210.00	66.8	92.9	48.0	0	0	40.7	46.3	53.6	51.0	54.6	54.3	53.0	58.5	59.5	52.3	57.9	59.1	50.5	49.1	51.2	41.9	40.4	41.2	35.4
B9 Sth Level 1 Pre-Dryer End	B9	381	225.00	72.9	90.1	32.0	0	0	55.8	54.8	56.0	50.9	55.0	58.3	54.5	64.3	61.5	56.0	58.8	56.6	53.4	53.5	55.3	62.4	61.1	65.1	61.7
B9 Sth Ground Pre-Dryer Mid tx	B9	382	157.50	65.9	93.3	48.0	0	0	39.8	45.4	52.7	50.1	53.7	53.4	52.1	57.6	58.6	51.4	57.0	58.2	49.6	48.2	50.3	41.0	39.5	40.3	34.6
B9 Sth Level 1 Pre-Dryer Mid	B9	383	168.75	75.6	94.0	32.0	0	0	58.5	57.5	58.7	53.6	57.7	61.0	57.2	67.0	64.2	58.7	61.5	59.3	56.1	56.2	58.0	65.1	63.8	67.8	64.4
B9 Sth Ground Pre-Dryer Start tx	B9	384	31.50	58.9	93.3	48.0	0	0	32.9	38.5	45.8	43.2	46.8	46.5	45.2	50.7	51.7	44.5	50.1	51.3	42.7	41.3	43.4	34.1	32.6	33.4	27.6
B9 Sth Level 1 Pre-Dryer Start	B9	385	33.75	69.6	95.0	32.0	0	0	52.5	51.5	52.7	47.6	51.7	55.0	51.2	61.0	58.2	52.7	55.5	53.3	50.1	50.2	52.0	59.1	57.8	61.8	58.4
Low Roof Roof Roll Store	B9	973	201.25	90.4	94.0	32.0	0	0	76.3	81.6	79.9	75.4	77.7	80.8	76.8	76.0	76.5	73.0	74.0	73.5	66.6	68.7	67.6	64.7	64.5	63.8	58.8
Low Roof Roof Winder	B9	974	247.25	93.5	96.2	32.0	0	0	79.4	84.7	83.0	78.5	80.8	83.9	79.9	79.1	79.6	76.1	77.1	76.6	69.7	71.8	70.7	67.8	67.6	66.9	61.9
West Low Roof Area Dado Wall	B9	387	23.52	57.0	92.3	48.0	0	0	25.6	32.7	38.7	37.5	42.5	42.1	47.5	50.0	48.8	44.5	46.0	50.8	38.8	38.0	40.4	31.8	30.8	31.3	27.7
West Low Roof Area Ground Level	B9	388	54.88	77.9	92.3	32.0	0	0	57.3	64.4	70.4	61.2	66.2	65.8	67.2	69.7	68.5	62.2	63.7	68.5	59.5	58.7	61.1	58.5	57.5	58.0	56.4
West Low Roof Area Op Level	B9	389	33.60	75.8	92.3	32.0	0	0	55.2	62.3	68.3	59.1	64.1	63.7	65.1	67.6	66.4	60.1	61.6	66.4	57.4	56.6	59.0	56.4	55.4	55.9	54.3
Low Roof Winder Dado	B9	390	47.25	60.0	92.3	48.0	0	0	28.6	35.7	41.7	40.5	45.5	45.1	50.5	53.0	51.8	47.5	49.0	53.8	41.8	41.0	43.4	34.8	33.8	34.3	30.7

109169 Amcor Noise Model
Scen 1 Fans as calc or meas, no boundary walls, neutral

Source	Group	Obj ID	l or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
Low Roof Winder Sheeting	B9	391	110.25	80.9	92.3	32.0	0	0	60.3	67.4	73.4	64.2	69.2	68.8	70.2	72.7	71.5	65.2	66.7	71.5	62.5	61.7	64.1	61.5	60.5	61.0	59.4
Low Roof Winder Operating	B9	392	101.25	89.7	96.2	32.0	0	0	75.6	80.9	79.2	74.7	77.0	80.1	76.1	75.3	75.8	72.3	73.3	72.8	65.9	68.0	66.9	64.0	63.8	63.1	58.1
Low Roof Dado Paper Roll Store	B9	393	34.65	57.0	90.7	48.0	0	0	25.6	32.7	38.7	37.5	42.5	42.1	47.5	50.0	48.8	44.5	46.0	50.8	38.8	38.0	40.4	31.8	30.8	31.3	27.8
Low Roof Paper Rols Store Ground	B9	394	80.85	77.9	90.7	32.0	0	0	57.3	64.4	70.4	61.2	66.2	65.8	67.2	69.7	68.5	62.2	63.7	68.5	59.5	58.7	61.1	58.5	57.5	58.0	56.4
Low Roof Paper Roll Store Level 1	B9	395	74.25	86.1	94.0	32.0	0	0	72.0	77.3	75.6	71.1	73.4	76.5	72.5	71.7	72.2	68.7	69.7	69.2	62.3	64.4	63.3	60.4	60.2	59.5	54.5
Dry End Roof Paper roll storage	B9	972	86.25	86.7	94.0	32.0	0	0	72.6	77.9	76.2	71.7	74.0	77.1	73.1	72.3	72.8	69.3	70.3	69.8	62.9	65.0	63.9	61.0	60.8	60.1	55.1
Dry End Roof Reeler	B9	975	86.25	85.5	92.7	32.0	0	0	71.4	76.7	75.0	70.5	72.8	75.9	71.9	71.1	71.6	68.1	69.1	68.6	61.7	63.8	62.7	59.8	59.6	58.9	53.9
Dry End Roof After dryer	B9	976	86.25	70.6	91.9	32.0	0	0	53.5	52.5	53.7	48.6	52.7	56.0	52.2	62.0	59.2	53.7	56.5	54.3	51.1	51.2	53.0	60.1	58.8	62.8	59.4
Dry End Elect Ground Paper Roll	B9	397	52.50	58.8	90.7	48.0	0	0	27.4	34.5	40.5	39.3	44.3	43.9	49.3	51.8	50.6	46.3	47.8	52.6	40.6	39.8	42.2	33.6	32.6	33.1	29.6
Dry End Elect Level 1 Paper Roll	B9	398	48.75	84.2	94.0	32.0	0	0	70.1	75.4	73.7	69.2	71.5	74.6	70.6	69.8	70.3	66.8	67.8	67.3	60.4	62.5	61.4	58.5	58.3	57.6	52.6
Dry End Elect Ground Reeler	B9	399	52.50	57.7	89.5	48.0	0	0	26.3	33.4	39.4	38.2	43.2	42.8	48.2	50.7	49.5	45.2	46.7	51.5	39.5	38.7	41.1	32.5	31.5	32.0	28.4
Dry End Elect Level 1 Reeler	B9	400	48.75	74.6	89.5	32.0	0	0	54.0	61.1	67.1	57.9	62.9	62.5	63.9	66.4	65.2	58.9	60.4	65.2	56.2	55.4	57.8	55.2	54.2	54.7	53.1
Dry End Elect Ground After Dryer	B9	401	52.50	57.7	89.5	48.0	0	0	26.3	33.4	39.4	38.2	43.2	42.8	48.2	50.7	49.5	45.2	46.7	51.5	39.5	38.7	41.1	32.5	31.5	32.0	28.4
Dry End Elect Level 1 After Dryer	B9	402	48.75	68.2	91.9	32.0	0	0	51.0	50.0	51.2	46.1	50.2	53.5	49.7	59.5	56.7	51.2	54.0	51.8	48.6	48.7	50.5	57.6	56.3	60.3	56.9
Blower 100 mm concrete roof	B9	965	120.00	76.4	102.0	48.0	0	0		66.3			70.5			72.3			67.3			60.9			53.9		
Blower Room North	B9	404	60.00	73.4	102.0	48.0	0	0		63.3			67.5			69.3			64.3			57.9			50.9		
Blower Room West	B9	405	7.00	64.0	102.0	48.0	0	0		53.9			58.2			59.9			54.9			48.6			41.5		
Blower Dado	B9	406	63.00	73.6	102.0	48.0	0	0		63.5			67.7			69.5			64.5			58.1			51.1		
Blower 100 mm concrete	B9	407	432.00	81.9	102.0	48.0	0	0		71.8			76.1			77.9			72.9			66.5			59.4		
South Operating Winder Cladding	B9	287	270.00	93.9	96.2	32.0	0	0	79.8	85.1	83.4	78.9	81.2	84.3	80.3	79.5	80.0	76.5	77.5	77.0	70.1	72.2	71.1	68.2	68.0	67.3	62.3
South Operating Paper Roll Storage	B9	288	180.00	89.9	94.0	32.0	0	0	75.8	81.1	79.4	74.9	77.2	80.3	76.3	75.5	76.0	72.5	73.5	73.0	66.1	68.2	67.1	64.2	64.0	63.3	58.3
South Operating Paper Roll Storage	B9	289	75.00	86.1	94.0	32.0	0	0	72.0	77.3	75.6	71.1	73.4	76.5	72.5	71.7	72.2	68.7	69.7	69.2	62.3	64.4	63.3	60.4	60.2	59.5	54.5
South Operating Reeler Clad	B9	290	75.00	84.9	92.7	32.0	0	0	70.8	76.1	74.4	69.9	72.2	75.3	71.3	70.5	71.0	67.5	68.5	68.0	61.1	63.2	62.1	59.2	59.0	58.3	53.3
South Operating After Dryers West	B9	291	75.00	70.0	91.9	32.0	0	0	52.9	51.9	53.1	48.0	52.1	55.4	51.6	61.4	58.6	53.1	55.9	53.7	50.5	50.6	52.4	59.5	58.2	62.2	58.8
South Operating After Dryers East	B9	292	337.50	76.6	91.9	32.0	0	0	59.4	58.4	59.6	54.5	58.6	61.9	58.1	67.9	65.1	59.6	62.4	60.2	57.0	57.1	58.9	66.0	64.7	68.7	65.3
South Operating Size Press	B9	293	135.00	73.6	93.0	32.0	0	0	56.5	55.5	56.7	51.6	55.7	59.0	55.2	65.0	62.2	56.7	59.5	57.3	54.1	54.2	56.0	63.1	61.8	65.8	62.4
South Operating Pre-Dryer End	B9	294	270.00	75.6	92.0	32.0	0	0	58.5	57.5	58.7	53.6	57.7	61.0	57.2	67.0	64.2	58.7	61.5	59.3	56.1	56.2	58.0	65.1	63.8	67.8	64.4
South Operating Pre-Dryer Mid	B9	295	202.50	76.4	94.0	32.0	0	0	59.3	58.3	59.5	54.4	58.5	61.8	58.0	67.8	65.0	59.5	62.3	60.1	56.9	57.0	58.8	65.9	64.6	68.6	65.2
South Operating Pre-Dryer Start	B9	296	67.50	72.6	95.0	32.0	0	0	55.5	54.5	55.7	50.6	54.7	58.0	54.2	64.0	61.2	55.7	58.5	56.3	53.1	53.2	55.0	62.1	60.8	64.8	61.4
South Operating Pre-Dryer Start	B9	297	105.00	74.5	95.0	32.0	0	0	57.4	56.4	57.6	52.5	56.6	59.9	56.1	65.9	63.1	57.6	60.4	58.2	55.0	55.1	56.9	64.0	62.7	66.7	63.3
South Operating Press Cladding	B9	298	105.00	87.9	100.0	32.0	0	0	72.0	69.7	76.1	72.8	80.4	76.7	77.8	77.7	79.2	74.8	75.6	76.7	70.4	69.4	68.6	67.6	65.2	67.2	62.2
South Operating Approach Cladding	B9	299	67.50	81.6	95.6	32.0	0	0	65.7	63.4	69.8	66.5	74.1	70.4	71.5	71.4	72.9	68.5	69.3	70.4	64.1	63.1	62.3	61.3	58.9	60.9	55.9
South Operating Stock Prep	B9	300	540.00	85.0	90.0	32.0	0	0	69.1	66.8	73.2	69.9	77.5	73.8	74.9	74.8	76.3	71.9	72.7	73.8	67.5	66.5	65.7	64.7	62.3	64.3	59.3
East Ground Stock Prep Dado	B9	301	12.60	55.2	92.0	48.0	0	0	33.3	25.8	33.6	34.4	41.1	40.8	44.9	49.6	47.7	43.7	45.1	46.9	35.4	35.1	37.9	28.6	27.0	27.6	22.3
East Ground Stock Prep FEL Area	B9	302	101.25	64.3	92.0	48.0	0	0	42.3	34.8	42.6	43.4	50.1	49.8	53.9	58.6	56.7	52.7	54.1	55.9	44.4	44.1	46.9	37.6	36.0	36.6	31.4
East Ground Stock Prep Dado East	B9	303	14.70	55.9	92.0	48.0	0	0	33.9	26.4	34.2	35.0	41.7	41.4	45.5	50.2	48.3	44.3	45.7	47.5	36.0	35.7	38.5	29.2	27.6	28.2	23.0

109169 Amcor Noise Model
Scen 1 Fans as calc or meas, no boundary walls, neutral

Source	Group	Obj ID	l or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
East Ground Stock Prep Clad East	B9	304	21.15	74.7	92.0	32.0	0	0	63.6	56.1	63.9	56.7	63.4	63.1	63.2	67.9	66.0	60.0	61.4	63.2	54.7	54.4	57.2	53.9	52.3	52.9	49.6
East Ground Stock Prep Clad West	B9	305	24.67	75.4	92.0	32.0	0	0	64.2	56.7	64.5	57.3	64.0	63.7	63.8	68.5	66.6	60.6	62.0	63.8	55.3	55.0	57.8	54.5	52.9	53.5	50.2
East Operating Stock Prep Clad	B9	306	290.63	82.3	90.0	32.0	0	0	66.4	64.1	70.5	67.2	74.8	71.1	72.2	72.1	73.6	69.2	70.0	71.1	64.8	63.8	63.0	62.0	59.6	61.6	56.6
North Ground Roll Storage	B9	307	112.50	62.1	90.7	48.0	0	0	30.7	37.8	43.8	42.6	47.6	47.2	52.6	55.1	53.9	49.6	51.1	55.9	43.9	43.1	45.5	36.9	35.9	36.4	32.9
North Ground Winder Masonry	B9	308	168.75	63.9	90.7	48.0	0	0	32.5	39.6	45.6	44.4	49.4	49.0	54.4	56.9	55.7	51.4	52.9	57.7	45.7	44.9	47.3	38.7	37.7	38.2	34.6
North Ground Paper Roll Storage	B9	309	56.25	59.1	90.7	48.0	0	0	27.7	34.8	40.8	39.6	44.6	44.2	49.6	52.1	50.9	46.6	48.1	52.9	40.9	40.1	42.5	33.9	32.9	33.4	29.9
North Ground Paper Roll Storage	B9	310	15.75	53.6	90.7	48.0	0	0	22.2	29.3	35.3	34.1	39.1	38.7	44.1	46.6	45.4	41.1	42.6	47.4	35.4	34.6	37.0	28.4	27.4	27.9	24.3
North Ground Paper Roll Storage	B9	311	40.50	74.9	90.7	32.0	0	0	54.3	61.4	67.4	58.2	63.2	62.8	64.2	66.7	65.5	59.2	60.7	65.5	56.5	55.7	58.1	55.5	54.5	55.0	53.4
North Ground Paper Roll Storage	B9	312	56.25	59.1	90.7	48.0	0	0	27.7	34.8	40.8	39.6	44.6	44.2	49.6	52.1	50.9	46.6	48.1	52.9	40.9	40.1	42.5	33.9	32.9	33.4	29.9
North Ground Reeler Masonry	B9	313	56.25	58.0	89.5	48.0	0	0	26.6	33.7	39.7	38.5	43.5	43.1	48.5	51.0	49.8	45.5	47.0	51.8	39.8	39.0	41.4	32.8	31.8	32.3	28.7
North Ground After Dryers Masonry	B9	314	225.00	66.4	90.6	48.0	0	0	44.4	36.9	44.7	45.5	52.2	51.9	56.0	60.7	58.8	54.8	56.2	58.0	46.5	46.2	49.0	39.7	38.1	38.7	33.5
North Ground After Dryers Dado	B9	315	31.50	57.8	90.6	48.0	0	0	35.9	28.4	36.2	37.0	43.7	43.4	47.5	52.2	50.3	46.3	47.7	49.5	38.0	37.7	40.5	31.2	29.6	30.2	24.9
North Ground After Dryers Cladding	B9	316	81.00	79.2	90.6	32.0	0	0	68.0	60.5	68.3	61.1	67.8	67.5	67.6	72.3	70.4	64.4	65.8	67.6	59.1	58.8	61.6	58.3	56.7	57.3	54.0
North Ground Size Press Dado	B9	317	31.50	58.2	92.5	48.0	0	0	32.1	37.7	45.0	42.4	46.0	45.7	44.4	49.9	50.9	43.7	49.3	50.5	41.9	40.5	42.6	33.3	31.8	32.6	26.8
North Ground Size Press Cladding	B9	318	81.00	81.6	92.5	32.0	0	0	64.2	69.8	77.1	66.5	70.1	69.8	64.5	70.0	71.0	61.8	67.4	68.6	63.0	61.6	63.7	60.4	58.9	59.7	55.9
North Ground Pre Dryer End Dado	B9	319	63.00	61.7	93.0	48.0	0	0	35.6	41.2	48.5	45.9	49.5	49.2	47.9	53.4	54.4	47.2	52.8	54.0	45.4	44.0	46.1	36.8	35.3	36.1	30.3
North Ground Pre Dryer End	B9	320	162.00	85.1	93.0	32.0	0	0	67.7	73.3	80.6	70.0	73.6	73.3	68.0	73.5	74.5	65.3	70.9	72.1	66.5	65.1	67.2	63.9	62.4	63.2	59.4
North Ground Pre Dryer Mid Dado	B9	321	47.25	60.7	93.3	48.0	0	0	34.6	40.2	47.5	44.9	48.5	48.2	46.9	52.4	53.4	46.2	51.8	53.0	44.4	43.0	45.1	35.8	34.3	35.1	29.3
North Ground Pre Dryer Mid	B9	322	121.50	84.1	93.3	32.0	0	0	66.7	72.3	79.6	69.0	72.6	72.3	67.0	72.5	73.5	64.3	69.9	71.1	65.5	64.1	66.2	62.9	61.4	62.2	58.4
North Ground Pre Dryer Start Dado	B9	323	47.25	61.0	93.6	48.0	0	0	34.9	40.5	47.8	45.2	48.8	48.5	47.2	52.7	53.7	46.5	52.1	53.3	44.7	43.3	45.4	36.1	34.6	35.4	29.7
North Ground Pre Dryer Start	B9	324	121.50	84.4	93.6	32.0	0	0	67.1	72.7	80.0	69.4	73.0	72.7	67.4	72.9	73.9	64.7	70.3	71.5	65.9	64.5	66.6	63.3	61.8	62.6	58.8
North Ground Press Dado	B9	325	31.50	60.1	94.0	48.0	0	0	36.3	40.1	44.9	43.0	45.6	47.2	47.5	55.3	51.2	46.2	50.7	50.2	40.8	42.0	44.6	34.5	33.4	34.2	29.3
North Ground Press Cladding	B9	326	81.00	64.2	94.0	48.0	0	0	40.4	44.2	49.0	47.1	49.7	51.3	51.6	59.4	55.3	50.3	54.8	54.3	44.9	46.1	48.7	38.6	37.5	38.3	33.4
North Ground Former Dado	B9	327	47.25	60.9	93.0	48.0	0	0	37.1	40.9	45.7	43.8	46.4	48.0	48.3	56.1	52.0	47.0	51.5	51.0	41.6	42.8	45.4	35.3	34.2	35.0	30.1
North Ground Former Cladding	B9	328	121.50	83.7	93.0	32.0	0	0	69.2	73.0	77.8	67.9	70.5	72.1	68.4	76.2	72.1	65.1	69.6	69.1	62.7	63.9	66.5	62.4	61.3	62.1	59.2
North Ground Approach Dado	B9	329	36.75	59.3	92.5	48.0	0	0	35.5	39.3	44.1	42.2	44.8	46.4	46.7	54.5	50.4	45.4	49.9	49.4	40.0	41.2	43.8	33.7	32.6	33.4	28.5
North Ground Approach Cladding	B9	330	94.50	82.2	92.5	32.0	0	0	67.6	71.4	76.2	66.3	68.9	70.5	66.8	74.6	70.5	63.5	68.0	67.5	61.1	62.3	64.9	60.8	59.7	60.5	57.6
North Ground Approach	B9	331	37.50	78.2	92.5	32.0	0	0	63.6	67.4	72.2	62.3	64.9	66.5	62.8	70.6	66.5	59.5	64.0	63.5	57.1	58.3	60.9	56.8	55.7	56.5	53.6
North Ground Stock Prep Dado	B9	332	78.75	63.2	92.0	48.0	0	0	41.2	33.7	41.5	42.3	49.0	48.7	52.8	57.5	55.6	51.6	53.0	54.8	43.3	43.0	45.8	36.5	34.9	35.5	30.3
North Ground Stock Prep Cladding	B9	333	202.50	84.5	92.0	32.0	0	0	73.4	65.9	73.7	66.5	73.2	72.9	73.0	77.7	75.8	69.8	71.2	73.0	64.5	64.2	67.0	63.7	62.1	62.7	59.4
North Ground Stock Prep	B9	334	37.50	77.2	92.0	32.0	0	0	66.0	58.5	66.3	59.1	65.8	65.5	65.6	70.3	68.4	62.4	63.8	65.6	57.1	56.8	59.6	56.3	54.7	55.3	52.0
North Ground Stock Prep Dado	B9	335	36.75	59.9	92.0	48.0	0	0	37.9	30.4	38.2	39.0	45.7	45.4	49.5	54.2	52.3	48.3	49.7	51.5	40.0	39.7	42.5	33.2	31.6	32.2	27.0
North Ground Stock Prep Dado	B9	336	94.50	81.2	92.0	32.0	0	0	70.1	62.6	70.4	63.2	69.9	69.6	69.7	74.4	72.5	66.5	67.9	69.7	61.2	60.9	63.7	60.4	58.8	59.4	56.1
North Operating Roll Storage	B9	337	72.75	65.2	93.7	48.0	0	0	43.6	48.9	47.2	50.7	53.0	56.1	56.1	55.3	55.8	54.3	55.3	54.8	44.9	47.0	45.9	37.0	36.8	36.1	29.1
North Operating Winder Masonry	B9	338	128.25	70.1	96.2	48.0	0	0	48.5	53.8	52.1	55.6	57.9	61.0	61.0	60.2	60.7	59.2	60.2	59.7	49.8	51.9	50.8	41.9	41.7	41.0	34.1
North Operating Paper Roll Storage	B9	339	47.63	63.3	93.7	48.0	0	0	41.7	47.0	45.3	48.8	51.1	54.2	54.2	53.4	53.9	52.4	53.4	52.9	43.0	45.1	44.0	35.1	34.9	34.2	27.3

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Source	Group	Obj ID	l or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
North Operating Paper Roll Storage	B9	340	93.75	86.8	93.7	32.0	0	0	72.7	78.0	76.3	71.8	74.1	77.2	73.2	72.4	72.9	69.4	70.4	69.9	63.0	65.1	64.0	61.1	60.9	60.2	55.2
North Operating Paper Roll Storage	B9	341	48.75	63.4	93.7	48.0	0	0	41.8	47.1	45.4	48.9	51.2	54.3	54.3	53.5	54.0	52.5	53.5	53.0	43.1	45.2	44.1	35.2	35.0	34.3	27.4
North Operating Reeler Mason	B9	342	48.75	62.5	92.7	48.0	0	0	40.9	46.2	44.5	48.0	50.3	53.4	53.4	52.6	53.1	51.6	52.6	52.1	42.2	44.3	43.2	34.3	34.1	33.4	26.4
North Operating After Dryers	B9	343	195.00	53.5	90.2	48.0	0	0	27.3	26.3	27.5	30.4	34.5	37.8	38.0	47.8	45.0	41.5	44.3	42.1	35.9	36.0	37.8	38.9	37.6	41.6	36.3
North Operating After Dryers	B9	344	240.00	73.4	90.2	32.0	0	0	56.3	55.3	56.5	51.4	55.5	58.8	55.0	64.8	62.0	56.5	59.3	57.1	53.9	54.0	55.8	62.9	61.6	65.6	62.2
North Operating Size Press	B9	345	240.00	73.3	90.1	32.0	0	0	56.1	55.1	56.3	51.2	55.3	58.6	54.8	64.6	61.8	56.3	59.1	56.9	53.7	53.8	55.6	62.7	61.4	65.4	62.0
North Operating Pre-Dryer End	B9	346	480.00	76.2	90.1	32.0	0	0	59.1	58.1	59.3	54.2	58.3	61.6	57.8	67.6	64.8	59.3	62.1	59.9	56.7	56.8	58.6	65.7	64.4	68.4	65.0
North Operating Pre-Dryer Mid	B9	347	360.00	75.9	91.0	32.0	0	0	58.8	57.8	59.0	53.9	58.0	61.3	57.5	67.3	64.5	59.0	61.8	59.6	56.4	56.5	58.3	65.4	64.1	68.1	64.7
North Operating Pre-Dryer Start	B9	348	360.00	78.5	93.6	32.0	0	0	61.4	60.4	61.6	56.5	60.6	63.9	60.1	69.9	67.1	61.6	64.4	62.2	59.0	59.1	60.9	68.0	66.7	70.7	67.3
North Operating Press Cladding	B9	349	240.00	88.5	97.0	32.0	0	0	72.6	70.3	76.7	73.4	81.0	77.3	78.4	78.3	79.8	75.4	76.2	77.3	71.0	70.0	69.2	68.2	65.8	67.8	62.8
North Operating Former Cladding	B9	350	360.00	88.2	95.0	32.0	0	0	72.3	70.0	76.4	73.1	80.7	77.0	78.1	78.0	79.5	75.1	75.9	77.0	70.7	69.7	68.9	67.9	65.5	67.5	62.5
North Operating Approach Cladding	B9	351	360.00	86.4	93.2	32.0	0	0	70.5	68.2	74.6	71.3	78.9	75.2	76.3	76.2	77.7	73.3	74.1	75.2	68.9	67.9	67.1	66.1	63.7	65.7	60.7
North Operating Stock Prep	B9	352	960.00	-16.6	-39.4	32.0	0	0																			
North Operating Roll Storage	B9	353	167.25	-24.2	-39.4	32.0	0	0																			
North Operating Winder Cladding	B9	354	231.75	-22.7	-39.4	32.0	0	0																			
North Operating Paper Roll Storage	B9	355	72.38	-27.8	-39.4	32.0	0	0																			
North Operating Paper Roll Storage	B9	356	71.25	-27.9	-39.4	32.0	0	0																			
North Operating Reeler Cladd	B9	357	71.25	-27.9	-39.4	32.0	0	0																			
North Operating After Dryers Cladd	B9	358	285.00	-21.9	-39.4	32.0	0	0																			
West Ground Dado	B9	359	65.80	-32.3	-9.0	48.0	0	0		-39.8			-41.8			-41.8			-46.8			-56.8			-64.8		
West Ground Clad	B9	360	110.45	-3.9	-9.0	32.0	0	0		-9.6			-19.6			-23.6			-30.6			-37.6			-39.6		
West Operating Clad	B9	361	317.25	0.7	-9.0	32.0	0	0		-5.0			-15.0			-19.0			-26.0			-33.0			-35.0		
Elect & Stock Prep East End Roof	B9	962	776.25	92.2	95.6	32.0	0	0	76.3	74.0	80.4	77.1	84.7	81.0	82.1	82.0	83.5	79.1	79.9	81.0	74.7	73.7	72.9	71.9	69.5	71.5	66.5
Wet End Elect Roof & Stock Prep	B9	953	141.75	64.6	92.5	48.0	0	0	37.8	35.5	41.9	46.6	54.2	50.5	55.6	55.5	57.0	54.6	55.4	56.5	47.2	46.2	45.4	38.4	36.0	38.0	31.0
Wet End Elect Roof & Stock Prep	B9	954	81.00	62.2	92.5	48.0	0	0	35.3	33.0	39.4	44.1	51.7	48.0	53.1	53.0	54.5	52.1	52.9	54.0	44.7	43.7	42.9	35.9	33.5	35.5	28.6
Elect Roof & Stock Prep Sheeting	B9	955	40.50	76.3	92.5	32.0	0	0	60.4	58.1	64.5	61.2	68.8	65.1	66.2	66.1	67.6	63.2	64.0	65.1	58.8	57.8	57.0	56.0	53.6	55.6	50.6
Elect Roof & Stock Prep Sheeting	B9	957	243.00	84.1	92.5	32.0	0	0	68.1	65.8	72.2	68.9	76.5	72.8	73.9	73.8	75.3	70.9	71.7	72.8	66.5	65.5	64.7	63.7	61.3	63.3	58.3
Elect Roof & Stock Prep Sheeting	B9	958	472.50	90.1	95.6	32.0	0	0	74.1	71.8	78.2	74.9	82.5	78.8	79.9	79.8	81.3	76.9	77.7	78.8	72.5	71.5	70.7	69.7	67.3	69.3	64.3
Elect & Stock Prep East End	B9	960	86.25	62.5	92.5	48.0	0	0	35.6	33.3	39.7	44.4	52.0	48.3	53.4	53.3	54.8	52.4	53.2	54.3	45.0	44.0	43.2	36.2	33.8	35.8	28.8
Elect & Stock Prep East End Op lvl	B9	961	142.60	84.8	95.6	32.0	0	0	68.9	66.6	73.0	69.7	77.3	73.6	74.7	74.6	76.1	71.7	72.5	73.6	67.3	66.3	65.5	64.5	62.1	64.1	59.1
PV01/PM09 Fan07 Optiformer 1	Fans	920		111.5	0.0	0.0	0	0		96.5			102.6			103.1			103.5			105.7			103.9		
PV03/PM11 Optiformer 2	Fans	921		111.5	0.0	0.0	0	0		96.5			102.6			103.1			103.5			105.7			103.9		
PV02/PM10 Mist Collector	Fans	922		115.5	0.0	0.0	0	0		100.5			106.6			107.1			107.5			109.7			107.9		
Vacuum Blower Exhaust	Fans	923		96.0	0.0	0.0	0	0		77.8			85.0			86.5			91.1			83.4			91.9		
Fan 79/PV11/PM19 Winder Pulper	Fans	924		106.9	0.0	0.0	0	0		91.9			98.0			98.5			98.9			101.1			99.3		
PV06/PM14 Vacuum system Fan	Fans	925		96.0	0.0	0.0	0	0		44.2			57.3			64.9			75.6			80.9			95.2		

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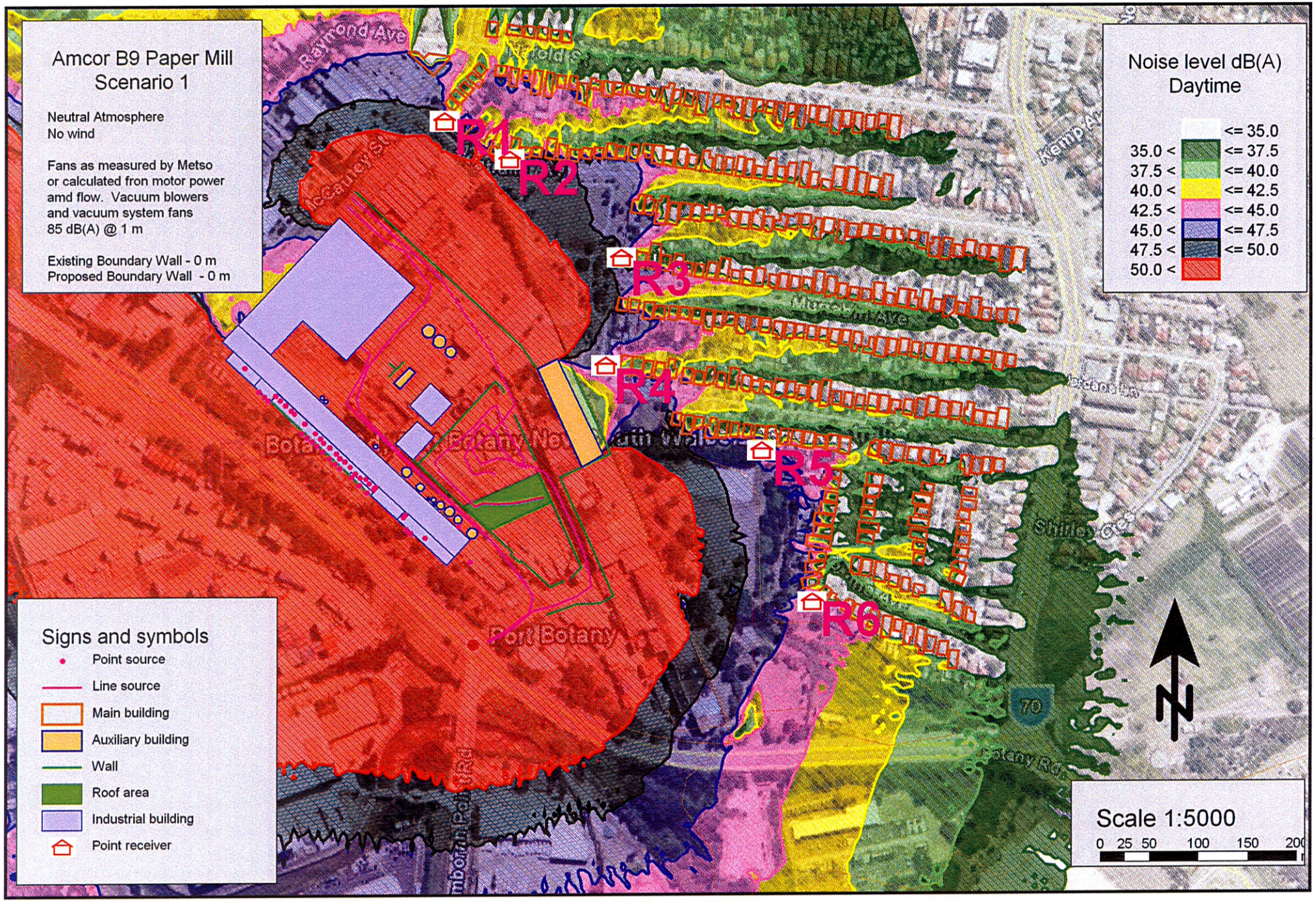
Source	Group	Obj ID	I or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
PV05/PM13 Vacuum system No 1	Fans	926		97.0	0.0	0.0	0	0		45.2			58.3			65.8			76.5			81.8			96.2		
Pulper Exhaust Fan	Fans	927		91.8	0.0	0.0	0	0		76.8			82.9			83.4			83.8			86.0			84.2		
Fan 44 - TwinRun Supply Air Fan	Fans	897		104.0	0.0	0.0	0	0		69.0			81.0			88.0			103.0			94.0			91.0		
Fan 42 - SymRun Plus Supply Air	Fans	898		102.1	0.0	0.0	0	0		69.0			82.0			90.0			98.0			97.0			94.0		
Fan 64 - SymRun Plus Supply Air	Fans	899		103.0	0.0	0.0	0	0		68.0			80.0			87.0			102.0			93.0			90.0		
Fan 74 - Hood Exhaust Air Fan 2	Fans	900		105.4	0.0	0.0	0	0		74.0			84.0			96.0			98.0			101.0			99.0		
Fan 52 - VacRoll Exhaust Air Fan 2	Fans	901		103.4	0.0	0.0	0	0		72.0			84.0			98.0			97.0			98.0			95.0		
Fan 38 - SymRun Plus Supply Air	Fans	902		105.0	0.0	0.0	0	0		73.0			85.0			93.0			101.0			100.0			97.0		
Fan 68 - Hood Exhaust Air Fan 1	Fans	903		102.7	0.0	0.0	0	0		72.0			85.0			90.0			96.0			99.0			95.0		
Fan 60 - Hood Supply Air Fan 1	Fans	904		105.0	0.0	0.0	0	0		73.0			85.0			93.0			101.0			100.0			97.0		
Fan 46 - VacRoll Exhaust Air Fan 1	Fans	905		103.4	0.0	0.0	0	0		72.0			84.0			98.0			97.0			98.0			95.0		
Fan 34 - SymRun Plus Supply Air	Fans	906		98.0	0.0	0.0	0	0		68.0			79.0			93.0			92.0			92.0			89.0		
Fan 32 - HiRun Supply Air Fan	Fans	907		107.1	0.0	0.0	0	0		73.0			86.0			94.0			104.0			101.0			99.0		
Fan 24 - PressRun Blow Box	Fans	908		96.3	0.0	0.0	0	0		64.0			76.0			84.0			92.0			91.0			89.0		
Fan 74 outlet - Hood Exhaust Air	Fans	909		115.0	0.0	0.0	0	0		86.2			95.2			101.2			114.2			104.2			100.2		
Fan 52 Outlet - VacRoll Exhaust	Fans	910		93.0	0.0	0.0	0	0		68.1			77.1			89.1			87.1			86.1			82.1		
Fan 68 Outlet - Hood Exhaust Air	Fans	911		88.2	0.0	0.0	0	0		57.3			70.3			75.3			81.3			84.3			81.3		
Fan 46 outlet - VacRoll Exhaust Air	Fans	912		93.0	0.0	0.0	0	0		68.1			77.1			89.1			87.1			86.1			82.1		
BV01 Exhaust	Fans	915		98.3	0.0	0.0	0	0		83.3			89.4			89.9			90.3			92.5			90.7		
BV02	Fans	916		98.3	0.0	0.0	0	0		83.3			89.4			89.9			90.3			92.5			90.7		
BV03 Exhaust (W.E Roof Area	Fans	917		98.3	0.0	0.0	0	0		83.3			89.4			89.9			90.3			92.5			90.7		
BV04 Exhaust (W.E Roof Area	Fans	918		98.3	0.0	0.0	0	0		83.3			89.4			89.9			90.3			92.5			90.7		
BV05 Stock Prep Exhaust	Fans	919		98.3	0.0	0.0	0	0		83.3			89.4			89.9			90.3			92.5			90.7		
BV01 fan casing	Fans	947		78.3	0.0	0.0	0	0		62.5			68.6			69.1			71.5			71.7			71.9		
BV02 Fan Casing	Fans	949		78.3	0.0	0.0	0	0		62.5			68.6			69.1			71.5			71.7			71.9		
BV03 Fan Casing	Fans	950		78.3	0.0	0.0	0	0		62.5			68.6			69.1			71.5			71.7			71.9		
BV04 Fan Casing	Fans	951		78.3	0.0	0.0	0	0		62.5			68.6			69.1			71.5			71.7			71.9		
BV05 Fan Casing	Fans	952		78.3	0.0	0.0	0	0		62.5			68.6			69.1			71.5			71.7			71.9		
Loader in Paper Yard	Loaders	230	437.91	105.5	0.0	0.0	0	0	62.2	65.1	69.2	82.3	78.3	92.6	97.7	85.1	86.7	87.9	94.8	92.4	93.9	94.3	95.0	97.6	92.5	91.5	90.8
Loader at Rejects area	Loaders	485		105.5	0.0	0.0	0	0	62.2	65.1	69.2	82.3	78.3	92.6	97.7	85.1	86.7	87.9	94.8	92.4	93.9	94.3	95.0	97.6	92.5	91.5	90.8
Transformer 1 B9 South	Transforme	256		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 2 B9 South	Transforme	257		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 3 B9 South	Transforme	258		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 4 B9 South	Transforme	259		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 5 B9 South	Transforme	260		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 6 B9 South	Transforme	261		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		

109169 Amcor Noise Model
Scen 1 Fans as calc or meas, no boundary walls, neutral

Source	Group	Obj ID	l or S	Lw	Li	R'w	KI	KT	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1,25 kHz	1,6 kHz	2 kHz	2,5 kHz	3,15 kHz
Transformer 7 B9 South	Transforme	262		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 8 B9 South	Transforme	263		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 9 B9 South	Transforme	264		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 10 B9 South	Transforme	265		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 11 B9 South	Transforme	266		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 12 B9 South	Transforme	267		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Transformer 13 B9 South	Transforme	268		55.0	0.0	0.0	0	0		31.4			43.5			46.0			51.4			48.6			44.8		
Product Trucks	Trucks	232	413.26	91.7	0.0	0.0	0	0	59.0	56.4	65.6	66.7	64.1	66.9	71.3	75.1	75.8	76.4	76.0	79.1	79.3	82.1	84.2	83.6	82.3	80.9	79.0
Trucks - starch, chemicals, solid	Trucks	233	604.60	93.3	0.0	0.0	0	0	60.6	58.0	67.2	68.3	65.7	68.5	72.9	76.7	77.4	78.0	77.6	80.7	80.9	83.7	85.8	85.2	83.9	82.5	80.6
Waste Paper Trucks	Trucks	269	667.91	93.7	0.0	0.0	0	0	61.1	58.5	67.7	68.8	66.2	69.0	73.4	77.2	77.9	78.5	78.1	81.2	81.4	84.2	86.3	85.7	84.4	83.0	81.1


Amcor B9 Paper Mill
Scenario 1
Neutral Atmosphere
No wind
Fans as measured by Metso or calculated fron motor power amd flow. Vacuum blowers and vacuum system fans 85 dB(A) @ 1 m
Existing Boundary Wall - 0 m
Proposed Boundary Wall - 0 m
Noise level dB(A)
Daytime
<= 35.0
35.0 < <= 37.5
37.5 < <= 40.0
40.0 < <= 42.5
42.5 < <= 45.0
45.0 < <= 47.5
47.5 < <= 50.0
50.0 <
R1
R2
R3
R4
R5
R6
Signs and symbols
Point source
Line source
Main building
Auxiliary building
Wall
Roof area
Industrial building
Point receiver
Port Botany
Scale 1:5000
0 25 50 100 150

Attachment 3: Predicted Noise Levels from All Plant – Certain fans with silencers, acoustic wall in place, no existing walls remaining in place

Scen 2 - fans as calc or meas., no exist, proposed 5m

Project description

Project title:	109169 Amcor Noise Model
Engineer:	Peter Eisenhuth, Anita Jo
Customer:	Balderstone for Amcor

Description:
Amcor's B9 paper machine and reorganised site

MGA coordinate system.
tecnical directory has a spreadsheet called "coordinate-transform.xls"
to convert from Amcor's coordinate system to MGA.

Run description

Calculation type:	Single Point Sound
Title:	Scen 2 - fans as calc or meas., no exist, proposed 5m
Run file:	Noname.runx
Result number:	5201
Calculation start:	14/12/2009 1:44:50 PM
Calculation end:	14/12/2009 1:45:53 PM
Calculation time:	00:08:922 [m:s:ms]
No. of points:	6
No. of calculated points:	6
Kernel version:	18/03/2008

Run parameters

Angle increment:	1.00 deg
Reflection depth:	1
Number of reflections:	1
Maximal search radius	5000
Weighting:	dB(A)

Calculation with side screening
Source side reflection precalculation enabled

Standards:

Industry:	Concawe	
Air absorption:	ISO 3891	
Limitation of screening loss:		
	single/multiple	20 dB /25 dB
Environment:		
	Air pressure	1013.25 mbar
	rel. Humidity	70 %
	Temperature	10 °C
	Pasquill Class	D
	Wind speed	0 m/s

Scen 2 - fans as calc or meas., no exist, proposed 5m

	Wind direction	worst case (always source to receiver)
Dissection parameters:		
	Distance to diameter factor	2
	Minimal Distance [m]	1 m
	Max. Difference GND+Diffractic	1 dB
	Max. No. of Iterations	4
Assessment:	Industrial Noise Policy	

Reflection of "own" facade is suppressed

Geometry data

RDGM0001.dgm	12/11/2009 9:16:54 AM
Scen 2 - fans as calc or meas., no exist, proposed 5m.sit	14/12/2009 1:29:20 PM
- contains:	
B9 Mezzanine Building.geo	14/12/2009 1:32:40 PM
B9.geo	14/12/2009 1:32:40 PM
Boiler House.geo	14/12/2009 1:32:40 PM
Boundary Wall - Proposed - 5m.geo	14/12/2009 1:29:18 PM
Car Park Wall.geo	14/12/2009 1:32:40 PM
Elevation Lines.geo	14/12/2009 1:32:42 PM
Exhausts for Internal Fans 70 deg calc & meas.geo	8/12/2009 2:10:46 PM
External Fans 70 deg calc & meas, blower 85@1.geo	14/12/2009 1:32:42 PM
No 7 Reel Store.geo	14/12/2009 1:32:42 PM
Off-site buildings.geo	14/12/2009 1:32:42 PM
Paper Yard Loader.geo	14/12/2009 1:32:42 PM
Product Store.geo	14/12/2009 1:32:42 PM
Product Trucks.geo	14/12/2009 1:32:42 PM
Receiver text.geo	3/12/2009 12:50:22 PM
Receivers.geo	14/12/2009 1:32:42 PM
Rejects Loader.geo	14/12/2009 1:32:42 PM
starch, cemicals & solid waste trucks.geo	14/12/2009 1:32:42 PM
Substation.geo	14/12/2009 1:32:42 PM
Tanks B9.geo	14/12/2009 1:32:42 PM
Transformers B9 South.geo	14/12/2009 1:32:42 PM
Waste Paper Trucks.geo	14/12/2009 1:32:42 PM
Waste Paper Yard Walls 5m.g	14/12/2009 1:32:42 PM
Water Treatment.geo	14/12/2009 1:32:42 PM

Scen 2 - fans as calc or meas., no exist, proposed 5m

Name	INP Day dB(A)	INP Evenin dB(A)	INP Night dB(A)	Lmax night dB(A)	
R1	45.7	45.1	45.1	46.6	
R2	45.2	44.7	44.6	48.9	
R3	45.4	44.9	44.8	50.3	
R4	42.0	40.9	41.0	46.2	
R5	42.2	41.8	39.0	44.1	
R6	42.8	42.4	38.6	45.5	

Scen 2 - fans as calc or meas., no exist, proposed 5m

Group	INP Day dB(A)	INP Evenin dB(A)	INP Night dB(A)	Lmax night dB(A)	
Name R1 Day 45.7 dB(A) Evening 45.1 dB(A) Night 45.1 dB(A) Lmax night 46.6 dB(A)					
B9	37.0	37.0	37.05		
Fans	43.1	43.1	43.15		
Loaders	36.8	36.8	36.23		46.56
Trucks	38.5	32.6	34.10		44.81
Transformers	-20.1	-20.1	-20.10		
Name R2 Day 45.2 dB(A) Evening 44.7 dB(A) Night 44.6 dB(A) Lmax night 48.9 dB(A)					
B9	37.1	37.1	37.05		
Fans	42.1	42.1	42.15		
Loaders	38.1	38.1	37.57		48.85
Trucks	37.3	30.8	32.53		44.98
Transformers	-20.5	-20.5	-20.49		
Name R3 Day 45.4 dB(A) Evening 44.9 dB(A) Night 44.8 dB(A) Lmax night 50.3 dB(A)					
B9	37.7	37.7	37.74		
Fans	41.6	41.6	41.64		
Loaders	39.6	39.6	39.06		50.29
Trucks	37.2	30.9	32.55		45.21
Transformers	-20.5	-20.5	-20.52		
Name R4 Day 42.0 dB(A) Evening 40.9 dB(A) Night 41.0 dB(A) Lmax night 46.2 dB(A)					
B9	31.3	31.3	31.27		
Fans	37.7	37.7	37.69		
Loaders	36.1	36.1	35.52		44.60
Trucks	36.8	30.7	32.25		46.24
Transformers	-18.2	-18.2	-18.21		
Name R5 Day 42.2 dB(A) Evening 41.8 dB(A) Night 39.0 dB(A) Lmax night 44.1 dB(A)					
B9	29.2	29.2	29.18		
Fans	36.8	36.8	36.76		
Loaders	39.5	39.5	31.99		44.12
Trucks	33.3	26.9	28.64		42.19
Transformers	-24.9	-24.9	-24.91		
Name R6 Day 42.8 dB(A) Evening 42.4 dB(A) Night 38.6 dB(A) Lmax night 45.5 dB(A)					
B9	27.3	27.3	27.30		
Fans	34.6	34.6	34.64		
Loaders	41.3	41.3	34.80		45.52
Trucks	33.8	27.3	28.99		42.02
Transformers	-26.5	-26.5	-26.45		

109169 Amcor Noise Model

Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
West Low Roof Area Dado Wall	B9	7.5	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
West Low Roof Area Ground Level Sheeting	B9	11.1	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9
West Low Roof Area Op Level Sheeting	B9	15.0	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8
West Ground Clad	B9	11.7	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9
West Ground Dado	B9	7.9	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3	-32.3
West Operating Clad	B9	20.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Low Roof Winder Dado	B9	7.5	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Low Roof Winder Operating Sheeting	B9	15.8	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7	89.7
Low Roof Winder Sheeting	B9	11.1	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
Low Roof Roof Winder	B9	18.0	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5
South Operating Winder Cladding	B9	24.0	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9	93.9
North Operating Roll Storage Cladding	B9	24.4	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2	-24.2
North Ground Roll Storage Masonry	B9	10.3	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1
North Operating Roll Storage Masonry	B9	16.4	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2
Low Roof Paper Rols Store Ground Sheetin	B9	11.0	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9
Low Roof Dado Paper Roll Store	B9	7.5	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
Low Roof Paper Roll Store Level 1 Shee	B9	15.8	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1
Low Roof Roof Roll Store	B9	18.0	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4	90.4
South Operating Paper Roll Storage Clad	B9	24.0	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
Dry End Elect Ground Paper Roll Storage	B9	10.0	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8
Dry End Elect Level 1 Paper Roll Storage	B9	16.8	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2
North Operating Winder Cladding	B9	24.8	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7	-22.7
North Ground Winder Masonry	B9	10.3	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9
North Operating Winder Masonry	B9	16.9	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1	70.1
Dry End Roof After dryer	B9	20.0	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6	70.6
Dry End Elect Level 1 Reeler	B9	16.8	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6	74.6
Dry End Elect Ground Reeler	B9	10.0	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7
South Operating Paper Roll Storage Clad	B9	25.0	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1	86.1
Dry End Roof Reeler	B9	20.0	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5
Dry End Elect Ground After Dryer	B9	10.0	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7
Dry End Elect Level 1 After Dryer	B9	16.8	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2	68.2
South Operating Reeler Clad	B9	25.0	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9	84.9
North Operating Paper Roll Storage Cladd	B9	25.2	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8	-27.8
North Ground Paper Roll Storage Masonry	B9	10.3	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1
North Operating Paper Roll Storage Mason	B9	17.2	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
Dry End Roof Paper roll storage	B9	20.0	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7

109169 Amcor Noise Model

Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
South Operating After Dryers West Clad	B9	25.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
North Operating Paper Roll Storage Cladd	B9	20.3	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8	86.8
North Ground Paper Roll Storage Dado	B9	7.5	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6	53.6
North Ground Paper Roll Storage Clad	B9	11.3	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9	74.9
North Operating Paper Roll Storage Cladd	B9	25.3	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9
North Operating Paper Roll Storage Mason	B9	17.3	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4
North Ground Paper Roll Storage Masonry	B9	10.3	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1
B9 Sth Dado After Dryer	B9	7.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
B9 Sth Level 1 After Dryer Sheeting	B9	17.3	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8	75.8
B9 Sth Ground After Dryer Sheeting	B9	11.1	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4	81.4
North Ground Reeler Masonry	B9	10.3	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0
North Operating Reeler Mason	B9	17.3	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
North Operating Reeler Cladd	B9	25.3	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9	-27.9
South Operating After Dryers East Clad	B9	25.5	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6	76.6
Mezzanine Roof After Dryer	B9	21.0	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
North Operating After Dryers Masonry	B9	17.3	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5
North Ground After Dryers Masonry	B9	10.3	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4	66.4
North Operating After Dryers Cladd	B9	25.3	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9
B9 Sth Ground Size Press Dado	B9	7.5	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9	57.9
B9 Sth Ground Size Press Sheeting	B9	11.0	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9	80.9
B9 Sth Level 1 Size Press Sheeting	B9	17.3	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
South Operating Size Press Cladding	B9	25.5	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6
Mezzanine Roof Size Press	B9	21.0	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
North Ground After Dryers Dado Concrete	B9	7.5	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8
North Ground After Dryers Cladding	B9	11.3	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2	79.2
North Operating After Dryers Cladding	B9	22.0	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
B9 Sth Ground Pre-Dryer End tx	B9	10.0	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8	66.8
B9 Sth Level 1 Pre-Dryer End Sheeting	B9	17.3	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9	72.9
South Operating Pre-Dryer End Cladding	B9	25.5	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6
North Operating Size Press Cladding	B9	22.0	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3
North Ground Size Press Dado	B9	7.5	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
North Ground Size Press Cladding	B9	11.3	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6
Mezzanine Roof Pre-dryer End	B9	21.0	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6	51.6
B9 Sth Ground Pre-Dryer Mid tx	B9	10.0	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9
B9 Sth Level 1 Pre-Dryer Mid Sheeting	B9	17.3	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6	75.6
North Ground Pre Dryer End Cladding	B9	11.3	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1	85.1

109169 Amcor Noise Model

Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
North Operating Pre-Dryer End Cladding	B9	22.0	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2	76.2
North Ground Pre Dryer End Dado	B9	7.5	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7	61.7
South Operating Pre-Dryer Mid Cladding	B9	25.5	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4
Mezzanine Roof Pre-dryer Mid	B9	21.0	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4
B9 Sth Ground Pre-Dryer Start tx	B9	10.0	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9
B9 Sth Level 1 Pre-Dryer Start sheeti	B9	17.3	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6	69.6
Blower Room West	B9	22.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0
Mezzanine Roof Pre-dryer Start	B9	21.0	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
South Operating Pre-Dryer Start West Cla	B9	25.5	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6
Blower Dado	B9	7.5	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6
Blower 100 mm concrete	B9	15.8	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9	81.9
North Ground Pre Dryer Mid Dado	B9	7.5	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7
North Ground Pre Dryer Mid Cladding	B9	11.3	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1
North Operating Pre-Dryer Mid Cladding	B9	22.0	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9	75.9
Blower 100 mm concrete roof	B9	23.0	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4	76.4
South Operating Pre-Dryer Start East Cla	B9	26.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5	74.5
Blower Room North	B9	22.0	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4	73.4
Mezzanine Roof Pre-dryer Start behind bl	B9	21.0	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6	52.6
South Operating Press Cladding	B9	26.5	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9	87.9
North Ground Pre Dryer Start Dado	B9	7.5	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
North Ground Pre Dryer Start Cladding	B9	11.3	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4	84.4
North Operating Pre-Dryer Start Cladding	B9	22.0	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5
Deaerator south former level 1 sheeting	B9	22.8	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1	93.1
Deaerator south former ground dado	B9	7.5	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1	62.1
Deaerator south former ground sheeting	B9	11.0	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6
Deaerator roof near former	B9	32.0	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7
North Ground Press Cladding	B9	11.3	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2
North Ground Press Dado	B9	7.5	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1
North Operating Press Cladding	B9	22.0	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5	88.5
Deaerator north top 2m	B9	31.0	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3	86.3
Deaerator south approach level 1 sheetin	B9	22.8	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2	84.2
Deaerator south approach ground sheetin	B9	11.0	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8	80.8
Deaerator south approach ground dado	B9	7.6	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Deaerator roof near approach	B9	32.0	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4	82.4
Elect Roof & Stock Prep Sheeting West of	B9	11.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3	76.3
Deaerator East level 1 sheeting	B9	22.8	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7	75.7

109169 Amcor Noise Model

Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
Deaerator East dado	B9	7.5	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8
Deaerator East ground sheeting	B9	11.1	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8	79.8
North Operating Former Cladding	B9	22.0	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2
North Ground Former Dado	B9	7.5	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9
North Ground Former Cladding	B9	11.3	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7
South Operating Approach Cladding	B9	25.5	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6	81.6
Wet End Elect Roof & Stock Prep Tx Wall	B9	11.3	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2	62.2
North Ground Approach Dado	B9	7.5	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3
North Ground Approach Cladding	B9	11.3	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2	82.2
North Operating Approach Cladding	B9	22.0	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4	86.4
Wet End Elect Roof & Stock Prep Dadao Wa	B9	7.5	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6
Elect Roof & Stock Prep Sheeting Op lvl	B9	17.5	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1	90.1
North Ground Approach RSD+Cladding	B9	10.3	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
Elect & Stock Prep East End Roof	B9	21.0	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2	92.2
Elect Roof & Stock Prep Sheeting East of	B9	11.3	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1
South Operating Stock Prep Cladding	B9	25.5	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
North Ground Stock Prep Dado East	B9	7.5	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2
North Ground Stock Prep Cladding East to	B9	11.3	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5	84.5
North Operating Stock Prep Cladding	B9	22.0	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
Elect & Stock Prep East End Ground	B9	10.3	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Elect & Stock Prep East End Op lvl	B9	14.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8	84.8
North Ground Stock Prep Cladding+RSD	B9	10.3	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2	77.2
East Ground Stock Prep Clad East to FEL	B9	11.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7	74.7
East Ground Stock Prep Dado West to FEL	B9	7.9	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
East Ground Stock Prep FEL Area	B9	10.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3	64.3
East Operating Stock Prep Clad	B9	20.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3
North Ground Stock Prep Dado West to RSD	B9	7.5	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9
North Ground Stock Prep Dado West to RSD	B9	11.3	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2	81.2
East Ground Stock Prep Dado East to FEL	B9	7.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9
East Ground Stock Prep Clad West to FEL	B9	11.7	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4
Fan 79/PV11/PM19 Winder Pulper meas	Fans	23.0	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9	106.9
Fan 44 - TwinRun Supply Air Fan AD casin	Fans	23.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0	104.0
Fan 42 - SymRun Plus Supply Air Fan 3 PD	Fans	23.0	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1	102.1
Fan 64 - SymRun Plus Supply Air Fan 3 PD	Fans	23.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0	103.0
Fan 74 - Hood Exhaust Air Fan 2 AD **	Fans	23.0	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4	105.4
Fan 74 outlet - Hood Exhaust Air Fan 2 A	Fans	26.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0	115.0

109169 Amcor Noise Model

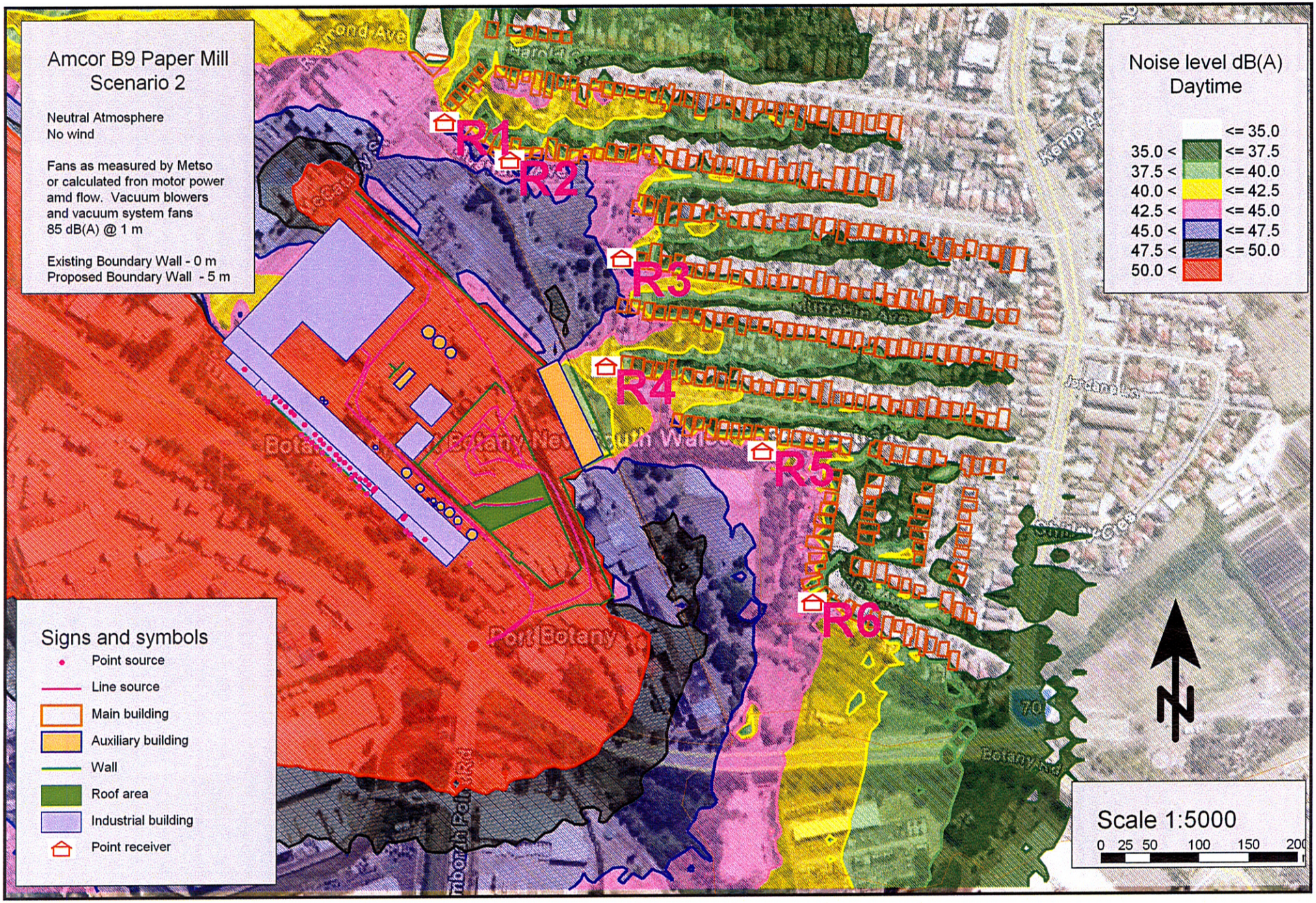
Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
BV01 Exhaust	Fans	26.0	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
BV01 fan casing	Fans	23.0	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Fan 52 Outlet - VacRoll Exhaust Air Fan	Fans	26.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0
Fan 52 - VacRoll Exhaust Air Fan 2 PD Ca	Fans	23.0	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4
Fan 38 - SymRun Plus Supply Air Fan 2 PD	Fans	23.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0
Fan 68 Outlet - Hood Exhaust Air Fan 1 m	Fans	26.0	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2
Fan 68 - Hood Exhaust Air Fan 1 PD casin	Fans	23.0	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7	102.7
Fan 60 - Hood Supply Air Fan 1 PD casing	Fans	23.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0
Fan 46 outlet - VacRoll Exhaust Air Fan	Fans	26.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0
Fan 46 - VacRoll Exhaust Air Fan 1 PD ca	Fans	23.0	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4	103.4
BV02	Fans	28.0	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
BV02 Fan Casing	Fans	25.0	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Fan 34 - SymRun Plus Supply Air Fan 1 PD	Fans	23.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0
BV03 Exhaust (W.E Roof Area Exhaust)	Fans	28.0	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
BV03 Fan Casing	Fans	25.0	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Fan 32 - HiRun Supply Air Fan casing	Fans	23.0	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1	107.1
Vacuum Blower Exhaust	Fans	26.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
BV04 Fan Casing	Fans	25.0	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
BV04 Exhaust (W.E Roof Area Exhaust)	Fans	28.0	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
Fan 24 - PressRun Blow Box Supply Air Fa	Fans	23.0	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3	96.3
PV02/PM10 Mist Collector	Fans	26.0	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5
PV03/PM11 Optiformer 2	Fans	26.0	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5
PV01/PM09 Fan07 Optiformer 1	Fans	26.0	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5	111.5
PV06/PM14 Vacuum system Fan No 2	Fans	26.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
PV05/PM13 Vacuum system No 1 Fan	Fans	26.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0
BV05 Stock Prep Exhaust	Fans	26.0	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3
BV05 Fan Casing	Fans	23.0	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3
Pulper Exhaust Fan	Fans	35.0	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8	91.8
Loader at Rejects area	Loader	8.4	105.5							105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5
Loader in Paper Yard	Loader	9.4		105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5	105.5
Transformer 1 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 2 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 3 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 4 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 5 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 6 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0

109169 Amcor Noise Model

Hourly sound power level in dB(A) - Scen 2 - fans as calc or meas., no exist, proposed 5m

Source	Group	Z	00-01 AM	01-02 AM	02-03 AM	03-04 AM	04-05 AM	05-06 AM	06-07 AM	07-08 AM	08-09 AM	09-10 AM	10-11 AM	11-12 AM	12-01 PM	01-02 PM	02-03 PM	03-04 PM	04-05 PM	05-06 PM	06-07 PM	07-08 PM	08-09 PM
Transformer 7 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 8 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 9 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 10 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 11 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 12 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Transformer 13 B9 South	Transf	8.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Trucks - starch, chemicals, solid waste	Trucks	6.5							93.3	96.3	93.3	96.3	93.3	96.3	93.3	96.3	93.3	96.3	93.3	93.3			
Product Trucks	Trucks	8.3							96.4	94.7	96.4	96.4	94.7	96.4	96.4	96.4	94.7	96.4	96.4	94.7			
Waste Paper Trucks	Trucks	9.1	98.5	98.5	98.5	98.5	98.5	98.5	108.1	107.7	107.2	106.8	106.5	106.1	106.1	106.1	104.5	102.8	102.2	100.7	99.8	99.8	99.8


Amcor B9 Paper Mill
Scenario 2
Neutral Atmosphere
No wind
Fans as measured by Metso or calculated fron motor power amd flow. Vacuum blowers and vacuum system fans 85 dB(A) @ 1 m
Existing Boundary Wall - 0 m
Proposed Boundary Wall - 5 m
R1
R2
R3
R4
R5
R6
Noise level dB(A)
Daytime
<= 35.0
35.0 < <= 37.5
37.5 < <= 40.0
40.0 < <= 42.5
42.5 < <= 45.0
45.0 < <= 47.5
47.5 < <= 50.0
50.0 <
Signs and symbols
Point source
Line source
Main building
Auxiliary building
Wall
Roof area
Industrial building
Point receiver
Port Botany
Scale 1:5000
0 25 50 100 150 200
N

Appendix D Road Traffic Noise Assessment

AMCOR New Paper Mill
Project B9 Modification No.2

MCCAULEY STREET -

TRAFFIC NOISE ASSESSMENT

- Final
- 14 January 2010

AMCOR New Paper Mill
Project B9 Modification No.2

MCCAULEY STREET -

TRAFFIC NOISE ASSESSMENT

- Final
- 14 January 2010

Sinclair Knight Merz
ABN 37 001 024 095
710 Hunter Street
Newcastle West NSW 2302 Australia
Postal Address
PO Box 2147 Dangar NSW 2309 Australia
Tel: +61 2 4979 2600
Fax: +61 2 4979 2666
Web: www.skmconsulting.com

Contents

1. Introduction

1.1. General Introduction

AMCOR Packaging (Australia) Pty Ltd currently operates a waste paper recycling facility at Botany which receives and processes approximately 40% of the waste paper collected in NSW. All paper entering and leaving this site does so via road transport.

In July 2007, AMCOR received approval (Application No.05_120) from the Minister for Planning for a New Paper Mill which included the replacement of two existing paper machines with a new paper machine. This upgrade would provide a 38% increase in processing capacity.

Since this approval was granted, further modifications have been identified to ensure that the mill will continue to operate safely, efficiently and with minimal environmental impact. These changes include:

- Changes to the site layout;
- Provision of a new shared access on to McCauley Street at Raymond Avenue;
- The use of McCauley Street by AMCOR's heavy and commercial vehicles (including B-Doubles) to exit the site;
- Subdivision of excess land to create two new development precincts – the McCauley Street Precinct and Botany Road Precinct.

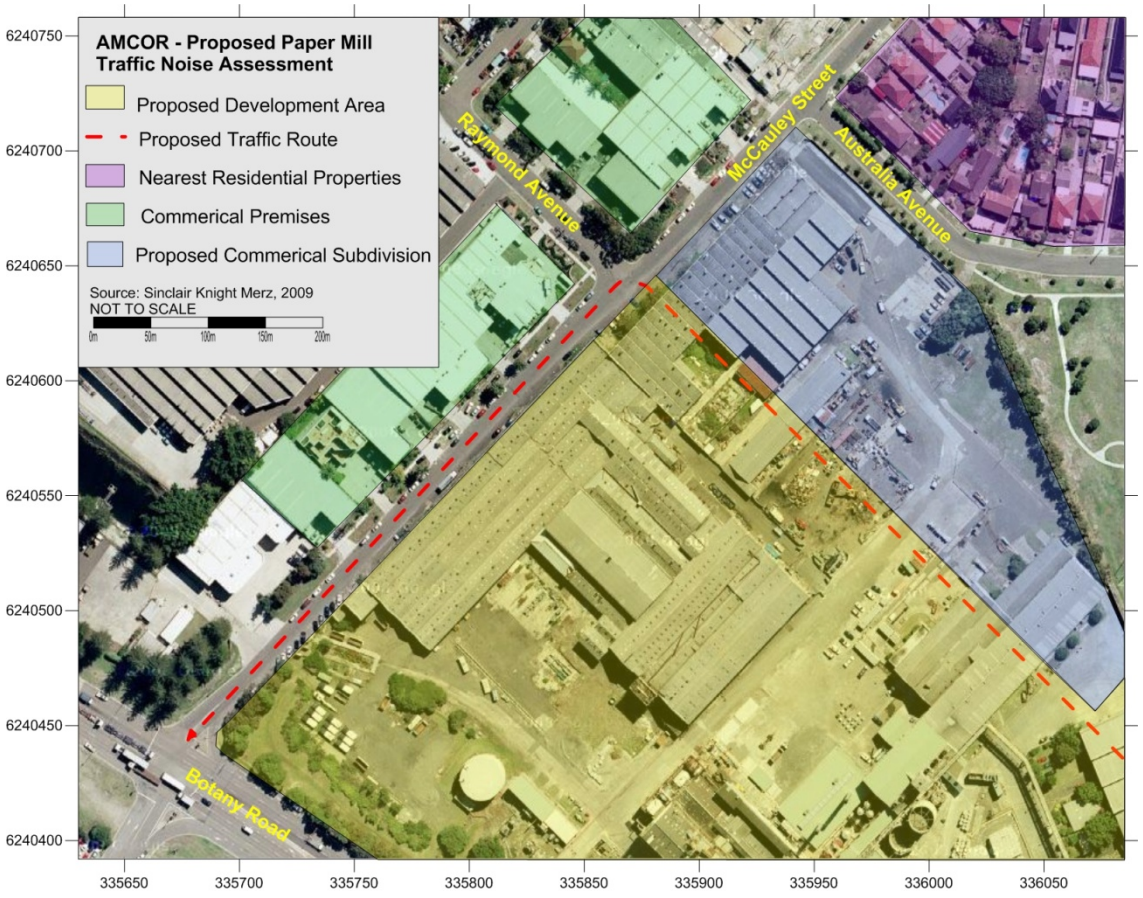
Currently the main route for traffic entering and exiting the existing AMCOR site is via Botany Road; however the use of the McCauley Street exit may result in increased traffic noise impacts at residential receivers north of the site.

This report has been prepared to consider potential noise impacts occurring as a result of the proposed traffic changes in McCauley Street, and includes the following sections:

- A description of the existing noise environment in the area surrounding the Project site;
- Consideration of legislation and noise limits as contained in the Environmental Criteria for Road and Traffic Noise (ECTRN);
- Assessment of likely operational traffic noise levels at nearby residential receivers; and
- Recommendations for noise mitigation where required.

A plan showing the McCauley Street exit and nearby receivers is included as **Figure 1-1**.

- **Figure 1-1 AMCOR Proposed On Site Traffic Route (McCauley Street Exit)**



2. Existing Environment

2.1. Sensitive receivers

As can be seen from **Figure 1-1** the nearest residential receivers are located approximately 130m to the north east of the site along McCauley Street, to the north of the intersection with Australia Avenue. There are no residential receivers adjacent to the proposed vehicle route in McCauley Street. The buildings adjacent to the road in this area are predominantly commercial premises.

2.2. Ambient Noise Levels

Botany Road runs along the southern boundary of the AMCOR site. Traffic flows on this road during the day and the night time are a significant source of noise in the area. The majority of the traffic movements are heavy vehicles related to the port activities. In addition to the impacts of traffic noise, there are numerous industrial and commercial sites in the area. These premises have vehicle movements and other onsite activities which also contribute to the local noise environment in the vicinity of the AMCOR site, and in the wider area surrounding the site.

3. Road Traffic Noise Criteria

The DECCW's *Environmental Criteria for Road Traffic Noise* (ECRTN) establishes criteria that define acceptable traffic noise levels for different types of developments. McCauley Street has been identified as a collector road in accordance with this guideline. In this instance, the following criterion from the ECRTN would apply for *'Landuse developments with the potential to create additional traffic on collector roads'* (EPA, 1999):

- Day 7:00 - 22:00 L_{Aeq}(1hr) 60 dB(A)
- Night 22:00 – 7:00 L_{Aeq}(1hr) 55 dB(A)

Where feasible and reasonable, noise levels should be reduced to meet the noise criteria via judicious design and construction of the development.

The DECCW recognises that it is not always possible to implement reasonable and feasible noise control measures to comply with the external noise levels. In these cases, it is recommended that the internal noise levels be designed to a level 10 dB(A) below the relevant external objectives (as detailed in **Table 3-1** of the ECTRN), which in this case would equate to 55dB(A) during daytime hours when measured in living areas, and 45 dB(A) at night when measured in bedrooms.

The DECCW and RTA accept that for standard buildings, there is a 10 dB(A) noise reduction through the facade of a dwelling when the windows are open for ventilation purposes. When the windows are closed, the noise reduction increases to at least 20 dB(A) with standard windows. When acoustically rated windows are present, the noise reduction may increase to around 30 dB(A).

In the event that the internal noise levels cannot be achieved with the "windows open" and the windows need to be closed as a means of noise control, the Building Code requires that alternative method of ventilation would need to be installed.

4. Road Traffic Noise Assessment

This section of the report provides an assessment of increased traffic on McCauley Street as a result of AMCOR's development of the site. This includes the operation of the proposed Materials Recycling Facility as well as the New Paper Mill– but does not include any assessment of increased traffic from the McCauley Street Precinct. As the future development of the McCauley Street Precinct is unknown at this stage, and would be subject to a separate development application and assessment process, traffic from the McCauley Street Precinct was not included. It also should be noted that development of the McCauley Street Precinct is likely include buildings and possibly other noise mitigation measures to reduce impacts on nearby residents. However as the traffic from the McCauley Street Precinct is not being considered, any noise mitigation from potential buildings was also not considered.

Road traffic noise calculations used the UK's Department of Environment, *Calculation of Road Traffic Noise* (CORTN) algorithms. Both the DECCW and RTA support this methodology. The modelled scenario assesses the potential noise impacts as vehicles accelerate out of the proposed exit on McCauley Street located opposite Raymond Avenue, as it is expected that this is where maximum noise impacts associated with the project may occur. Anticipated traffic data associated with AMCOR's activities on site was supplied by AMCOR. In order for a conservative estimate of noise impacts, it has been assumed that all traffic will exit through the exit opposite Raymond Avenue, although it is anticipated that Finished Product vehicles will exit the site via a new exit further south along McCauley Street (and further away from residential areas). **Table 1** lists the key input parameters used in the model to predict the night-time emissions for a number of scenarios.

- **Table 1 Summary of Modelling Inputs**

Input Variable	Data Source Notes
Traffic mix and volumes	Peak hour counts for McCauley Street; Estimates of vehicle movements generated by AMCOR
Topography	Not included
Ground surface type	Hard
Height of Sources	1m (Light Vehicle engines) and 4.0m (Heavy Vehicle exhausts)
Height of receivers	1.5 m above ground terrain
Traffic Speed	20km/hr (Light Vehicles), 10km/hr (Heavy Vehicles)
Attenuation due to building structures	Not included
Facade Reflection	Not included
Modelled Situation	All vehicles accelerating out of exit opposite Raymond Avenue
Sound Power Levels	98dB(A) Light Vehicles, 106dB(A) Heavy Vehicles*

* Sourced from internal SKM database and based on previous measurements

The CoRTN method predicts the LA_{10} (18hr) and the LA_{10} (1hr) noise levels at a receiver location based on the parameters listed in **Table 1**. To allow assessment against the NSW criteria, the 15 hour and 9 hour traffic numbers are modified so that the LA_{10} (18hr) and LA_{10} (1hr) model output are representative of the LAeq (15hr) and LAeq (1hr) noise levels. The results are then modified by the relationship, LA_{10} (period) = LA_{eq} (period) + 3 dB(A), to predict the LA_{eq} (15hr) and LA_{eq} (9hr) noise levels. Both the DECCW and RTA support the use of the CoRTN algorithms and the correction to LA_{eq} values.

Peak hour traffic volumes for traffic flows on McCauley Street have been used to generate the AADT values and are presented in **Table 2**.

- **Table 2 McCauley Street Traffic Data**

Period	Light Vehicles	Heavy Vehicles
Day (7:00 – 22:00)	1099	471
Night (22:00 – 7:00)	243	104

Predicted traffic levels generated by AMCOR in McCauley Street are detailed in **Table 3**.

- **Table 3 McCauley Street Traffic Data**

Period	Light Vehicles	Heavy Vehicles
Day (7:00 – 22:00)	161	255
Night (22:00 – 7:00)	14	56

4.1. Predicted Noise Levels

Road traffic noise levels have been predicted at the nearest residential receiver located at the intersection of McCauley Street and Australia Avenue. These results are presented in **Table 4**.

- **Table 4 Modelled Traffic Noise – No Mitigation**

Location		Daytime Noise Levels – L_{Aeq}(1hr) dB(A)		Night Time Noise Levels – L_{Aeq}(1hr) dB(A)	
	Distance (m)	ECTRN Criteria	Predicted Noise Levels	ECTRN Criteria	Predicted Noise Levels
Residential	130	60	**53**	55	**51**

The results show that without consideration of potential screening effects of buildings on the McCauley St Precinct , day and night-time road traffic noise impacts are expected to comply with the ECTRN criteria during day and night time hours at the nearest residential location.

5. Recommendations

Given that noise levels as a result of AMCOR traffic exiting onto McCauley Street exit are not anticipated to exceed RTA road noise criteria, mitigation options are not considered necessary. However general traffic noise management techniques such as those outlined below should be incorporated into site procedures where it is considered reasonable and feasible, in order that noise impacts are minimised for nearby receivers.

- Truck movements would be restricted to the routes outlined in the Traffic Management Plan.
- Loading and unloading activities should be carried out during daytime hours wherever it is consider reasonable and feasible to do so.
- If traffic movements differ substantially from those outlined in **Table 3** of this report, further assessment of traffic noise will be required.
- Where noise complaints are received, these will be taken seriously, and dealt with promptly.
- Where it has been identified as necessary, noise monitoring may be undertaken in response to community complaints to confirm the results of operational and traffic noise assessments.

6. Conclusion

Sinclair Knight Merz was commissioned to undertake a supplementary assessment of road traffic noise impacts on McCauley Street associated with the proposed New Paper Mill and MRF.

The assessment considered potential noise impacts at the nearest residential receivers as a result of the acceleration of heavy and light vehicles out of the northern site exit on McCauley Road. This assessment has shown that noise levels at residential receivers located on McCauley Street are not likely to exceed RTA road noise criteria.

It is also expected that with the development of McCauley Street Precinct , the screening provided by new buildings will further reduce noise generated by AMCOR site traffic at these receiver locations.

Although traffic noise is anticipated to comply with noise criteria, traffic management recommendations have been made. Where it is considered reasonable and feasible, these should be incorporated into the site operating procedures to further reduce traffic noise impacts on nearby residential receivers.

7. References

Environmental Protection Authority (1999). *Environmental Criteria for Road Traffic Noise.*

Council of Standards Australia (1989). *Australian Standards 3671 – 1989, Acoustics – Road Traffic Noise Intrusion – Building Siting and Construction.*

Council of Standards Australia (1989). *Australian Standards 1055, Acoustics –Description and Measurement of Environmental Noise) Part 3, Appendix A*

Sinclair Knight Merz (2009). *New Paper Mill – Project B9 Modification No.2, Traffic and Access Assessment.*

Appendix E Odour Assessment

FINAL ODOUR ASSESSMENT REPORT
FOR AMCOR PAPER PTY LTD
MATRAVILLE, NSW

Prepared for: Brian Batchelor, Process and Technology Engineer, AMCOR PAPER Pty Ltd

Prepared by: Filbert Hidayat, Environmental Engineer
Gusni Melington, Senior Environmental Engineer
R T Benbow, Principal Consultant
BENBOW ENVIRONMENTAL
North Parramatta NSW

Report No: 109170 Final Report v3
January 2010
(Released: 19 January 2010)

Benbow
ENVIRONMENTAL

Engineering a Sustainable Future for Our Environment

Head office: 13 Daking Street North Parramatta NSW 2151 AUSTRALIA
Tel: 61 2 9890 5099 Fax: 61 2 9890 5399
BE Australia: Wollongong NSW, Taree NSW, Calamvale QLD
BE Asia: Causeway Bay, Hong Kong
Email: admin@benbowenviro.com.au
Visit our website at: www.benbowenviro.com.au

EXECUTIVE SUMMARY

An odour impact assessment for the revised location of the ventilation exhaust stack outlets has been completed using the industry standard air dispersion model CALPUFF.

The odour ground level criterion of 6 Odour Units adopted for the B9 Project will be satisfied at all residential receivers.

The air dispersion modelling was used to evaluate several available scenarios and has found that the location of the exhaust outlets on the south side of the paper machine building will benefit noise control, the appearance of the building from the residential areas and also aid in improved atmospheric dispersion.

The sensitivity of the residents to odour as a potential issue has been considered in the site layout and specifically in the control of where air discharges would be located.

The site will have a number of odour control safeguards designed into the facility to ensure odour will not have annoying characteristics or be at a level that would detract from the existing amenity of the residential area.

The B9 plant and its associated activities will be able to operate at the current acceptable levels of odour from the site.

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TABLES PAGE

FIGURES PAGE

ATTACHMENTS

Attachment 1: Sample of CALPUFF v7.3 software output, Scenario 1 –Individual Stacks

1. INTRODUCTION

Benbow Environmental was commissioned by AMCOR PAPER PTY LTD (AMCOR) to provide an assessment of Odour Impact for the proposed site upgrade in Matraville – the B9 Project. The proposed development would involve decommissioning the two current paper mills that have been operating for more than 40 years on a site that has been involved with paper manufacture for over 100 years. The B9 Project involves building a state-of-the-art paper recycling mill along the south-western side of the plant, adjoining Botany Road.

The state-of-the-art technology would improve the energy and process efficiency and increase the annual production rate. The new facility would also incorporate improved environmental controls to minimise the potential odour exposure at the surrounding sensitive receptors to a level that complies with current regulations and guidelines. The production rates would increase from 250,000 tonnes per year to 345,000 tonnes per year, whilst the odour levels are set to be reduced significantly.

1.1 SCOPE

This odour assessment has been limited to the following:

- A review of the proposed site operations;
- Modelling of the proposed operation of the paper mill to determine potential odour levels at the nearest potentially affected sensitive receivers to the site;
- An assessment of the predicted levels of odour against standards established by relevant legislation and guidelines; and
- The compilation of a report containing concise statements of potential impact.

To aid in the review of this report, supporting documentation has been included as Attachments.

2. SITE IDENTIFICATION

A brief outline of the subject site follows.

2.1 SITE LOCATION

The subject site is located at 1891 Botany Road, Matraville, NSW, 2036. The site is located within the Port Botany Industrial Area. A diagram of the site location (in its regional context) has been provided as Figure 2-1.

To the north-west lie industrial warehouses along McCauley Street. The Port Botany Industrial areas continue to the south west to the south east of the site boundary and on the opposite side of Botany Road. Residential areas span from the north to the north-west and north-east boundaries of the site.

2.2 SITE DESCRIPTION

AMCOR occupies a semi-triangle shaped block of land, where the north-west site boundary adjoins with McCauley Street. The northern site boundary is adjacent to Australia Avenue. The boundary continues to the east where the site borders a public park.

The south-east corner of the site coincides with Botany road. Along the northern boundary on Australia Avenue is the residential area of Matraville. These are the closest residences which are considered as the sensitive receptors that could potentially be affected by odour emissions from the proposed site activities.

2.3 TERRAIN

The nature of the area is relatively flat, however for the purpose of model accuracy, terrain elevations were included in the model. Terrain was acquired by digitally tracing the elevation lines of the topography map from the Department of Lands website using the SoundPlan 6.5 software. The data was then incorporated into the air dispersion modelling software – CALPUFF.

Figure 2-1: Location of Site in Local Context

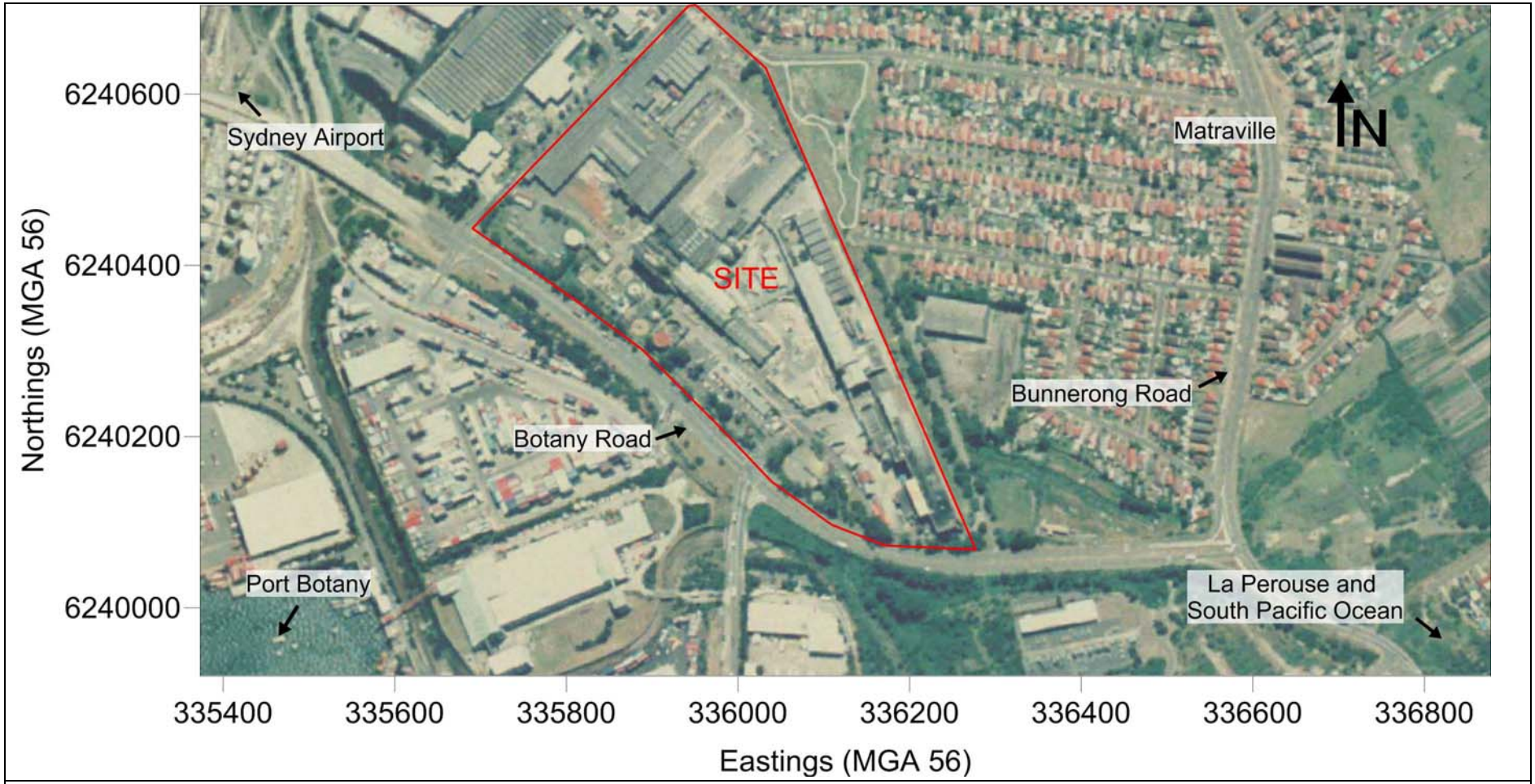


Image Source: Department of Lands © 2008 – SIX Portal - www.lands.nsw.gov.au

2.4 PROPOSED SITE LAYOUT

The proposed site layout involves constructing the B9 paper mill on the south west area of the site, parallel to Botany Road.

The stock preparation area will be located on the eastern end of the paper mill building. This is the most significant change to the site layout that has required odour to be re-assessed. The existing B7 and B8 mills will be decommissioned, retaining only the reel store building of the B7 mill. As the result, odour emissions from the B7 and B8 paper mills will cease.

The B9 paper mill and its associated facilities will be designed and constructed to the world's best practice and therefore it is anticipated that odour source strength would be reduced in comparison to the odour levels from the existing mills, B7 and B8.

Since the development consent was approved, the location of ventilation exhaust stack outlets and heights had been revised to implement a number of environmental improvements to the site layout and ensure compliance to odour levels.

The original odour assessment involved ventilation exhaust ducts being located above the roof of the B9 paper machine building. In this revised odour study, an alternative location above the southern edge of the roof line of the B9 building has been recommended due to advantages that were identified which have reduced the level of odour predicted at nearest receptors.

This study has therefore examined the predicted odour levels of this revised site layout with the absence of the existing mills and compares the results of the original site layout.

Figure 2-2: Proposed Site Layout

Image Source: Department of Lands © 2008 – SIX Portal - www.lands.nsw.gov.au

2.5 ADJACENT LAND USE

The subject site is surrounded by residential areas to the north, north-east and east, with the closest residence located approximately 30 m away from the northern site boundary. A list of the nearest residential dwellings R1-R6 are listed in Table 2-1 and are shown in Figure 2-3.

Table 2-1: Sensitive Receptors

Receptors	Direction	Distances to Closest Site Boundaries (m)
R1	North	110
R2	North	115
R3	North-East	105
R4	North-East	35
R5	East	165
R6	East	210

The industrial area of Port Botany borders the site on the north-west, west, south-west, south and south-east. Sydney Airport is located 4 km away to the north-west of the site. Directly to the south-west and south, lies Botany Bay.

Recently, there have been no odour complaints from the operations of the AMCOR site. There has been a past history of complaints associated with specific activities of the site, mainly arising from the past operation of the waste water treatment processes.

2.6 FUTURE SUB-DIVISION

AMCOR plans to sub-divide the land that it currently resides on. This is shown as Lot 1 and Lot 3 in Figure 2-4.

Figure 2-3: Nearest Sensitive Receptors

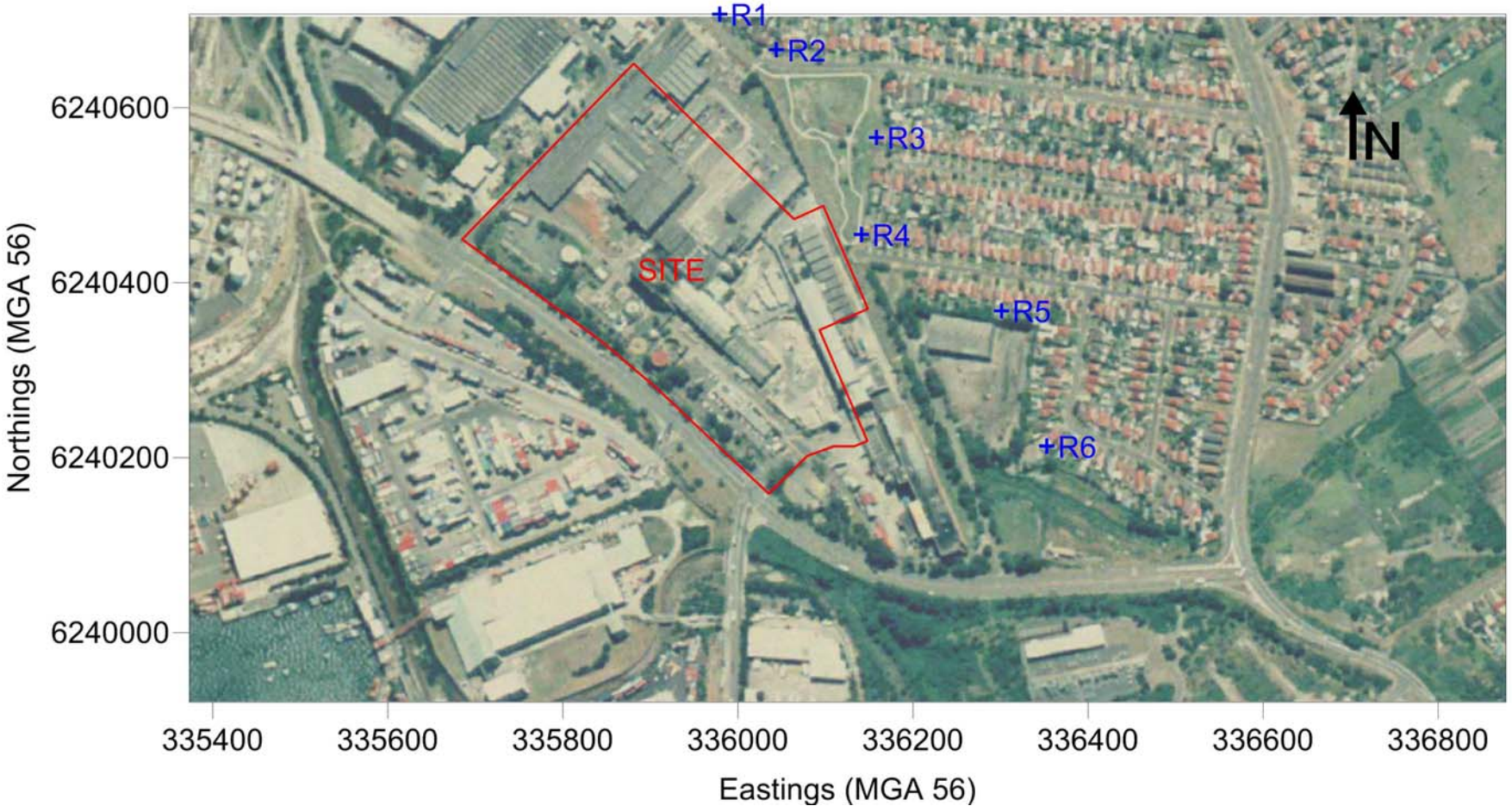


Image Source: Department of Lands © 2008 – SIX Portal - www.lands.nsw.gov.au

Figure 2-4: Future Subdivision of AMCOR

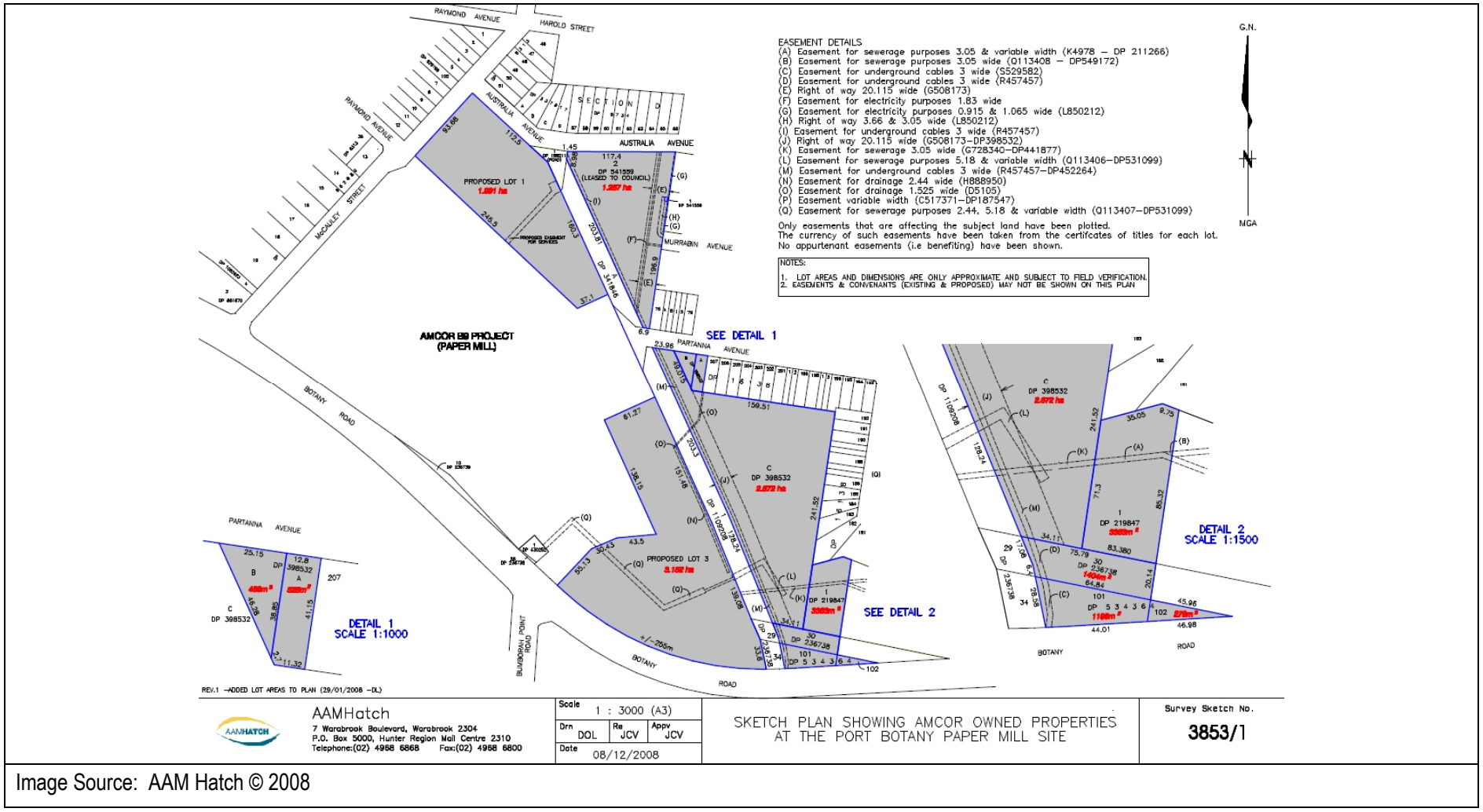


Image Source: AAM Hatch © 2008

3. DISPERSION METEOROLOGY

3.1 DISPERSION METEOROLOGY – SITE REPRESENTATIVE DATA

There is one weather monitoring station located in the region of the subject site which is the Sydney Airport AWS operated by the Bureau of Meteorology (BOM). The monitoring station at Sydney Airport is located approximately 4 km to the north-east from the subject site. Weather conditions at this monitoring station are logged every half an hour, however it is not considered to be an ideal station to entirely represent the paper mill site's meteorological conditions given the nature of the immediate area being a major airport. Thus a prognostic simulation program of *TAPM* (The Air Pollution Modelling) was subsequently used to generate a synthetic meteorological data file specific for the subject area.

TAPM is a three dimensional meteorological and air pollution model developed by the CSIRO Division of Atmospheric Research. TAPM uses databases of terrain, vegetation, soil type, sea surface temperature and synoptic-scale meteorological analysis for Australia. The New South Wales Department of Environmental, Climate Change and Water guidelines of the Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales (2005) allows the use of prognostic meteorological models to be used for generating meteorological data for areas where neither site-specific nor site-representative meteorological data are available.

A site-representative meteorological data file was generated for Port Botany for the year 2007 with TAPM. The TAPM meteorological file contained values for temperature, wind speed, wind direction, mixing height, stability class and the sigma theta parameter, as well as upper air meteorological data that is required for the CALPUFF advanced modelling software. To ensure that the TAPM-generated file was as accurate as possible for the area, meteorological data from the Sydney Airport monitoring station was used in the input file for TAPM to help guide its calculations. This was necessary as TAPM-generated files are often perceived to lack those conditions for which air dispersion is poorest and thus important conditions for determining the worst potential impact on sensitive receptors.

Seasonal wind rose plots for the site-representative meteorological file have been included in the following section as Figure 3-1 and Figure 3-2.

3.1.1 Atmospheric Stability

The "stability" of the atmosphere is a classification used to describe the structure of the atmosphere in terms of temperature, specifically, how temperature changes in the atmosphere with altitude. Classification is often done according to the Pasquill-Gifford classification system that consists of six stability class groups, shown in Table 3-1. The class "A" describes an atmosphere where the air is well-mixed and there is little hindrance of dispersion into the atmosphere. At the other end of the scale is class "F", which describes conditions under which temperature inversions would occur, where winds are calm or absent and air close to the earth's surface cannot rise into the atmosphere due to the presence of warmer air layers above. The classes in between A and F indicate changing degrees of stability due to variations in temperature in the atmosphere.

Table 3-1: Pasquill-Gifford Stability Class System	
Stability Class	Description
A	Extremely Unstable
B	Unstable
C	Slightly Unstable
D	Neutral
E	Slightly Stable
F	Very Stable

Worst case dispersion conditions from the site would be best associated with F-class stability conditions – generally associated with still/light winds and clear skies during the night time or early morning period (stable conditions). Analysis of the referenced site-specific meteorological data indicates the F-class dispersion conditions were present for approximately 0.7% of the time for the Port Botany 2007 file, suggesting a very low risk of enhanced impacts from the odour emissions due to this weather condition.

Looking at Table 3-3, it can be seen that stability class frequencies in the meteorological file have not been biased by TAPM towards giving enhanced dispersive conditions. Stability class D is the most frequent followed by stability class E, with an occurrence of 30.8% and 25.8% respectively. Stability classes A, B, C, which offered the best dispersion conditions, occur with frequencies of 13.7%, 17.9% and 11.1% respectively.

The stability class data are reinforced by the fact that stability class D occurs during Sunrise and Sunset, and is a neutral condition in terms of winds and convective mixing.

Table 3-2: Wind Direction/Stability Class Frequency Distribution (Count) for TAPM Generated Meteorological Data Input File – Port Botany (2007)

Frequency Distribution (Count)							
Direction (Blowing From)	Stability Class						
	A	B	C	D	E	F	Total
N	87	61	38	132	246	11	575
NE	200	476	173	577	552	7	1,985
E	305	315	59	284	397	4	1,364
SE	202	237	159	510	302	0	1,410
S	120	136	173	295	87	5	816
SW	92	67	78	144	60	1	442
W	106	144	193	469	231	9	1,152
NW	85	130	102	290	387	22	1,016
Total	1,197	1,566	975	2,701	2,262	59	8,760

Table 3-3: Wind Direction/Stability Class Frequency Distribution (Percentage) for TAPM Generated Meteorological Data Input File – Port Botany (2007)

Frequency Distribution (Percentage %)							
Direction (Blowing From)	Stability Class						
	A	B	C	D	E	F	Total
N	0.99	0.70	0.43	1.51	2.81	0.13	6.56
NE	2.28	5.43	1.97	6.59	6.30	0.08	22.66
E	3.48	3.60	0.67	3.24	4.53	0.05	15.57
SE	2.31	2.71	1.82	5.82	3.45	0.00	16.10
S	1.37	1.55	1.97	3.37	0.99	0.06	9.32
SW	1.05	0.76	0.89	1.64	0.68	0.01	5.05
W	1.21	1.64	2.20	5.35	2.64	0.10	13.15
NW	0.97	1.48	1.16	3.31	4.42	0.25	11.60
Total	13.66	17.88	11.13	30.83	25.82	0.67	100.00

3.1.2 Wind Rose Plots

Wind rose plots show the direction from which the wind is coming with triangles known as "petals". The petals of the plots in the figure summarise wind direction data into the 8 compass directions e.g. north, north-east, east, south-east.

The length of the triangles, or "petals", indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class.

The proportion of time for which wind speed is less than speeds in the first class (i.e. 0.5 $m.s^{-1}$), when speed is negligible, is referred to as calm hours or "calms". Calms are not shown on a wind rose as they have no direction, but the proportion of time that these make up for the period under consideration is noted under each wind rose.

The concentric circles in each wind rose are the axes that denote wind frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are the same size. The frequencies shown in the first quadrant (top-left quarter) of each wind rose are stated beneath the wind rose.

3.1.3 Local Wind Trends

A synthetic site representative meteorological data for the year 2007 was generated by TAPM in accordance with the Approved Method for Modelling and Assessment of Air Pollutants in New South Wales (2005) guidance. The TAPM file was prepared for Benbow Environmental by Simtars.

Seasonal wind rose plots for this site-representative meteorological data have been included as Figure 3-1. Long term wind rose plots from Sydney Airport AWS for the year of 2004 to 2008 are provided as Figure 3-2.

For site specific data of Port Botany, it can be seen that medium strength winds from the north-east dominated the region for approximately 22% of the time throughout the year with an average wind speed of 2.38 m/s and a calms frequency of 0.79%. Medium strength winds were also detected from the east and south-east direction for 15% and 16% of the time respectively, followed by the westerly and north-westerly for approximately 13% and 12% of the time. Minor contributions of less than 8% came from the southerly, northerly and south-westerly winds.

Over the course of a year, Figure 3-1 shows that north-easterly, easterly and south-easterly winds stand out with a frequency of approximately 23%, 15%, and 16% each. These winds would help to disperse the odour, as the odour particles would be transported away from the residences, towards Port Botany.

Average wind speed values range from 2.00 m/s (Autumn) up to 2.66 m/s (Winter). Calms were observed to range from 0.09% (Summer) to 2.08% (Autumn).

The average wind speed recorded for the summer season was 2.51 m/s, with a calms frequency of 0.09%. Dominant medium strength north-easterly winds occurred at a frequency of nearly 45% followed by the easterly winds (23%) and south-easterly winds (18%). Minor contributions from the rest of the directional winds made up the season with the frequency of less than 5%.

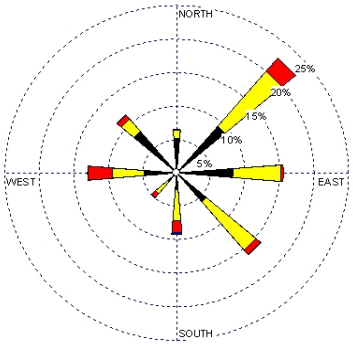
The autumn period showed a wide range of wind directions starting with the predominance of medium strength winds from the north-east (19%), followed by medium strength winds from south-east (17%) and north-west (16%). Notable contributions of winds from north, east, south, and west for the frequency of 10% to 12% made up the wind patterns. The average wind speed for the autumn period was recorded at 2.00 m/s with a calms frequency of 2.08%.

The winter season showed quite the opposite wind patterns to the summer period. Medium westerly winds were dominant, followed by north-westerly winds at frequencies of 27% and 20% respectively. The average wind speed in the winter season was 2.66 m/s and a calms frequency occurred at around 0.36%. Notable contributions of medium strength south-westerly, south-easterly, and strong southerly winds were recorded at frequencies of 10% to 14%, with minor contributions of northerly, north-easterly and easterly winds fulfilling the wind patterns for this season.

In the spring time, average wind speeds of 2.34 m/s with a frequency of calms of 0.60% were recorded. Dominant medium strength winds can be seen coming from the north-east at a frequency of 23%, followed by medium strength easterly and south-easterly winds at frequencies of 20% and 18% respectively. Notable contribution of winds from the west was recorded at a frequency of 11%, while winds from the north, north-west and south were recorded at frequencies of 7% to 9%. Minor contribution of south-westerly winds for 4% of the time made up the wind patterns for the period.

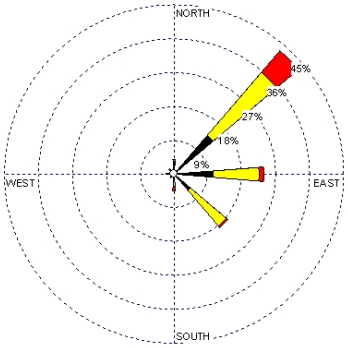
Figure 3-1: Wind Rose Plots for the TAPM Generated Synthetic Meteorological Data – Port Botany (2007)

All Seasons



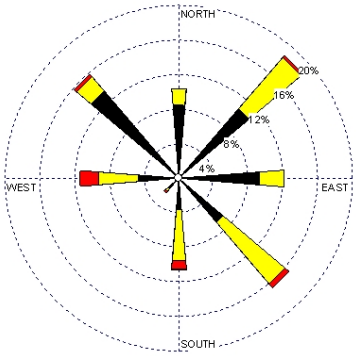
Average Wind Speed: 2.38 m/s
Calms Frequency: 0.79 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

Summer (December – February)



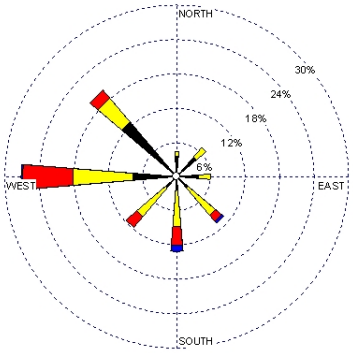
Average Wind Speed: 2.51 m/s
Calms Frequency: 0.09 %
Axis Frequencies: 9%, 18%, 27%, 36%, 45%

Autumn (March – May)



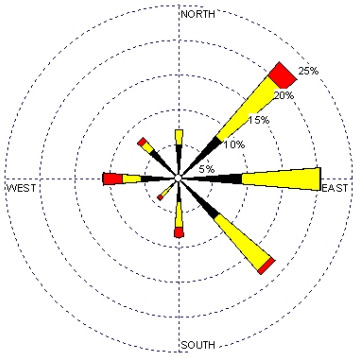
Average Wind Speed: 2.00 m/s
Calms Frequency: 2.08 %
Axis Frequencies: 4%, 8%, 12%, 16%, 20%

Winter (June – August)



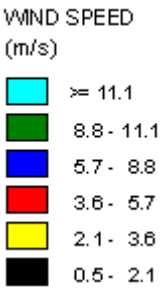
Average Wind Speed: 2.66 m/s
Calms Frequency: 0.36 %
Axis Frequencies: 6%, 12%, 18%, 24%, 30%

Spring (September – November)



Average Wind Speed: 2.34 m/s
Calms Frequency: 0.60 %
Axis Frequencies: 5%, 10%, 15%, 20%, 25%

Legend



As expected the Sydney Airport weather station recorded a much higher average wind speed of 5.61 m/s with the calms frequency of 0.76% expected to be due to the operation of runways. Low occurrence of calms (or higher wind speed average) can provide better dispersion of air pollutants, but may also lead to extension of impacts in distance by transporting odour emissions further from the source. The trends of directional winds were pictured in wind rose plots. Strong winds from south and north-west dominate the area with a frequency of occurrence of 18% each, followed by strong winds from north-east and west with a frequency of occurrence of 14% and 13% respectively. Strong winds of south-easterly, northerly and south-westerly contributed for 9% to 11% of the time, while easterly wind contributed for 7% of the time. From the overall season wind rose plot, it can be seen that the strong winds are quite evenly distributed in all directions.

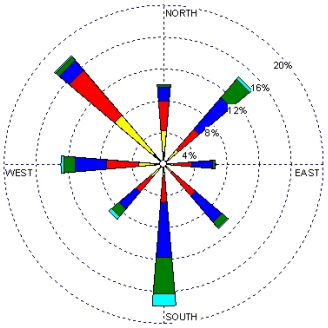
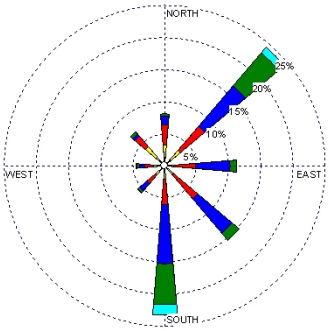
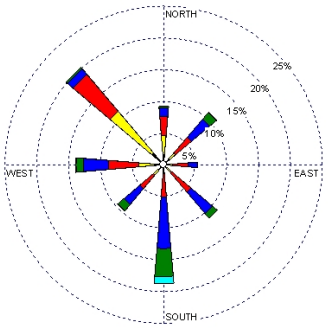
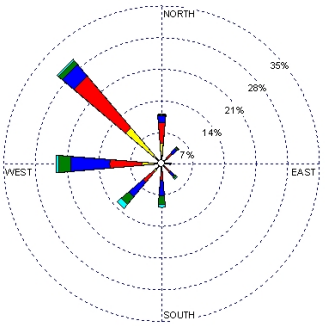
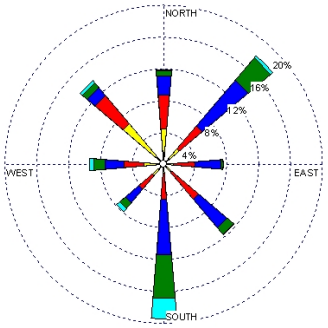
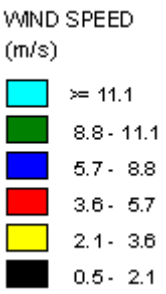
Autumn season presents strong dominant north-westerly and southerly winds at a frequency of 20% and 18% respectively followed by strong westerly wind at a frequency of 14%. Easterly wind contributed the least with 6% frequency of occurrence. Even contribution of northerly, north-easterly, south-easterly, and south-westerly winds at a frequency of 9% to 11% made up the rest of the season. Average wind speed for the season is 5.15 m/s with the highest calm frequency of 1.07%.

In spring time, the trends of strong and dominant winds from the south and north-east were seen throughout the long term wind rose plot with frequencies of occurrence of 19% and 18% respectively. The rest of the time was made up with an even distribution of the more frequent directional winds at 8% to 14%, where north-westerly winds occurred the most, and easterly winds occurred the least. The average wind speed for the spring period is 5.95 m/s with a calm frequency of 0.63%.

Summer period presented the highest average wind speed of all seasons (5.61 m/s) and a calm frequency of 0.76%. The directional wind pattern from the wind rose plot showed major contributions of strong north-easterly and southerly winds at frequencies of occurrence of 24% and 23% respectively, followed by strong south-easterly wind at 15% of the time. Notable contribution of easterly winds can be seen for 12% of the time, with the rest of the directional winds contributing at frequencies of occurrence of 4% to 8%.

Winter season wind patterns showed a domination of strong north-westerly and westerly winds at frequencies of occurrence of 30% and 24% respectively, followed by south-westerly wind at the frequency of 13%, while the rest of the directional winds contributed for 4% to 10% throughout the season. Average wind speed was recorded at 5.28 m/s with the lowest frequency of calms of 0.57%.

Figure 3-2: Wind Rose Plots for the Referenced Meteorological Station - Bureau of Meteorology Sydney Airport (2004-2008)

All Seasons	Summer (December – February)
 Average Wind Speed: 5.61 m/s Calms Frequency: 0.76 % Axis Frequencies: 4%, 8%, 12%, 16%, 20%	 Average Wind Speed: 6.06 m/s Calms Frequency: 0.78 % Axis Frequencies: 5%, 10%, 15%, 20%, 25%
Autumn (March – May)	**Winter (June – August)**
 Average Wind Speed: 5.15 m/s Calms Frequency: 1.07 % Axis Frequencies: 5%, 10%, 15%, 20%, 25%	 Average Wind Speed: 5.28 m/s Calms Frequency: 0.57 % Axis Frequencies: 7%, 14%, 21%, 28%, 35%
Spring (September – November)	**Legend**
 Average Wind Speed: 5.95 m/s Calms Frequency: 0.63 % Axis Frequencies: 4%, 8%, 12%, 16%, 20%	

The comparison between long term wind rose plot of Sydney Airport for the years 2004-2008 and the wind rose plot of Port Botany for the year of 2007 showed similarities in the wind patterns. Similar frequency of winds from north-east and the west were recorded, as well as similar frequency of calms.

The north-easterly winds stands out on both of the summer and spring seasons for long term and short term wind rose plots, while during the autumn and winter season, similar trends of winds from north, north-west and west are observed. Both wind rose plots have shown that a low frequency of calms is experienced within the region. The meteorological data for Port Botany for the year 2007 provided a reasonable representation of the long term meteorological data of Sydney Airport AWS for the year 2004 to 2008, and is therefore appropriate to be used for the purpose of this odour impact assessment.

4. ODOUR IMPACT ASSESSMENT

This odour impact assessment has been prepared to assess the effects of potential odorous emissions on the existing ambient air quality as a direct result of the proposal. The results of the assessment follow.

4.1 ADOPTED CRITERIA AND GUIDELINES

The guidelines referenced in this assessment were the New South Wales Department of Environmental, Climate Change and Water documents:

- Technical framework - Assessment and management of odour from stationary sources in New South Wales (November 2006) and the associated Technical Notes (November 2006); and
- The Approved Method of Modelling and Assessment of Air Pollutants in New South Wales (August 2005).

Table 4-1 shows how the odour criteria recommended by the New South Wales Department of Environmental, Climate Change and Water varies with population.

Table 4-1: New South Wales Department of Environmental, Climate Change and Water Odour Performance Criteria

Size of Affected Community	Odour Performance Criteria (Odour Units) (to be complied with for 99.0% of the time)
Urban (Population ≥ ≈ 2000)	2.0 OU/m^3
Population ≈ 500	3.0 OU/m^3
Population ≈ 125	4.0 OU/m^3
Population ≈ 30	5.0 OU/m^3
Population ≈ 10	6.0 OU/m3
Single residence (≤ ≈ 2)	7.0 OU/m^3

Given the urban nature of the subject area, 2 OU (99.0th Percentile) value would usually be the appropriate odour assessment criterion to adopt for the adjacent receptors in this study situation. Below this level, annoyance caused by odour from the proposal is considered to be negligible.

Section 3.1 of the New South Wales Department of Environmental, Climate Change and Water Technical Notes for odour assessments also sets 7 OU as a design criterion for the maximum odour level an individual should be exposed to.

The Odour Impact Assessment (SKM 2006) presented in the Environmental Assessment determined that due to the characteristics of the odour released by the Mill not having an unpleasant hedonic tone, the appropriate site specific odour criterion for the new Mill would be 6 Odour Units. From Benbow Environmental's experience with paper recycling mills with effective odour management plans in place, this level of odour is supported. An odour management plan for the redeveloped site is a recommended safeguard. This would ensure the characteristics of the odour emission do not become unpleasant and that the odour intensity would remain at a "weak" level.

In addition to environmental controls, an odour complaint or feedback procedure will be established to support the ongoing odour monitoring program on the site.

The following information would be recorded:

1. The nature of the complaint.
2. The time the odour was said to have occurred.
3. The weather conditions at the time the odour was said to be offensive.
4. The time the complaint was lodged.

4.2 ODOUR IMPACT MODELLING

The CALPUFF Professional version 7.3 Plus is the software modelling package used in the assessment. It is an advanced Gaussian plume dispersion model used for the prediction of potential off-site impacts.

A year of meteorological data, described in Section 3, was obtained as input for CALPUFF. The data is considered as being representative of the wind climate at the subject site and study region in general. A total number of 8,760 individual temperatures, wind speed and wind direction events were obtained for the meteorological input file. This ensured that sufficient meteorological data was available so as to guarantee that worst-case conditions were adequately represented in the model predictions.

To simulate the odorous emissions from the proposed operation, constant emission rates were used as an input data for CALPUFF. The procedure and methodology of calculating the emissions is described in the following sections.

4.2.1 Calculation of Odour Emission Rate (OER) Inputs

The odour emissions data were provided by AMCOR based on the existing paper mill exhaust duct testing results performed by Environ Odour. Odour emission inventory for the modelling is provided below.

4.2.1.1 Correlation of Odour Strength

Research and analyses to correlate the odour strength at Standard Temperature and Pressure (STP) conditions with the odour emission rates at actual operating conditions have been performed by Cambridge Environmental Research Consultants (CERC©2009)[1], United Kingdom.

The generic correlation is given by the following equation:

$$Q = Q_{ou} \times V \times \frac{T_{STP}}{T_R}$$

Where,

Q = Odour Emission Rate (OU.m³/s)
Q_{ou} = Strength of Release (OU)
V = Flow Rate at Actual temperature and pressure (m³/s)
T_{STP} = Temperature at Standard Temperature and Pressure (K)
T_R = Temperature at the release (K)

This has been used to estimate the most representative odour emission rates to be used in the dispersion modelling.

4.2.1.2 Peak-to-Mean Ratios

One of the parameters that need to be set to run dispersion models is the averaging time parameter. In the case of odour, the Approved Methods of Modelling and Assessment of Air Pollutants in New South Wales (2005) require that an averaging time of one hour is used. It is a realistic approach given that one hour is usually the shortest time spacing available for the meteorological data needed for modelling.

However the modelling of odour faces a serious limitation in that human noses generally detect odour over a period of approximately one second or less. The comparatively long one hour model averaging time means that the peak odour concentration of the modelled plumes, at a level that would cause annoyance, would effectively be averaged during the modelling process to a point of being non-offensive, and thus portraying a source to be less of a nuisance in odour than it might actually be.

To compensate for this and allow more realistic predictions of odour impacts, peak-to-mean ratios, which relate long-term modelled averages to the short-term averages that would better approximate peak concentrations, are applied to odour emission rates.

[1] Gray, S.J., McHugh, C.A., Calculation of Odour Levels, CERC, March 2009

Peak-to-mean ratios are dependent on the distance of the receptor to the source, the stability of weather during the transport of the odour through the air, the type of source, and length of the averaging time used in the model.

New South Wales Department of Environmental, Climate Change and Water has recommended peak-to-mean ratio factors developed by Katestone Scientific, which have been reproduced in Section 6.6 of the Approved Methods of Modelling and Assessment of Air Pollutants in NSW (2005). These factors were utilised in this assessment.

The ratios for a wake-affected point were applied to the odour emissions from the proposed exhaust ducts (i.e. stacks) as it is the most appropriate peak-to-mean ratio to be used. The peak-to-mean ratios are listed in Table 4-2 below.

Table 4-2: Factors for Estimating Peak Concentrations in Flat Terrain

Source Type	Pasquill-Gifford Stability Class	Near-field P/M60*	Far-field P/M60*
Area	A, B, C, D	2.5	2.3
	E, F	2.3	1.9
Line	A – F	6	6
Surface wake-free point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A – F	2.3	2.3
Volume	A – F	2.3	2.3

Note: * Ratio of peak 1-second average concentrations to mean 1-hour average concentrations.
Source: The Approved Methods of Modelling and Assessment of Air Pollutants in NSW (2005), Section 6.6.

4.2.2 Terrain

Due to the elevation nature of the site, the terrain is not considered as a significant factor that would affect the modelling. Although the surroundings of the proposed development terrain can be considered flat, elevation of the terrain is taken into account to ensure that any enhanced impact and the probable worst case scenario due to terrain elevation is captured within the model.

4.2.3 Scenarios

As it is a sensitive issue to the local community, 2 scenarios were considered in the modelling as discussed below. The two scenarios represent the initial proposed development of the site, taking into account that the proposed facility would discharge emissions into the atmosphere as individual tilted stacks without any flow combining factors. The modelling took into account the maximum odour emission rates for 24 hours continuous operation of the proposed site. Paper breaks, shut down and maintenance of equipment are excluded from the modelling to capture the maximum odour impacts to the off-site receptors. The air discharges are designed to direct the exhaust emissions stacks towards Port Botany, thus directing the emission away from the direction of the residences.

For scenario 1, the stacks are individually aligned along the roof on the southern part of the B9 paper mill building with stack outlets tilted by 20^{o} from vertical axis. In scenario 2, the individual tilted stacks are represented as a set of 3 pseudo-stacks.

4.2.3.1 Scenario 1 Odour Emission Inventory

Scenario 1 showed odour impact modelling where the 20^{o} tilting factor only affects the exit velocity of the stacks. The stacks are raised 5 m above their respective roof level, while the exit velocity of each stack would then be adjusted to reflect the vertical component. In other words, a tilted stack is represented by a straight stack emitting odour at slightly lower velocity. The detailed odour emission inventory is presented as Table 4-3.

Table 4-3: Odour Emission Inventory Scenario 1

Modelling Name	Description	Stack Coordinates (MGA 56)		Stack Height (m)	Discharge Temperature (°C)	Stack Diameter (m)	Exit Velocity (m/s)	Odour Strength at STP (OU/m³)	Odour Emission Rates (OU/s)	Odour Emission Rates with P/M Ratio (OU/s)
		Easting (m)	Northing (m)							
Building Ventilation										
BV01	Roof Exhaust Fan No. 1	335834	6240404	19.5	30	1.60	14.10	300	8,109	18,652
BV02	Roof Exhaust Fan No. 2	335885	6240345	21.5	30	1.60	14.10	300	8,109	18,652
BV03	Roof Exhaust Fan No. 3	335893	6240337	21.5	30	1.60	14.10	300	8,109	18,652
BV04	Roof Exhaust Fan No. 4	335898	6240334	21.5	30	1.60	14.10	300	8,109	18,652
BV05	Roof Exhaust Fan No. 5	335957	6240283	19.5	30	1.60	14.10	300	8,109	18,652
Process Ventilation										
PV01	Optiformer Exhaust Fan No.1	335915	6240319	30.5	40	1.62	14.10	500	13,520	31,096
PV02	Mist Collector and Vac. Fabric	335904	6240329	30.5	40	1.15	14.10	500	6,804	15,648
PV03	Optiformer Exhaust Fan No.2	335907	6240336	30.5	40	1.62	14.10	500	13,520	31,096
PV04	Vacuum Blower No.1+ No. 2	335881	6240358	19.5	105.6	1.50	14.10	700	13,328	30,653
PV05	Vacuum System Fan No.1	335931	6240312	30.5	86	0.57	14.10	700	2,071	4,763
PV06	Vacuum System Fan No.2	335925	6240318	30.5	99	0.38	14.10	700	884	2,033
PV07	Vac Roll Exhaust Air No.1 Fan	335874	6240366	19.5	47.7	1.34	14.10	350	6,287	14,460
PV08	Hood Exhaust Air No.1 Fan	335858	6240381	19.5	51.4	1.92	14.10	350	12,843	29,539
PV09	Vac Roll Exhaust Air No.2 Fan	335843	6240395	19.5	51.6	1.32	14.10	350	6,006	13,813
PV10	Vac Roll Exhaust Air No.3 Fan	335822	6240415	19.5	47.7	2.06	14.10	300	12,770	29,371
PV11	Winder Pulper Exhaust Fan	335769	6240464	16.5	30	0.90	14.10	500	4,280	9,844
PV13	Vent	335851	6240430	15	30	0.11	2.07	5250	77	178
PV14	Pulper Exhaust Fan	335986	6240295	28.5	30	0.46	14.10	500	1,126	2,590

4.2.3.2 Scenario 1 Modelling Results

The modelling results for Scenario 1 are listed in Table 4-4 below.

Table 4-4: Modelling Results of Scenario 1

Receptors	Ground Level Odour Impact as 99th Percentile (OU)	Odour Level Predicted in the 2006 EA at the Nearest Residential Receivers (OU)
R1	3.2	5 (Calpuff model)
R2	3.0	
R3	3.8	
R4	5.5	
R5	5.0	
R6	4.6	

4.2.3.3 Scenario 2

According to the Good Practice Guide for Atmospheric Dispersion Modelling (2004)[2] published by the Ministry for the Environment, New Zealand, a tilted stack can be better modelled as a series of puffs.

Since the stack is tilted by 20^{o}, the plume very close to the point of discharge would be travelling at a 20^{o} angle instead of in a vertical direction. This behaviour can be represented by a set of pseudo-stacks which are placed along the direction of plume flow.

In Scenario 2, each tilted stack is modelled as 3 pseudo-stacks. The location of the first stack is the same as the actual point of discharge whilst the second and third stacks are placed along the direction of the plume flow within a 1 second timeframe.

The modelling approach is detailed as follows:

- Each individual tilted stack is represented as 3 pseudo-stacks;
- The 3 pseudo-stacks represent 1 second of odour discharge;
- The first pseudo-stack is located at the initial position of the discharge;
- The second pseudo-stack is located in between the first and the third pseudo-stacks;
- The third pseudo-stack is located after a 1 second discharge from the initial position;
- The first pseudo-stack would have the highest odour emission rates due to its location being at the initial discharge point whilst the other two would have less contribution. To account for this effect, the contribution of odour emission rates were assumed as follows:
  - 50% of odour emission rates on the first pseudo-stacks;
  - 25% of odour emission rates on the second pseudo-stack; and
  - 25% of odour emission rates on the third pseudo-stacks.
- The first of the pseudo-stacks is discharging its initial exit velocity (i.e. the same vertical velocity as used in Scenario 1). The exit velocity is reduced by 10% for the second and third pseudo-stack. Note that the exit velocity of each pseudo-stack is based on the vertical component only;
- The coordinate and the height of the pseudo-stacks are adjusted based on the approximate location of the plume travelling at 20^{o} angle, within a 1 second timeframe; and
- The diameter of the pseudo-stacks are set to be exactly the same as the actual tilted stack.

[2] Ministry for the Environment, New Zealand, Good Practice Guide for Atmospheric Dispersion Modelling, June 2004

Table 4-5: Odour Emission Inventory Scenario 2

Modelling Name	Description	Stack Coordinates (MGA 56)		Stack Height (m)	Discharge Temperature (°C)	Stack Diameter (m)	Exit Velocity (m/s)	Odour Strength at STP (OU/m³)	Odour Emission Rates (OU/s)	Odour Emission Rates with P/M Ratio (OU/s)
		Easting (m)	Northing (m)							
Building Ventilation - First pseudo-stacks										
BV01A	Roof Exhaust Fan No. 1	335834	6240404	19.5	30.0	1.6	14.1	300	4,055	9,326
BV02A	Roof Exhaust Fan No. 2	335885	6240345	21.5	30.0	1.6	14.1	300	4,055	9,326
BV03A	Roof Exhaust Fan No. 3	335893	6240337	21.5	30.0	1.6	14.1	300	4,055	9,326
BV04A	Roof Exhaust Fan No. 4	335898	6240334	21.5	30.0	1.6	14.1	300	4,055	9,326
BV05A	Roof Exhaust Fan No. 5	335957	6240283	19.5	30.0	1.6	14.1	300	4,055	9,326
Process Ventilation - First pseudo-stacks										
PV01A	Optiformer Exhaust Fan No.1	335915	6240319	30.5	40.0	1.6	14.1	500	6,760	15,548
PV02A	Mist Collector and Vac. Fabric	335904	6240329	30.5	40.0	1.2	14.1	500	3,402	7,824
PV03A	Optiformer Exhaust Fan No.2	335907	6240336	30.5	40.0	1.6	14.1	500	6,760	15,548
PV04A	Vacuum Blower No.1+ No. 2	335881	6240358	19.5	105.6	1.5	14.1	700	6,664	15,327
PV05A	Vacuum System Fan No.1	335931	6240312	30.5	86.0	0.6	14.1	700	1,035	2,382
PV06A	Vacuum System Fan No.2	335925	6240318	30.5	99.0	0.4	14.1	700	442	1,016
PV07A	Vac Roll Exhaust Air No.1 Fan	335874	6240366	19.5	47.7	1.3	14.1	350	3,144	7,230
PV08A	Hood Exhaust Air No.1 Fan	335858	6240381	19.5	51.4	1.9	14.1	350	6,422	14,770
PV09A	Vac Roll Exhaust Air No.2 Fan	335843	6240395	19.5	51.6	1.3	14.1	350	3,003	6,906
PV10A	Vac Roll Exhaust Air No.3 Fan	335822	6240415	19.5	47.7	2.1	14.1	300	6,385	14,685
PV11A	Winder Pulper Exhaust Fan	335769	6240464	16.5	30.0	0.9	14.1	500	2,140	4,922

Table 4-5: Odour Emission Inventory Scenario 2

Modelling Name	Description	Stack Coordinates (MGA 56)		Stack Height (m)	Discharge Temperature (°C)	Stack Diameter (m)	Exit Velocity (m/s)	Odour Strength at STP (OU/m³)	Odour Emission Rates (OU/s)	Odour Emission Rates with P/M Ratio (OU/s)
		Easting (m)	Northing (m)							
PV13A	Vent	335851	6240430	15.0	97.0	0.1	2.1	5,250	39	89
PV14A	Pulper Exhaust Fan	335986	6240295	28.5	30.0	0.5	14.1	500	563	1,295
Building Ventilation - Second pseudo-stacks										
BV01B	Roof Exhaust Fan No. 1	335833	6240402	26.5	30.0	1.6	12.7	300	2,027	4,663
BV02B	Roof Exhaust Fan No. 2	335883	6240343	28.5	30.0	1.6	12.7	300	2,027	4,663
BV03B	Roof Exhaust Fan No. 3	335891	6240335	28.5	30.0	1.6	12.7	300	2,027	4,663
BV04B	Roof Exhaust Fan No. 4	335896	6240332	28.5	30.0	1.6	12.7	300	2,027	4,663
BV05B	Roof Exhaust Fan No. 5	335956	6240281	26.5	30.0	1.6	12.7	300	2,027	4,663
Process Ventilation - Second pseudo-stacks										
PV01B	Optiformer Exhaust Fan No.1	335913	6240317	37.5	40.0	1.6	12.7	500	3,380	7,774
PV02B	Mist Collector and Vac. Fabric	335902	6240327	37.5	40.0	1.2	12.7	500	1,701	3,912
PV03B	Optiformer Exhaust Fan No.2	335905	6240334	37.5	40.0	1.6	12.7	500	3,380	7,774
PV04B	Vacuum Blower No.1+ No. 2	335879	6240356	26.5	105.6	1.5	12.7	700	3,332	7,663
PV05B	Vacuum System Fan No.1	335929	6240310	37.5	86.0	0.6	12.7	700	518	1,191
PV06B	Vacuum System Fan No.2	335924	6240316	37.5	99.0	0.4	12.7	700	221	508
PV07B	Vac Roll Exhaust Air No.1 Fan	335872	6240364	26.5	47.7	1.3	12.7	350	1,572	3,615
PV08B	Hood Exhaust Air No.1 Fan	335856	6240379	26.5	51.4	1.9	12.7	350	3,211	7,385
PV09B	Vac Roll Exhaust Air No.2 Fan	335842	6240393	26.5	51.6	1.3	12.7	350	1,501	3,453
PV10B	Vac Roll Exhaust Air No.3 Fan	335820	6240413	26.5	47.7	2.1	12.7	300	3,192	7,343

Table 4-5: Odour Emission Inventory Scenario 2

Modelling Name	Description	Stack Coordinates (MGA 56)		Stack Height (m)	Discharge Temperature (°C)	Stack Diameter (m)	Exit Velocity (m/s)	Odour Strength at STP (OU/m³)	Odour Emission Rates (OU/s)	Odour Emission Rates with P/M Ratio (OU/s)
		Easting (m)	Northing (m)							
PV11B	Winder Pulper Exhaust Fan	335767	6240462	23.5	30.0	0.9	12.7	500	1,070	2,461
PV13B	Vent	335850	6240429	16.0	97.0	0.1	1.9	5,250	19	45
PV14B	Pulper Exhaust Fan	335984	6240294	35.5	30.0	0.5	12.7	500	282	648
Building Ventilation - Third pseudo-stacks										
BV01C	Roof Exhaust Fan No. 1	335831	6240400	33.6	30.0	1.6	11.4	300	2,027	4,663
BV02C	Roof Exhaust Fan No. 2	335881	6240341	35.6	30.0	1.6	11.4	300	2,027	4,663
BV03C	Roof Exhaust Fan No. 3	335889	6240333	35.6	30.0	1.6	11.4	300	2,027	4,663
BV04C	Roof Exhaust Fan No. 4	335894	6240330	35.6	30.0	1.6	11.4	300	2,027	4,663
BV05C	Roof Exhaust Fan No. 5	335954	6240279	33.6	30.0	1.6	11.4	300	2,027	4,663
Process Ventilation - Third pseudo-stacks										
PV01C	Optiformer Exhaust Fan No.1	335913	6240317	44.6	40.0	1.6	11.4	500	3,380	7,774
PV02C	Mist Collector and Vac. Fabric	335900	6240325	44.6	40.0	1.2	11.4	500	1,701	3,912
PV03C	Optiformer Exhaust Fan No.2	335903	6240332	44.6	40.0	1.6	11.4	500	3,380	7,774
PV04C	Vacuum Blower No.1+ No. 2	335877	6240354	33.6	105.6	1.5	11.4	700	3,332	7,663
PV05C	Vacuum System Fan No.1	335927	6240308	44.6	86.0	0.6	11.4	700	518	1,191
PV06C	Vacuum System Fan No.2	335922	6240314	44.6	99.0	0.4	11.4	700	221	508
PV07C	Vac Roll Exhaust Air No.1 Fan	335870	6240362	33.6	47.7	1.3	11.4	350	1,572	3,615
PV08C	Hood Exhaust Air No.1 Fan	335854	6240377	33.6	51.4	1.9	11.4	350	3,211	7,385
PV09C	Vac Roll Exhaust Air No.2 Fan	335840	6240391	33.6	51.6	1.3	11.4	350	1,501	3,453

Table 4-5: Odour Emission Inventory Scenario 2

Modelling Name	Description	Stack Coordinates (MGA 56)		Stack Height (m)	Discharge Temperature (°C)	Stack Diameter (m)	Exit Velocity (m/s)	Odour Strength at STP (OU/m³)	Odour Emission Rates (OU/s)	Odour Emission Rates with P/M Ratio (OU/s)
		Easting (m)	Northing (m)							
PV10C	Vac Roll Exhaust Air No.3 Fan	335818	6240412	33.6	47.7	2.1	11.4	300	3,192	7,343
PV11C	Winder Pulper Exhaust Fan	335766	6240460	30.6	30.0	0.9	11.4	500	1,070	2,461
PV13C	Vent	335849	6240427	18.1	30.0	0.7	11.4	5,250	19	45
PV14C	Pulper Exhaust Fan	335984	6240293	18.1	30.0	0.7	11.4	500	282	648

4.2.3.4 Scenario 2 Modelling Results

The modelling results for Scenario 2 are listed in Table 4-6 below.

Table 4-6: Modelling Results of Scenario 2

Receptors	Ground Level Odour Impact as 99th Percentile (OU)	Odour Level Predicted in the 2006 EA at the Nearest Residential Receivers (OU)
R1	3.2	5 (Calpuff model)
R2	3.0	
R3	3.7	
R4	5.0	
R5	4.6	
R6	4.2	

4.3 DISCUSSION OF ODOUR IMPACT MODELLING

The modelling was performed using CALPUFF Professional Plus (version 7.3), which is an advanced air dispersion modelling programme.

The modelling of the proposed facility uses the worst-case scenario for when the facility is operating. High odour emission rates were found for the Optiformer Exhaust fans, Vacuum Blower Exhaust fans, and Vacuum Roll Exhaust fans. These fans are believed to be the direct major contributor to the ground level odour levels that are predicted at the sensitive receptors.

Within the process, there are 3 processes that would not operate all the time, these are:

- Press Pulper Exhaust fans;
- Size Press Pulper Exhaust fans; and
- Reel Pulper Exhaust fans.

These processes would only operate during the event of a paper break. The paper break would happen typically for a period of 15 minutes or less in a frequency of several times a day, in which, the residual materials that had been fed through the process would be re-routed. Depending on the location of the paper break, only one of the pulpers will be activated and producing odour. At the same time, since the process is interrupted, other equipment would cease to produce odour during the event, and reducing the odour emission from the process.

Another interruption to the process may occur from operational breaks, which are scheduled for the planned maintenance of the mill. Operational breaks would typically occur for 12 to 14 hours per 2 to 3 weeks cycle. The operational break is calculated to reduce the operating hours by 3% to 4% within a single year.

Improvements to the paper making processes and further clarification from AMCOR, has enabled the removal of the thickener and disc filter as odour sources.

As shown inTable 4-4, the more conservative modelling of scenario 1 where the tilted stack is modelled as a straight stack with slightly lower exit velocity showed a maximum odour impact of 5.5 OU at the nearest potential receptors. Table 4-6 showed the results of scenario 2, where the design of the tilted stacks were taken into account. The tilted stacks design is expected to direct a plume migration away from the residents and towards Port Botany bay. The predicted results have reflected this and give a lower maximum odour impact of 5.0 OU. Benbow Environmental considers that the levels of odour impacts are better represented from the modelling technique used in Scenario 2.

For the sub-divided land shown in Figure 2-4, named as Lot 1 (McCauley St Precinct) and Lot 3 (Botany Road Precinct), various ground level odour impact were predicted. Scenario 1 resulted in ground level odour impact of 4 OU to 7 OU for Lot 1, and 5 OU to 9 OU for Lot 3, while Scenario 2 resulted in 4 OU to 6 OU for Lot 1 and 5 OU to 8 OU for Lot 3.

In order to validate the results of the dispersion modelling, a stack testing scheme is recommended to be established once the B9 Plant is commissioned.

4.4 COMPARISON OF ODOUR MODELLING METHODOLOGY WITH THE PRELIMINARY ENVIRONMENTAL ASSESSMENT

Previous to the current odour impact assessment, AMCOR had commission SKM to perform odour impact modelling with the use of Ausplume and CALPUFF modelling software. Since the site is located on the coastal area of Port Botany, the use of Ausplume modelling software might not be as appropriate as CALPUFF, due to the cross wind flow that can be captured in CALPUFF, but not in Ausplume.

The preliminary Environmental Assessment performed by SKM in 2006 predicted a maximum odour impact to the nearest receptors to be around 5 OU. Benbow Environmental performed an independent odour assessment as outlined in this report. The odour assessment included odour modelling with refinement of the details of the site and surroundings, and found that the maximum odour impacts to the nearest residences to be 5.5 OU for conservative modelling, and 5.0 OU for the tilted stack approach modelling.

The differences of the odour impacts predicted were mainly due to the slight difference in methodology and approach in creating the model featuring the updated site plan and processes. These are listed below:

- Different year of meteorological data is used;
- Removal of several parts of the processes as a result of process improvement, thus total odour emission from B9 paper mill building is lower;
- Reduced air flow requirements by the processes;
- Updated site plan, including building location, and heights;
- The use of CALPUFF required complete sets of upper air meteorological data which can only be provided by TAPM. SKM used TAPM v3.0.5 software, while Benbow Environmental used the recently released TAPM v4 to generate the meteorological data;
- Benbow Environmental incorporated meteorological data from 4 surface stations and 2 upper air stations with 12 km by 12 km domain and 25 vertical layers. These parameters may differ from the parameters used by SKM;
- Benbow Environmental incorporates tilted stack design modelling to better represent the source of emissions. In reality, the tilted design would assist in directing the dispersion of odour away from the residential area;
- Benbow Environmental have modelled the stacks to be 5 m above the respective roof level to prevent excessive building downwash from happening and therefore the potential of enhancing the odour impacts to the nearest residences; and
- Benbow Environmental used the latest release of CALPUFF Professional v7.3 Plus.

5. STATEMENT OF POTENTIAL ODOUR IMPACTS

The odour impact assessment is required to show compliance to the relevant regulations and guidelines. With respect to the New South Wales Department of Environmental, Climate Change and Water guidelines, the proposed site is required to achieve compliance with the ground level odour impact at all the nearest identified receptors and recommended improvements developed in order to achieve compliance. Controls that will achieve this aim have been incorporated into the dispersion models and were recommended. The maximum predicted levels of odour are less than 6.0 Odour Units at the nearest residential receivers.

6. CONCLUSION

The New South Wales Department of Environment, Climate Change and Water guidelines "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales", "Technical framework - Assessment and management of odour from stationary sources in New South Wales" and "Technical notes - Assessment and management of odour from stationary sources in New South Wales" were followed in the preparation of this odour assessment report.

Ground level odour impacts predicted from the proposed operation, including the worst-case scenario, have been modelled using CALPUFF Professional Plus (version 7.3). The results obtained from the modelling indicated that the odour management is expected to be able to satisfy reasonable levels of odour at the nearest residences as the assumptions used are conservative.

The actual odour impacts are believed to be reasonably low, given the inherent conservative nature of Benbow Environmental's odour assessment modelling, the hedonic tone of the odour emissions from the site and the basis of the odour strengths provided by AMCOR. Post-commissioning testing may be required to further validate the results of the air dispersion modelling.

This concludes the report.

Prepared by:

Filbert Hidayat
Environmental Engineer

Gusni Melington
Senior Environmental Engineer

R T Benbow
Principal Consultant

7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use by AMCOR PAPER PTY LTD, as per our agreement for providing environmental assessment services. Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

AMCOR PAPER PTY LTD is entitled to rely upon the findings in the report within the scope of work described in this report. No responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

8. REFERENCES

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ATTACHMENTS

Attachment 1: Sample of CALPUFF v7.3 software output, Scenario 1 –Individual Stacks

```
109170
AMCOR
Run 13B
---------------- Run title (3 lines) ------------------------------------------

                    CALPUFF MODEL CONTROL FILE
                    --------------------------

--------------------------------------------------------------------------------

INPUT GROUP: 0 -- Input and Output File Names

--------------
Default Name  Type          File Name
------------  ----          ---------
CALMET.DAT    input    ! METDAT =C:\ACTIVE~1\109170\CALMET3.DAT   !
    or
ISCMET.DAT    input    * ISCDAT =             *
    or
PLMMET.DAT    input    * PLMDAT =             *
    or
PROFILE.DAT   input    * PRFDAT =             *
SURFACE.DAT   input    * SFCDAT =             *
RESTARTB.DAT  input    * RSTARTB=             *
--------------------------------------------------------------------------------
CALPUFF.LST   output   ! PUFLST =C:\ACTIVE~1\109170\CPF13B.LST  !
CONC.DAT      output   ! CONDAT =C:\ACTIVE~1\109170\CPF13B.DAT     !
DFLX.DAT      output   * DFDAT  =             *
WFLX.DAT      output   * WFDAT  =             *

VISB.DAT      output   * VISDAT =             *
TK2D.DAT      output   * T2DDAT =             *
RHO2D.DAT     output   * RHODAT =             *
RESTARTE.DAT  output   * RSTARTE=             *
--------------------------------------------------------------------------------
Emission Files
--------------
PTEMARB.DAT   input    * PTDAT  =             *
VOLEMARB.DAT  input    * VOLDAT =             *
BAEMARB.DAT   input    * ARDAT  =             *
LNEMARB.DAT   input    * LNDAT  =             *
--------------------------------------------------------------------------------
Other Files
-----------
OZONE.DAT     input    * OZDAT  =             *
VD.DAT        input    * VDDAT  =             *
CHEM.DAT      input    * CHEMDAT=             *
H2O2.DAT      input    * H2O2DAT=             *
HILL.DAT      input    * HILDAT=             *
HILLRCT.DAT   input    * RCTDAT=             *
COASTLN.DAT   input    * CSTDAT=             *
FLUXBDY.DAT   input    * BDYDAT=             *
BCON.DAT      input    * BCNDAT=             *
DEBUG.DAT     output   * DEBUG =             *
MASSFLX.DAT   output   * FLXDAT=             *
MASSBAL.DAT   output   * BALDAT=             *
FOG.DAT       output   * FOGDAT=             *
RISE.DAT      output   * RISDAT=             *
--------------------------------------------------------------------------------
All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
         T = lower case      ! LCFILES = F !
         F = UPPER CASE
NOTE: (1) file/path names can be up to 70 characters in length


Provision for multiple input files
----------------------------------
```

```
     Number of CALMET.DAT files for run (NMETDAT)
                                   Default: 1       ! NMETDAT =   1   !

     Number of PTEMARB.DAT files for run (NPTDAT)
                                   Default: 0       ! NPTDAT =  0  !

     Number of BAEMARB.DAT files for run (NARDAT)
                                   Default: 0       ! NARDAT =  0  !

     Number of VOLEMARB.DAT files for run (NVOLDAT)
                                   Default: 0       ! NVOLDAT =  0  !

!END!

-------------
Subgroup (0a)
-------------

  The following CALMET.DAT filenames are processed in sequence if NMETDAT>1

Default Name  Type          File Name
------------  ----          ---------
 none         input    * METDAT=     *   *END*


------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

    Option to run all periods found
    in the met. file     (METRUN)   Default: 0       ! METRUN =   1  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in met. file

     Starting date:    Year   (IBYR)  --    No default   ! IBYR  =  2007  !
                       Month  (IBMO)  --    No default   ! IBMO  =  0  !
                       Day    (IBDY)  --    No default   ! IBDY  =  0  !
     Starting time:    Hour   (IBHR)  --    No default   ! IBHR  =  0  !
                       Minute (IBMIN) --    No default   ! IBMIN =  0  !
                       Second (IBSEC) --    No default   ! IBSEC =  0  !

     Ending date:      Year   (IEYR)  --    No default   ! IEYR  =  0  !
                       Month  (IEMO)  --    No default   ! IEMO  =  0  !
                       Day    (IEDY)  --    No default   ! IEDY  =  0  !
     Ending time:      Hour   (IEHR)  --    No default   ! IEHR  =  0  !
                       Minute (IEMIN) --    No default   ! IEMIN =  0  !
                       Second (IESEC) --    No default   ! IESEC =  0  !

     (These are only used if METRUN = 0)

     Base time zone        (XBTZ) -- No default       ! XBTZ= -10.0  !
     The zone is the number of hours that must be
     ADDED to the time to obtain UTC (or GMT)
     Examples: PST = 8., MST = 7.
               CST = 6., EST = 5.

     Length of modeling time-step (seconds)
     Equal to update period in the primary
     meteorological data files, or an
     integer fraction of it (1/2, 1/3 ...)
     Must be no larger than 1 hour
     (NSECDT)                      Default:3600     ! NSECDT =  3600  !
                                   Units: seconds

     Number of chemical species (NSPEC)
```

```
                                   Default: 5       ! NSPEC =  1   !

     Number of chemical species
     to be emitted  (NSE)          Default: 3       ! NSE =  1   !

     Flag to stop run after
     SETUP phase (ITEST)           Default: 2       ! ITEST =  2   !
     (Used to allow checking
     of the model inputs, files, etc.)
           ITEST = 1 - STOPS program after SETUP phase
           ITEST = 2 - Continues with execution of program
                       after SETUP

     Restart Configuration:

        Control flag (MRESTART)    Default: 0       ! MRESTART =  0   !

           0 = Do not read or write a restart file
           1 = Read a restart file at the beginning of
               the run
           2 = Write a restart file during run
           3 = Read a restart file at beginning of run
               and write a restart file during run

        Number of periods in Restart
        output cycle (NRESPD)      Default: 0       ! NRESPD =  0   !

           0 = File written only at last period
          >0 = File updated every NRESPD periods

     Meteorological Data Format (METFM)
                                   Default: 1       ! METFM =  1   !

           METFM = 1 - CALMET binary file (CALMET.MET)
           METFM = 2 - ISC ASCII file (ISCMET.MET)
           METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
           METFM = 4 - CTDM plus tower file (PROFILE.DAT) and
                       surface parameters file (SURFACE.DAT)
           METFM = 5 - AERMET tower file (PROFILE.DAT) and
                       surface parameters file (SURFACE.DAT)

     Meteorological Profile Data Format (MPRFFM)
            (used only for METFM = 1, 2, 3)
                                   Default: 1       ! MPRFFM =  1   !

           MPRFFM = 1 - CTDM plus tower file (PROFILE.DAT)
           MPRFFM = 2 - AERMET tower file (PROFILE.DAT)

     PG sigma-y is adjusted by the factor (AVET/PGTIME)**0.2
     Averaging Time (minutes) (AVET)
                                   Default: 60.0    ! AVET = 60. !
     PG Averaging Time (minutes) (PGTIME)
                                   Default: 60.0    ! PGTIME = 60. !


!END!


--------------------------------------------------------------------------------

INPUT GROUP: 2 -- Technical options
--------------


     Vertical distribution used in the
     near field (MGAUSS)                    Default: 1     ! MGAUSS =  1   !
        0 = uniform
        1 = Gaussian
```

```
Terrain adjustment method
(MCTADJ)                              Default: 3     ! MCTADJ =  3   !
   0 = no adjustment
   1 = ISC-type of terrain adjustment
   2 = simple, CALPUFF-type of terrain
       adjustment
   3 = partial plume path adjustment

Subgrid-scale complex terrain
flag (MCTSG)                          Default: 0     ! MCTSG =  0   !
   0 = not modeled
   1 = modeled

Near-field puffs modeled as
elongated slugs? (MSLUG)              Default: 0     ! MSLUG =  0   !
   0 = no
   1 = yes (slug model used)

Transitional plume rise modeled?
(MTRANS)                              Default: 1     ! MTRANS =  1   !
   0 = no  (i.e., final rise only)
   1 = yes (i.e., transitional rise computed)

Stack tip downwash? (MTIP)            Default: 1     ! MTIP =  1  !
   0 = no  (i.e., no stack tip downwash)
   1 = yes (i.e., use stack tip downwash)

Method used to compute plume rise for
point sources not subject to building
downwash? (MRISE)                     Default: 1     ! MRISE =  1  !
   1 = Briggs plume rise
   2 = Numerical plume rise

Method used to simulate building
downwash? (MBDW)                      Default: 1     ! MBDW =   2  !
   1 = ISC method
   2 = PRIME method

Vertical wind shear modeled above
stack top (modified Briggs plume rise)?
(MSHEAR)                              Default: 0     ! MSHEAR =  0  !
   0 = no  (i.e., vertical wind shear not modeled)
   1 = yes (i.e., vertical wind shear modeled)

Puff splitting allowed? (MSPLIT)      Default: 0     ! MSPLIT =  0  !
   0 = no (i.e., puffs not split)
   1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM)       Default: 1     ! MCHEM =  0   !
   0 = chemical transformation not
       modeled
   1 = transformation rates computed
       internally (MESOPUFF II scheme)
   2 = user-specified transformation
       rates used
   3 = transformation rates computed
       internally (RIVAD/ARM3 scheme)
   4 = secondary organic aerosol formation
       computed (MESOPUFF II scheme for OH)
   5 = user-specified half-life with or
       without transfer to child species

Aqueous phase transformation flag (MAQCHEM)
(Used only if MCHEM = 1, or 3)        Default: 0     ! MAQCHEM =  0   !
   0 = aqueous phase transformation
       not modeled
   1 = transformation rates adjusted
```

for aqueous phase reactions

```
Wet removal modeled ? (MWET)          Default: 1     ! MWET =  0   !
   0 = no
   1 = yes

Dry deposition modeled ? (MDRY)       Default: 1     ! MDRY =  0   !
   0 = no
   1 = yes
   (dry deposition method specified
    for each species in Input Group 3)


Gravitational settling (plume tilt)
modeled ? (MTILT)                     Default: 0     ! MTILT =  0   !
   0 = no
   1 = yes
   (puff center falls at the gravitational
    settling velocity for 1 particle species)

Restrictions:
    - MDRY  = 1
    - NSPEC = 1  (must be particle species as well)
    - sg    = 0  GEOMETRIC STANDARD DEVIATION in Group 8 is
                 set to zero for a single particle diameter

Method used to compute dispersion
coefficients (MDISP)                  Default: 3     ! MDISP =  3   !

   1 = dispersion coefficients computed from measured values
       of turbulence, sigma v, sigma w
   2 = dispersion coefficients from internally calculated
       sigma v, sigma w using micrometeorological variables
       (u*, w*, L, etc.)
   3 = PG dispersion coefficients for RURAL areas (computed using
       the ISCST multi-segment approximation) and MP coefficients in
       urban areas
   4 = same as 3 except PG coefficients computed using
       the MESOPUFF II eqns.
   5 = CTDM sigmas used for stable and neutral conditions.
       For unstable conditions, sigmas are computed as in
       MDISP = 3, described above.  MDISP = 5 assumes that
       measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)
(Used only if MDISP = 1 or 5)         Default: 3     ! MTURBVW =  3  !
   1 = use sigma-v or sigma-theta measurements
       from PROFILE.DAT to compute sigma-y
       (valid for METFM = 1, 2, 3, 4, 5)
   2 = use sigma-w measurements
       from PROFILE.DAT to compute sigma-z
       (valid for METFM = 1, 2, 3, 4, 5)
   3 = use both sigma-(v/theta) and sigma-w
       from PROFILE.DAT to compute sigma-y and sigma-z
       (valid for METFM = 1, 2, 3, 4, 5)
   4 = use sigma-theta measurements
       from PLMMET.DAT to compute sigma-y
       (valid only if METFM = 3)

Back-up method used to compute dispersion
when measured turbulence data are
missing (MDISP2)                      Default: 3     ! MDISP2 =  3  !
(used only if MDISP = 1 or 5)
   2 = dispersion coefficients from internally calculated
       sigma v, sigma w using micrometeorological variables
       (u*, w*, L, etc.)
   3 = PG dispersion coefficients for RURAL areas (computed using
       the ISCST multi-segment approximation) and MP coefficients in
```

```
       urban areas
   4 = same as 3 except PG coefficients computed using
       the MESOPUFF II eqns.

[DIAGNOSTIC FEATURE]
Method used for Lagrangian timescale for Sigma-y
(used only if MDISP=1,2 or MDISP2=1,2)
(MTAULY)                              Default: 0     ! MTAULY =  0  !
   0 = Draxler default 617.284 (s)
   1 = Computed as Lag. Length / (.75 q) -- after SCIPUFF
  10 < Direct user input (s)             -- e.g., 306.9


[DIAGNOSTIC FEATURE]
Method used for Advective-Decay timescale for Turbulence
(used only if MDISP=2 or MDISP2=2)
(MTAUADV)                             Default: 0     ! MTAUADV =  0  !
   0 = No turbulence advection
   1 = Computed (OPTION NOT IMPLEMENTED)
  10 < Direct user input (s)   -- e.g., 800


Method used to compute turbulence sigma-v &
sigma-w using micrometeorological variables
(Used only if MDISP = 2 or MDISP2 = 2)
(MCTURB)                              Default: 1     ! MCTURB =  1  !
   1 = Standard CALPUFF subroutines
   2 = AERMOD subroutines

PG sigma-y,z adj. for roughness?      Default: 0     ! MROUGH =  0  !
(MROUGH)
   0 = no
   1 = yes

Partial plume penetration of          Default: 1     ! MPARTL =  1  !
elevated inversion modeled for
point sources?
(MPARTL)
   0 = no
   1 = yes

Partial plume penetration of          Default: 1     ! MPARTLBA =  1  !
elevated inversion modeled for
buoyant area sources?
(MPARTLBA)
   0 = no
   1 = yes

Strength of temperature inversion     Default: 0     ! MTINV =  0  !
provided in PROFILE.DAT extended records?
(MTINV)
   0 = no (computed from measured/default gradients)
   1 = yes

PDF used for dispersion under convective conditions?
                                      Default: 0     ! MPDF =  0  !
(MPDF)
   0 = no
   1 = yes

Sub-Grid TIBL module used for shore line?
                                      Default: 0     ! MSGTIBL = 0  !
(MSGTIBL)
   0 = no
   1 = yes

Boundary conditions (concentration) modeled?
                                      Default: 0     ! MBCON = 0  !
```

```
(MBCON)
   0 = no
   1 = yes, using formatted BCON.DAT file
   2 = yes, using unformatted CONC.DAT file

Note:  MBCON > 0 requires that the last species modeled
       be 'BCON'.  Mass is placed in species BCON when
       generating boundary condition puffs so that clean
       air entering the modeling domain can be simulated
       in the same way as polluted air.  Specify zero
       emission of species BCON for all regular sources.

Individual source contributions saved?
                                       Default: 0     ! MSOURCE = 0  !
(MSOURCE)
   0 = no
   1 = yes


Analyses of fogging and icing impacts due to emissions from
arrays of mechanically-forced cooling towers can be performed
using CALPUFF in conjunction with a cooling tower emissions
processor (CTEMISS) and its associated postprocessors.  Hourly
emissions of water vapor and temperature from each cooling tower
cell are computed for the current cell configuration and ambient
conditions by CTEMISS. CALPUFF models the dispersion of these
emissions and provides cloud information in a specialized format
for further analysis. Output to FOG.DAT is provided in either
'plume mode' or 'receptor mode' format.

Configure for FOG Model output?
                                       Default: 0     ! MFOG =  0   !
(MFOG)
   0 = no
   1 = yes  - report results in PLUME Mode format
   2 = yes  - report results in RECEPTOR Mode format


Test options specified to see if
they conform to regulatory
values? (MREG)                         Default: 1     ! MREG =  0   !

   0 = NO checks are made
   1 = Technical options must conform to USEPA
       Long Range Transport (LRT) guidance
                   METFM    1 or 2
                   AVET     60. (min)
                   PGTIME   60. (min)
                   MGAUSS   1
                   MCTADJ   3
                   MTRANS   1
                   MTIP     1
                   MRISE    1
                   MCHEM    1 or 3 (if modeling SOx, NOx)
                   MWET     1
                   MDRY     1
                   MDISP    2 or 3
                   MPDF     0 if MDISP=3
                            1 if MDISP=2
                   MROUGH   0
                   MPARTL   1
                   MPARTLBA 0
                   SYTDEP   550. (m)
                   MHFTSZ   0
                   SVMIN    0.5 (m/s)


!END!
```

INPUT GROUP: 3a, 3b -- Species list

Subgroup (3a)

The following species are modeled:

```
! CSPEC =         ODOR !         !END!

                                                          Dry                 OUTPUT
GROUP
    SPECIES          MODELED          EMITTED       DEPOSITED
NUMBER
     NAME         (0=NO, 1=YES)    (0=NO, 1=YES)    (0=NO,
(0=NONE,
   (Limit: 12                                        1=COMPUTED-GAS        1=1st
CGRUP,
    Characters                                       2=COMPUTED-PARTICLE   2=2nd
CGRUP,
    in length)                                       3=USER-SPECIFIED)     3=
etc.)

!         ODOR  =         1,               1,           0,                 0   !

!END!
```

Note: The last species in (3a) must be 'BCON' when using the boundary condition option (MBCON > 0). Species BCON should typically be modeled as inert (no chem transformation or removal).

Subgroup (3b)

The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above.

INPUT GROUP: 4 -- Map Projection and Grid control parameters

Projection for all (X,Y):

Map projection
(PMAP) Default: UTM ! PMAP = UTM !

- UTM : Universal Transverse Mercator
- TTM : Tangential Transverse Mercator
- LCC : Lambert Conformal Conic
- PS : Polar Stereographic
- EM : Equatorial Mercator
- LAZA : Lambert Azimuthal Equal Area

```
     False Easting and Northing (km) at the projection origin
     (Used only if PMAP= TTM, LCC, or LAZA)
     (FEAST)                   Default=0.0     ! FEAST  = 0.000  !
     (FNORTH)                  Default=0.0     ! FNORTH = 0.000  !

     UTM zone (1 to 60)
     (Used only if PMAP=UTM)
     (IUTMZN)                  No Default      ! IUTMZN =  56   !

     Hemisphere for UTM projection?
     (Used only if PMAP=UTM)
     (UTMHEM)                  Default: N      ! UTMHEM = S  !
         N   :  Northern hemisphere projection
         S   :  Southern hemisphere projection

     Latitude and Longitude (decimal degrees) of projection origin
     (Used only if PMAP= TTM, LCC, PS, EM, or LAZA)
     (RLAT0)                   No Default      ! RLAT0 =  0N  !
     (RLON0)                   No Default      ! RLON0 =  0E  !

         TTM :  RLON0 identifies central (true N/S) meridian of projection
                RLAT0 selected for convenience
         LCC :  RLON0 identifies central (true N/S) meridian of projection
                RLAT0 selected for convenience
         PS  :  RLON0 identifies central (grid N/S) meridian of projection
                RLAT0 selected for convenience
         EM  :  RLON0 identifies central meridian of projection
                RLAT0 is REPLACED by 0.0N (Equator)
         LAZA:  RLON0 identifies longitude of tangent-point of mapping plane
                RLAT0 identifies latitude of tangent-point of mapping plane

     Matching parallel(s) of latitude (decimal degrees) for projection
     (Used only if PMAP= LCC or PS)
     (XLAT1)                   No Default      ! XLAT1 =  0N  !
     (XLAT2)                   No Default      ! XLAT2 =  0N  !

         LCC :  Projection cone slices through Earth's surface at XLAT1 and
XLAT2
         PS  :  Projection plane slices through Earth at XLAT1
                (XLAT2 is not used)

     ----------
     Note:  Latitudes and longitudes should be positive, and include a
            letter N,S,E, or W indicating north or south latitude, and
            east or west longitude.  For example,
            35.9  N Latitude  =  35.9N
            118.7 E Longitude = 118.7E


     Datum-region
     ------------

     The Datum-Region for the coordinates is identified by a character
     string.  Many mapping products currently available use the model of the
     Earth known as the World Geodetic System 1984 (WGS-84).  Other local
     models may be in use, and their selection in CALMET will make its output
     consistent with local mapping products.  The list of Datum-Regions with
     official transformation parameters is provided by the National Imagery and
     Mapping Agency (NIMA).

     NIMA Datum - Regions(Examples)

-------------------------------------------------------------------------------
     WGS-84    WGS-84 Reference Ellipsoid and Geoid, Global coverage (WGS84)
     NAS-C     NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS (NAD27)
     NAR-C     NORTH AMERICAN 1983 GRS 80 Spheroid, MEAN FOR CONUS (NAD83)
     NWS-84    NWS 6370KM Radius, Sphere
```

```
     ESR-S     ESRI REFERENCE 6371KM Radius, Sphere

     Datum-region for output coordinates
     (DATUM)                    Default: WGS-84    ! DATUM = WGS-84  !


METEOROLOGICAL Grid:

     Rectangular grid defined for projection PMAP,
     with X the Easting and Y the Northing coordinate

            No. X grid cells (NX)      No default     ! NX =  40   !
            No. Y grid cells (NY)      No default     ! NY =  40   !
        No. vertical layers (NZ)       No default     ! NZ =  6    !

          Grid spacing (DGRIDKM)       No default     ! DGRIDKM = .3 !
                                       Units: km

               Cell face heights
                   (ZFACE(nz+1))       No defaults
                                       Units: m
   ! ZFACE = .0, 20.0, 50.0, 100.0, 500.0, 2000.0, 2985.0 !

            Reference Coordinates
           of SOUTHWEST corner of
                grid cell(1, 1):

            X coordinate (XORIGKM)     No default     ! XORIGKM = 330.009 !
            Y coordinate (YORIGKM)     No default     ! YORIGKM = 6234.12 !
                                      Units: km


COMPUTATIONAL Grid:

     The computational grid is identical to or a subset of the MET. grid.
     The lower left (LL) corner of the computational grid is at grid point
     (IBCOMP, JBCOMP) of the MET. grid.  The upper right (UR) corner of the
     computational grid is at grid point (IECOMP, JECOMP) of the MET. grid.
     The grid spacing of the computational grid is the same as the MET. grid.

        X index of LL corner (IBCOMP)      No default     ! IBCOMP =  15   !
                  (1 <= IBCOMP <= NX)

        Y index of LL corner (JBCOMP)      No default     ! JBCOMP =  15   !
                  (1 <= JBCOMP <= NY)


        X index of UR corner (IECOMP)      No default     ! IECOMP =  25   !
                  (1 <= IECOMP <= NX)

        Y index of UR corner (JECOMP)      No default     ! JECOMP =  25   !
                  (1 <= JECOMP <= NY)


SAMPLING Grid (GRIDDED RECEPTORS):

     The lower left (LL) corner of the sampling grid is at grid point
     (IBSAMP, JBSAMP) of the MET. grid.  The upper right (UR) corner of the
     sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.
     The sampling grid must be identical to or a subset of the computational
     grid.  It may be a nested grid inside the computational grid.
     The grid spacing of the sampling grid is DGRIDKM/MESHDN.

        Logical flag indicating if gridded
        receptors are used (LSAMP)         Default: T     ! LSAMP = T !
        (T=yes, F=no)
```

```
       X index of LL corner (IBSAMP)      No default     ! IBSAMP =  15   !
        (IBCOMP <= IBSAMP <= IECOMP)

       Y index of LL corner (JBSAMP)      No default     ! JBSAMP =  15   !
        (JBCOMP <= JBSAMP <= JECOMP)


       X index of UR corner (IESAMP)      No default     ! IESAMP =  25   !
        (IBCOMP <= IESAMP <= IECOMP)

       Y index of UR corner (JESAMP)      No default     ! JESAMP =  25   !
        (JBCOMP <= JESAMP <= JECOMP)


      Nesting factor of the sampling
       grid (MESHDN)                      Default: 1     ! MESHDN =  6  !
       (MESHDN is an integer >= 1)

!END!

------------------------------------------------------------------------------


INPUT GROUP: 5 -- Output Options
--------------
                                          *                          *
     FILE                        DEFAULT VALUE             VALUE THIS RUN
     ----                        -------------             --------------

   Concentrations (ICON)               1                   !  ICON =  1   !
   Dry Fluxes (IDRY)                   1                   !  IDRY =  0   !
   Wet Fluxes (IWET)                   1                   !  IWET =  0   !
   2D Temperature (IT2D)               0                   !  IT2D =  0   !
   2D Density (IRHO)                   0                   !  IRHO =  0   !
   Relative Humidity (IVIS)            1                   !  IVIS =  0   !
    (relative humidity file is
     required for visibility
     analysis)
   Use data compression option in output file?
   (LCOMPRS)                          Default: T          ! LCOMPRS = T !

   *
    0 = Do not create file, 1 = create file


    QA PLOT FILE OUTPUT OPTION:

       Create a standard series of output files (e.g.
       locations of sources, receptors, grids ...)
       suitable for plotting?
       (IQAPLOT)                      Default: 1          !  IQAPLOT =  1   !
         0 = no
         1 = yes

    DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

       Mass flux across specified boundaries
       for selected species reported?
       (IMFLX)                        Default: 0          ! IMFLX =  0  !
         0 = no
         1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
                  are specified in Input Group 0)

       Mass balance for each species
       reported?
       (IMBAL)                        Default: 0          ! IMBAL =  0  !
         0 = no
```

```
        1 = yes (MASSBAL.DAT filename is
             specified in Input Group 0)


    NUMERICAL RISE OUTPUT OPTION:

       Create a file with plume properties for each rise
       increment, for each model timestep?
       This applies to sources modeled with numerical rise
       and is limited to ONE source in the run.
       (INRISE)                        Default: 0         ! INRISE =  0  !
         0 = no
         1 = yes (RISE.DAT filename is
                  specified in Input Group 0)


    LINE PRINTER OUTPUT OPTIONS:

       Print concentrations (ICPRT)    Default: 0         ! ICPRT =  0   !
       Print dry fluxes (IDPRT)        Default: 0         ! IDPRT =  0   !
       Print wet fluxes (IWPRT)        Default: 0         ! IWPRT =  0   !
       (0 = Do not print, 1 = Print)

       Concentration print interval
       (ICFRQ) in timesteps            Default: 1         ! ICFRQ =  1   !
       Dry flux print interval
       (IDFRQ) in timesteps            Default: 1         ! IDFRQ =  1   !
       Wet flux print interval
       (IWFRQ) in timesteps            Default: 1         ! IWFRQ =  1   !

       Units for Line Printer Output
       (IPRTU)                         Default: 1         ! IPRTU =  5   !
                      for              for
                  Concentration    Deposition
           1 =       g/m**3          g/m**2/s
           2 =      mg/m**3         mg/m**2/s
           3 =      ug/m**3         ug/m**2/s
           4 =      ng/m**3         ng/m**2/s
           5 =     Odour Units

       Messages tracking progress of run
       written to the screen ?
       (IMESG)                         Default: 2         ! IMESG =  2   !
         0 = no
         1 = yes (advection step, puff ID)
         2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)


     SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

                  ---- CONCENTRATIONS ----   ------ DRY FLUXES ------   ------
WET FLUXES ------   -- MASS FLUX --
   SPECIES
   /GROUP        PRINTED?  SAVED ON DISK?   PRINTED?  SAVED ON DISK?   PRINTED?
SAVED ON DISK?   SAVED ON DISK?
   -------       ----------------------   ----------------------
----------------------   ---------------
!         ODOR =     0,           1,           0,           0,           0,
     0,           0   !

  Note:  Species BCON (for MBCON > 0) does not need to be saved on disk.


     OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

       Logical for debug output
       (LDEBUG)                                Default: F     ! LDEBUG = F !
```

```
       First puff to track
       (IPFDEB)                                  Default: 1     ! IPFDEB =  1  !

       Number of puffs to track
       (NPFDEB)                                  Default: 1     ! NPFDEB =  1  !

       Met. period to start output
       (NN1)                                     Default: 1     ! NN1 =  1   !

       Met. period to end output
       (NN2)                                     Default: 10    ! NN2 =  10  !

!END!


-------------------------------------------------------------------------------


INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs
-------------------------

---------------
Subgroup (6a)
---------------
       Number of terrain features (NHILL)        Default: 0     ! NHILL =  0   !

       Number of special complex terrain
       receptors  (NCTREC)                       Default: 0     ! NCTREC =  0   !

       Terrain and CTSG Receptor data for
       CTSG hills input in CTDM format ?
       (MHILL)                                   No Default     ! MHILL =  2   !
       1 = Hill and Receptor data created
           by CTDM processors & read from
           HILL.DAT and HILLRCT.DAT files
       2 = Hill data created by OPTHILL &
           input below in Subgroup (6b);
           Receptor data in Subgroup (6c)

       Factor to convert horizontal dimensions   Default: 1.0   ! XHILL2M = 1.0 !
       to meters (MHILL=1)

       Factor to convert vertical dimensions     Default: 1.0   ! ZHILL2M = 1.0 !
       to meters (MHILL=1)

       X-origin of CTDM system relative to       No Default     ! XCTDMKM = 0 !
       CALPUFF coordinate system, in Kilometers (MHILL=1)

       Y-origin of CTDM system relative to       No Default     ! YCTDMKM = 0 !
       CALPUFF coordinate system, in Kilometers (MHILL=1)

! END !

---------------
Subgroup (6b)
---------------

                      1 **
     HILL information


HILL           XC        YC       THETAH  ZGRID  RELIEF    EXPO 1    EXPO 2
SCALE 1    SCALE 2    AMAX1     AMAX2
 NO.          (km)      (km)      (deg.)   (m)     (m)       (m)       (m)
(m)        (m)        (m)       (m)
----         ----      ----      ------  -----  ------    ------    ------
-------    -------    -----     -----
```

Subgroup (6c)

COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH

1

Description of Complex Terrain Variables:
- XC, YC = Coordinates of center of hill
- THETAH = Orientation of major axis of hill (clockwise from North)
- ZGRID = Height of the 0 of the grid above mean sea level
- RELIEF = Height of the crest of the hill above the grid elevation
- EXPO 1 = Hill-shape exponent for the major axis
- EXPO 2 = Hill-shape exponent for the major axis
- SCALE 1 = Horizontal length scale along the major axis
- SCALE 2 = Horizontal length scale along the minor axis
- AMAX = Maximum allowed axis length for the major axis
- BMAX = Maximum allowed axis length for the major axis

XRCT, YRCT = Coordinates of the complex terrain receptors
- ZRCT = Height of the ground (MSL) at the complex terrain Receptor
- XHH = Hill number associated with each complex terrain receptor (NOTE: MUST BE ENTERED AS A REAL NUMBER)

**

NOTE: DATA for each hill and CTSG receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases
---

SPECIES NAME	DIFFUSIVITY (cm**2/s)	ALPHA STAR (dimensionless)	REACTIVITY	MESOPHYLL RESISTANCE (s/cm)	HENRY'S LAW COEFFICIENT

!END!

INPUT GROUP: 8 -- Size parameters for dry deposition of particles
---

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

```
      SPECIES      GEOMETRIC MASS MEAN        GEOMETRIC STANDARD
       NAME             DIAMETER                 DEVIATION
                        (microns)                (microns)
      -------      -------------------        ------------------

!END!


------------------------------------------------------------------------------


INPUT GROUP: 9 -- Miscellaneous dry deposition parameters
--------------

     Reference cuticle resistance (s/cm)
     (RCUTR)                          Default: 30    !  RCUTR = 30.0 !
     Reference ground resistance  (s/cm)
     (RGR)                            Default: 10    !    RGR = 10.0 !
     Reference pollutant reactivity
     (REACTR)                         Default: 8     ! REACTR = 8.0 !

     Number of particle-size intervals used to
     evaluate effective particle deposition velocity
     (NINT)                           Default: 9     !   NINT =  9  !

     Vegetation state in unirrigated areas
     (IVEG)                           Default: 1     !   IVEG =  1   !
        IVEG=1 for active and unstressed vegetation
        IVEG=2 for active and stressed vegetation
        IVEG=3 for inactive vegetation

!END!


------------------------------------------------------------------------------


INPUT GROUP: 10 -- Wet Deposition Parameters
---------------


                     Scavenging Coefficient -- Units: (sec)**(-1)

       Pollutant      Liquid Precip.       Frozen Precip.
       ---------      --------------       --------------

!END!


------------------------------------------------------------------------------


INPUT GROUP: 11a, 11b -- Chemistry Parameters
---------------------

---------------
Subgroup (11a)
---------------

     Ozone data input option (MOZ)     Default: 1            ! MOZ =  0   !
     (Used only if MCHEM = 1, 3, or 4)
        0 = use a monthly background ozone value
        1 = read hourly ozone concentrations from
            the OZONE.DAT data file

     Monthly ozone concentrations
     (Used only if MCHEM = 1, 3, or 4 and
```

```
 MOZ = 0 or MOZ = 1 and all hourly O3 data missing)
(BCKO3) in ppb                    Default: 12*80.
!  BCKO3 = 80.00, 80.00, 80.00, 80.00, 80.00, 80.00, 80.00, 80.00, 80.00,
80.00, 80.00, 80.00 !

Monthly ammonia concentrations
(Used only if MCHEM = 1, or 3)
(BCKNH3) in ppb                   Default: 12*10.
!  BCKNH3 = 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00, 10.00,
10.00, 10.00, 10.00 !

Nighttime SO2 loss rate (RNITE1)
in percent/hour                   Default: 0.2          ! RNITE1 = .2 !

Nighttime NOx loss rate (RNITE2)
in percent/hour                   Default: 2.0          ! RNITE2 = 2.0 !

Nighttime HNO3 formation rate (RNITE3)
in percent/hour                   Default: 2.0          ! RNITE3 = 2.0 !

H2O2 data input option (MH2O2)    Default: 1            ! MH2O2 =  1   !
(Used only if MAQCHEM = 1)
   0 = use a monthly background H2O2 value
   1 = read hourly H2O2 concentrations from
       the H2O2.DAT data file

Monthly H2O2 concentrations
(Used only if MQACHEM = 1 and
 MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)
(BCKH2O2) in ppb                  Default: 12*1.
!  BCKH2O2 = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00,
1.00, 1.00 !


--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option
    (used only if MCHEM = 4)

    The SOA module uses monthly values of:
         Fine particulate concentration in ug/m^3 (BCKPMF)
         Organic fraction of fine particulate     (OFRAC)
         VOC / NOX ratio (after reaction)         (VCNX)
    to characterize the air mass when computing
    the formation of SOA from VOC emissions.
    Typical values for several distinct air mass types are:

       Month    1    2    3    4    5    6    7    8    9   10   11   12
                Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

    Clean Continental
       BCKPMF   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.   1.
       OFRAC  .15  .15  .20  .20  .20  .20  .20  .20  .20  .20  .20  .15
       VCNX    50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.

    Clean Marine (surface)
       BCKPMF  .5   .5   .5   .5   .5   .5   .5   .5   .5   .5   .5   .5
       OFRAC  .25  .25  .30  .30  .30  .30  .30  .30  .30  .30  .30  .25
       VCNX    50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.  50.

    Urban - low biogenic (controls present)
       BCKPMF  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.  30.
       OFRAC  .20  .20  .25  .25  .25  .25  .25  .25  .20  .20  .20  .20
       VCNX     4.   4.   4.   4.   4.   4.   4.   4.   4.   4.   4.   4.

    Urban - high biogenic (controls present)
       BCKPMF  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.  60.
       OFRAC  .25  .25  .30  .30  .30  .55  .55  .55  .35  .35  .35  .25
       VCNX    15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.
```

```
     Regional Plume
        BCKPMF  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.  20.
        OFRAC  .20  .20  .25  .35  .25  .40  .40  .40  .30  .30  .30  .20
        VCNX    15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.  15.

     Urban - no controls present
        BCKPMF 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100. 100.
        OFRAC  .30  .30  .35  .35  .35  .55  .55  .55  .35  .35  .35  .30
        VCNX     2.   2.   2.   2.   2.   2.   2.   2.   2.   2.   2.   2.

     Default: Clean Continental
     !  BCKPMF = 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00,
1.00, 1.00 !
     !  OFRAC  = 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20,
0.20, 0.15 !
     !  VCNX   = 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00,
50.00, 50.00, 50.00 !

 --- End Data for SECONDARY ORGANIC AEROSOL (SOA) Option


     Number of half-life decay specification blocks provided in Subgroup 11b
     (Used only if MCHEM = 5)
     (NDECAY)                                    Default: 0      ! NDECAY =  0
!

!END!


--------------
Subgroup (11b)
--------------

     Each species modeled may be assigned a decay half-life (sec), and the
associated
     mass lost may be assigned to one or more other modeled species using a mass
yield
     factor. This information is used only for MCHEM=5.

     Provide NDECAY blocks assigning the half-life for a parent species and mass
yield
     factors for each child species (if any) produced by the decay.
     Set HALF_LIFE=0.0 for NO decay (infinite half-life).


                              a            b
        SPECIES      Half-Life   Mass Yield
         NAME          (sec)       Factor
        -------      ---------   ----------

     *   SPEC1   =    3600.,        -1.0   *    (Parent)*
     *   SPEC2   =     -1.0,         0.0   *    (Child)*
   *END*

--------
    a
     Specify a half life that is greater than or equal to zero for 1 parent
species
     in each block, and set the yield factor for this species to -1
    b
     Specify a yield factor that is greater than or equal to zero for 1 or more
child
     species in each block, and set the half-life for each of these species to
-1

     NOTE: Assignments in each block are treated as a separate input
           subgroup and therefore must end with an input group terminator.
           If NDECAY=0, no assignments and input group terminators should
```

```
appear.

------------------------------------------------------------------------------


INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters
---------------

     Horizontal size of puff (m) beyond which
     time-dependent dispersion equations (Heffter)
     are used to determine sigma-y and
     sigma-z (SYTDEP)                          Default: 550.   ! SYTDEP =
5.5E02 !

     Switch for using Heffter equation for sigma z
     as above (0 = Not use Heffter; 1 = use Heffter
     (MHFTSZ)                                  Default: 0      ! MHFTSZ =  0
!

     Stability class used to determine plume
     growth rates for puffs above the boundary
     layer (JSUP)                              Default: 5      ! JSUP =  5   !

     Vertical dispersion constant for stable
     conditions (k1 in Eqn. 2.7-3)  (CONK1)    Default: 0.01   ! CONK1 = .01 !

     Vertical dispersion constant for neutral/
     unstable conditions (k2 in Eqn. 2.7-4)
     (CONK2)                                   Default: 0.1    ! CONK2 = .1 !

     Factor for determining Transition-point from
     Schulman-Scire to Huber-Snyder Building Downwash
     scheme (SS used for Hs < Hb + TBD * HL)
     (TBD)                                     Default: 0.5    ! TBD = .5 !
        TBD < 0   ==> always use Huber-Snyder
        TBD = 1.5 ==> always use Schulman-Scire
        TBD = 0.5 ==> ISC Transition-point

     Range of land use categories for which
     urban dispersion is assumed
     (IURB1, IURB2)                            Default: 10     ! IURB1 =  10  !
                                                        19     ! IURB2 =  19  !

     Site characterization parameters for single-point Met data files ---------
     (needed for METFM = 2,3,4,5)

        Land use category for modeling domain
        (ILANDUIN)                             Default: 20     ! ILANDUIN =  20
 !

        Roughness length (m) for modeling domain
        (Z0IN)                                 Default: 0.25   ! Z0IN = .25 !

        Leaf area index for modeling domain
        (XLAIIN)                               Default: 3.0    ! XLAIIN = 3.0 !

        Elevation above sea level (m)
        (ELEVIN)                               Default: 0.0    ! ELEVIN = .0 !

        Latitude (degrees) for met location
        (XLATIN)                               Default: -999.  ! XLATIN =
-999.0 !

        Longitude (degrees) for met location
        (XLONIN)                               Default: -999.  ! XLONIN =
-999.0 !

     Specialized information for interpreting single-point Met data files -----
```

```
        Anemometer height (m) (Used only if METFM = 2,3)
        (ANEMHT)                                Default: 10.    ! ANEMHT = 10.0
!

        Form of lateral turbulance data in PROFILE.DAT file
        (Used only if METFM = 4,5 or MTURBVW = 1 or 3)
        (ISIGMAV)                               Default: 1      ! ISIGMAV =  1
!
            0 = read sigma-theta
            1 = read sigma-v

        Choice of mixing heights (Used only if METFM = 4)
        (IMIXCTDM)                              Default: 0      ! IMIXCTDM =  0
!
            0 = read PREDICTED mixing heights
            1 = read OBSERVED mixing heights

     Maximum length of a slug (met. grid units)
     (XMXLEN)                                   Default: 1.0    ! XMXLEN = 1.0 !

     Maximum travel distance of a puff/slug (in
     grid units) during one sampling step
     (XSAMLEN)                                  Default: 1.0    ! XSAMLEN = 1.0
!

     Maximum Number of slugs/puffs release from
     one source during one time step
     (MXNEW)                                    Default: 99     ! MXNEW =  99
!

     Maximum Number of sampling steps for
     one puff/slug during one time step
     (MXSAM)                                    Default: 99     ! MXSAM =  99
!

     Number of iterations used when computing
     the transport wind for a sampling step
     that includes gradual rise (for CALMET
     and PROFILE winds)
     (NCOUNT)                                   Default: 2      ! NCOUNT =  2
!

     Minimum sigma y for a new puff/slug (m)
     (SYMIN)                                    Default: 1.0    ! SYMIN = 1.0  !

     Minimum sigma z for a new puff/slug (m)
     (SZMIN)                                    Default: 1.0    ! SZMIN = 1.0  !

     Maximum sigma z (m) allowed to avoid
     numerical problem in calculating virtual
     time or distance.  Cap should be large
     enough to have no influence on normal events.
     Enter a negative cap to disable.
     (SZCAP_M)                                  Default: 5.0e06 ! SZCAP_M =
5.0E06 !

     Default minimum turbulence velocities sigma-v and sigma-w
     for each stability class over land and over water (m/s)
     (SVMIN(12) and SWMIN(12))

                     ----------  LAND  ----------       ---------  WATER
----------
        Stab Class :  A    B    C    D    E    F         A    B    C    D    E
 F
                     ---  ---  ---  ---  ---  ---       ---  ---  ---  ---  ---
---
     Default SVMIN : .50, .50, .50, .50, .50, .50,      .37, .37, .37, .37, .37,
```

```
.37
     Default SWMIN : .20, .12, .08, .06, .03, .016,     .20, .12, .08, .06, .03,
.016

          ! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.370, 0.370,
0.370, 0.370, 0.370, 0.370!
          ! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120,
0.080, 0.060, 0.030, 0.016!

     Divergence criterion for dw/dz across puff
     used to initiate adjustment for horizontal
     convergence (1/s)
     Partial adjustment starts at CDIV(1), and
     full adjustment is reached at CDIV(2)
     (CDIV(2))                                   Default: 0.0,0.0  ! CDIV = .0,
.0 !

     Search radius (number of cells) for nearest
     land and water cells used in the subgrid
     TIBL module
     (NLUTIBL)                                   Default: 4      ! NLUTIBL =  4
!

     Minimum wind speed (m/s) allowed for
     non-calm conditions. Also used as minimum
     speed returned when using power-law
     extrapolation toward surface
     (WSCALM)                                    Default: 0.5    ! WSCALM = .5 !

     Maximum mixing height (m)
     (XMAXZI)                                    Default: 3000.  ! XMAXZI =
3000.0 !

     Minimum mixing height (m)
     (XMINZI)                                    Default: 50.    ! XMINZI = 50.0
!

     Default wind speed classes --
     5 upper bounds (m/s) are entered;
     the 6th class has no upper limit
     (WSCAT(5))                       Default   :
                                      ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8
(10.8+)

                                Wind Speed Class :  1     2     3     4     5
                                                   ---   ---   ---   ---   ---
                                        ! WSCAT = 1.54, 3.09, 5.14, 8.23, 10.80 !

     Default wind speed profile power-law
     exponents for stabilities 1-6
     (PLX0(6))                        Default   : ISC RURAL values
                                      ISC RURAL : .07, .07, .10, .15, .35, .55
                                      ISC URBAN : .15, .15, .20, .25, .30, .30

                                Stability Class :  A     B     C     D     E
F
                                                   ---   ---   ---   ---   ---
---
                                           ! PLX0 = 0.07, 0.07, 0.10, 0.15, 0.35,
0.55 !

     Default potential temperature gradient
     for stable classes E, F (degK/m)
     (PTG0(2))                        Default: 0.020, 0.035
                                         ! PTG0 = 0.020,   0.035 !

     Default plume path coefficients for
     each stability class (used when option
```

```
     for partial plume height terrain adjustment
     is selected -- MCTADJ=3)
     (PPC(6))                  Stability Class :  A     B     C     D     E
F
                                  Default  PPC : .50,  .50,  .50,  .50,  .35,
.35
                                                 ---   ---   ---   ---   ---
---
                                       !  PPC = 0.50, 0.50, 0.50, 0.50, 0.35,
0.35 !

     Slug-to-puff transition criterion factor
     equal to sigma-y/length of slug
     (SL2PF)                              Default: 10.        ! SL2PF = 10.0 !

     Puff-splitting control variables ------------------------

       VERTICAL SPLIT
       --------------

       Number of puffs that result every time a puff
       is split - nsplit=2 means that 1 puff splits
       into 2
       (NSPLIT)                           Default:   3        ! NSPLIT =  3  !

       Time(s) of a day when split puffs are eligible to
       be split once again; this is typically set once
       per day, around sunset before nocturnal shear develops.
       24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)
       0=do not re-split    1=eligible for re-split
       (IRESPLIT(24))                     Default:  Hour 17 = 1
       !  IRESPLIT = 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0 !

       Split is allowed only if last hour's mixing
       height (m) exceeds a minimum value
       (ZISPLIT)                          Default: 100.       ! ZISPLIT = 100.0
!

       Split is allowed only if ratio of last hour's
       mixing ht to the maximum mixing ht experienced
       by the puff is less than a maximum value (this
       postpones a split until a nocturnal layer develops)
       (ROLDMAX)                          Default: 0.25       ! ROLDMAX = 0.25
!


       HORIZONTAL SPLIT
       ----------------

       Number of puffs that result every time a puff
       is split - nsplith=5 means that 1 puff splits
       into 5
       (NSPLITH)                          Default:   5        ! NSPLITH =  5  !

       Minimum sigma-y (Grid Cells Units) of puff
       before it may be split
       (SYSPLITH)                         Default:  1.0       ! SYSPLITH = 1.0
!

       Minimum puff elongation rate (SYSPLITH/hr) due to
       wind shear, before it may be split
       (SHSPLITH)                         Default:  2.        ! SHSPLITH = 2.0
!

       Minimum concentration (g/m^3) of each
       species in puff before it may be split
       Enter array of NSPEC values; if a single value is
       entered, it will be used for ALL species
```

```
      (CNSPLITH)                          Default:  1.0E-07   ! CNSPLITH =
1.0E-07 !

     Integration control variables ----------------------

       Fractional convergence criterion for numerical SLUG
       sampling integration
       (EPSSLUG)                          Default:   1.0e-04  ! EPSSLUG =
1.0E-04 !

       Fractional convergence criterion for numerical AREA
       source integration
       (EPSAREA)                          Default:   1.0e-06  ! EPSAREA =
1.0E-06 !

       Trajectory step-length (m) used for numerical rise
       integration
       (DSRISE)                           Default:   1.0      ! DSRISE = 1.0 !

       Boundary Condition (BC) Puff control variables -----------------------

       Minimum height (m) to which BC puffs are mixed as they are emitted
       (MBCON=2 ONLY).  Actual height is reset to the current mixing height
       at the release point if greater than this minimum.
       (HTMINBC)                          Default:   500.     ! HTMINBC = 500.0
!

       Search radius (km) about a receptor for sampling nearest BC puff.
       BC puffs are typically emitted with a spacing of one grid cell
       length, so the search radius should be greater than DGRIDKM.
       (RSAMPBC)                          Default:   10.      ! RSAMPBC = 10.0
!

       Near-Surface depletion adjustment to concentration profile used when
       sampling BC puffs?
       (MDEPBC)                           Default:   1        ! MDEPBC =  1  !
          0 = Concentration is NOT adjusted for depletion
          1 = Adjust Concentration for depletion

!END!


--------------------------------------------------------------------------------


INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters
---------------------------------

---------------
Subgroup (13a)
---------------

     Number of point sources with
     parameters provided below      (NPT1)  No default  !  NPT1 =  54  !

     Units used for point source
     emissions below                (IPTU)  Default: 1  !  IPTU =   5  !
           1 =        g/s
           2 =       kg/hr
           3 =       lb/hr
           4 =     tons/yr
           5 =     Odour Unit * m**3/s  (vol. flux of odour compound)
           6 =     Odour Unit * m**3/min
           7 =     metric tons/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
```

```
     provided below in (13d)        (NSPT1) Default: 0  !  NSPT1 =  0  !

     Number of point sources with
     variable emission parameters
     provided in external file      (NPT2)  No default  !  NPT2 =  0  !

     (If NPT2 > 0, these point
     source emissions are read from
     the file: PTEMARB.DAT)

!END!

---------------
Subgroup (13b)
---------------
                                      a
          POINT SOURCE: CONSTANT DATA
          ---------------------------
                                                                        b
        c
  Source       X         Y       Stack    Base     Stack    Exit  Exit    Bldg.
Emission
   No.     Coordinate Coordinate Height Elevation Diameter  Vel.  Temp.   Dwash
 Rates
              (km)      (km)       (m)      (m)       (m)  (m/s) (deg. K)

  ------   ---------- ---------- ------  ------   -------- ----- -------- -----
--------
   1 ! SRCNAM = BV01A !
   1 ! X =  335.834, 6240.404,    19.5,   6.5,       1.6,  14.1,  303.2,
1.0,9.326E03 !
   1 ! ZPLTFM  =       .0 !
   1 ! FMFAC  =      1.0 !   !END!
   2 ! SRCNAM = BV02A !
   2 ! X =  335.885, 6240.345,    21.5,   6.5,       1.6,  14.1,  303.2,
1.0,9.326E03 !
   2 ! ZPLTFM  =       .0 !
   2 ! FMFAC  =      1.0 !   !END!
   3 ! SRCNAM = BV03A !
   3 ! X =  335.893, 6240.337,    21.5,   6.5,       1.6,  14.1,  303.2,
1.0,9.326E03 !
   3 ! ZPLTFM  =       .0 !
   3 ! FMFAC  =      1.0 !   !END!
   4 ! SRCNAM = BV04A !
   4 ! X =  335.898, 6240.334,    21.5,   6.5,       1.6,  14.1,  303.2,
1.0,9.326E03 !
   4 ! ZPLTFM  =       .0 !
   4 ! FMFAC  =      1.0 !   !END!
   5 ! SRCNAM = BV05A !
   5 ! X =  335.957, 6240.283,    19.5,   6.5,       1.6,  14.1,  303.2,
1.0,9.326E03 !
   5 ! ZPLTFM  =       .0 !
   5 ! FMFAC  =      1.0 !   !END!
   6 ! SRCNAM = PV01A !
   6 ! X =  335.915, 6240.319,    30.5,   6.5,      1.62,  14.1,  313.2,
1.0,1.5548E04 !
   6 ! ZPLTFM  =       .0 !
   6 ! FMFAC  =      1.0 !   !END!
   7 ! SRCNAM = PV02A !
   7 ! X =  335.904, 6240.329,    30.5,   6.5,      1.15,  14.1,  313.2,
1.0,7.824E03 !
   7 ! ZPLTFM  =       .0 !
   7 ! FMFAC  =      1.0 !   !END!
   8 ! SRCNAM = PV03A !
   8 ! X =  335.907, 6240.336,    30.5,   6.5,      1.62,  14.1,  313.2,
1.0,1.5548E04 !
   8 ! ZPLTFM  =       .0 !
   8 ! FMFAC  =      1.0 !   !END!
```

```
   9 ! SRCNAM = PV04A !
   9 ! X =  335.881, 6240.358,    19.5,   6.5,       1.5,  14.1,  378.8,
1.0,1.5327E04 !
   9 ! ZPLTFM  =       .0 !
   9 ! FMFAC  =      1.0 !   !END!
  10 ! SRCNAM = PV05A !
  10 ! X =  335.931, 6240.312,    30.5,   6.5,       .57,  14.1,  359.2,
1.0,2.382E03 !
  10 ! ZPLTFM  =       .0 !
  10 ! FMFAC  =      1.0 !   !END!
  11 ! SRCNAM = PV06A !
  11 ! X =  335.925, 6240.318,    30.5,   6.5,       .38,  14.1,  372.2,
1.0,1.016E03 !
  11 ! ZPLTFM  =       .0 !
  11 ! FMFAC  =      1.0 !   !END!
  12 ! SRCNAM = PV07A !
  12 ! X =  335.874, 6240.366,    19.5,   6.5,      1.34,  14.1,  320.9,
1.0,7.23E03 !
  12 ! ZPLTFM  =       .0 !
  12 ! FMFAC  =      1.0 !   !END!
  13 ! SRCNAM = PV08A !
  13 ! X =  335.858, 6240.381,    19.5,   6.5,      1.92,  14.1,  324.6,
1.0,1.477E04 !
  13 ! ZPLTFM  =       .0 !
  13 ! FMFAC  =      1.0 !   !END!
  14 ! SRCNAM = PV09A !
  14 ! X =  335.843, 6240.395,    19.5,   6.5,      1.32,  14.1,  324.8,
1.0,6.906E03 !
  14 ! ZPLTFM  =       .0 !
  14 ! FMFAC  =      1.0 !   !END!
  15 ! SRCNAM = PV10A !
  15 ! X =  335.822, 6240.415,    19.5,   6.5,      2.06,  14.1,  320.9,
1.0,1.4685E04 !
  15 ! ZPLTFM  =       .0 !
  15 ! FMFAC  =      1.0 !   !END!
  16 ! SRCNAM = PV11A !
  16 ! X =  335.769, 6240.464,    16.5,   6.5,        .9,  14.1,  303.2,
1.0,4.922E03 !
  16 ! ZPLTFM  =       .0 !
  16 ! FMFAC  =      1.0 !   !END!
  17 ! SRCNAM = PV13A !
  17 ! X =  335.851,  6240.43,    15.0,   6.5,       .11,  2.07,  370.2,  1.0,
8.9E01 !
  17 ! ZPLTFM  =       .0 !
  17 ! FMFAC  =      1.0 !   !END!
  18 ! SRCNAM = PV14A !
  18 ! X =  335.986, 6240.295,    28.5,   6.5,       .46,  14.1,  303.2,
1.0,1.295E03 !
  18 ! ZPLTFM  =       .0 !
  18 ! FMFAC  =      1.0 !   !END!
  19 ! SRCNAM = BV01B !
  19 ! X =  335.833, 6240.402,    26.5,   6.5,       1.6, 12.69,  303.2,
1.0,4.663E03 !
  19 ! ZPLTFM  =       .0 !
  19 ! FMFAC  =      1.0 !   !END!
  20 ! SRCNAM = BV02B !
  20 ! X =  335.883, 6240.343,    28.5,   6.5,       1.6, 12.69,  303.2,
1.0,4.663E03 !
  20 ! ZPLTFM  =       .0 !
  20 ! FMFAC  =      1.0 !   !END!
  21 ! SRCNAM = BV03B !
  21 ! X =  335.891, 6240.335,    28.5,   6.5,       1.6, 12.69,  303.2,
1.0,4.663E03 !
  21 ! ZPLTFM  =       .0 !
  21 ! FMFAC  =      1.0 !   !END!
  22 ! SRCNAM = BV04B !
  22 ! X =  335.896, 6240.332,    28.5,   6.5,       1.6, 12.69,  303.2,
1.0,4.663E03 !
```

```
  22 ! ZPLTFM  =       .0 !
  22 ! FMFAC  =      1.0 !   !END!
  23 ! SRCNAM = BV05B !
  23 ! X =  335.956, 6240.281,    26.5,   6.5,       1.6, 12.69,  303.2,
1.0,4.663E03 !
  23 ! ZPLTFM  =       .0 !
  23 ! FMFAC  =      1.0 !   !END!
  24 ! SRCNAM = PV01B !
  24 ! X =  335.913, 6240.317,    37.5,   6.5,      1.62, 12.69,  313.2,
1.0,7.774E03 !
  24 ! ZPLTFM  =       .0 !
  24 ! FMFAC  =      1.0 !   !END!
  25 ! SRCNAM = PV02B !
  25 ! X =  335.902, 6240.327,    37.5,   6.5,      1.15, 12.69,  313.2,
1.0,3.912E03 !
  25 ! ZPLTFM  =       .0 !
  25 ! FMFAC  =      1.0 !   !END!
  26 ! SRCNAM = PV03B !
  26 ! X =  335.905, 6240.334,    37.5,   6.5,      1.62, 12.69,  313.2,
1.0,7.774E03 !
  26 ! ZPLTFM  =       .0 !
  26 ! FMFAC  =      1.0 !   !END!
  27 ! SRCNAM = PV04B !
  27 ! X =  335.879, 6240.356,    26.5,   6.5,       1.5, 12.69,  378.8,
1.0,7.663E03 !
  27 ! ZPLTFM  =       .0 !
  27 ! FMFAC  =      1.0 !   !END!
  28 ! SRCNAM = PV05B !
  28 ! X =  335.929,  6240.31,    37.5,   6.5,       .57, 12.69,  359.2,
1.0,1.191E03 !
  28 ! ZPLTFM  =       .0 !
  28 ! FMFAC  =      1.0 !   !END!
  29 ! SRCNAM = PV06B !
  29 ! X =  335.924, 6240.316,    37.5,   6.5,       .38, 12.69,  372.2,
1.0,5.08E02 !
  29 ! ZPLTFM  =       .0 !
  29 ! FMFAC  =      1.0 !   !END!
  30 ! SRCNAM = PV07B !
  30 ! X =  335.872, 6240.364,    26.5,   6.5,      1.34, 12.69,  320.9,
1.0,3.615E03 !
  30 ! ZPLTFM  =       .0 !
  30 ! FMFAC  =      1.0 !   !END!
  31 ! SRCNAM = PV08B !
  31 ! X =  335.856, 6240.379,    26.5,   6.5,      1.92, 12.69,  324.6,
1.0,7.385E03 !
  31 ! ZPLTFM  =       .0 !
  31 ! FMFAC  =      1.0 !   !END!
  32 ! SRCNAM = PV09B !
  32 ! X =  335.842, 6240.393,    26.5,   6.5,      1.32, 12.69,  324.8,
1.0,3.453E03 !
  32 ! ZPLTFM  =       .0 !
  32 ! FMFAC  =      1.0 !   !END!
  33 ! SRCNAM = PV10B !
  33 ! X =   335.82, 6240.413,    26.5,   6.5,      2.06, 12.69,  320.9,
1.0,7.343E03 !
  33 ! ZPLTFM  =       .0 !
  33 ! FMFAC  =      1.0 !   !END!
  34 ! SRCNAM = PV11B !
  34 ! X =  335.767, 6240.462,    23.5,   6.5,        .9, 12.69,  303.2,
1.0,2.461E03 !
  34 ! ZPLTFM  =       .0 !
  34 ! FMFAC  =      1.0 !   !END!
  35 ! SRCNAM = PV13B !
  35 ! X =   335.85, 6240.429,    16.0,   6.5,       .11,  1.86,  370.2,  1.0,
4.5E01 !
  35 ! ZPLTFM  =       .0 !
  35 ! FMFAC  =      1.0 !   !END!
  36 ! SRCNAM = PV14B !
```

```
  36 ! X =  335.984, 6240.294,    35.5,   6.5,       .46, 12.69,  303.2,
1.0,6.48E02 !
  36 ! ZPLTFM  =       .0 !
  36 ! FMFAC  =      1.0 !   !END!
  37 ! SRCNAM = BV01C !
  37 ! X =  335.831,   6240.4,    33.6,   6.5,       1.6, 11.42,  303.2,
1.0,4.663E03 !
  37 ! ZPLTFM  =       .0 !
  37 ! FMFAC  =      1.0 !   !END!
  38 ! SRCNAM = BV02C !
  38 ! X =  335.881, 6240.341,    35.6,   6.5,       1.6, 11.42,  303.2,
1.0,4.663E03 !
  38 ! ZPLTFM  =       .0 !
  38 ! FMFAC  =      1.0 !   !END!
  39 ! SRCNAM = BV03C !
  39 ! X =  335.889, 6240.333,    35.6,   6.5,       1.6, 11.42,  303.2,
1.0,4.663E03 !
  39 ! ZPLTFM  =       .0 !
  39 ! FMFAC  =      1.0 !   !END!
  40 ! SRCNAM = BV04C !
  40 ! X =  335.894,  6240.33,    35.6,   6.5,       1.6, 11.42,  303.2,
1.0,4.663E03 !
  40 ! ZPLTFM  =       .0 !
  40 ! FMFAC  =      1.0 !   !END!
  41 ! SRCNAM = BV05C !
  41 ! X =  335.954, 6240.279,    33.6,   6.5,       1.6, 11.42,  303.2,
1.0,4.663E03 !
  41 ! ZPLTFM  =       .0 !
  41 ! FMFAC  =      1.0 !   !END!
  42 ! SRCNAM = PV01C !
  42 ! X =  335.913, 6240.317,    44.6,   6.5,      1.62, 11.42,  313.2,
1.0,7.774E03 !
  42 ! ZPLTFM  =       .0 !
  42 ! FMFAC  =      1.0 !   !END!
  43 ! SRCNAM = PV02C !
  43 ! X =    335.9, 6240.325,    44.6,   6.5,      1.15, 11.42,  313.2,
1.0,3.912E03 !
  43 ! ZPLTFM  =       .0 !
  43 ! FMFAC  =      1.0 !   !END!
  44 ! SRCNAM = PV03C !
  44 ! X =  335.903, 6240.332,    44.6,   6.5,      1.62, 11.42,  313.2,
1.0,7.774E03 !
  44 ! ZPLTFM  =       .0 !
  44 ! FMFAC  =      1.0 !   !END!
  45 ! SRCNAM = PV04C !
  45 ! X =  335.877, 6240.354,    33.6,   6.5,       1.5, 11.42,  378.8,
1.0,7.663E03 !
  45 ! ZPLTFM  =       .0 !
  45 ! FMFAC  =      1.0 !   !END!
  46 ! SRCNAM = PV05C !
  46 ! X =  335.927, 6240.308,    44.6,   6.5,       .57, 11.42,  359.2,
1.0,1.191E03 !
  46 ! ZPLTFM  =       .0 !
  46 ! FMFAC  =      1.0 !   !END!
  47 ! SRCNAM = PV06C !
  47 ! X =  335.922, 6240.314,    44.6,   6.5,       .38, 11.42,  372.2,
1.0,5.08E02 !
  47 ! ZPLTFM  =       .0 !
  47 ! FMFAC  =      1.0 !   !END!
  48 ! SRCNAM = PV07C !
  48 ! X =   335.87, 6240.362,    33.6,   6.5,      1.34, 11.42,  320.9,
1.0,3.615E03 !
  48 ! ZPLTFM  =       .0 !
  48 ! FMFAC  =      1.0 !   !END!
  49 ! SRCNAM = PV08C !
  49 ! X =  335.854, 6240.377,    33.6,   6.5,      1.92, 11.42,  324.6,
1.0,7.385E03 !
  49 ! ZPLTFM  =       .0 !
```

```
  49 ! FMFAC  =      1.0 !   !END!
  50 ! SRCNAM = PV09C !
  50 ! X =   335.84, 6240.391,    33.6,   6.5,      1.32, 11.42,  324.8,
1.0,3.453E03 !
  50 ! ZPLTFM  =       .0 !
  50 ! FMFAC  =      1.0 !   !END!
  51 ! SRCNAM = PV10C !
  51 ! X =  335.818, 6240.412,    33.6,   6.5,      2.06, 11.42,  320.9,
1.0,7.343E03 !
  51 ! ZPLTFM  =       .0 !
  51 ! FMFAC  =      1.0 !   !END!
  52 ! SRCNAM = PV11C !
  52 ! X =  335.766,  6240.46,    30.6,   6.5,        .9, 11.42,  303.2,
1.0,2.461E03 !
  52 ! ZPLTFM  =       .0 !
  52 ! FMFAC  =      1.0 !   !END!
  53 ! SRCNAM = PV13C !
  53 ! X =  335.849, 6240.427,    17.1,   6.5,       .11,  1.67,  370.2,  1.0,
4.5E01 !
  53 ! ZPLTFM  =       .0 !
  53 ! FMFAC  =      1.0 !   !END!
  54 ! SRCNAM = PV14C !
  54 ! X =  335.984, 6240.293,    42.6,   6.5,       .46, 11.42,  303.2,
1.0,6.48E02 !
  54 ! ZPLTFM  =       .0 !
  54 ! FMFAC  =      1.0 !   !END!
```

---

a

Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

SRCNAM is a 12-character name for a source
(No default)

X is an array holding the source data listed by the column headings
(No default)

SIGYZI is an array holding the initial sigma-y and sigma-z (m)
(Default: 0.,0.)

FMFAC is a vertical momentum flux factor (0. or 1.0) used to represent the effect of rain-caps or other physical configurations that reduce momentum rise associated with the actual exit velocity.
(Default: 1.0 -- full momentum used)

ZPLTFM is the platform height (m) for sources influenced by an isolated structure that has a significant open area between the surface and the bulk of the structure, such as an offshore oil platform. The Base Elevation is that of the surface (ground or ocean), and the Stack Height is the release height above the Base (not above the platform). Building heights entered in Subgroup 13c must be those of the buildings on the platform, measured from the platform deck. ZPLTFM is used only with MBDW=1 (ISC downwash method) for sources with building downwash.
(Default: 0.0)

b

0. = No building downwash modeled
1. = Downwash modeled for buildings resting on the surface
2. = Downwash modeled for buildings raised above the surface (ZPLTFM > 0.)
NOTE: must be entered as a REAL number (i.e., with decimal point)

c

An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IPTU (e.g. 1 for g/s).

Subgroup (13c)

```
---------------

            BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH
            -------------------------------------------------------
Source                                                                    a
 No.        Effective building height, width, length and X/Y offset (in meters)
            every 10 degrees.  LENGTH, XBADJ, and YBADJ are only needed for
            MBDW=2 (PRIME downwash option)
------      ------------------------------------------------------------------

 1     ! SRCNAM  =   BV01A !
 1     ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 1     ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 1     ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 1     ! XBADJ   =   -109.5,   -78.0,   -44.0,   -9.0,   -7.5,   -28.25,
                    -48.5,   -67.25,   -84.0,   -98.19,   -109.38,   -117.0,
                    -121.5,   -123.5,   -124.0,   -121.0,   -113.5,   -103.0,
                    -89.5,   -73.0,   -54.5,   -34.0,   -48.0,   -82.25,
                    -113.75,   -142.13,   -166.0,   -184.88,   -198.0,   -205.25,

                    -206.25,   -203.0,   -195.0,   -181.5,   -162.5,   -138.0!
 1     ! YBADJ   =   -43.31,   -44.31,   -44.0,   -42.25,   -39.25,   -35.5,
                    -30.5,   -24.25,   -17.5,   -10.0,   -2.5,   5.25,
                    12.25,   20.5,   27.0,   32.75,   37.44,   41.0,
                    43.38,   44.31,   44.0,   42.38,   39.25,   35.5,
                    30.5,   24.25,   17.5,   10.5,   2.75,   -5.0,
                    -12.75,   -20.5,   -27.0,   -32.75,   -37.44,   -41.0!
!END!
 2     ! SRCNAM  =   BV02A !
 2     ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   23.5!
 2     ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   250.0!
 2     ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   241.0!
 2     ! XBADJ   =   -60.5,   -40.0,   -18.5,   3.5,   -8.5,   -43.0,
                    -76.25,   11.0,   14.0,   16.56,   18.63,   20.25,
                    -198.5,   -201.5,   16.5,   13.5,   10.0,   -162.0,
                    -139.0,   -111.0,   -80.0,   -46.5,   -47.0,   -67.75,
                    -86.0,   -43.63,   -50.0,   -54.81,   -57.88,   -131.75,
                    -129.25,   -125.0,   -57.0,   -53.5,   -48.5,   -79.0!
```

```
 2    ! YBADJ  =   17.13,   23.69,   29.75,   34.75,   38.75,   41.0,
                   42.5,   -29.25,   -24.0,   -18.25,   -11.25,   -4.75,
                   24.75,   19.5,   15.62,   21.87,   27.31,   -10.0,
                   -17.13,   -23.69,   -29.75,   -34.63,   -38.75,   -41.0,
                   -42.5,   29.25,   24.0,   18.0,   11.75,   -31.0,
                   -25.25,   -19.5,   -15.62,   -21.87,   -27.38,   10.0!
!END!
 3    ! SRCNAM  =   BV03A !
 3    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 3    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                   40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                   38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                   40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                   42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 3    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                   28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                   32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                   28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                   328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 3    ! XBADJ  =   -28.0,   -20.5,   -13.0,   -5.0,   -.5,   1.25,
                   3.0,   4.5,   6.0,   7.31,   8.37,   9.25,
                   -209.75,   -213.0,   5.5,   3.5,   .5,   -2.0,
                   -5.0,   -7.0,   -9.5,   -11.5,   -16.5,   -24.5,
                   -31.25,   -37.13,   -42.0,   -45.56,   -47.63,   -120.75,
                   -118.0,   -113.5,   -46.0,   -43.0,   -39.0,   -34.0!
 3    ! YBADJ  =   -26.38,   -28.06,   -28.75,   -28.63,   -27.75,   -26.0,
                   -23.0,   -20.25,   -16.0,   -11.75,   -6.75,   -1.75,
                   25.75,   18.5,   12.88,   17.13,   20.81,   24.0,
                   26.44,   28.06,   28.87,   28.75,   28.0,   26.0,
                   23.5,   20.25,   16.0,   11.5,   6.75,   -33.5,
                   -26.25,   -18.5,   -12.63,   -17.13,   -20.88,   -24.0!
!END!
 4    ! SRCNAM  =   BV04A !
 4    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 4    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                   40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                   38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                   40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                   42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 4    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                   28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                   32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                   28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                   328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 4    ! XBADJ  =   -26.0,   -19.5,   -13.0,   -6.0,   -2.5,   -1.75,
                   -.75,   .13,   1.0,   1.81,   2.75,   3.5,
                   -215.5,   -218.5,   .5,   -1.0,   -3.5,   -5.0,
                   -7.0,   -8.5,   -9.5,   -10.5,   -14.5,   -21.75,
                   -27.75,   -32.75,   -37.0,   -40.13,   -41.87,   -115.0,
                   -112.25,   -108.0,   -41.0,   -38.5,   -35.0,   -31.0!
 4    ! YBADJ  =   -20.94,   -22.31,   -23.0,   -22.88,   -22.25,   -21.0,
                   -18.5,   -16.25,   -13.0,   -9.75,   -5.75,   -1.75,
                   24.75,   16.5,   9.87,   13.38,   16.44,   19.0,
                   21.0,   22.31,   22.88,   23.0,   22.5,   21.0,
```

```
                    19.0,   16.25,   13.0,   9.5,   5.75,   -34.0,
                    -25.25,   -16.5,   -9.87,   -13.38,   -16.5,   -19.0!
!END!
 5    ! SRCNAM  =   BV05A !
 5    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 5    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.5,   35.5,
                    42.5,   55.0,   35.5,   35.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.5,   98.0,
                    42.5,   55.0,   35.5,   35.5,   209.37,   250.0!
 5    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 5    ! XBADJ   =   -12.0,   -6.5,   -1.0,   5.0,   -24.0,   -74.25,
                    -122.75,   -167.38,   -207.0,   -240.31,   39.25,   39.0,
                    -293.5,   -295.5,   40.5,   40.0,   -254.0,   -224.0,
                    -187.5,   -144.5,   -97.5,   -47.5,   -32.0,   -36.25,
                    -39.75,   -42.0,   -43.0,   -42.69,   39.25,   -38.25,
                    -34.25,   -31.0,   40.0,   40.0,   -21.5,   -17.0!
 5    ! YBADJ   =   98.81,   112.56,   123.25,   129.75,   132.25,   131.0,
                    125.5,   116.25,   103.5,   87.5,   39.25,   39.0,
                    26.25,   4.0,   40.5,   40.0,   -62.69,   -82.0,
                    -98.81,   -112.56,   -123.0,   -129.63,   -132.25,   -131.0,

                    -125.5,   -116.25,   -103.5,   -87.5,   39.25,   -48.5,
                    -26.25,   -4.0,   40.0,   40.0,   62.69,   82.0!
!END!
 6    ! SRCNAM  =   PV01A !
 6    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 6    ! WIDTH   =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 6    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 6    ! XBADJ   =   -14.0,   -11.5,   -8.5,   -5.5,   -6.0,   -9.0,
                    -11.5,   -14.0,   -16.0,   -17.5,   -18.38,   -18.75,
                    -238.25,   -241.0,   -21.0,   -21.0,   -21.0,   -20.0,
                    -18.5,   -16.5,   -14.0,   -11.0,   -11.5,   -14.5,
                    -16.75,   -18.63,   -20.0,   -20.75,   -20.88,   -92.75,
                    -89.75,   -85.5,   -19.5,   -19.0,   -17.5,   -16.0!
 6    ! YBADJ   =   -1.63,   -1.19,   -.75,   -.37,   .25,   .5,
                    1.0,   1.25,   2.0,   2.25,   2.75,   2.75,
                    25.75,   13.0,   2.62,   2.62,   2.31,   2.0,
                    1.63,   1.19,   .88,   .25,   .0,   -.5,
                    -1.0,   -1.75,   -2.0,   -2.5,   -2.75,   -38.5,
                    -25.75,   -13.0,   -2.62,   -2.62,   -2.38,   -2.0!
!END!
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```
 7    ! SRCNAM  =   PV02A !
 7    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 7    ! WIDTH   =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                   40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                   38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                   40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                   42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 7    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                   28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                   32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                   28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                   328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 7    ! XBADJ   =   -22.0,   -17.0,   -11.5,   -6.0,   -4.0,   -4.25,
                   -4.5,   -4.88,   -5.0,   -4.94,   -4.62,   -4.25,
                   -223.5,   -226.0,   -7.0,   -8.0,   -9.0,   -10.0,
                   -10.5,   -11.0,   -11.0,   -10.5,   -13.5,   -19.0,
                   -23.75,   -27.75,   -31.0,   -33.31,   -34.63,   -107.25,
                   -104.5,   -100.5,   -33.5,   -32.0,   -29.0,   -26.0!
 7    ! YBADJ   =   -14.19,   -14.94,   -15.25,   -15.13,   -14.25,   -13.5,
                   -12.0,   -10.25,   -8.0,   -5.75,   -2.75,   -.25,
                   24.75,   15.0,   7.12,   9.37,   11.44,   13.0,
                   14.19,   14.94,   15.38,   15.25,   14.5,   13.5,
                   12.0,   10.25,   8.0,   5.5,   3.25,   -35.0,
                   -25.25,   -15.0,   -7.12,   -9.62,   -11.37,   -13.0!
!END!
 8    ! SRCNAM  =   PV03A !
 8    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 8    ! WIDTH   =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                   40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                   38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                   40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                   42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 8    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                   28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                   32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                   28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                   328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 8    ! XBADJ   =   -29.5,   -24.5,   -19.5,   -13.0,   -10.5,   -10.5,
                   -9.75,   -9.13,   -8.0,   -6.69,   -5.12,   -3.25,
                   -221.25,   -222.5,   -2.5,   -2.5,   -3.0,   -3.0,
                   -3.5,   -3.5,   -3.5,   -3.0,   -6.5,   -12.75,
                   -18.5,   -23.5,   -28.0,   -31.63,   -34.13,   -108.25,
                   -106.75,   -103.5,   -38.0,   -37.5,   -35.5,   -33.0!
 8    ! YBADJ   =   -12.44,   -14.56,   -16.25,   -17.37,   -17.75,   -18.0,
                   -17.5,   -16.75,   -15.0,   -13.25,   -10.75,   -7.75,
                   17.75,   8.0,   1.13,   4.13,   7.19,   10.0,
                   12.44,   14.56,   16.12,   17.25,   18.0,   18.0,
                   17.5,   16.75,   15.0,   13.0,   10.75,   -27.5,
                   -17.75,   -8.5,   -1.13,   -4.37,   -7.25,   -10.0!
!END!
 9    ! SRCNAM  =   PV04A !
 9    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   23.5,
```

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                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   23.5!
 9    ! WIDTH  =    283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   22.25,   22.25,
                    42.5,   55.0,   22.25,   22.25,   22.25,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   22.25,   98.0,
                    42.5,   55.0,   22.25,   22.25,   22.25,   250.0!
 9    ! LENGTH =    199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   241.0!
 9    ! XBADJ  =    -72.5,   -51.0,   -28.0,   -4.0,   -14.0,   -46.0,
                    -77.0,   -105.5,   -131.0,   -152.44,   39.25,   39.0,
                    -187.25,   -189.0,   40.5,   40.0,   38.5,   -149.0,
                    -126.5,   -100.0,   -70.5,   -39.0,   -42.0,   -64.75,
                    -85.5,   -103.75,   -119.0,   -130.56,   39.25,   -141.75,
                    -140.75,   -137.5,   40.0,   40.0,   38.5,   -92.0!
 9    ! YBADJ  =    10.94,   15.56,   19.75,   23.25,   26.25,   28.0,
                    29.0,   29.25,   28.5,   27.0,   39.25,   39.0,
                    17.75,   14.0,   40.5,   40.0,   38.5,   -6.0,
                    -10.94,   -15.56,   -19.75,   -23.13,   -26.25,   -28.0,
                    -29.0,   -29.25,   -28.5,   -27.0,   39.25,   -21.5,
                    -17.75,   -14.0,   40.0,   40.0,   38.5,   6.0!
!END!
 10    ! SRCNAM  =   PV05A !
 10    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 10    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 10    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 10    ! XBADJ  =    -10.0,   -10.0,   -10.5,   -10.0,   -13.5,   -19.25,
                    -24.25,   -28.5,   -32.0,   -34.5,   -35.88,   -36.25,
                    -255.0,   -256.5,   -35.0,   -33.0,   -30.5,   -27.0,
                    -23.0,   -17.5,   -12.0,   -6.0,   -3.5,   -4.0,
                    -4.25,   -4.0,   -4.0,   -3.81,   -3.38,   -75.25,
                    -73.0,   -70.0,   -5.5,   -6.5,   -8.0,   -9.0!
 10    ! YBADJ  =   15.38,   16.19,   16.5,   16.38,   15.75,   15.0,
                    13.5,   11.25,   9.0,   6.25,   3.75,   .75,
                    20.75,   5.0,   -7.62,   -10.12,   -12.31,   -14.0,
                    -15.31,   -16.31,   -16.63,   -16.5,   -16.0,   -15.0,
                    -13.0,   -11.25,   -9.0,   -6.5,   -3.75,   -36.5,
                    -20.75,   -5.5,   7.62,   10.12,   12.25,   14.0!
!END!
 11    ! SRCNAM  =   PV06A !
 11    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 11    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
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                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 11    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 11    ! XBADJ  =   -15.0,   -14.0,   -12.5,   -11.0,   -13.0,   -17.0,
                    -20.5,   -23.75,   -26.0,   -27.5,   -28.12,   -28.0,
                    -246.5,   -248.0,   -27.0,   -25.5,   -23.5,   -21.0,
                    -18.0,   -14.0,   -10.0,   -5.0,   -4.5,   -6.25,
                    -7.75,   -8.88,   -10.0,   -10.75,   -11.12,   -83.5,
                    -81.25,   -78.5,   -13.5,   -14.5,   -15.0,   -15.0!
 11    ! YBADJ  =   8.44,   8.56,   8.5,   8.12,   7.25,   6.5,
                    5.5,   4.25,   3.0,   1.75,   .25,   -1.25,
                    19.75,   6.0,   -5.37,   -6.63,   -7.44,   -8.0,
                    -8.37,   -8.56,   -8.37,   -8.0,   -7.5,   -6.5,
                    -5.5,   -4.25,   -3.0,   -1.5,   -.25,   -34.0,
                    -20.25,   -6.0,   5.37,   6.37,   7.37,   8.0!
!END!
 12    ! SRCNAM  =   PV07A !
 12    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 12    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   34.0,
                    42.5,   55.0,   34.0,   34.0,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   34.0,   34.0,   209.37,   250.0!
 12    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 12    ! XBADJ  =   -79.0,   -56.0,   -31.5,   -5.5,   -13.5,   -44.0,
                    -73.0,   -100.0,   -124.0,   -144.13,   -159.88,   39.0,
                    -176.75,   -178.5,   40.5,   40.0,   -158.0,   -141.0,
                    -120.0,   -95.0,   -67.5,   -37.5,   -42.0,   -66.75,
                    -89.25,   -109.25,   -126.0,   -138.88,   -147.38,   -151.75,

                    -151.25,   -148.0,   40.0,   40.0,   -118.0,   -100.0!
 12    ! YBADJ  =   2.69,   6.19,   9.75,   12.75,   15.25,   17.5,
                    19.0,   20.25,   20.5,   20.5,   19.5,   39.0,
                    15.75,   14.0,   40.5,   40.0,   4.69,   1.0,
                    -2.62,   -6.19,   -9.5,   -12.63,   -15.75,   -17.5,
                    -19.0,   -20.25,   -20.5,   -20.0,   -19.25,   -18.0,
                    -16.25,   -14.5,   40.0,   40.0,   -4.56,   -1.0!
!END!
 13    ! SRCNAM  =   PV08A !
 13    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 13    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
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                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   35.0,   162.5,   209.37,   250.0!
 13    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   40.0,   302.0,   276.0,   241.0!
 13    ! XBADJ  =   -91.0,   -64.5,   -36.5,   -6.5,   -11.0,   -37.5,
                    -63.25,   -86.88,   -108.0,   -125.81,   -139.75,   -149.5,

                    -154.75,   -156.5,   -156.0,   -151.0,   -140.5,   -126.0,
                    -108.0,   -86.5,   -62.5,   -36.0,   -44.5,   -73.0,
                    -99.25,   -122.5,   -142.0,   -157.25,   -167.63,   -173.0,

                    -173.25,   -169.5,   40.0,   -151.5,   -135.5,   -115.0!
 13    ! YBADJ  =   -15.69,   -13.94,   -11.5,   -9.25,   -6.25,   -3.5,
                    -.5,   2.75,   5.5,   8.5,   10.5,   13.25,
                    14.75,   17.0,   17.75,   18.0,   17.81,   17.0,
                    15.75,   13.94,   11.75,   9.13,   6.25,   3.5,
                    .5,   -2.75,   -5.5,   -8.0,   -10.75,   -13.0,
                    -15.25,   -17.0,   40.0,   -18.0,   -17.81,   -17.0!
!END!
 14    ! SRCNAM  =   PV09A !
 14    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 14    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 14    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 14    ! XBADJ  =   -102.5,   -72.5,   -41.0,   -8.0,   -8.5,   -31.5,
                    -53.75,   -74.5,   -93.0,   -108.56,   -120.88,   -129.5,
                    -134.25,   -136.5,   -136.0,   -132.5,   -124.0,   -112.0,
                    -97.0,   -78.5,   -57.5,   -35.0,   -47.0,   -79.0,
                    -108.5,   -134.75,   -157.0,   -174.44,   -186.5,   -193.0,

                    -193.75,   -190.0,   -182.5,   -170.0,   -152.0,   -129.0!
 14    ! YBADJ  =   -32.88,   -32.81,   -31.5,   -29.75,   -26.75,   -23.0,
                    -19.0,   -13.75,   -8.5,   -3.0,   2.5,   8.25,
                    13.75,   19.5,   23.75,   27.25,   30.06,   32.0,
                    32.94,   32.81,   31.75,   29.63,   26.75,   23.0,
                    19.0,   13.75,   8.5,   3.0,   -2.75,   -8.5,
                    -13.75,   -19.5,   -23.75,   -27.5,   -30.06,   -32.0!
!END!
 15    ! SRCNAM  =   PV10A !
 15    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 15    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
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                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 15    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 15    ! XBADJ  =   -118.5,   -84.0,   -47.5,   -9.5,   -5.0,   -23.25,
                    -41.0,   -57.38,   -72.0,   -84.44,   -94.25,   -101.25,
                    -105.25,   -107.5,   -108.5,   -106.5,   -101.0,   -92.0,
                    -81.0,   -66.5,   -51.0,   -33.0,   -50.5,   -87.25,
                    -121.25,   -152.0,   -178.0,   -198.56,   -213.0,   -221.25,

                    -222.5,   -219.0,   -210.5,   -196.0,   -175.0,   -149.0!
 15    ! YBADJ  =   -57.06,   -59.44,   -59.75,   -58.5,   -55.75,   -51.0,
                    -45.0,   -37.25,   -28.5,   -19.0,   -9.0,   1.75,
                    11.75,   22.5,   31.75,   40.25,   47.31,   53.0,
                    57.06,   59.44,   60.0,   58.63,   55.25,   51.0,
                    45.0,   37.25,   28.5,   19.0,   8.75,   -1.5,
                    -12.25,   -22.5,   -31.75,   -40.25,   -47.31,   -53.0!
!END!
 16    ! SRCNAM  =   PV11A !
 16    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 16    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 16    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 16    ! XBADJ  =   -157.5,   -112.0,   -63.5,   -13.0,   4.0,   -2.0,
                    -8.0,   -13.62,   -19.0,   -23.75,   -27.75,   -30.75,
                    -33.25,   -36.0,   -39.5,   -42.5,   -43.5,   -43.0,
                    -41.5,   -38.5,   -35.0,   -29.5,   -59.5,   -108.5,
                    -154.5,   -195.75,   -231.0,   -259.31,   -279.63,   -291.75,

                    -294.75,   -290.5,   -279.5,   -260.0,   -232.5,   -198.0!
 16    ! YBADJ  =   -117.75,   -125.94,   -130.25,   -130.75,   -127.25,
-120.0,
                    -109.0,   -94.75,   -77.5,   -58.0,   -37.0,   -14.25,
                    8.25,   31.5,   53.25,   73.25,   91.06,   106.0,
                    117.75,   125.94,   130.25,   130.63,   127.25,   120.0,
                    109.0,   94.75,   77.5,   58.0,   36.75,   14.5,
                    -8.75,   -31.5,   -53.25,   -73.25,   -91.06,   -106.0!
!END!
 17    ! SRCNAM  =   PV13A !
 17    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5!
 17    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   209.37,   250.0!
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 17    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                   327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                   199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                   328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 17    ! XBADJ  =   -138.0,   -108.0,   -75.0,   -39.5,   -37.0,   -56.0,
                   -73.25,   -88.5,   -101.0,   -110.38,   -116.38,   -118.75,

                   -118.0,   -114.5,   -110.0,   -102.5,   -91.0,   -77.0,
                   -61.0,   -42.5,   -23.5,   -3.0,   -18.5,   -54.5,
                   -89.0,   -120.88,   -149.0,   -172.63,   -190.88,   -203.75,

                   -210.0,   -211.5,   -147.5,   -145.0,   -185.0,   -164.0!
 17    ! YBADJ  =   -31.13,   -37.31,   -42.25,   -46.0,   -48.25,   -49.5,
                   -49.0,   -46.75,   -43.5,   -38.5,   -33.0,   -25.75,
                   -18.25,   -9.5,   -.75,   7.75,   16.19,   24.0,
                   31.13,   37.31,   42.25,   46.12,   48.25,   49.5,
                   49.0,   46.75,   43.5,   39.0,   32.75,   26.0,
                   18.25,   9.5,   -2.62,   -24.88,   -16.19,   -24.0!
!END!
 18    ! SRCNAM  =   PV14A !
 18    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   25.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 18    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                   302.0,   275.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                   283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                   302.0,   275.5,   36.0,   199.0,   150.5,   98.0,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 18    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                   162.25,   209.37,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                   199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                   162.25,   209.37,   36.0,   283.06,   307.37,   322.5,
                   328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 18    ! XBADJ  =   -28.5,   -27.5,   -26.0,   -23.0,   -53.5,   -105.5,
                   -154.0,   -198.0,   -87.0,   -91.56,   -93.38,   -92.25,
                   -308.0,   -305.0,   -294.5,   -275.5,   -247.5,   -212.0,
                   -170.5,   -123.5,   -73.0,   -19.5,   -2.0,   -5.25,
                   -8.25,   -11.37,   51.0,   -16.25,   -17.88,   -19.25,
                   -19.75,   -21.5,   -24.5,   -27.0,   -28.5,   -29.0!
 18    ! YBADJ  =   125.31,   135.69,   142.25,   144.25,   141.75,   135.0,
                   124.0,   109.25,   26.0,   13.75,   .75,   -11.75,
                   -1.75,   -26.0,   -50.25,   -73.0,   -93.31,   -111.0,
                   -125.25,   -135.81,   -142.0,   -144.13,   -141.75,   -135.0,

                   -124.0,   -109.25,   -26.0,   -70.5,   -47.75,   -23.5,
                   1.25,   26.0,   50.25,   72.75,   93.31,   111.0!
!END!
 19    ! SRCNAM  =   BV01B !
 19    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 19    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                   283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 19    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
```

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                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 19    ! XBADJ  =   -107.5,   -76.0,   -42.0,   -6.5,   -5.5,   -26.5,
                    -46.75,   -65.88,   -83.0,   -97.5,   -109.13,   -117.25,
                    -122.0,   -124.5,   -125.0,   -122.5,   -115.5,   -105.0,
                    -91.5,   -75.0,   -56.5,   -36.0,   -50.5,   -84.25,
                    -115.5,   -143.38,   -167.0,   -185.5,   -198.25,   -205.25,

                    -205.75,   -202.0,   -193.5,   -180.0,   -160.5,   -136.0!
 19    ! YBADJ  =   -43.94,   -44.69,   -43.75,   -41.75,   -38.75,   -34.0,
                    -29.0,   -22.75,   -15.5,   -8.0,   -.5,   7.25,
                    14.75,   22.5,   28.75,   34.25,   38.81,   42.0,
                    44.0,   44.56,   44.0,   41.87,   38.25,   34.0,
                    29.0,   22.25,   15.5,   8.0,   .25,   -7.5,
                    -14.75,   -22.5,   -28.75,   -34.5,   -38.69,   -42.0!
!END!
 20    ! SRCNAM  =   BV02B !
 20    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5!
 20    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   209.37,   250.0!
 20    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 20    ! XBADJ  =   -58.0,   -37.5,   -16.0,   6.5,   -5.5,   -40.25,
                    10.25,   13.38,   16.0,   18.19,   19.87,   21.0,
                    -198.25,   -202.0,   15.5,   12.5,   -182.5,   -164.0,
                    -141.0,   -113.5,   -82.5,   -49.0,   -50.0,   -70.5,
                    -38.75,   -46.0,   -52.0,   -56.44,   -59.13,   -132.5,
                    -129.5,   -124.5,   -56.0,   -52.5,   -93.5,   -77.0!
 20    ! YBADJ  =   15.5,   22.56,   29.0,   34.5,   38.75,   42.0,
                    -32.5,   -27.75,   -22.0,   -15.75,   -8.75,   -1.75,
                    27.75,   22.0,   18.38,   24.38,   -.19,   -8.0,
                    -15.5,   -22.56,   -29.0,   -34.37,   -38.75,   -42.0,
                    32.5,   27.75,   22.0,   16.0,   9.25,   -33.5,
                    -28.25,   -22.0,   -18.38,   -24.38,   .31,   8.0!
!END!
 21    ! SRCNAM  =   BV03B !
 21    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 21    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 21    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
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                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 21    ! XBADJ  =   -25.5,   -18.0,   -10.5,   -2.0,   2.5,   4.0,
                    5.5,   6.87,   8.0,   8.94,   9.62,   10.0,
                    -209.5,   -213.0,   5.0,   2.0,   -1.0,   -4.0,
                    -7.0,   -9.5,   -12.0,   -14.0,   -19.5,   -27.25,
                    -34.0,   -39.5,   -44.0,   -47.19,   -48.87,   -121.5,
                    -118.25,   -113.5,   -45.0,   -42.0,   -37.5,   -32.0!
 21    ! YBADJ  =   -28.0,   -29.19,   -29.5,   -28.87,   -27.25,   -25.0,
                    -22.0,   -18.25,   -14.0,   -9.25,   -4.25,   .75,
                    28.75,   21.0,   15.38,   19.63,   23.19,   26.0,
                    28.06,   29.19,   29.63,   29.0,   27.5,   25.0,
                    22.0,   18.25,   14.0,   9.5,   4.25,   -36.5,
                    -29.25,   -21.0,   -15.38,   -19.63,   -23.25,   -26.0!
!END!
 22    ! SRCNAM  =   BV04B !
 22    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 22    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 22    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 22    ! XBADJ  =   -23.5,   -17.0,   -10.5,   -3.0,   .5,   1.0,
                    2.0,   2.5,   3.0,   3.44,   3.87,   4.25,
                    -215.25,   -218.5,   -.5,   -2.5,   -5.0,   -7.0,
                    -9.0,   -11.0,   -12.5,   -13.0,   -17.5,   -24.5,
                    -30.25,   -35.0,   -39.0,   -41.75,   -43.13,   -115.75,
                    -112.5,   -107.5,   -40.0,   -37.5,   -33.5,   -29.0!
 22    ! YBADJ  =   -22.56,   -23.44,   -23.75,   -23.13,   -21.75,   -20.0,
                    -17.5,   -14.75,   -11.0,   -7.25,   -2.75,   1.25,
                    27.75,   19.0,   12.63,   15.88,   18.69,   21.0,
                    22.63,   23.44,   23.63,   23.25,   22.0,   20.0,
                    17.5,   14.75,   11.0,   7.0,   3.25,   -36.5,
                    -28.25,   -19.5,   -12.63,   -16.12,   -18.75,   -21.0!
!END!
 23    ! SRCNAM  =   BV05B !
 23    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 23    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.5,   35.5,
                    42.5,   55.0,   35.5,   35.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.5,   98.0,
                    42.5,   55.0,   35.5,   35.5,   209.37,   250.0!
 23    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 23    ! XBADJ  =   -9.5,   -4.0,   1.5,   7.0,   -21.5,   -72.5,
                    -121.0,   -166.0,   -206.0,   -239.69,   39.25,   39.0,
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                    -294.0,    -296.5,    40.5,    40.0,    -256.0,    -226.0,
                    -189.5,    -146.5,    -100.0,    -49.5,    -34.0,    -38.25,
                    -41.25,    -43.38,    -44.0,    -43.38,    39.25,    -38.25,
                    -33.75,    -30.0,    40.0,    40.0,    -20.0,    -15.0!
 23    ! YBADJ  =    98.19,    112.31,    123.25,    130.25,    133.25,    132.0,
                    127.0,    118.25,    105.5,    90.0,    39.25,    39.0,
                    28.25,    6.0,    40.5,    40.0,    -61.31,    -81.0,
                    -98.19,    -112.31,    -123.0,    -130.13,    -133.25,    -132.0,

                    -127.0,    -118.25,    -105.5,    -89.5,    39.25,    -50.5,
                    -28.75,    -6.0,    40.0,    40.0,    61.44,    81.0!
!END!
 24    ! SRCNAM  =    PV01B !
 24    ! HEIGHT  =  25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    23.5,    23.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    23.5,
                    23.5,    23.5,    25.5,    25.5,    25.5,    25.5!
 24    ! WIDTH  =    38.25,    39.38,    39.0,    37.75,    39.5,    40.0,
                    40.0,    38.5,    36.0,    32.5,    27.5,    22.5,
                    42.5,    55.0,    23.25,    28.25,    32.63,    36.0,
                    38.25,    39.38,    39.25,    38.0,    39.0,    40.0,
                    40.0,    38.5,    36.0,    32.0,    27.5,    98.0,
                    42.5,    55.0,    23.25,    28.25,    32.75,    36.0!
 24    ! LENGTH =    32.5,    27.5,    22.5,    16.0,    17.0,    23.25,
                    28.25,    32.63,    36.0,    38.25,    39.25,    39.0,
                    327.75,    326.5,    40.5,    40.0,    38.5,    36.0,
                    32.5,    28.0,    22.5,    16.0,    17.0,    23.25,
                    28.5,    32.63,    36.0,    38.25,    39.25,    322.5,
                    328.0,    326.5,    40.0,    40.0,    38.5,    36.0!
 24    ! XBADJ  =    -11.5,    -9.0,    -6.0,    -2.5,    -3.0,    -6.25,
                    -9.0,    -11.75,    -14.0,    -15.88,    -17.25,    -18.0,
                    -238.0,    -241.0,    -22.0,    -22.0,    -22.5,    -22.0,
                    -21.0,    -19.0,    -17.0,    -13.5,    -14.0,    -17.25,
                    -19.5,    -20.88,    -22.0,    -22.38,    -22.0,    -93.5,
                    -90.0,    -85.5,    -18.5,    -17.5,    -16.0,    -14.0!
 24    ! YBADJ  =    -3.25,    -2.44,    -1.5,    -.62,    .75,    1.5,
                    2.5,    3.25,    4.0,    4.75,    5.25,    5.75,
                    28.25,    16.0,    5.37,    5.12,    4.56,    4.0,
                    3.25,    2.31,    1.38,    .5,    -.5,    -1.5,
                    -2.5,    -3.25,    -4.0,    -4.5,    -5.25,    -41.0,
                    -28.75,    -16.0,    -5.37,    -5.12,    -4.62,    -4.0!
!END!
 25    ! SRCNAM  =    PV02B !
 25    ! HEIGHT  =  25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    23.5,    23.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    25.5,
                    25.5,    25.5,    25.5,    25.5,    25.5,    23.5,
                    23.5,    23.5,    25.5,    25.5,    25.5,    25.5!
 25    ! WIDTH  =    38.25,    39.38,    39.0,    37.75,    39.5,    40.0,
                    40.0,    38.5,    36.0,    32.5,    27.5,    22.5,
                    42.5,    55.0,    23.25,    28.25,    32.63,    36.0,
                    38.25,    39.38,    39.25,    38.0,    39.0,    40.0,
                    40.0,    38.5,    36.0,    32.0,    27.5,    98.0,
                    42.5,    55.0,    23.25,    28.25,    32.75,    36.0!
 25    ! LENGTH =    32.5,    27.5,    22.5,    16.0,    17.0,    23.25,
                    28.25,    32.63,    36.0,    38.25,    39.25,    39.0,
                    327.75,    326.5,    40.5,    40.0,    38.5,    36.0,
                    32.5,    28.0,    22.5,    16.0,    17.0,    23.25,
                    28.5,    32.63,    36.0,    38.25,    39.25,    322.5,
                    328.0,    326.5,    40.0,    40.0,    38.5,    36.0!
 25    ! XBADJ  =    -19.5,    -14.5,    -9.0,    -3.0,    -1.0,    -1.75,
                    -2.0,    -2.62,    -3.0,    -3.31,    -3.5,    -3.5,
                    -223.25,    -226.5,    -7.5,    -9.0,    -11.0,    -12.0,
                    -13.0,    -13.5,    -13.5,    -13.0,    -16.0,    -21.75,
                    -26.25,    -30.0,    -33.0,    -34.94,    -35.75,    -108.0,
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                    -104.75,   -100.0,   -33.0,   -31.0,   -27.5,   -24.0!
 25    ! YBADJ  =   -15.81,   -16.19,   -16.0,   -15.38,   -14.25,   -12.5,
                    -11.0,   -8.75,   -6.0,   -3.25,   -.25,   2.25,
                    27.75,   18.0,   9.87,   11.87,   13.69,   15.0,
                    15.81,   16.06,   16.12,   15.5,   14.5,   12.5,
                    11.0,   8.75,   6.0,   3.5,   .25,   -38.0,
                    -28.25,   -18.0,   -9.87,   -12.13,   -13.75,   -15.0!
!END!
 26    ! SRCNAM  =   PV03B !
 26    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 26    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 26    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 26    ! XBADJ  =   -27.0,   -22.0,   -16.5,   -10.5,   -7.5,   -7.75,
                    -7.25,   -6.75,   -6.0,   -5.06,   -3.87,   -2.5,
                    -221.0,   -223.0,   -3.0,   -3.5,   -4.5,   -5.0,
                    -5.5,   -6.0,   -6.0,   -6.0,   -9.5,   -15.5,
                    -21.0,   -25.88,   -30.0,   -33.25,   -35.38,   -109.0,
                    -107.0,   -103.5,   -37.5,   -36.5,   -34.0,   -31.0!
 26    ! YBADJ  =   -14.06,   -15.69,   -17.0,   -17.63,   -17.75,   -17.5,
                    -16.5,   -15.25,   -13.0,   -10.75,   -7.75,   -5.25,
                    20.25,   11.0,   3.87,   6.87,   9.56,   12.0,
                    14.06,   15.69,   16.88,   17.5,   18.0,   17.5,
                    16.5,   15.25,   13.0,   11.0,   8.25,   -30.5,
                    -20.75,   -11.0,   -3.87,   -6.87,   -9.62,   -12.0!
!END!
 27    ! SRCNAM  =   PV04B !
 27    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 27    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   35.0,   35.0,   35.0,
                    42.5,   55.0,   35.0,   35.0,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   35.0,   35.0,   98.0,
                    42.5,   55.0,   35.0,   35.0,   209.37,   250.0!
 27    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 27    ! XBADJ  =   -70.0,   -48.5,   -25.0,   -1.0,   -11.0,   -43.25,
                    -74.25,   -103.25,   -129.0,   38.25,   39.25,   39.0,
                    -187.0,   -189.5,   40.5,   40.0,   -169.0,   -151.0,
                    -129.0,   -102.5,   -73.5,   -41.5,   -44.5,   -67.25,
                    -88.0,   -106.13,   -121.0,   38.25,   39.25,   -142.5,
                    -141.0,   -137.0,   40.0,   40.0,   -107.0,   -90.0!
 27    ! YBADJ  =   9.31,   14.31,   19.0,   23.0,   26.25,   28.5,
                    30.0,   30.75,   30.5,   38.25,   39.25,   39.0,
                    20.25,   17.0,   40.5,   40.0,   1.44,   -4.0,
```

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                    -9.31,   -14.31,   -19.0,   -22.88,   -26.25,   -28.5,
                    -30.0,   -30.75,   -30.5,   38.25,   39.25,   -24.5,
                    -20.75,   -17.0,   40.0,   40.0,   -1.44,   4.0!
!END!
 28    ! SRCNAM  =   PV05B !
 28    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 28    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 28    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 28    ! XBADJ  =   -7.5,   -7.5,   -8.0,   -7.5,   -10.5,   -16.5,
                    -21.5,   -26.25,   -30.0,   -32.88,   -34.63,   -35.5,
                    -254.75,   -256.5,   -36.0,   -34.5,   -32.5,   -29.0,
                    -25.0,   -20.0,   -15.0,   -9.0,   -6.5,   -6.75,
                    -6.75,   -6.37,   -6.0,   -5.44,   -4.62,   -76.0,
                    -73.25,   -69.5,   -4.5,   -5.5,   -6.0,   -7.0!
 28    ! YBADJ  =   13.75,   15.06,   16.0,   16.12,   16.25,   15.5,
                    14.5,   12.75,   11.0,   8.75,   6.25,   3.75,
                    23.25,   8.0,   -4.88,   -7.62,   -9.94,   -12.0,
                    -13.75,   -15.06,   -15.88,   -16.25,   -16.0,   -15.5,
                    -14.5,   -12.75,   -11.0,   -8.5,   -6.25,   -39.0,
                    -23.75,   -8.0,   4.88,   7.37,   9.87,   12.0!
!END!
 29    ! SRCNAM  =   PV06B !
 29    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 29    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 29    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 29    ! XBADJ  =   -12.5,   -11.5,   -10.5,   -9.0,   -10.5,   -15.25,
                    -19.0,   -22.38,   -25.0,   -26.87,   -27.87,   -28.0,
                    -247.0,   -249.0,   -28.0,   -27.0,   -25.5,   -23.0,
                    -20.0,   -16.5,   -12.0,   -7.5,   -6.5,   -8.25,
                    -9.5,   -10.25,   -11.0,   -11.37,   -11.37,   -83.5,
                    -80.75,   -77.5,   -12.5,   -13.0,   -13.0,   -13.0!
 29    ! YBADJ  =   7.75,   8.31,   8.5,   8.62,   8.25,   8.0,
                    7.0,   5.75,   5.0,   3.75,   2.25,   .75,
                    22.25,   8.0,   -3.63,   -4.88,   -6.06,   -7.0,
                    -7.75,   -8.31,   -8.62,   -8.5,   -8.0,   -8.0,
                    -7.0,   -6.25,   -5.0,   -3.5,   -2.25,   -36.5,
                    -22.25,   -8.0,   3.63,   4.88,   6.0,   7.0!
!END!
```

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 30    ! SRCNAM  =   PV07B !
 30    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 30    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.0,   35.0,
                    42.5,   55.0,   35.0,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   35.0,   98.0,
                    42.5,   55.0,   35.0,   162.5,   209.37,   250.0!
 30    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   39.25,   39.0,
                    327.75,   326.5,   40.5,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   39.25,   322.5,
                    328.0,   326.5,   40.0,   302.0,   276.0,   241.0!
 30    ! XBADJ   =   -77.0,   -53.5,   -28.5,   -2.5,   -10.5,   -41.25,
                    -70.5,   -97.75,   -122.0,   -142.5,   39.25,   39.0,
                    -176.5,   -178.5,   40.5,   -171.5,   -159.5,   -143.0,
                    -122.5,   -97.5,   -70.0,   -40.0,   -45.0,   -69.5,
                    -91.75,   -111.63,   -128.0,   -140.5,   39.25,   -152.5,
                    -151.5,   -147.5,   40.0,   -131.0,   -116.5,   -98.0!
 30    ! YBADJ   =   1.06,   5.06,   9.0,   12.5,   15.75,   18.0,
                    20.0,   21.75,   22.5,   22.5,   39.25,   39.0,
                    18.75,   17.0,   40.5,   10.75,   6.94,   3.0,
                    -1.0,   -5.06,   -8.75,   -12.37,   -15.75,   -18.0,
                    -20.0,   -21.75,   -22.5,   -22.5,   39.25,   -21.0,
                    -19.25,   -17.0,   40.0,   -10.75,   -6.94,   -3.0!
!END!
 31    ! SRCNAM  =   PV08B !
 31    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 31    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 31    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 31    ! XBADJ   =   -89.0,   -62.0,   -33.5,   -4.0,   -8.0,   -34.75,
                    -60.5,   -84.63,   -106.0,   -124.19,   -138.63,   -148.75,

                    -154.5,   -157.0,   -156.5,   -152.0,   -142.0,   -128.0,
                    -110.5,   -89.0,   -65.0,   -39.0,   -47.5,   -75.75,
                    -101.75,   -124.75,   -144.0,   -158.88,   -168.75,
-173.75,
                    -173.5,   -169.5,   -162.5,   -150.5,   -134.0,   -113.0!
 31    ! YBADJ   =   -17.31,   -15.19,   -12.25,   -9.5,   -6.25,   -2.5,
                    .5,   4.25,   7.5,   10.5,   13.5,   15.75,
                    17.75,   19.5,   20.5,   20.5,   20.06,   19.0,
                    17.31,   15.19,   12.5,   9.37,   6.25,   3.0,
                    -.5,   -4.25,   -7.5,   -10.5,   -13.25,   -16.0,
                    -17.75,   -19.5,   -20.5,   -20.75,   -20.06,   -19.0!
!END!
 32    ! SRCNAM  =   PV09B !
 32    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
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                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 32    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                   283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 32    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                   327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                   199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                   328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 32    ! XBADJ  =   -100.0,   -70.5,   -38.5,   -5.5,   -6.5,   -29.75,
                   -52.25,   -73.25,   -92.0,   -107.94,   -120.63,   -129.5,
                   -134.75,   -137.0,   -137.5,   -134.0,   -126.0,   -114.0,
                   -99.0,   -80.5,   -60.0,   -37.0,   -49.0,   -81.0,
                   -110.0,   -136.13,   -158.0,   -175.06,   -186.75,   -193.0,

                   -193.25,   -189.0,   -181.5,   -168.5,   -150.0,   -127.0!
 32    ! YBADJ  =   -33.56,   -33.06,   -31.5,   -29.25,   -25.75,   -22.0,
                   -17.5,   -12.25,   -6.5,   -.5,   5.0,   10.75,
                   15.75,   21.5,   25.5,   29.0,   31.44,   33.0,
                   33.56,   33.06,   31.5,   29.13,   25.75,   22.0,
                   17.5,   12.25,   6.5,   1.0,   -5.25,   -10.5,
                   -16.25,   -21.5,   -25.5,   -29.0,   -31.44,   -33.0!
!END!
 33    ! SRCNAM  =   PV10B !
 33    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 33    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                   283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                   42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 33    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                   327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                   199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                   328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 33    ! XBADJ  =   -116.0,   -81.5,   -45.0,   -7.0,   -2.5,   -20.5,
                   -38.25,   -55.0,   -70.0,   -82.81,   -93.13,   -100.5,
                   -105.0,   -108.0,   -109.0,   -107.5,   -102.5,   -94.0,
                   -83.0,   -69.0,   -53.5,   -36.0,   -53.0,   -90.0,
                   -124.0,   -154.38,   -180.0,   -200.19,   -214.25,   -222.0,

                   -222.75,   -218.5,   -210.0,   -194.5,   -173.5,   -147.0!
 33    ! YBADJ  =   -58.69,   -60.56,   -60.5,   -58.75,   -55.25,   -50.0,
                   -43.5,   -35.75,   -26.5,   -16.5,   -6.5,   4.25,
                   14.75,   25.5,   34.5,   42.75,   49.69,   55.0,
                   58.69,   60.56,   60.75,   58.87,   55.25,   50.0,
                   43.5,   35.75,   26.5,   17.0,   6.25,   -4.5,
                   -14.75,   -25.5,   -34.5,   -42.75,   -49.69,   -55.0!
!END!
 34    ! SRCNAM  =   PV11B !
 34    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
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                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 34    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 34    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 34    ! XBADJ  =   -155.0,   -109.5,   -61.0,   -10.0,   6.5,   .75,
                    -5.25,   -11.37,   -17.0,   -22.13,   -26.5,   -30.0,
                    -33.0,   -36.0,   -40.0,   -43.5,   -45.0,   -45.0,
                    -44.0,   -41.5,   -37.5,   -32.5,   -62.5,   -111.25,
                    -157.0,   -198.0,   -233.0,   -260.94,   -280.87,   -292.5,

                    -295.0,   -290.0,   -278.5,   -259.0,   -231.0,   -196.0!
 34    ! YBADJ  =   -119.38,   -127.19,   -131.0,   -131.0,   -126.75,   -119.0,

                    -108.0,   -93.25,   -75.5,   -55.5,   -34.5,   -11.75,
                    11.25,   34.5,   56.0,   75.75,   93.31,   108.0,
                    119.38,   127.19,   131.0,   130.88,   126.75,   119.0,
                    108.0,   93.25,   75.5,   56.0,   34.25,   11.5,
                    -11.25,   -34.5,   -56.0,   -76.0,   -93.31,   -108.0!
!END!
 35    ! SRCNAM  =   PV13B !
 35    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5!
 35    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   23.25,   25.25,   209.37,   250.0!
 35    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 35    ! XBADJ  =   -137.0,   -107.0,   -74.0,   -38.5,   -35.5,   -54.5,
                    -72.0,   -87.38,   -100.0,   -109.56,   -115.88,   -118.5,
                    -117.75,   -115.0,   -110.5,   -103.0,   -92.0,   -78.0,
                    -62.0,   -44.0,   -25.0,   -4.5,   -20.0,   -56.0,
                    -90.25,   -122.0,   -150.0,   -173.44,   -191.5,   -204.0,
                    -210.25,   -211.5,   -147.0,   40.0,   -184.0,   -163.0!
 35    ! YBADJ  =   -31.88,   -37.94,   -42.5,   -46.25,   -48.25,   -49.0,
                    -48.5,   -46.25,   -42.5,   -37.5,   -31.5,   -24.25,
                    -16.75,   -8.0,   .5,   9.0,   17.31,   25.0,
                    31.94,   37.81,   42.75,   46.12,   48.25,   49.0,
                    48.5,   46.25,   42.5,   38.0,   31.75,   24.5,
                    16.75,   8.0,   -3.87,   40.0,   -17.31,   -25.0!
!END!
 36    ! SRCNAM  =   PV14B !
 36    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   23.5,   23.5,   23.5,
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                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 36    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   36.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 36    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   36.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 36    ! XBADJ  =   -27.5,   -26.0,   -24.0,   -21.0,   -51.5,   -103.25,
                    -151.75,   -195.88,   -85.0,   -89.81,   -91.75,   -91.0,
                    -307.25,   -304.5,   -294.0,   -275.5,   -248.0,   -213.0,
                    -172.0,   -125.0,   -74.5,   -21.5,   -4.0,   -7.5,
                    -10.5,   -13.5,   49.0,   -18.06,   -19.5,   -20.5,
                    -20.75,   -22.0,   -24.5,   -26.5,   -28.0,   -28.0!
 36    ! YBADJ  =   123.5,   134.19,   141.0,   143.25,   141.25,   135.0,
                    124.5,   110.25,   27.0,   14.75,   2.75,   -10.25,
                    .25,   -24.0,   -48.0,   -70.75,   -91.19,   -109.0,
                    -123.5,   -134.19,   -140.75,   -143.38,   -141.25,   -135.0,

                    -124.0,   -110.25,   -27.0,   -72.0,   -49.25,   -25.5,
                    -.75,   23.5,   48.0,   70.5,   91.19,   109.0!
!END!
 37    ! SRCNAM  =   BV01C !
 37    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 37    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 37    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 37    ! XBADJ  =   -105.0,   -73.0,   -39.0,   -4.0,   -2.5,   -23.75,
                    -44.25,   -63.63,   -81.0,   -95.88,   -107.88,   -116.5,
                    -121.75,   -125.0,   -126.0,   -123.5,   -117.0,   -107.0,
                    -94.0,   -77.5,   -59.5,   -39.0,   -53.0,   -87.0,
                    -118.0,   -145.75,   -169.0,   -187.13,   -199.5,   -206.0,

                    -206.0,   -201.5,   -193.0,   -178.5,   -159.0,   -134.0!
 37    ! YBADJ  =   -45.56,   -45.81,   -44.5,   -42.0,   -38.25,   -33.5,
                    -27.5,   -20.75,   -13.5,   -5.5,   2.0,   10.25,
                    17.25,   25.5,   31.5,   36.75,   41.06,   44.0,
                    45.63,   45.81,   44.75,   42.13,   38.25,   33.5,
                    27.5,   20.75,   13.5,   6.0,   -2.25,   -10.0,
                    -17.75,   -25.5,   -31.5,   -37.0,   -41.06,   -44.0!
!END!
 38    ! SRCNAM  =   BV02C !
 38    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   23.5,   23.5,   23.5!
 38    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
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                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   162.5,   209.37,   250.0!
 38    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   302.0,   276.0,   241.0!
 38    ! XBADJ  =   -56.0,   -35.0,   -13.0,   9.0,   -3.0,   -37.5,
                    13.0,   15.62,   18.0,   19.81,   21.13,   21.75,
                    -198.0,   -202.0,   15.0,   11.5,   -184.0,   -166.0,
                    -143.5,   -116.0,   -85.5,   -52.0,   -52.5,   -73.25,
                    -41.25,   -48.25,   -54.0,   -58.06,   -60.25,   -133.25,
                    -129.75,   -124.5,   -55.5,   -106.0,   -92.0,   -75.0!
 38    ! YBADJ  =   13.88,   21.31,   28.25,   34.25,   39.25,   42.5,
                    -31.0,   -26.25,   -20.0,   -13.25,   -6.25,   .75,
                    30.75,   25.0,   21.13,   26.87,   2.06,   -6.0,
                    -13.88,   -21.31,   -28.25,   -34.13,   -39.25,   -42.5,
                    31.0,   26.25,   20.0,   13.5,   6.25,   -36.5,
                    -30.75,   -25.0,   -21.13,   -10.25,   -2.06,   6.0!
!END!
 39    ! SRCNAM  =   BV03C !
 39    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 39    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 39    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 39    ! XBADJ  =   -23.5,   -15.5,   -7.5,   .5,   5.0,   6.5,
                    8.25,   9.13,   10.0,   10.56,   10.88,   10.75,
                    -209.25,   -213.5,   4.0,   1.0,   -2.5,   -6.0,
                    -9.5,   -12.5,   -15.0,   -17.0,   -22.0,   -30.0,
                    -36.5,   -41.75,   -46.0,   -48.81,   -50.0,   -122.25,
                    -118.5,   -113.0,   -44.5,   -41.0,   -36.0,   -30.0!
 39    ! YBADJ  =   -29.63,   -30.44,   -30.25,   -29.13,   -27.25,   -24.5,
                    -21.0,   -16.75,   -12.0,   -6.75,   -1.75,   3.75,
                    31.75,   24.0,   18.13,   22.13,   25.44,   28.0,
                    29.69,   30.44,   30.38,   29.25,   27.5,   24.5,
                    21.0,   16.75,   12.0,   7.0,   1.75,   -39.0,
                    -31.75,   -24.0,   -18.13,   -22.38,   -25.5,   -28.0!
!END!
 40    ! SRCNAM  =   BV04C !
 40    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 40    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
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                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 40    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 40    ! XBADJ  =   -21.0,   -14.5,   -7.5,   .0,   3.5,   3.75,
                    4.5,   4.75,   5.0,   5.06,   5.12,   5.0,
                    -215.0,   -219.0,   -1.0,   -3.5,   -6.5,   -9.0,
                    -11.5,   -13.5,   -15.0,   -16.0,   -20.5,   -27.0,
                    -32.75,   -37.38,   -41.0,   -43.38,   -44.38,   -116.5,
                    -112.75,   -107.5,   -39.5,   -36.5,   -32.0,   -27.0!
 40    ! YBADJ  =   -24.19,   -24.69,   -24.5,   -23.38,   -21.75,   -19.5,
                    -16.5,   -13.25,   -9.0,   -4.75,   -.25,   3.75,
                    30.75,   22.0,   15.38,   18.38,   21.06,   23.0,
                    24.25,   24.69,   24.38,   23.5,   22.0,   19.5,
                    16.5,   12.75,   9.0,   5.0,   .75,   -39.5,
                    -30.75,   -22.0,   -15.38,   -18.63,   -21.13,   -23.0!
!END!
 41    ! SRCNAM  =   BV05C !
 41    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   23.5!
 41    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   22.5,
                    42.5,   55.0,   23.25,   23.75,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   23.25,   23.75,   23.75,   250.0!
 41    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   241.0!
 41    ! XBADJ  =   -7.5,   -1.5,   4.0,   10.0,   -19.0,   -69.75,
                    -118.5,   -163.75,   -204.0,   -238.06,   -264.88,   -72.5,

                    -293.75,   -296.5,   -75.0,   40.0,   -257.5,   -228.0,
                    -192.0,   -149.5,   -102.5,   -52.5,   -36.5,   -41.0,
                    -43.75,   -45.63,   -46.0,   -45.0,   -42.5,   -39.0,
                    -34.0,   -30.0,   35.0,   40.0,   38.5,   -13.0!
 41    ! YBADJ  =   96.56,   111.19,   122.5,   130.0,   133.25,   133.0,
                    128.0,   119.75,   107.5,   92.0,   73.5,   17.75,
                    31.25,   9.0,   -11.12,   40.0,   -59.06,   -79.0,
                    -96.56,   -111.19,   -122.5,   -129.88,   -133.75,   -133.0,

                    -128.0,   -119.75,   -107.5,   -92.0,   -73.75,   -53.5,
                    -31.25,   -9.0,   11.12,   40.0,   38.5,   79.0!
!END!
 42    ! SRCNAM  =   PV01C !
 42    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 42    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 42    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
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                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 42    ! XBADJ  =   -11.5,   -9.0,   -6.0,   -2.5,   -3.0,   -6.25,
                    -9.0,   -11.75,   -14.0,   -15.88,   -17.25,   -18.0,
                    -238.0,   -241.0,   -22.0,   -22.0,   -22.5,   -22.0,
                    -21.0,   -19.0,   -17.0,   -13.5,   -14.0,   -17.25,
                    -19.5,   -20.88,   -22.0,   -22.38,   -22.0,   -93.5,
                    -90.0,   -85.5,   -18.5,   -17.5,   -16.0,   -14.0!
 42    ! YBADJ  =   -3.25,   -2.44,   -1.5,   -.62,   .75,   1.5,
                    2.5,   3.25,   4.0,   4.75,   5.25,   5.75,
                    28.25,   16.0,   5.37,   5.12,   4.56,   4.0,
                    3.25,   2.31,   1.38,   .5,   -.5,   -1.5,
                    -2.5,   -3.25,   -4.0,   -4.5,   -5.25,   -41.0,
                    -28.75,   -16.0,   -5.37,   -5.12,   -4.62,   -4.0!
!END!
 43    ! SRCNAM  =   PV02C !
 43    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 43    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 43    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 43    ! XBADJ  =   -17.5,   -12.0,   -6.5,   -.5,   2.0,   1.0,
                    .5,   -.25,   -1.0,   -1.69,   -2.25,   -2.75,
                    -223.0,   -226.5,   -8.5,   -10.0,   -12.5,   -14.0,
                    -15.5,   -16.0,   -16.5,   -16.0,   -19.0,   -24.5,
                    -28.75,   -32.38,   -35.0,   -36.56,   -37.0,   -108.75,
                    -105.0,   -100.0,   -32.0,   -29.5,   -26.0,   -22.0!
 43    ! YBADJ  =   -17.44,   -17.31,   -16.75,   -15.62,   -13.75,   -12.0,
                    -9.5,   -7.25,   -4.0,   -1.25,   2.25,   5.25,
                    30.75,   20.5,   12.63,   14.63,   16.06,   17.0,
                    17.44,   17.31,   16.88,   15.75,   14.0,   12.0,
                    9.5,   7.25,   4.0,   1.0,   -2.25,   -40.5,
                    -30.75,   -20.5,   -12.63,   -14.63,   -16.12,   -17.0!
!END!
 44    ! SRCNAM  =   PV03C !
 44    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 44    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 44    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
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                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 44    ! XBADJ  =   -25.0,   -19.5,   -14.0,   -7.5,   -5.0,   -5.0,
                    -4.75,   -4.5,   -4.0,   -3.44,   -2.62,   -2.0,
                    -220.75,   -223.0,   -4.0,   -4.5,   -6.0,   -7.0,
                    -8.0,   -8.5,   -9.0,   -8.5,   -12.0,   -18.25,
                    -23.75,   -28.12,   -32.0,   -34.81,   -36.5,   -109.5,
                    -107.25,   -103.0,   -36.5,   -35.0,   -32.5,   -29.0!
 44    ! YBADJ  =   -15.69,   -16.94,   -17.75,   -17.88,   -17.25,   -16.5,
                    -15.0,   -13.25,   -11.0,   -8.25,   -5.25,   -2.25,
                    23.25,   14.0,   6.63,   9.37,   11.81,   14.0,
                    15.69,   16.94,   17.63,   17.75,   17.5,   16.5,
                    15.0,   13.25,   11.0,   8.5,   5.75,   -33.0,
                    -23.75,   -14.0,   -6.63,   -9.37,   -11.87,   -14.0!
!END!
 45    ! SRCNAM  =   PV04C !
 45    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   23.5,   23.5!
 45    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   25.0,   25.0,   22.5,
                    42.5,   55.0,   23.25,   25.0,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   25.0,   25.0,   98.0,
                    42.5,   55.0,   23.25,   25.0,   209.37,   250.0!
 45    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   276.0,   241.0!
 45    ! XBADJ  =   -68.0,   -45.5,   -22.5,   2.0,   -8.0,   -40.5,
                    -71.75,   -100.88,   -127.0,   38.25,   39.25,   31.75,
                    -186.75,   -189.5,   28.0,   40.0,   -170.5,   -153.0,
                    -131.5,   -105.0,   -76.0,   -44.5,   -47.5,   -70.0,
                    -90.5,   -108.5,   -123.0,   38.25,   39.25,   -143.25,
                    -141.25,   -137.0,   -68.5,   40.0,   -105.5,   -88.0!
 45    ! YBADJ  =   7.69,   13.19,   18.25,   22.75,   26.75,   29.5,
                    31.5,   32.25,   32.5,   38.25,   39.25,   -8.75,
                    23.25,   19.5,   18.13,   40.0,   3.81,   -2.0,
                    -7.69,   -13.19,   -18.25,   -22.63,   -26.75,   -29.5,
                    -31.0,   -32.25,   -32.5,   38.25,   39.25,   -27.0,
                    -23.25,   -19.5,   -18.13,   40.0,   -3.69,   2.0!
!END!
 46    ! SRCNAM  =   PV05C !
 46    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                    25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 46    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                    40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                    38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                    40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                    42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 46    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                    28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                    32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                    28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                    328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 46    ! XBADJ  =   -5.5,   -5.0,   -5.0,   -4.5,   -8.0,   -13.75,
                    -19.0,   -23.87,   -28.0,   -31.25,   -33.5,   -34.75,
                    -254.5,   -257.0,   -36.5,   -35.5,   -34.0,   -31.0,
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                    -27.5,   -23.0,   -17.5,   -11.5,   -9.0,   -9.5,
                    -9.25,   -8.62,   -8.0,   -7.06,   -5.75,   -76.75,
                    -73.5,   -69.5,   -4.0,   -4.5,   -4.5,   -5.0!
 46    ! YBADJ  =   12.13,   13.81,   15.25,   15.88,   16.25,   16.0,
                   15.5,   14.25,   13.0,   11.25,   8.75,   6.25,
                   26.25,   11.0,   -2.13,   -5.12,   -7.56,   -10.0,
                   -12.13,   -13.81,   -15.13,   -16.0,   -16.5,   -16.0,
                   -15.5,   -14.25,   -13.0,   -11.0,   -8.75,   -42.0,
                   -26.75,   -11.0,   2.13,   4.88,   7.62,   10.0!
!END!
 47    ! SRCNAM  =   PV06C !
 47    ! HEIGHT  =  25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   25.5,
                   25.5,   25.5,   25.5,   25.5,   25.5,   23.5,
                   23.5,   23.5,   25.5,   25.5,   25.5,   25.5!
 47    ! WIDTH  =   38.25,   39.38,   39.0,   37.75,   39.5,   40.0,
                   40.0,   38.5,   36.0,   32.5,   27.5,   22.5,
                   42.5,   55.0,   23.25,   28.25,   32.63,   36.0,
                   38.25,   39.38,   39.25,   38.0,   39.0,   40.0,
                   40.0,   38.5,   36.0,   32.0,   27.5,   98.0,
                   42.5,   55.0,   23.25,   28.25,   32.75,   36.0!
 47    ! LENGTH =   32.5,   27.5,   22.5,   16.0,   17.0,   23.25,
                   28.25,   32.63,   36.0,   38.25,   39.25,   39.0,
                   327.75,   326.5,   40.5,   40.0,   38.5,   36.0,
                   32.5,   28.0,   22.5,   16.0,   17.0,   23.25,
                   28.5,   32.63,   36.0,   38.25,   39.25,   322.5,
                   328.0,   326.5,   40.0,   40.0,   38.5,   36.0!
 47    ! XBADJ  =   -10.5,   -9.0,   -7.5,   -6.0,   -8.0,   -12.5,
                   -16.25,   -20.0,   -23.0,   -25.25,   -26.75,   -27.25,
                   -246.75,   -249.0,   -29.0,   -28.0,   -27.0,   -25.0,
                   -22.5,   -19.0,   -15.0,   -10.0,   -9.0,   -10.75,
                   -12.0,   -12.63,   -13.0,   -13.0,   -12.5,   -84.25,
                   -81.0,   -77.0,   -11.5,   -11.5,   -11.5,   -11.0!
 47    ! YBADJ  =   6.19,   7.06,   7.75,   8.37,   8.75,   8.5,
                   8.5,   7.75,   7.0,   5.75,   5.25,   3.75,
                   24.75,   11.0,   -.88,   -2.38,   -3.69,   -5.0,
                   -6.12,   -7.06,   -7.88,   -8.25,   -8.5,   -8.5,
                   -8.0,   -7.75,   -7.0,   -6.0,   -4.75,   -39.0,
                   -25.25,   -11.0,   .88,   2.13,   3.75,   5.0!
!END!
 48    ! SRCNAM  =   PV07C !
 48    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                   23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 48    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   35.0,   35.0,
                   42.5,   55.0,   35.0,   162.5,   209.37,   250.0,
                   283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                   302.0,   275.5,   241.0,   199.0,   35.0,   98.0,
                   42.5,   55.0,   35.0,   162.5,   209.37,   250.0!
 48    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.0,   39.25,   39.0,
                   327.75,   326.5,   40.5,   302.5,   276.0,   241.0,
                   199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                   162.25,   209.37,   250.0,   283.06,   39.25,   322.5,
                   328.0,   326.5,   40.0,   302.0,   276.0,   241.0!
 48    ! XBADJ  =   -74.5,   -51.0,   -26.0,   .0,   -8.0,   -38.5,
                   -68.0,   -95.38,   -120.0,   -140.94,   39.25,   39.0,
                   -176.25,   -179.0,   40.5,   -172.5,   -161.5,   -145.0,
                   -124.5,   -100.0,   -73.0,   -43.0,   -47.5,   -72.25,
                   -94.5,   -114.0,   -130.0,   -142.13,   39.25,   -153.25,
                   -151.75,   -147.5,   40.0,   -129.5,   -114.5,   -96.0!
 48    ! YBADJ  =   -.56,   3.81,   8.25,   12.25,   15.75,   19.0,
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                    21.5,   23.25,   24.5,   25.0,   39.25,   39.0,
                    21.75,   20.0,   40.5,   13.25,   9.31,   5.0,
                    .62,   -3.81,   -8.25,   -12.13,   -16.25,   -19.0,
                    -21.5,   -23.25,   -24.5,   -24.5,   39.25,   -23.5,
                    -21.75,   -20.0,   40.0,   -13.25,   -9.19,   -5.0!
!END!
 49    ! SRCNAM  =   PV08C !
 49    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 49    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 49    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 49    ! XBADJ   =   -86.5,   -59.5,   -31.0,   -1.0,   -5.5,   -32.0,
                    -58.0,   -82.25,   -104.0,   -122.56,   -137.38,   -148.0,
                    -154.25,   -157.0,   -157.5,   -153.0,   -144.0,   -130.0,
                    -112.5,   -91.5,   -68.0,   -41.5,   -50.5,   -78.5,
                    -104.25,   -127.13,   -146.0,   -160.5,   -170.0,   -174.5,

                    -173.75,   -169.0,   -161.5,   -149.0,   -132.0,   -111.0!
 49    ! YBADJ   =   -18.94,   -16.31,   -13.0,   -9.75,   -5.75,   -2.0,
                    2.0,   5.75,   9.5,   13.0,   16.0,   18.75,
                    20.25,   22.5,   23.25,   23.0,   22.44,   21.0,
                    18.94,   16.31,   13.25,   9.62,   5.75,   2.0,
                    -1.5,   -5.75,   -9.5,   -13.0,   -15.75,   -18.5,
                    -20.75,   -22.5,   -23.0,   -23.25,   -22.44,   -21.0!
!END!
 50    ! SRCNAM  =   PV09C !
 50    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 50    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 50    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 50    ! XBADJ   =   -98.0,   -68.0,   -36.0,   -3.0,   -3.5,   -27.0,
                    -49.75,   -70.88,   -90.0,   -106.31,   -119.38,   -128.75,

                    -134.5,   -137.5,   -138.0,   -135.0,   -127.5,   -116.0,
                    -101.5,   -83.0,   -62.5,   -40.0,   -52.0,   -83.75,
                    -112.75,   -138.5,   -160.0,   -176.69,   -187.88,   -193.75,

                    -193.5,   -189.0,   -180.5,   -167.0,   -148.5,   -125.0!
 50    ! YBADJ   =   -35.13,   -34.31,   -32.25,   -29.5,   -25.75,   -21.0,
                    -16.0,   -10.25,   -4.5,   1.5,   7.5,   13.25,
```

```
                    18.75,   24.0,   28.25,   31.5,   33.81,   35.0,
                    35.19,   34.31,   32.25,   29.38,   25.25,   21.0,
                    16.0,   10.25,   4.5,   -1.5,   -7.75,   -13.5,
                    -18.75,   -24.0,   -28.25,   -31.5,   -33.81,   -35.0!
!END!
 51    ! SRCNAM  =   PV10C !
 51    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 51    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 51    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 51    ! XBADJ  =   -115.0,   -80.0,   -43.0,   -4.5,   .0,   -18.5,
                    -36.25,   -52.88,   -68.0,   -81.0,   -91.63,   -99.25,
                    -104.25,   -107.0,   -109.0,   -108.0,   -103.0,   -95.0,
                    -84.5,   -71.0,   -55.5,   -38.0,   -55.5,   -92.25,
                    -126.25,   -156.5,   -182.0,   -202.0,   -215.75,   -223.25,

                    -223.75,   -219.0,   -210.0,   -194.5,   -173.0,   -146.0!
 51    ! YBADJ  =   -60.44,   -62.19,   -61.75,   -59.75,   -55.75,   -50.5,
                    -43.5,   -34.75,   -25.5,   -15.0,   -4.5,   6.25,
                    16.75,   27.5,   36.75,   45.0,   51.81,   57.0,
                    60.5,   62.19,   62.0,   59.63,   55.75,   50.5,
                    43.5,   34.75,   25.5,   15.5,   4.75,   -6.5,
                    -16.75,   -27.5,   -36.75,   -45.0,   -51.81,   -57.0!
!END!
 52    ! SRCNAM  =   PV11C !
 52    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 52    ! WIDTH  =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 52    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 52    ! XBADJ  =   -153.0,   -107.5,   -58.5,   -8.0,   8.5,   2.75,
                    -3.75,   -10.0,   -16.0,   -21.5,   -26.25,   -30.25,
                    -33.5,   -37.0,   -41.5,   -45.0,   -47.0,   -47.0,
                    -46.0,   -43.5,   -40.0,   -34.5,   -64.5,   -113.25,
                    -158.5,   -199.38,   -234.0,   -261.56,   -281.13,   -292.25,

                    -294.5,   -289.5,   -277.5,   -257.0,   -229.0,   -194.0!
 52    ! YBADJ  =   -120.0,   -127.44,   -130.75,   -130.5,   -126.25,   -118.0,

                    -106.5,   -91.25,   -73.5,   -53.5,   -32.0,   -9.25,
                    13.25,   36.5,   57.75,   77.5,   94.69,   109.0,
```

```
                    120.06,   127.44,   131.0,   130.37,   125.75,   118.0,
                    106.5,   91.25,   73.5,   53.5,   31.75,   9.5,
                    -13.75,   -36.5,   -57.75,   -77.5,   -94.69,   -109.0!
!END!
 53    ! SRCNAM  =   PV13C !
 53    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   23.5,   23.5,   23.5!
 53    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   151.0,   98.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   241.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   23.25,   162.5,   209.37,   250.0!
 53    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.0,   307.37,   322.5,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   250.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   40.0,   302.0,   276.0,   241.0!
 53    ! XBADJ   =   -135.0,   -104.5,   -71.5,   -36.0,   -33.5,   -52.75,
                    -70.5,   -86.0,   -99.0,   -108.94,   -115.63,   -118.5,
                    -118.25,   -115.5,   -111.5,   -104.5,   -93.5,   -80.0,
                    -64.5,   -46.0,   -27.0,   -6.5,   -22.0,   -57.75,
                    -92.0,   -123.38,   -151.0,   -174.06,   -191.75,   -203.75,

                    -209.75,   -210.5,   -146.0,   -198.0,   -182.5,   -161.0!
 53    ! YBADJ   =   -32.56,   -38.19,   -42.5,   -45.75,   -47.25,   -48.0,
                    -47.0,   -44.25,   -40.5,   -35.5,   -29.5,   -22.25,
                    -14.75,   -6.0,   2.5,   10.75,   18.69,   26.0,
                    32.56,   38.19,   42.5,   45.63,   47.25,   48.0,
                    47.0,   44.25,   40.5,   35.5,   29.25,   22.0,
                    14.25,   6.0,   -5.87,   -10.75,   -18.69,   -26.0!
!END!
 54    ! SRCNAM  =   PV14C !
 54    ! HEIGHT  =  23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   25.5,   25.5,   25.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   25.5,   23.5,   23.5,   23.5,
                    23.5,   23.5,   23.5,   23.5,   23.5,   23.5!
 54    ! WIDTH   =   283.0,   307.37,   322.5,   328.0,   326.5,   319.0,
                    302.0,   275.5,   36.0,   32.5,   27.5,   22.5,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0,
                    283.0,   307.37,   322.5,   327.75,   326.5,   319.0,
                    302.0,   275.5,   36.0,   199.0,   150.5,   98.0,
                    42.5,   55.0,   110.5,   162.5,   209.37,   250.0!
 54    ! LENGTH =   199.0,   151.0,   98.5,   43.0,   55.5,   110.5,
                    162.25,   209.37,   36.0,   38.25,   39.25,   39.0,
                    327.75,   326.5,   319.0,   302.5,   276.0,   241.0,
                    199.0,   151.0,   98.5,   42.5,   55.5,   110.5,
                    162.25,   209.37,   36.0,   283.06,   307.37,   322.5,
                    328.0,   326.5,   319.0,   302.0,   276.0,   241.0!
 54    ! XBADJ   =   -26.5,   -25.0,   -23.0,   -20.5,   -51.0,   -102.75,
                    -151.5,   -195.75,   -85.0,   -90.0,   -92.13,   -91.5,
                    -307.75,   -305.0,   -295.0,   -276.5,   -249.0,   -214.0,
                    -173.0,   -126.0,   -75.5,   -22.5,   -4.5,   -8.0,
                    -10.75,   -13.62,   49.0,   -17.88,   -19.13,   -20.0,
                    -20.0,   -21.5,   -24.0,   -26.0,   -27.0,   -27.0!
 54    ! YBADJ   =   123.69,   134.56,   141.5,   144.0,   142.25,   135.5,
                    125.0,   111.25,   28.0,   15.75,   3.75,   -9.25,
                    1.25,   -23.0,   -47.5,   -70.25,   -91.06,   -109.0,
                    -123.63,   -134.56,   -141.25,   -143.88,   -142.25,
-135.5,
                    -125.0,   -111.25,   -28.0,   -73.0,   -50.25,   -26.5,
```

-1.25, 23.0, 47.5, 70.25, 91.06, 109.0!
!END!

---

a
Building height, width, length, and X/Y offset from the source are treated as a separate input subgroup for each source and therefore must end with an input group terminator. The X/Y offset is the position, relative to the stack, of the center of the upwind face of the projected building, with the x-axis pointing along the flow direction.

Subgroup (13d)
---

a
POINT SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 13b. Factors entered multiply the rates in 13b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

0 =	Constant	
1 =	Diurnal cycle	(24 scaling factors: hours 1-24)
2 =	Monthly cycle	(12 scaling factors: months 1-12)
3 =	Hour & Season	(4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab.	(6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
5 =	Temperature	(12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---
a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters

Subgroup (14a)

Number of polygon area sources with parameters specified below (NAR1) No default ! NAR1 = 0 !

Units used for area source emissions below (IARU) Default: 1 ! IARU = 1 !

1 =	g/m**2/s
2 =	kg/m**2/hr
3 =	lb/m**2/hr
4 =	tons/m**2/yr
5 =	Odour Unit * m/s (vol. flux/m**2 of odour compound)

```
          6 =     Odour Unit * m/min
          7 =     metric tons/m**2/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
     provided below in (14d)        (NSAR1) Default: 0  !  NSAR1 =  0  !

     Number of buoyant polygon area sources
     with variable location and emission
     parameters (NAR2)                      No default  !  NAR2 =  0   !
     (If NAR2 > 0, ALL parameter data for
     these sources are read from the file: BAEMARB.DAT)

!END!

---------------
Subgroup (14b)
---------------
                                  a
          AREA SOURCE: CONSTANT DATA
          --------------------------
                                                          b
Source           Effect.    Base      Initial    Emission
 No.             Height   Elevation   Sigma z     Rates
                   (m)       (m)       (m)
-------          ------    ------     --------   ---------


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.
    b
     An emission rate must be entered for every pollutant modeled.
     Enter emission rate of zero for secondary pollutants that are
     modeled, but not emitted.  Units are specified by IARU
     (e.g. 1 for g/m**2/s).

---------------
Subgroup (14c)
---------------

          COORDINATES (km) FOR EACH VERTEX(4) OF EACH POLYGON
          ---------------------------------------------------------
Source                                                              a
 No.      Ordered list of X followed by list of Y, grouped by source
------    ------------------------------------------------------------


--------
    a
     Data for each source are treated as a separate input subgroup
     and therefore must end with an input group terminator.


---------------
Subgroup (14d)
---------------
                                          a
          AREA SOURCE: VARIABLE EMISSIONS DATA
          ------------------------------------

     Use this subgroup to describe temporal variations in the emission
     rates given in 14b.  Factors entered multiply the rates in 14b.
     Skip sources here that have constant emissions.  For more elaborate
     variation in source parameters, use BAEMARB.DAT and NAR2 > 0.
```

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

0 =	Constant	
1 =	Diurnal cycle	(24 scaling factors: hours 1-24)
2 =	Monthly cycle	(12 scaling factors: months 1-12)
3 =	Hour & Season	(4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab.	(6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
5 =	Temperature	(12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---

a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 15a, 15b, 15c -- Line source parameters

Subgroup (15a)

Number of buoyant line sources with variable location and emission parameters (NLN2) No default ! NLN2 = 0 !

(If NLN2 > 0, ALL parameter data for these sources are read from the file: LNEMARB.DAT)

Number of buoyant line sources (NLINES) No default ! NLINES = 0 !

Units used for line source emissions below (ILNU) Default: 1 ! ILNU = 1 !

1 =	g/s
2 =	kg/hr
3 =	lb/hr
4 =	tons/yr
5 =	Odour Unit * m**3/s (vol. flux of odour compound)
6 =	Odour Unit * m**3/min
7 =	metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (15c) (NSLN1) Default: 0 ! NSLN1 = 0 !

Maximum number of segments used to model each line (MXNSEG) Default: 7 ! MXNSEG = 7 !

The following variables are required only if NLINES > 0. They are used in the buoyant line source plume rise calculations.

Number of distances at which transitional rise is computed Default: 6 ! NLRISE = 6 !

Average building length (XL)	No default (in meters)	! XL = .0 !
Average building height (HBL)	No default (in meters)	! HBL = .0 !
Average building width (WBL)	No default (in meters)	! WBL = .0 !
Average line source width (WML)	No default (in meters)	! WML = .0 !
Average separation between buildings (DXL)	No default (in meters)	! DXL = .0 !
Average buoyancy parameter (FPRIMEL)	No default (in m**4/s**3)	! FPRIMEL = .0 !

!END!

Subgroup (15b)

BUOYANT LINE SOURCE: CONSTANT DATA

Source No.	Beg. X Coordinate (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height (m)	Base Elevation (m)	Emission Rates[a]

[a] Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

[b] An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by ILNTU (e.g. 1 for g/s).

Subgroup (15c)

BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA[a]

Use this subgroup to describe temporal variations in the emission rates given in 15b. Factors entered multiply the rates in 15b. Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors,

```
                                 where first group is DEC-JAN-FEB)
          4 =       Speed & Stab. (6 groups of 6 scaling factors, where
                                   first group is Stability Class A,
                                   and the speed classes have upper
                                   bounds (m/s) defined in Group 12
          5 =       Temperature   (12 scaling factors, where temperature
                                   classes have upper bounds (C) of:
                                   0, 5, 10, 15, 20, 25, 30, 35, 40,
                                   45, 50, 50+)
```

---

[a] Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters

Subgroup (16a)

```
     Number of volume sources with
     parameters provided in 16b,c (NVL1)     No default  !  NVL1 =  0   !

     Units used for volume source
     emissions below in 16b       (IVLU)     Default: 1  !  IVLU =   1  !
           1 =        g/s
           2 =       kg/hr
           3 =       lb/hr
           4 =     tons/yr
           5 =     Odour Unit * m**3/s  (vol. flux of odour compound)
           6 =     Odour Unit * m**3/min
           7 =     metric tons/yr

     Number of source-species
     combinations with variable
     emissions scaling factors
     provided below in (16c)      (NSVL1)    Default: 0  !  NSVL1 =  0  !

     Number of volume sources with
     variable location and emission
     parameters                   (NVL2)     No default  !  NVL2 =   0   !

     (If NVL2 > 0, ALL parameter data for
      these sources are read from the VOLEMARB.DAT file(s) )

!END!
```

Subgroup (16b)

---

[a]

VOLUME SOURCE: CONSTANT DATA

---

[b]

X Coordinate (km)	Y Coordinate (km)	Effect. Height (m)	Base Elevation (m)	Initial Sigma y (m)	Initial Sigma z (m)	Emission Rates
----------	----------	------	------	--------	--------	--------

---

a
Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b
An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IVLU (e.g. 1 for g/s).

Subgroup (16c)

---

a
VOLUME SOURCE: VARIABLE EMISSIONS DATA

Use this subgroup to describe temporal variations in the emission rates given in 16b. Factors entered multiply the rates in 16b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:
(IVARY) Default: 0

0 =	Constant	
1 =	Diurnal cycle	(24 scaling factors: hours 1-24)
2 =	Monthly cycle	(12 scaling factors: months 1-12)
3 =	Hour & Season	(4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
4 =	Speed & Stab.	(6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12
5 =	Temperature	(12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

---

a
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information

---

Subgroup (17a)

Number of non-gridded receptors (NREC) No default ! NREC = 6 !

!END!

Subgroup (17b)

---

a
NON-GRIDDED (DISCRETE) RECEPTOR DATA

X	Y	Ground	Height	b

Attachment 1 - SC1 CALPUFF Input File

Receptor No.		Coordinate (km)	Coordinate (km)	Elevation (m)	Above Ground (m)	
1	! X =	335.983,	6240.706,	0.000,	0.000!	!END!
2	! X =	336.047,	6240.673,	0.000,	0.000!	!END!
3	! X =	336.167,	6240.563,	0.000,	0.000!	!END!
4	! X =	336.15,	6240.456,	0.000,	0.000!	!END!
5	! X =	336.301,	6240.368,	0.000,	0.000!	!END!
6	! X =	336.349,	6240.235,	0.000,	0.000!	!END!

---

a
Data for each receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

b
Receptor height above ground is optional. If no value is entered, the receptor is placed on the ground.

Appendix F Revised Preliminary Hazard Assessment

New Paper Mill

UPDATED PRELIMINARY HAZARD ANALYSIS

Final Rev 02

- 14 April 2009

New Paper Mill

UPDATED PRELIMINARY HAZARD ANALYSIS

Final Rev 02

- 14 April 2009

Sinclair Knight Merz
ABN 37 001 024 095
100 Christie Street
PO Box 164
St Leonards NSW
Australia 1590
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.skmconsulting.com

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1. Introduction

1.1 Background

AMCOR Packaging (Australia) Pty Ltd (referred to hereafter as “AMCOR”, proposes to construct and operate a new paper making facility which uses 100% recycled waste paper, at their Botany site in Sydney, NSW (NSW DoP Application No. 05_0120). The New Paper Mill would replace the two existing 1960s vintage papermaking machines at the site, with a single machine, incorporating modern technology.

To support the Development Application a Preliminary Hazard Analysis was prepared by SKM for the proposal and submitted to the NSW DoP for comment in April 2007 (Project No: EN01893 Rev 2- Proposed New Paper Mill Botany). The New Paper Mill development was approved by the Minister for Planning in July 2007.

Since project approval, there have been a number of proposed modifications to the approved project , including:

- Changes to the boundaries to divest surplus land (refer Figure 1 : AMCOR Proposal - Site Plan. Proposed Modifications to Approved Building layout) to the north and north-east;
- Changes in Dangerous Goods storage quantities & locations.

The NSW DoP has requested that AMCOR provide an updated Preliminary Hazard Analysis covering the proposed modifications, and whether these changes affect the SEPP 33 findings / conclusions from the original PHA.

AMCOR has again commissioned Sinclair Knight Merz to conduct the updated PHA study and to report on the study findings, incorporating any recommendations. In that context this updated report only comments on the changes and as the bulk of the proposal remains essentially unchanged this updated report should be read in conjunction with PHA report Project No: EN01893 Rev 2- Proposed New Paper Mill Botany.

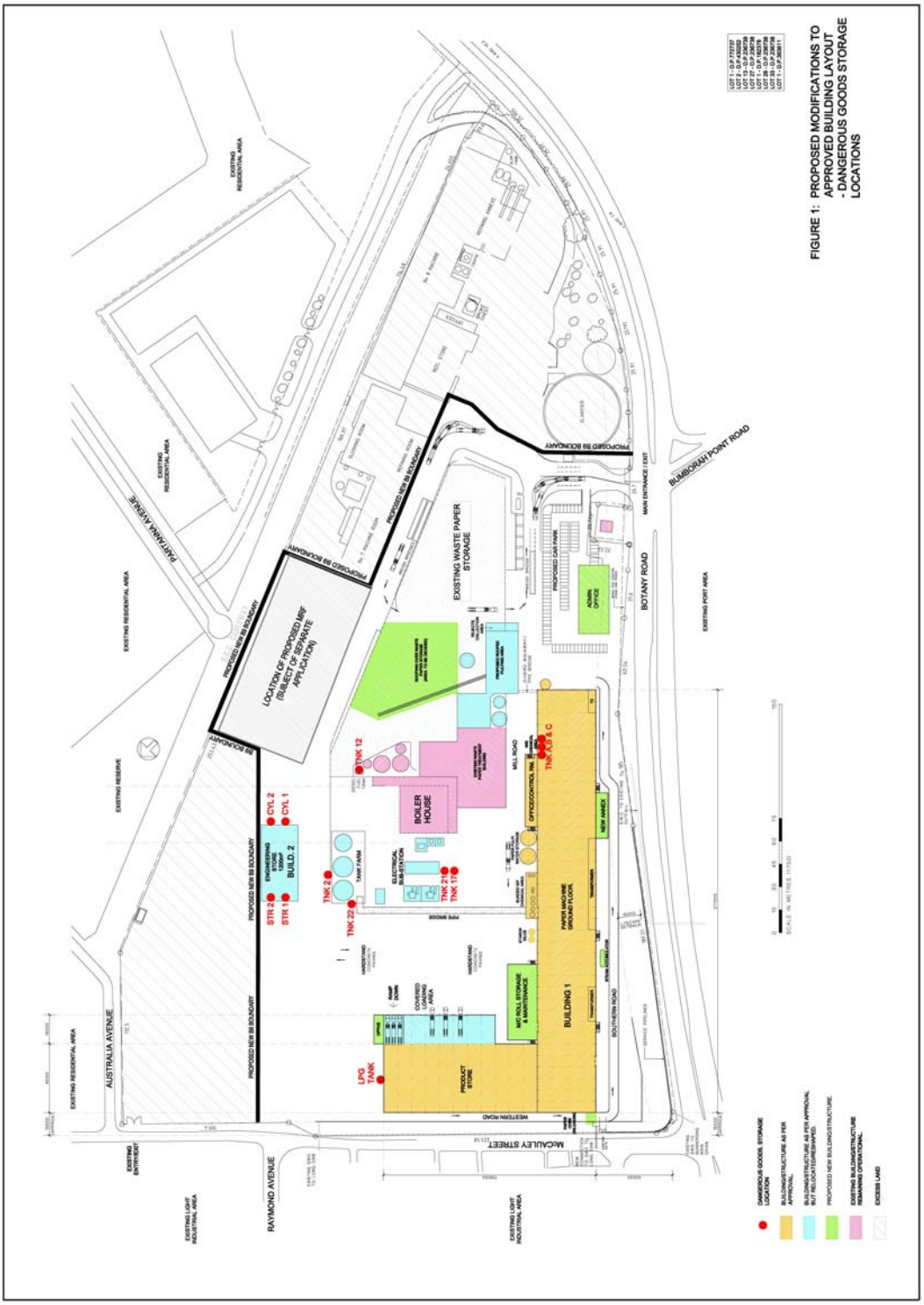

Figure 1 : AMCOR Proposal – Site Plan

1.2 Objectives

The objectives of the study are to:

- Update the Preliminary Hazard Analysis (PHA) for the proposed New Paper Mill at Botany, NSW, in accordance with Hazardous Industry Planning Advisory Paper (HIPAP) No.6 – Hazard Analysis Guidelines (Ref.1); and
- Provide a report on the results of the PHA study for submission to the regulatory authority in support of the modification application.

1.3 Scope of Work

The scope of work is to update the PHA for the proposed New Paper Mill at Botany, NSW, in accordance with HIPAP No.6.

The original PHA report Project No: EN01893 Rev 2- Proposed New Paper Mill Botany already demonstrates that the facility is not potentially hazardous in accordance with the requirements of SEPP 33 and land use safety planning requirements, and hence is acceptable subject to approval by the NSW DoP. Reference should also be made to this study for completeness.

2. Summary of Changes

This section provides the road map for the changes to the proposal and the updated PHA.

2.1 Land Use Changes

The Amcor site is located at Botany Road, Matraville, NSW as shown in Figure 1 – AMCOR Proposal - Site Plan. The site is zoned 4(a) Industrial and the proposed facility is permitted in this zone provided the facility is not classified as "Hazardous or Offensive", which has been demonstrated by the original PHA.

The surrounding area is characterised by industrial and commercial facilities and residential as follows:

- **West** –Commercial offices on the western side of McCauley Street and Light Industrial /warehousing facilities;
- **South** –Botany Road and Port Botany. The closest site is the CTAL Container Terminal a containers storage facility. Other uses (>300m away) include Bulk Liquids Storage Area, the P&O Container Terminal, and Patrick Container Terminal (Australian Stevedore) are located to the south and south-east
- **East and north east**: Residential.

Changes to the northern and eastern boundaries are depicted and denoted as "Proposed new B9 boundary" on Figure 1. It is expected that these two sites will be subdivided and divested sometime in the future. Proposed uses for the site (subject to Council and / or NSW DoP approval) will be warehousing or Port related uses.

If successful this will reduce the AMCOR site area from 15.5 hectares to around 10 hectares, and extend the distances from the site boundary to residential areas in the north and north east. In particular the separation distance for residences at the western end of Australia Ave will increase from 30-50 m to about 100 metres, thereby presenting a greater buffer distance to existing residences.

2.2 Dangerous Goods Storage Arrangements

Purpose designed and built Chemical Storage Areas would be constructed with the New Paper Mill. The New Main Chemical Storage Areas would be located within and to the north of the New Paper Mill building in dedicated storage areas and contain all Class 8 substances. LPG would be stored adjacent to the Product Store.

Table 2.1 lists the quantity of dangerous goods which would be used and stored in each area of the proposed new mill. Class 3 substances would be stored adjacent to the Boiler house in a bunded area. The location of the stores is as shown in Figure 1.

All chemical storages associated with Machine No.7 and Machine No. 8 would be decommissioned according to the program described in Section 2.2.1.

Table 2-1 : List of Dangerous Goods Proposed For Storage at the New Mill

Depot No.	Name of DG	Un.No.	Class	PG	Max. Quantity (L)	Storage Type & Location
LPG	Petroleum Gases, Liquefied	1075	2.1	N/A	6773	Above ground tank north of Product Store
CYL 2	Acetylene, Dissolved Petroleum Gas, Liquefied	1001 1075	2.1 2.1	N/A N/A	642 (Total for CYL 2 Store)	Cylinders in storage area outside the Engineering Store (Build. 2)
CYL 1 CYL 1 CYL 1 CYL 1	Oxygen, Compressed Nitrogen Argon, compressed Argoshield, Stainshield	1072 1066 1006 1956	2.2 (5.1) 2.2 2.2 2.2	N/A N/A N/A N/A	1300 (Total for CYL 1 Store)	
TNK 17	Flammable Liquid, Corrosive Nos. BWT 8235 (Morpholine)	2924	3 (8)	N/A	800	Above ground storage tank in bunded storage area outside south western corner of Boiler house
TNK 21	Sodium Hydroxide Solution	1824	8	II	1500	Above ground storage tank in bunded area outside south western corner of Boiler House.
TNK 22	Sodium hydroxide Solution	1824	8	II	10000	Above ground tank in locked and bunded store, adjacent to new water and effluent storage tanks
TNK 2	Hypochlorite Solution	1791	8	II	1500	Above ground storage tank in bunded area north of the proposed new water and effluent storage tanks.
TNK 12	Combustible Liquid (Diesel Fuel)	00C1	C1	N/A	15000	Above ground storage tank north east of the boiler house
TNK A	Sodium Hydroxide Solution	1824	8	II	1500	Chemical Storage Area (Eastern end of PM Building - inside).
TNK B	Potassium Hydroxide Solution (Prestige FB9090)	1814	8	II	1500	Chemical Storage Area (Eastern end of PM Building – inside).
TNK C	Hypochlorite Solution	1791	8	II	1500	Chemical Storage Area (Eastern end of PM Building – inside).
OIL	Combustible Liquid - Exempt	00C2	C2	N/A	70,000	Above ground storage tanks (bunded) on ground floor of paper machine building
STR2	7. Oils and Greases	00C2	C2	N/A	30,000	Storage area within Engineering Store (Build.2)
STR1	Hypochlorite Solution Sodium Hydroxide Solution Potassium Hydroxide Solution (Prestige FB9090)	1791 1824 1814	8 8 8	II II II	30000 (Total for store STR1)	Storage Area within Engineering Store (Build.2)

2.2.1 Use and Storage of Chemicals during Commissioning

During the Commissioning (or transition) stage of the new paper mill, there will be a short period where both the existing and new storage areas will be in operation (3-6 months) as outlined in Table 2-2: "List of Dangerous Goods for Storage during Transition". These storage areas are located on opposite sides of the site. The safety features at the new and old mill will be operational throughout this phase to manage this risk.

Table 2-2: List of Dangerous Goods for Storage during Transition

No	Depot Type	Goods	Class	UN No	PG	Max Qty (L)	Typical Qty (L)	Approx Distance to Nearest Residence (m)
EXISTING MILL								
TNK 1	Above ground tank	Potassium Hydroxide Solution (Prestige FB9090)	8	1814	II	2500	-	140
TNK 2	Process Vessel/Area	Hypochlorite Solution	8	1791	II	1500	-	175
TNK 6	Above ground tank	Sodium Hydroxide	8	1824	II	13000	-	125
TNK 7	Process Vessel/Area	Hypochlorite Solution	8	1791	II	4000	-	95
TNK 10	Above ground tank	Sodium Hydroxide	8	1824	II	4000	-	125
TNK 11	Above ground tank	Sodium Hydroxide	8	1824	II	5000	-	85
TNK12	Above ground tank	Combustible Liquid (Diesel Fuel)	C1	00C1	N/A	15000	-	150
TNK 14	Tank (IBC)	Potassium Hydroxide Solution (Prestige FB9090)	8	1814	II	1500	-	120
TNK 17	Above ground tank	Flammable Liquid, Corrosive Nos. BWT 8235	3 (8)	2924	N/A	800	-	225
TNK 19	Tank (IBC)	Sodium Hydroxide	8	1824	II	1500	-	120
TNK 20	Tank (IBC)	Sodium Hydroxide	8	1824	II	1500	-	200
TNK21	Above ground tank	Sodium Hydroxide	8	1824	II	1500	-	220
LPG	Above ground tank	Petroleum Gases, Liquefied	2.1	1075	N/A	6773	-	230
OIL1	Above ground tank	Combustible Liquid – Exempt	C2	00C2	N/A	13500	-	130
OIL 2	Above Ground Tank	Combustible Liquid - Exempt	C2	00C2	N/A	18000	-	100
STR2	Roofed Store	Combustible Liquid – Exempt	C2	00C2	N/A	30000	4000	125
STR1	Roofed Store	Hypochlorite Solution	8	1791	II	30000 (Total for STR1)	6000	150
STR1	Roofed Store	Sodium Hydroxide Solution	8	1824	II		4000	150

No	Depot Type	Goods	Class	UN No	PG	Max Qty (L)	Typical Qty (L)	Approx Distance to Nearest Residence (m)
STR1	Roofed Store	Potassium Hydroxide Solution (Prestige FB9090)	8	1814	II		4000	150
CYL1	Cylinder Store	Oxygen, Compressed	2.2(5.1)	1072	N/A	1300 (Total for CYL 1 Store)	175.5	100
CYL1	Cylinder Store	Nitrogen	2.2	1066	N/A		95	100
CYL1	Cylinder Store	Argon, Compressed	2.2	1006	N/A		213	100
CYL1	Cylinder Store	Argoshield, Stainshield	2.2	1956	N/A		156	100
CYL2	Cylinder Store	Acetylene, Dissolved	2.1	1001	N/A	642 (Total for CYL 2 Store)	105	80
CYL2	Cylinder Store	Petroleum Gases, Liquefied	2.1	1075	N/A		220	80
New Paper Mill								
TNK 22	Above ground tank	Sodium Hydroxide Solution	8	1824	II	10000		170
TNK A	Above ground tank	Sodium Hydroxide Solution	8	1824	II	1500		230
TNK C	Above ground Tank	Hypochlorite Solution	8	1791	II	1500		230
TNK B	Above ground tank	Potassium Hydroxide Solution (Prestige FB9090)	8	1814	II	1500		230
LPG	Above ground tank	Petroleum Gases, Liquefied	2.1	1075	N/A	6773		180
OIL	Above ground tanks	Combustible Liquid – Exempt (Lubrication oil)	C2	00C2	N/A	70,000		250 See Note 3.
STR1		See Note 1						130
STR2		See Note 1						130
CYL1		See Note 2						130
CYL2		See Note 2						130

Note 1: The goods currently stored at STR1 and STR2 will be relocated to the new Engineering Store (Build 2) when this facility is available. It is expected the types and quantities of goods stored for the existing and new mills will be essentially the same and the two areas will not be used concurrently.

Note 2: The goods currently stored at CYL1 and CYL2 will be relocated to outside the new Engineering Store (Build 2) when this facility is available. It is expected the types and quantities of goods stored for the existing and new mills will be essentially the same and the two areas will not be used concurrently.

Note 3: There will be several lubrication and hydraulic oil units including oil tanks located on the ground floor of the paper machine building adjacent to the paper machine.

2.3 Delivery of Chemicals / NSW RTA Approved Routes

Presented in Table 2.3 is a summary of suppliers, delivery routes and the approximate number of deliveries per week for major chemicals. In terms of risk from the transport of these substances, the direct chemical delivery routes use major road transport routes and do not deviate into suburban streets. This presents very little risk to surrounding receptors. There are about 2 chemical deliveries a day which would include Class 3 and 8 substances. This equates to approximately 14 deliveries a week which is below the SEPP 33 screening level threshold for these substances. The delivery volumes and frequencies of other dangerous goods on site are considered low and do not warrant any special consideration.

Table 2.3: Transport Routes of the Delivery of Chemicals

Chemical Class	Supplier	Traffic Route	Approx No. of Deliveries Per Week
Classes 2.1 and 2.2	-	Varies dependent on deliveries to other customers	4
Class 3	Integra Water - Kurnell	Cook Street, Captain Cook Drive, The Boulevarde, Taren Point Road, Rocky Point Road, Ramsgate Road, The Grande parade, General Holmes Drive, Foreshore Road, Botany Road.	2
Class 8 (Hydroxide and Hypochlorite)	Orica – Botany	Beauchamp Road and Botany Road	4
	Hercules Chemicals – Ingleburn / Campbelltown	Hume Highway (M5), King Georges Road, Stoney Creek Road, Forest Road, Marsh Street, Airport Drive, Joyce Drive, General Holmes Drive, Foreshore Road, Botany Road.	

2.4 Effect during transition/Decommissioning Phase

During the Transition Phase Paper Machine Nos. 7 and 8 would be decommissioned and all chemical stores directly used in their operation would be removed. Also the cylinders of acetylene, rare gases, nitrogen and oxygen (i.e. the goods in Stores CYL1 and CYL2) would be moved to the Engineering Store (Build.2) as would the stocks of sodium hydroxide, potassium hydroxide, sodium hypochlorite, oils and greases (i.e. the goods in Stores STR1 and STR2). Also since the last PHA was prepared the above ground tank storing the class 3 Boiler Treatment Chemical- (Morpholine) has been moved from the existing store and transferred to another store outside the boiler room (refer **Figure 1**).

The existing storage areas which will exist in parallel with construction of the new storage areas for the New Paper Mill will have been operating for a number of years and there

have been no major incidents. Therefore these storage areas can currently be considered to be proved to be non hazardous and within acceptable risk levels.

The new storage areas will be constructed on the opposite side of the site to the existing storage areas (>250m away), hence there will be limited risk of interaction between chemicals in the new and old storage areas. The original hazard risk assessment (SKM Project No: EN01893 Rev 2- Proposed New Paper Mill Botany) has shown that the proposed new storage areas represent an acceptable risk.

It is noted that until recently sulphuric acid was stored on the site and this could represent a risk if there was a pathway for it to come in contact with the Class 8 Corrosive Sodium hypochlorite to form chlorine gas. However, the use of sulphuric acid was associated with the old boilers at the site which have recently been upgraded to new boilers which use a reverse osmosis system for the treatment of the boiler feedwater. Thus this potential risk has been eliminated.

Also since the previous PHA was prepared the use of Solid Pesticide (Class 6.1) has ceased and will not be required for the operation of the New Mill.

2.5 SEPP 33 Findings

The original PHA study concludes that only one incident was identified to have consequences offsite exceeding published criteria (Ref. 10 – HIPAP 4). This was a BLEVE at the aboveground 7 tonne LPG storage tank located about 30m from the site boundary. When viewed in risk terms this gave a risk level at the western boundary of around 0.016 E-06, or 0.016 pmpy. When viewed against the NSW DoP land use safety criteria for residential areas (1.0 E-06 or 1 pmpy) this level is regarded as acceptable.

The relocation of the northern boundaries (see Proposed New B9 boundary) does not change these conclusions.

3. AMCOR Response to NSW DoP Port Botany Study

NSW DoP has completed such an assessment for the entire Randwick / Botany Industrial Complex and the Port, and requires any new industrial development to address the following issues in any development application. AMCOR respond as follows:

1. Future developments in the Port area should undergo early risk assessment and comprehensive environmental impact processes to conclusively demonstrate that they will not contribute to any increase in cumulative risk as shown in figure 2. Developments should also conclusively demonstrate that, consistent with the Department of Urban Affairs and Planning risk criteria, there would not be any propagation of risks to neighbouring facilities.

AMCOR response: This risk assessment prepared by SKM will demonstrate that there is no cumulative increase in risk, nor unacceptable risks imposed on neighbours by the AMCOR proposal. Indeed risk levels at the boundary of the site do not exceed 1 in a million per year (cf SKM PHA Report - Project No: EN01893 Rev 2- Proposed New Paper Mill Botany)

1.1 In particular, there should not be any significant increase in toxic compressed or liquefied gases stored or handled at the Port.

AMCOR response: This proposal does not include bulk storage of toxic compressed or liquefied gases on the site. However, this proposal does include bulk storage of flammable and corrosive liquids. However, the original PHA prepared by SKM demonstrated that there is no cumulative increase in risk, nor unacceptable risks imposed on neighbours by the AMCOR proposal. Indeed risk levels at the boundary of the site are computed to be well below NSW DoP criteria for residential areas. The updated PHA (accounting for the boundary changes) draws these same conclusions.

1.2 Proposals for expansion of Port facilities should be subjected to the seven-stage assessment process under the Environmental Planning and Assessment Act 1979 and demonstrate compliance with relevant risk criteria. There should be no increase in cumulative risk, including both individual and societal risk, beyond that shown in figure 2.

AMCOR response: The proposal by AMCOR does fall into the hazard categories annunciated under NSW DoP's SEPP 33 policy on "Multilevel Risk Assessment". However, this updated PHA will demonstrate no cumulative increase in individual or societal risk levels is anticipated.

1.3 The Director-General's requirements for Environmental Impact Statement (EIS) should incorporate the above requirements to ensure appropriate assessment is carried out.

AMCOR response: The proposal by AMCOR was assessed under Part 3A of the EP&A Act gazetted on 1st August 2005, and hence an EA was prepared and approved by the Director-General. The location and nature of the development requires a risk assessment to address land use safety issues

1.4 An ongoing process of updating the cumulative risk contours, as shown in figure 2, should be undertaken in light of decisions on future developments in the Port and changes in external factors, such as aircraft movements.

AMCOR response: Noted - Refer to response to item 1.

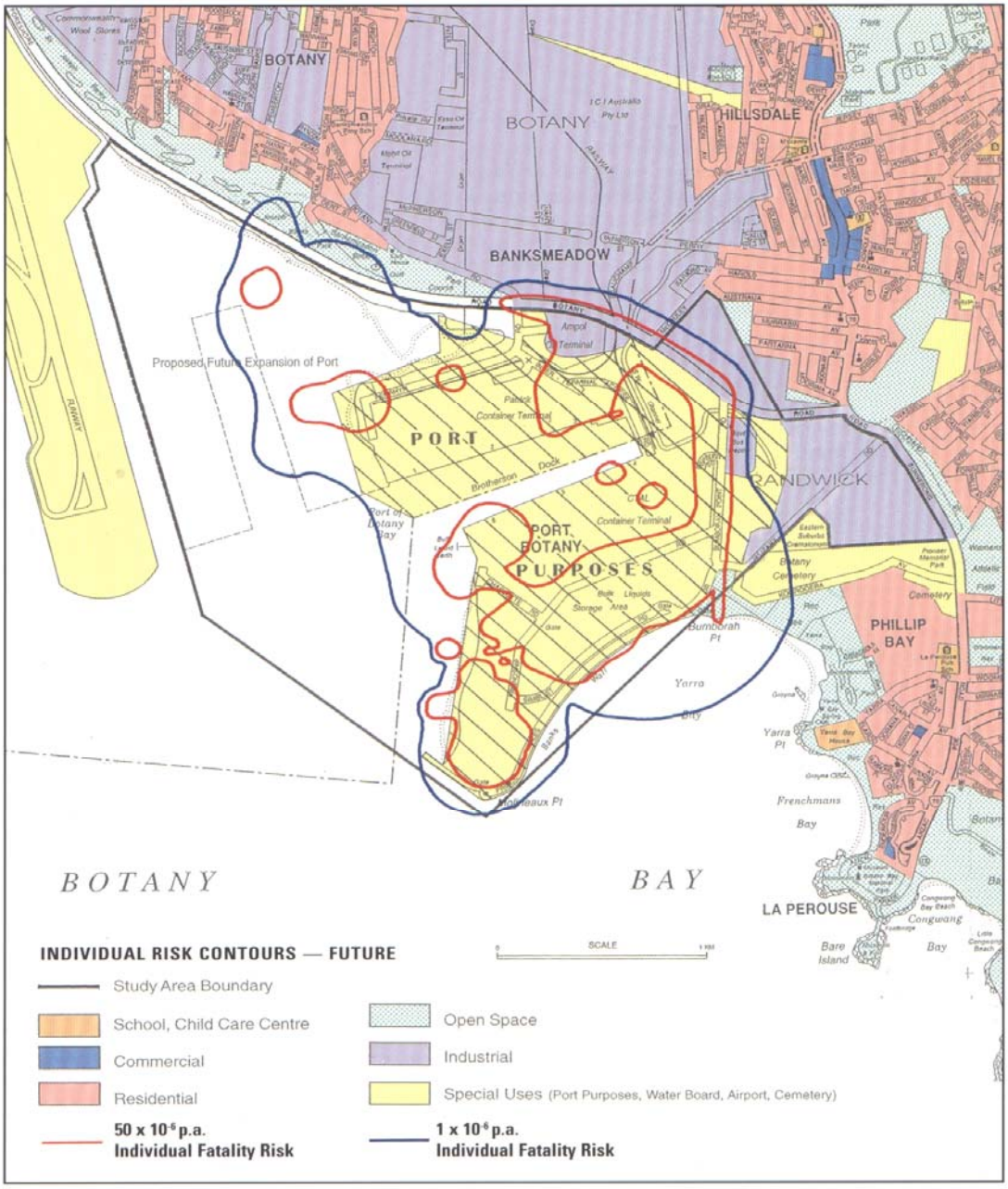

Figure 2 – Cumulative Individual Risk Contours – including future development

2. Development controls should be put in place to ensure there is no significant increase in the number of people exposed to risk inside the residential risk contour shown in figure 2.

AMCOR response: The proposal by AMCOR is located wholly within the General Industrial 4(a) Zone. The nearest residences are located approximately 30 meters to the north-east across Australia Ave, and resultant risk levels are demonstrated to be below the NSW DoP residential risk criteria.

Also any heavy truck movements will be directed to RTA routes, primarily Foreshore Rd and only the most southern portion of Botany Road, and will exclude Botany Rd north as required by the RTA. Refer Figure 3 – Recommended Routes for Heavy Vehicles and RTA NSW for further detail.

2.1 New development in the vicinity of the Port should be consistent with the recommendations of the Department of Planning's (1992) Botany Bay Regional Policy Guidelines. Such developments should be generally port-related or associated activities which will form a buffer between the Port and the surrounding residential and commercial areas.

AMCOR response: The Botany Mill site has been occupied by paper manufacturing facilities for over 100 years. The development by Amcor involves the replacement of the two 1960's vintage paper machines currently operating on the site with a new modern paper machine. The buildings required to house the paper machine and ancillary activities will continue to form a buffer between the Port and the surrounding residential and commercial areas.

Also the proposal by AMCOR will include the export of significant quantities of paper packaging products via Port Botany. Hence the proposal is consistent with the NSW DoP Regional Planning Policy for the Port and Surrounds.

2.2 Proposals for the development or redevelopment of residential, commercial or high density developments outside the Port area, particularly inside the one in a million residential risk contour, identified in figure 2 should not take place. Residential intensification in the vicinity of the residential risk contour should also be the subject of an assessment of the risk from sources outside the port, such as industry, transport and the nearby airport, together with the societal risk implications.

AMCOR response: The proposal by AMCOR does not involve residential intensification.

3. Risk reduction and safety management measures, identified in the individual site studies, should be implemented in accordance with an agreed program and with particular emphasis on the following:

3.1 Improved surveillance and monitoring of external transfer pipelines for bulk liquids, to improve leak detection. This should include both technical and operational measures.

AMCOR response: The proposal by AMCOR does not involve pipelines. All goods will be moved by road along designated NSW RTA heavy vehicle routes.

3.2 Loading arms rather than flexible hoses should be used for all high volume or high-pressure volatile liquid and liquefied gas transfer operations.

AMCOR response: Not applicable

3.3 Sites should initiate a systematic program to identify, inspect and maintain safety critical equipment.

AMCOR response: A comprehensive SMS already exists (See Section 3.6) and will be reviewed for the new proposal.

3.4 Restrictions on roadside parking and queuing of heavy vehicles in the port area should be strictly enforced to reduce the likelihood of traffic obstructions causing dangerous goods transport accidents.

AMCOR response: The proposal by AMCOR will ensure that no heavy vehicles servicing the site will stand in public areas during normal operations.

3.5 All sites transporting LPG by road in bulk should review their driver training, inspection, operating and emergency procedures and safeguards to minimise transport risks.

AMCOR response: Not applicable.

3.6 All sites should review and strengthen their safety management system (SMS). The effectiveness of the SMS should be monitored by periodic independent compliance audits at intervals of not less than once every two years.

AMCOR response: Amcor's Botany Mill operates a detailed quality assurance program, accredited through Lloyds that incorporates an Occupational Health and Safety Management System, an Environmental System and a Quality Assurance System. The

Safety Management System has been assessed and is registered as complying with all the requirements of the Australian Standard AS/NZS4801:2001.

AMCOR's Botany Mill also has a comprehensive Site Emergency Plan prepared in accordance with the OH&S Act & Regulations.

3.7 Safety management systems (SMS) should include effective measures for management of change.

AMCOR response: Amcor's SMS incorporates detailed procedures for the management of change.

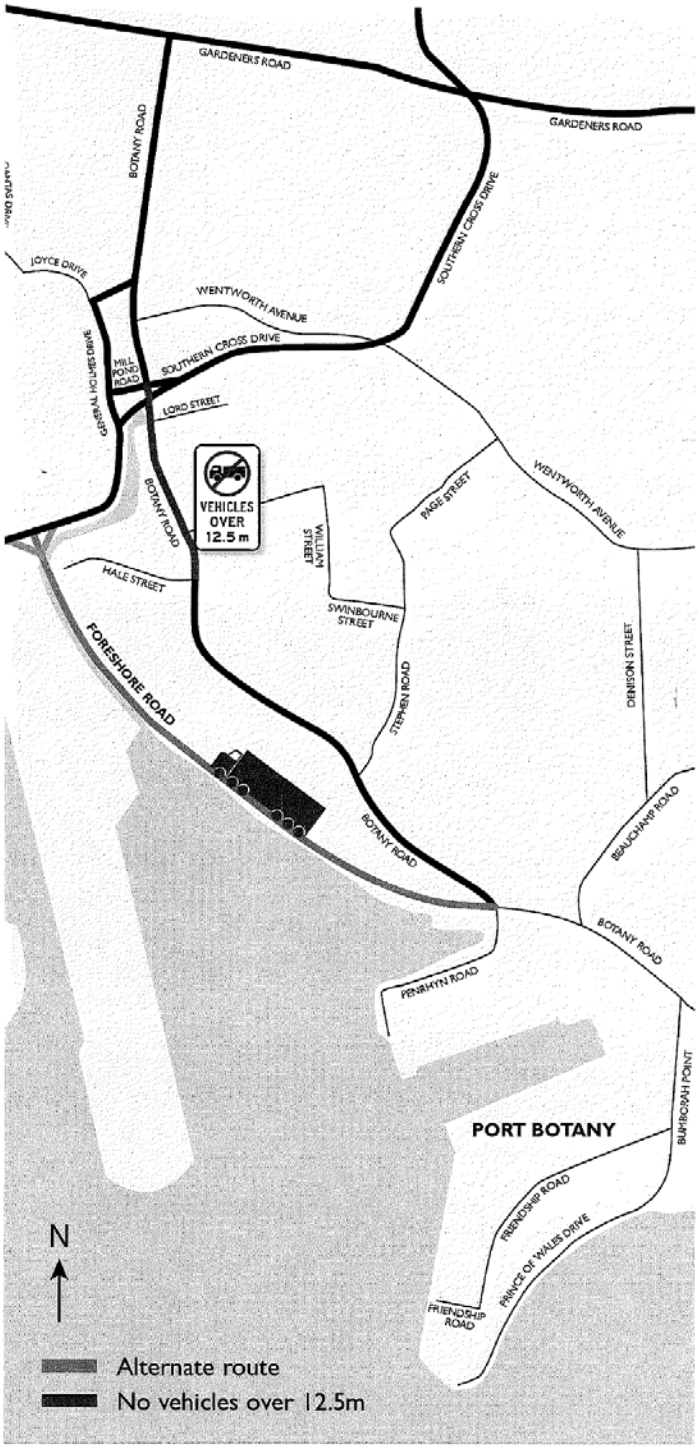

Figure 3 – Recommended Routes for Heavy Vehicles – Port Botany

3.8 Container handling procedures for volatile and toxic dangerous goods should be reviewed by Sydney Ports Corporation and the container terminal operators, to minimise the time these materials spend on the port. Procedures should ensure that containers are appropriately marked, segregated and protected from damage during loading, unloading, storage and transport operations.

AMCOR response: Not Applicable.

3.9 All sites should review their training arrangements to ensure that personnel have an appropriate understanding of operational hazards and are fully trained in operating and emergency procedures.

AMCOR response: Noted. The AMCOR Botany Mill has a comprehensive training plan in place to ensure that all personnel are aware of all operational hazards and are fully trained in operating and emergency procedures. This plan will be reviewed for the new proposal. (See also Sections 3.6 and 4.3).

3.10 An overall review of incident/accident recording and reporting systems should be undertaken. A consistent best practice guideline should be developed and adopted by industry in the Port.

AMCOR Response: Noted. (See also Section 3.6.)

4. Emergency plans and procedures and fire prevention and protection systems should be kept up to date. Security arrangements for the Port area should be strengthened.

4.1 The Sydney Ports Corporation, in liaison with Port users and occupiers, should review and strengthen/upgrade overall security arrangements in the Port area to prevent unauthorised third party access. Both procedural and physical measures to restrict access should be considered.

AMCOR response: The Amcor proposal site perimeter will be protected by a security fence and automatic electronic keycard operated gates. Only authorised and "site inducted" company and service provider personnel will be issued with cards.

4.2 The Port emergency and fire prevention/ protection systems and procedures should he kept up to date as new development proposals progress.

AMCOR response: The Amcor development will include the installation and maintenance of a fire prevention / protection system in line with the recommendations of FM Global.

4.3 Consideration should be given to holding periodic co-ordinated field surprise emergency exercises to validate emergency procedures and practices.

AMCOR response: Noted. AMCOR already have a comprehensive emergency plan for the site – See Section 3.6. Routine evacuation exercises are and will continue to be conducted.

5.0 Port users should adopt community-right-to-know principles to ensure the community is adequately informed about port activities associated risks and the safety management measures that are adopted. The Responsible Care Program adopted by the Plastics and Chemicals Industry Association (PACIA) is an appropriate model.

5.1 A formal mechanism should be established to implement the community-right-to-know program through a consultative committee having representation from Sydney Ports Corporation, port users, councils, community groups and relevant government agencies.

AMCOR response: Noted.

5.2 Priority should be given to regular dissemination to the community of information relating to safety and environmental management and performance through regular annual reporting, newsletters and public forums. Relevant details should include:

- general operational information
- information about safety and emergency management systems
- safety performance statistics
- incident and accident details
- adherence to conditions of consent and license conditions
- responses to specific community information requests.

AMCOR response: AMCOR Botany Mill has an established community liaison group (CLG) consisting of representatives of local residents, businesses and Government that has been active since 1996. The CLG meets every 3 months and provides a forum for the exchange of information regarding all aspects of site operations that impact the local community.

AMCOR also attend regular regional meetings with Councils and other relevant State Emergency Services.

4. Risk Analysis

4.1 Offsite Risks

In SKM's original PHA (Ref 1 – SKM PHA) only one incident was identified to have consequences in offsite areas exceeding published criteria (Ref. 11 – HIPAP 4), this was a BLEVE at the LPG storage tank located about 30m from the site boundary.

It was identified that other potential hazardous incidents did not exceed published criteria (Ref. 11 – HIPAP 4) due to the location of the dangerous goods storages and hazardous facilities well clear of the site boundaries.

4.2 BLEVE Risks

The consequence analysis identified that the BLEVE fireball would impact with a radius of 46m and about 15m offsite. However, the fireball heat radiation would impact much further. Fatalities would occur as a result of people at the site boundary (west – McCauley Street) impacted by the fire ball. Hence, there is a risk of fatalities at the site boundary to the west (McCauley Street).

At the boundary to the west and north, the fireball from the BLEVE will extend into the adjacent sites by about 15m. People in this area would be immediately impacted by the BLEVE fireball and fatalities would result if people were within 15m of the boundary fence at McCauley Street.

Hence, the probability of fatality as a result of a BLEVE at the LPG storage is 1 and therefore the fatality risk is:

BLEVE Fatality Risk = Fatality Probability x BLEVE Frequency

BLEVE Fatality Risk = 1 x 1.6 x 10^{-8} p.a. or 0.016 chances in a million per year (pmpy).

4.3 Risk Criteria

Risk criteria are published by a number of regulatory authorities. For NSW, Hazardous Industry Planning Advisory Paper No 4 (Ref.11) has been used. **Table 4-1** repeats the HIPAP 4 risk criteria.

The adjacent land at the site boundary can be classed as residential, as the public can access this area from residences close by. The risk criterion for residential zones is 1

chance in a million per year or 1 pmpy. The assessed fatality risk for the BLEVE scenario is 0.016 pmpy. Hence, the site does not exceed the recommended risk levels.

Land Use	Suggested Criteria (risk in a million per year)
Hospitals, schools, child-care facilities, old age housing	0.5
Residential, hotels motels, tourist resorts	1
Commercial developments including retail centres, offices and entertainment centres	5
Sporting complexes and active open space	10
Industrial	50

Table 4-1: Risk Criteria Published In HIPAP 4(Ref. 11)

4.4 Summary of Risk Assessment

In summary, there were no postulated incidents identified to exceed consequence and risks from the installations and operations at the Amcor site.

It is noted that the analyses conducted in this assessment are very conservative. The data used was that from the upper range of the data sets (i.e. the conservative end, with the exception of flange leaks) and the results of the analysis would be at the upper end of the risk scale. It is considered that a more detailed analysis would yield lower risks in all cases.

4.5 Effect on Botany Risk Contours

As the site is located in the Botany area, the effect on changes in dangerous goods storage on the risk contours for the Botany area as presented in the *Botany/Randwick Land Use Industrial Area Safety Study (DoP 2001)* has been considered and responded to by AMCOR in Section 3 of this updated PHA.

A comparison between the Dangerous Goods storage for the Old Mill and the proposed New Mill has also been presented in **Table 4-2.** The proposed changes to the Amcor site will result in the elimination of Class 5 and Class 6.1 Dangerous Goods storage. Quantities of combustible oils (Class C2) will slightly increase, however Class C2 are regarded as low risk substances.

- **Table 4-2 Summary of Dangerous Goods for New Mill and Old Mill**

Dangerous Good Class and type	Packing Class	Maximum quantity for New Paper Mill Operation	Maximum Quantity in Old Mill
2.1 (LPG)	N/A	6773 L	6773L
2.1 (Acetylene)	N/A	642 L	1650kg
2.2	N/A	1300 L	120m^3
3	III	800 L	1600
5	III	Nil	7000L
6.1 (b)	III	Nil	80kg
8	II	47,500 L	91,000L
			8225kg
C1	N/A	15000 L	40000
C2	N/A	100,000L	73500

Note : For Material Safety Data Sheets for the above Dangerous Goods – Refer Original PHA (Ref 1) . These can also be supplied on request.

4.6 Conclusions

Based on this updated Preliminary hazard assessment, and the reduction in storage of Dangerous Goods, it is concluded that the proposed changes, namely:

- Changes to the boundaries to divest surplus land (refer Figure 1 : AMCOR Proposal - Site Plan. Proposed Modifications to approved project layout) to the north and north – east; and
- Changes in Dangerous Goods storage quantities & locations;

will not change the findings of the original PHA (Ref 1) nor have any long term impact on the Cumulative Risk Contours as described in the NSW DoP Port Botany Risk Assessment Study (Ref 12).

5. References

1. SKM PHA Report - Project No: EN01893 Rev 2- Proposed New Paper Mill Botany
2. Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis, Department of Planning, NSW, 1992.
3. State Environmental Planning Policy No.33 – Hazardous and Offensive Development Application Guidelines (1994), "Applying SEPP 33", Department of Planning NSW.
4. Multi-Level Risk Assessment, Department of Infrastructure, Planning and Natural Resources – 1997.
5. The Australian Code for the Transport of Dangerous Goods by Road and Rail (known as the Australian Dangerous Goods Code or ADG 7), Federal office of Road Safety, Canberra.
6. AS1596-2000, "The Storage and Handling of LP Gas", Standards Association of Australia, Sydney
7. AS1940-2004, "The Storage and Handling of Flammable and Combustible Liquids", Standards Association of Australia, Sydney
8. AS2444-2000, "Fire Extinguishers and Fire Blankets – Selection and Location", Standards Association of Australia, Sydney.
9. Occupational Health and Safety Act 2000 and Regulations (Dangerous Goods Amendment)– 2005, WorkCover, NSW
10. AS4332 - The Storage and Handling of Gases in Cylinders, Standards Association of Australia,
11. Hazardous Industry Planning Advisory paper No.4, "Risk Criteria for Land Use Safety Planning", NSW Department of Infrastructure, Planning and Natural Resources (1992)
12. Port Botany Risk Assessment Study, Department of Planning, NSW, 2001.