# Prince of Wales Hospital State Significant Development

## Response to Submissions

## Avoca and High Streets, Randwick

### Stage 2 Development of the Nelune Comprehensive Cancer Care (NCCC) & Australian Advanced Treatment Centre (AATC)

Submitted to Department of Planning & Infrastructure
On Behalf of Health Infrastructure

January 2014 ■ 11422

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This report has been prepared by: Oliver Klein

Date 22/01/14

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## Tables



## Appendices

# 1.0 Introduction

An Environmental Impact Statement (EIS) in relation to the State Significant Development, Development Application (SSD DA) for the Stage 2 Development of the Nelune Comprehensive Cancer Care (NCCC) and Australian Advanced Treatment Centre (AATC) at the Prince of Wales Hospital was publicly exhibited for a period of 30 days between 14 November 2013 and 13 December 2013.

In total 3 agency submissions were received. These were from Randwick City Council, Sydney Water, and the EPA. The main issues identified in the submissions were related to:

- height, bulk, and scale of the building;
- heritage impacts;
- traffic and parking;
- landscaping and the building's legibility and interaction at the public domain level;
- adequacy of existing water and waste water infrastructure; and
- a range of environmental impacts during both the construction and operational phases of the development.

The Department of Planning and Infrastructure provided a written request for (NSW Health Infrastructure (HI)) to provide a response to the submissions received, as well as provide a demolition plan as part of the response documentation. A demolition plan is provided as appended.

The proponent (HI) and its consultant team have reviewed and considered the Department of Planning and Infrastructure's (the Department) comments and the agency submissions and, in accordance with clause 85B(2) of the *Environmental Planning and Assessment Regulation* 2000, have responded to the issues raised. This Response to Submissions including a detailed Response to Submissions table (at **Appendix A**) sets out the proponent's response to the issues raised and provides revised Mitigation Measures for which approval is now sought.

The main issues requiring further input and investigations were undertaken by the following consultants with support from HI, the South Eastern Sydney Local Health District, and Prince of Wales Hospital:

- HDR Rice Daubney
- Worley Parsons
- SKM
- Aurecon
- Acoustic Logic
- Radiation Services Group

This report should be read in conjunction with the EIS dated November 2013 and will form part of the DA approval.

# 2.0 Final Mitigation Measures

This chapter of the Report provides the original Mitigation Measures that were provided within Section 9 of the EIS and any updated Mitigation Measures as a result of the public exhibition and submissions. Proposed deletion to the original Mitigation Measures are shown as ~~**bold strike through**~~. Any amendments or additions are shown as ***bold italic***.

**Table 1** – Revised Mitigation Measures

| Mitigation Measures |
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| **Traffic and Access (Construction and Operation)**<br>▪ Traffic, access servicing and layout arrangements are to be in accordance with the Traffic Report by Aurecon (***22*** May 2013).<br>▪ The draft Traffic Construction Management Plan is to be finalised ***by the managing contractor*** and recommendations are to be implemented. |
| **Geotechnical and Contamination**<br>▪ After demolition of the existing buildings on the Stage 2 site, an inspection of the ground surface should be carried out by a qualified environmental consultant to assess the potential for contamination and the need for any further intrusive sampling, if required. If signs of contamination are observed, further assessment is required.<br>▪ Detailed excavation design is to incorporate the recommendations of the Structural Engineering Report (prepared by SKM April 2013).<br>▪ ***During excavation, any works within 2.5m of any existing structures (including heritage buildings) will employ saw cutting of rock.***<br>▪ ***Council's standard ground anchor requirements will be employed for excavation works, particularly in the vicinity of High Street.*** |
| **Operational Management**<br>▪ Detail design must incorporate the noise attenuation measures outlined in the Acoustic Report prepared by Acoustic Logic.<br>▪ Detail design must incorporate the measures for radiation mitigation outlined in the Radiation Report prepared by Radiation Services Group undated. |
| **Heritage**<br>▪ Works must incorporate the recommendation of the Heritage Impact Statement prepared by Worley Parsons April 2013.<br>▪ Excavation works must incorporate the recommendations of the European Archaeological Assessment report prepared by Casey and Lowe March 2012, however it is noted that a s139 permit under *Heritage Act 1977* and a s140 application to the Heritage Branch will not be required for a SSD application.<br>▪ Excavation works must incorporate the recommendations of the Aboriginal Archaeological Assessment report prepared by Mary Dallas Archaeologist. |
| **Building Code of Australia (BCA) / Fire Statements**<br>▪ The recommendations of the BCA and Fire Compliance Statements are to be implemented before detailed design and the release of a Construction Certificate. |
| **Construction Noise and Vibration**<br>▪ The recommendations of the construction noise and vibration report***s*** prepared by Acoustic Logic dated April 2013 ***and 15 January 2014*** are to be implemented. |

| Mitigation Measures |
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| **Stormwater**<br>▪ The recommendations of the Structural Engineering Report prepared by SKM April 2013 are to be implemented for stormwater control. |
| **Construction Management Plan**<br>▪ A Construction Management Plan is to be prepared by the Managing Contractor prior to the works commencing on site. Measures to control sediment and erosion control, noise, odour, tree protection and construction waste are to be implemented. |
| **Ecologically Sustainable Development (ESD)**<br>▪ The Stage ***2*** works and detailed design must incorporate the Environmental Sustainable Design Principles ***to satisfy Section J of the BCA.*** |
| **Aviation Impacts**<br>▪ Health Infrastructure***'s*** ~~**will engage a**~~ specialist aerospace risk management consultant~~ **to** *will* **undertake**~~ ***continue to liaise with all relevant authorities (such as SACL, CASA and the Commonwealth Government) in relation to*** ~~**an assessment of**~~ the proposed development, and its relationship with and impacts upon the existing helipads with respect to existing or future anticipated flight paths. ***Note: CASA is presently considering the Stage 2 development.*** |
| **Wind Impacts**<br>▪ The recommendations of the Wind Assessment Report prepared by CPP dated February 2013 are to be implemented. |

# 3.0 Conclusion

This report and appendices for the Response to Submission has addressed the issues raised within each submission during the public exhibition process. This Report should be read in conjunction with the Environmental Impact Statement which demonstrates that the proposed development will be appropriately mitigated and designed to have minimal adverse environmental impacts.

In light of the benefits of the proposed development and the absence of any adverse environmental impacts, we have no hesitation in recommending the Stage 2 Development of the Nelune Comprehensive Cancer Care (NCCC) and Australian Advanced Treatment Centre (AATC) at the Prince of Wales Hospital for approval.

# Response to Submissions Table

*JBA Planning*

Appendix A

# Appendix A – Response to Submission Table

| | Issues Raised | Proponent's Response |
|---|---|---|
| **Randwick City Council** | | |
| | **General Comments**<br>Council generally supports the proposal, in particular:<br>• the siting of the development. This is a high public interface location with easy access to high frequency bus services and future light rail connections, which is considered a suitable location for the proposed medical facility;<br>• its positive social and economic impacts to the region, including improved cancer and blood disorder treatment services and increased education and training opportunities; and<br>• its proposed Ecologically Sustainable Development (ESD) features, such as energy conservation, materials reuse/recycle, indoor environmental quality, rainwater reuse and waste minimisation. | Noted. |
| | **Height**<br>This non-compliance in height needs to be appropriately addressed to mitigate the resultant visual bulk of the building and its shadow impacts on neighbouring buildings/open space and visual dominance over the heritage buildings.<br>Council recommends consideration of measures that promote a cohesive presence along the High. St frontage on the hospitals campus. It is also recommended that the proposal reinforce an appropriate sense of legibility to better respond to its location close to active edges of Avoca and High Streets and within the overall circulation hierarchy of the hospitals campus. | Health Infrastructure is not seeking to vary the height.<br>The envelope – including the bulk, scale and footprint for the building was previously approved as part of the Stage 1 application. The new building has been constrained to a top RL of 105.3 and has a direct relationship to the Parkes Building to the immediate south west within the Hospital Campus and 66 High street located directly opposite the proposed site. The new development will sit in between the two taller buildings (Parkes and 66 High Street) within the local area, which creates a bookend to the heritage precinct.<br>As indicated in the Heritage Impact Assessment (HIA), it is considered that the form and scale of the proposed building has been appropriately derived from a direct response to both building use and |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | Further, the inconsistent information in terms of the proposed building height (41.5m or 40.89m? - refer to the conflicting figures on pages 23, 36, 59, 61, 63) is recommended to be clarified. | the local context including existing buildings and open space areas. The building envelope was established and accepted in Stage 1. Matters such as articulation of the façade, materials, finishes and colours have been refined in the design process for Stage 2. The spatial relationships between the heritage buildings and open space areas were established and settled in Stage 1 and remain unaltered.<br><br>The proposed building has been designed to be a key facilitator in the overall connectivity of the campus to the public edges along High Street and Avoca Street and its location within the Heritage Precinct. The proposed development will make a substantial contribution in the creation of a new setting for the heritage buildings and spaces. It unifies the below ground Stage 1 development, its bunkers and access corridors with other sections of the hospital. It creates an entirely new level of awareness for the public of the exceptionally significant adjoining heritage buildings.<br><br>The building has also been designed to incorporate the functions required to deliver the service in line with the Australasian Health Facilities Guidelines (AHFG) and the approved Project Definition Plan. As noted above and in the EIS, the height is consistent with other buildings on the campus and within the greater campus of UNSW and the proposed Urban Activation Precinct and the Randwick Education and Health Specialised Centre and represents an appropriate level of development for the site in this strategic context. Reducing the height at this time would require relocation and fragmentation of services, requiring these to be accommodated elsewhere on the campus and result in an underdevelopment of the site.<br><br>The dislocation of co-located services and functions would have significant impacts on the quality of care and treatment.<br><br>The building sits at RL105.3 making it a building in the order of 40.89m in height. References to the height on pages 23, 36 and 59 are correct. Those references on pages 61 and 63 should be to 40.89m, not to 41.5m. |

| | Issues Raised | Proponent's Response |
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| | **Building Envelope**<br><br>Council recommends that the building setbacks to the two heritage buildings be reconsidered and adjusted to create an appropriate curtilage and a sensitive setting for these adjoining heritage items.<br><br>A further setback from High St (to align up with the Superintendents Cottage) is recommended to deliver a consistent building line along the street, while also facilitating the spatial needs for integration with any future/potential light rail stops and associated circulation needs.<br><br>As previously noted in Stage 1 submission, the new building should utilise a simple block form in order to provide a more neutral backdrop to the heritage items, and be subject to careful detailed design (including carefully selected materials and finishes). | HI is not seeking to change the setbacks.<br><br>The Building Envelope Design is a result of careful consideration of its context, responding to the necessary setbacks from adjacent buildings (Superintendents Cottage / Edmund Blacket Building / Building 3), while relating to the precedent building heights, responding to the neighbouring 10 storey Parkes Building and 8 storey office building across High Street.<br><br>Randwick LEP's height controls, if strictly applied, would result in a building with an ungainly appearance and massing and a significantly reduced functional capacity to accommodate the proposed clinical purposes.<br><br>The Building Envelope Design has had regard to the Heritage Design Principles prepared for the site as well as the 1997 Conservation Management Plan and the Burra Charter. The proposed Nelune Comprehensive Cancer Centre (NCCC + AATC) is a free standing element, its rhythm and form echoes those built forms in its context and setting. It is considered that the proposed building will bring an appropriate level of cohesiveness to the site and its environs. The sensitivity of the built form has been dealt with in the design process.<br><br>The relativities of scale, design, materials, finishes and colours are important keys in the design process. The new building has been broken into three separate elements, each responding to the local context.<br><br>1) The taller of the elements that of Precinct Block provides a new nodal element within the Heritage Precinct. It is respectful of the neighbouring heritage buildings and responds to their solidity, form and proportion.<br><br>2) The High Street block will provide a simple form against which the Medical Superintendents Cottage can be viewed. It forms the northern boundary to the hospital campus and provides a contemporary street edge to High St.<br><br>3) The third element provides a central spine to the building and references the existing hospital campus. It will provide a |

| | Issues Raised | Proponent's Response |
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| | | natural break between the solid Precinct Block and the glazed High Street Block.<br>The set-backs were formulated and accepted in Stage 1. The articulation of the façade and its materials, finishes and colours of the new building have been carefully considered so as to have appropriate regard to its respective neighbours especially for the fine articulation of the northern elevation of the Edmund Blacket Building and the relationship with the Medical Superintendent's Cottage.<br><br>The alignments/setbacks of the proposed building on its High Street elevation are considered to be an appropriate response from a heritage conservation planning perspective. This is because they reinforce the park-like setting that is proposed for the Medical Superintendent's Cottage. Further, it will enable the Medical Superintendent's Cottage to be "seen in the round".<br><br>The solidity proposed on the precinct block respects the form and proportions outlined by the Edmund Blacket Building and the Superintendent's Residence, which are, each in their respective architectural styles, powerful architectural statements. A simple façade is proposed to the eastern façade as it becomes the backdrop of the Medical Superintendent's Cottage. This will allow the silhouette/reflection of the Cottage to be referenced against the local context. It is considered that the selected proposed materials and finishes provide a sensitive response to the form and scale of its surrounding context and setting.<br><br>Under the exhibited EIS for the CBD and South East Light Rail project, the nearest light rail stop to the site is across Avoca Street in High Cross Park. The High Street / Wansey Road stop at UNSW is not in direct proximity of the site. The current design of the NCCC + AATC will not compromise circulation needs or access requirements for the light rail. |
| | **Overshadowing**<br><br>Council requests that the shadow impacts be further investigated to ensure the proposal maintains adequate solar | The new building has been constrained to a top RL of 105.3 and has a direct relationship to the Parkes Building to the immediate south west within the Hospital Campus and 66 High street located directly |

| | Issues Raised | Proponent's Response |
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| | access to the adjacent High Cross Park, heritage buildings and associated heritage open space (e.g. the central courtyard of Edmund Blacket Building), to respect and protect the integrity of these significant heritage areas/buildings. | opposite the proposed site.<br><br>As noted in the EIS, the proposal provides an adequate response to the solar access needs of nearby and adjacent development and land uses. Appropriate levels of solar access will be maintained under the Stage 2 design. |
| | **Heritage**<br><br>It is recommended that strict consent conditions be included to monitor and protect the current condition and status of the heritage buildings from any damages/impacts caused by the demolition, excavation or building works.<br><br>The Godden Mackay Logan heritage investigations recommended that an Interpretation Strategy be prepared for the heritage items and that the former Destitute Children's Asylum buildings and grounds be meaningfully interpreted to the public. It is recommended that interpretation of the heritage significance of the Superintendents Cottage and the Edmund Blacket building be installed in conjunction with the development which will change the settings of these heritage buildings. The HIS includes an Interpretation Strategy which recommends naming open spaces after the architects who designed the adjacent heritage items – John Horbury Hunt and Edmund Blacket, and the installation of open space information plaques which describe the design and history of the Superintendents Cottage and the Blacket Building. Further detail is requested on the design and location of these plaques. | Health Infrastructure will undertake appropriate due diligence and visual monitoring of heritage buildings adjacent to the proposed development.<br><br>To maintain compliance with recommended vibration limits in relation to sensitive structures Douglas Partners has recommended a buffer distance from existing structures for various excavation methods. This requirement will form part of the contract set of documents for the Stage 2 works and will be required to be adhered to during works. The proposed method of excavation is via saw cutting of the rock within 2.5m of any existing structures. Similarly, to protect the northern boundary at High Street, Council's standard ground anchor requirements will also be adhered to.<br><br>It is noted that the Council's comment requires consideration of elements that are located outside the boundaries of the land the subject of the DA. In relation to the site of the proposed development, proposed interpretive measures were prepared as part of the HIA for Stage 2. In response to this document Rice Daubney have actioned the first interpretive measure "restoration of historical view cones through the site and between the Superintendent's Residence and Edmund Blacket Building" as demonstrated in the Design Statement which accompanied the EIS at lodgement.<br><br>As part of the detailed design development phase, the remaining interpretive measures put forward within the HIA will be reviewed and where feasible, incorporated into the final designed solution following consultation with the project architects and the Prince of Wales Hospital. The inclusion of interpretive signage is to be undertaken as an element of the project Wayfinding and Signage design in |

| | Issues Raised | Proponent's Response |
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| | | consultation with the project architect and landscape architect to ensure seamless integration with the open space around the development. It is noted that place naming outside of the project footprint is under the jurisdiction of the Prince of Wales Hospital and the South Eastern Sydney Local Health District and is therefore outside the scope of the project. Accordingly, requirements with respect to place naming are requested to be omitted from the drafted consent documentation. |
| | **Transport and Accessibility**<br><br>Council supports the continuous and close liaison between Transport for NSW (TfNSW) and NSW Health Infrastructure (HI), to ensure the two projects are delivered with minimal disruptions to each other and surrounding road network. Council also recommends that the NCCC & AATC development be designed and managed in a manner that provides potential opportunities for future integration with the light rail project.<br><br>Council requests that the southern section of High St remain open to pedestrians during the course of the proposed works. Appropriate pedestrian safety measures will need to be incorporated in the CTMP.<br><br>Council considers that any reduced car parking provision contingent on increased public transport mode share must be based on a sound analysis and detailed travel demand management strategy. It is recommended that specific conditions of consent are included to:<br><br>• require a detailed campus-wide parking study as suggested in the Traffic Assessment Report;<br><br>and<br><br>• require development of a campus-wide sustainable travel plan, including implementation and ongoing monitoring and reporting. The sustainable travel plan should be developed in consultation with Council. | HI have reviewed the EIS for the light rail and submitted a response. This included the need for ongoing liaison regarding integration with the light rail both during construction and operation.<br><br>With respect to the Campus-wide parking study, it should be understood that the parking assessment performed in relation to the NCCC & AATC focused on the proposed development and its site conditions, constraints and opportunities. The parking assessment examined the additional parking demand and compared it to the provisions for additional staff/patients. This included a parking utilisation survey at the Edmund Blackett Building. At the time that the Traffic Assessment Report was prepared, additional parking was in the process of being constructed at the Mental Health Intensive Care Unit in the south-east corner of the site (60 car parking spaces). This would have the opportunity to provide additional parking capacity.<br><br>It should be acknowledged that a parking occupancy survey was undertaken in May 2013, as part of the Environmental Impact Statement by Transport for New South Wales for the CBD and South East Light Rail Project. The local impacts to the Randwick Precinct on parking supply, demand and occupancy were investigated, which may be relevant to the subject development but as Council highlighted, the details of the light rail project are yet to be finalised.<br><br>In relation to comments on the development of a Sustainable Travel Plan please refer to Section 7 of the Traffic Assessment Report.<br><br>A campus wide parking study will not be undertaken for this development as it involves a range of other stakeholders and further |

| | Issues Raised | Proponent's Response |
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| | | details of the light rail are to be finalised. HI will be investigating this independently of this development.<br><br>Construction Traffic Management Plan<br>According to the Roads and Maritime Services, TMPs are generally consulted and endorsed by the governing Council (Local Traffic Committee) and ultimately approved by Roads and Maritime. Site specific TMPs and Traffic Control Plans will be prepared by the preferred contractor during subsequent detailed design stages when information relating to the construction methodology is available. The Final CTMP will be subject to appointment of a preferred contractor where the recommendations from the Traffic Assessment Report and Randwick City Council would be followed in respect to the development of this plan. |
| | **Landscaping and Public Domain**<br><br>Council recommends that the paving treatment for the entire site be further considered to achieve a consistent paving pattern with high quality materials and finishes at such a significant location that visually complements the heritage buildings and the new contemporary medical facility.<br><br>The landscape aspect, which proposes raised lawn around the Superintendents Cottage is suggested to be revised, to provide level access from surrounding public domain and to ensure no increased risk of damp affecting the Cottage.<br><br>In relation to the proposed widening of the heritage gateway, Council requests details of the widened opening and use of any new gates be provided. Additionally, the original gate should be salvaged and stored, displayed or reused on site.<br><br>Council requests that species for the proposed tree planting behind the Avoca St fence be carefully selected to maintain the visibility of the main front elevation of the heritage buildings.<br><br>Council recommends that the HI closely liaise with TfNSW to reconstruct/restore the footpaths fronting High and Avoca | Paving Banding: The proposed paving 'banding' is intended to provide some visual interest without resulting in visual disruption of the ground plane. The 'banding' as such will be subtle with 2 different finishes proposed (broom finish & grit blast) for what will otherwise be the same colour/aggregate of concrete. These 2 finishes and the different scale of the 'banding' between vehicular and pedestrian areas will be almost indistinguishable from a distance but will provide some variety when viewed close up within some often large areas of paving. We do not consider that this will result in visual discontinuity or disruption, nor that it will negatively impact upon the setting of the existing heritage buildings and new building.<br><br>Raised Lawn: The levels around the Medical Superintendent's Cottage as being maintained as existing and are not being raised as such. This is identified on the plans where existing levels around the cottage are noted as "Ex". The lawn area around the cottage becomes effectively raised as the levels of the pathways on the south, east and west sides are lower than existing, creating a simple grass plinth around the heritage building. The levels of the adjacent pathways have been designed to the levels shown on the landscape plans in order to provide accessible paths of travel from the Avoca and High St entries to the main entry of the NCCC & AATC. Raising the levels of these pathways to provide level access to the area around the cottage |

| | Issues Raised | Proponent's Response |
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| | Streets to appropriate standards. | would preclude accessible access to the new building from Avoca & High Streets.<br><br>Heritage Gate: The existing original sandstone pedestrian gateway and pillars at the Avoca St frontage will be retained / re-instated in the project as a significant element of the heritage fence and precinct. For the current Stage 1 construction works, the two existing sandstone pillars and single metal gate have been recorded, dismantled and placed into safe storage on campus especially for this reuse purpose.<br><br>As part of the Stage 2 proposals the north pillar and gate (open position) will be reinstated and the other pillar relocated such that the existing opening in the fence is widened to allow generous pedestrian access and to align with the hospital street axis. The wider pedestrian entry will provide an improved entrance to the heritage precinct and the new facility. The final reuse/location and its feasibility will be considered as part of the Landscape design and Architectural Design. A key consideration will be that its location and use make a meaningful and not tokenistic contribution. If not feasible, HI will consider alternative reuse options with the project's heritage architect and landscape architect.<br><br>Trees along the Avoca St frontage: the proposed trees are small to medium sized deciduous trees planted at quite wide spacings. They will not grow to a size where they will significantly block views of the heritage buildings and as they grow, they will develop clear stems which will allow views under the canopies. The trees will contribute in a positive way to the setting of both the existing and new buildings and to the streetscape of Avoca St opposite High Cross Park, as well as providing some valuable afternoon shade to the Avoca St footpath. It should be noted that further down Avoca St there are several large existing Figs which significantly obstruct views of the Edmund Blackett Building.<br><br>Avoca & High St Footpaths: Footpath upgrades are supported but do not form part of the scope of this project and it is assumed that these would be undertaken by TfNSW as part of the light rail works. We would agree that there should be close co-ordination between HI & |

| | Issues Raised | Proponent's Response |
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| | | TfNSW in relation to the interface between the landscape design of the NCCC & AATC and the adjacent works on Avoca & High St proposed as part of the light rail. |
| | **Site permeability and legibility**<br><br>Council recommends that further measures be considered to ensure the pedestrian safety in the forecourt (shared pedestrian/vehicle zone), such as legible direction signs that direct pedestrians to various key destinations using the designated pedestrian pathways. | The wider pedestrian entry will provide an improved entrance to the heritage precinct and the new facility. The new building located to the west of the heritage precinct will be a key facilitator in the overall connectivity of the campus to the public edges along High St and Avoca St. New access will be provided to both the north and east boundaries to encourage permeability through the site. The boundary to the north of the campus will be removed allowing a greater public and community connection to High Street. The new building will provide a new node along both High St and Avoca St. The main entrance to the building is located on the east elevation facing the heritage precinct. The legibility of the entrance zone is further refined by the building's mass. By breaking the mass into three elements an entrance slot is formed. This extends the full height of the building and is set out on the existing hospital axis. |
| | **Other Comments**<br><br>It is recommended that any proposal seeking change of use of these buildings incorporate quality landscape design and integrate the landscape elements with other design aspects, e.g. circulation, new building entries and connections, to maximise the potential of these heritage buildings while appreciating and preserving their heritage values. | The Edmund Blacket Building and the Medical Superintendent's Cottage are not part of the site that is the subject of the proposed development. |
| | **Recommended specific conditions**<br><br>A range of conditions were recommended to be considered under the following headings:<br>• European Heritage<br>• European Archaeology<br>• Aboriginal Archaeology<br>• Sustainable Travel Plan | As relevant to Crown DAs, HI seeks a formal review of proposed draft conditions prior to determination of the application. |

| | Issues Raised | Proponent's Response |
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| | • Construction Traffic Management Plan<br>• Drainage and Groundwater / Seepage<br>• Civil Works / Drainage Deposit | |
| **Sydney Water** | | |
| | Water - The drinking water main available for connection is the 150mm main on the southern side of High Street. | Noted. |
| | Waste water - The wastewater main available for connection is the 225mm main constructed under WO 18427 | Noted. |
| | Waste water - Where proposed works are in close proximity to a Sydney Water asset, the developer may be required to carry out additional works to facilitate their development and protect the wastewater main. Subject to the scope of development, servicing options may involve adjustment/deviation and or compliance with the Guidelines for building over/adjacent to Sydney Water assets. The proponent will need to refer to a Water Servicing Coordinator for details of requirements. | Noted. |
| | Trade Waste Information - Should this development generate trade wastewater, this correspondence does not guarantee the applicant that Sydney Water will accept the trade wastewater to its sewerage system. In the event trade wastewater is generated, the property owner is required to submit an application for permission to discharge trade wastewater to the sewerage system before business activities commence. | Noted. |
| | Sydney Water Servicing - If the development falls within the Section 73 criteria, Sydney Water will further assess the impact of any subsequent development when the developer applies for a Section 73 Certificate. This assessment will enable Sydney Water to specify any works required as a result of future development and to assess if amplification and/or | Noted. |

| | Issues Raised | Proponent's Response |
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| | changes to the system are applicable. The developer must fund any adjustments needed.<br><br>The developer should engage a Water Servicing Coordinator to get a Section 73 Certificate and manage the servicing aspects of the development including building over and adjacent to Sydney Water assets. | |
| | Sydney Water e-planning - Sydney Water has an email address for planning authorities submit statutory or strategic planning documents for review. This email address is urbangrowthsvdneywater.com.au. The use of this email will help Sydney Water provide advice on planning projects faster, in line with current planning reforms. | Noted. |
| **NSW Environment Protection Authority** | | |
| | **1. General Comments**<br><br>Section 6.11.1 raises confusion over the status of the EPA as an independent statutory authority and that the EPA was not consulted in the course of preparing the EIS.<br><br>The EPA has not found any draft statement of commitments for the project. | Noted.<br><br>Statement of Commitments are a former Part 3A vehicle to ensuring proponents by their own volition prepare and meet a set of accepted mitigation measures. Mitigation Measures are the contemporary version of this and are provided for at Section 9.0 of the exhibited EIS. This submission provides for updated and refined Mitigation Measures as relevant to submissions made in relation to the EIS. |
| | **2. Construction Phase** | |
| | **Site Investigation and Remediation**<br><br>The EPA understands from the EIS that a Phase 1 contamination assessment was undertaken and is the subject of Douglas Partners Project Report 72505.1 dated March 2012 and Status of Contamination Assessment Works letter (project 72505.03) dated January 2013. | In response to this matter we can confirm that:<br><br>- No diagnostic Nuclear Medicine procedures take place either currently or historically in the Radiation Oncology Department and therefore there will be no unsealed radionuclides to account for on decommissioning<br><br>- There is a radioactive material store and a hot lab that |

| | Issues Raised | Proponent's Response |
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| | The EIS concludes (Appendix P, p.4) that the " ... site of the Stage 2 works is also a low risk site from a contamination perspective." and goes on to recommended more comprehensive assessment following demolition of the existing buildings.<br><br>The EPA is concerned that the scope of the site investigations conducted to date are insufficient to adequately characterise the general contamination status of the site, noting at the same time that additional investigation is recommended.<br><br>The EPA further understands from consultation with the hospital's radiation safety officer that -<br><br>(a) no diagnostic nuclear medicine procedures have taken place recently or historically,<br><br>(b) the radioactive material store and 'hot lab' will be de-commissioned but that those current facilities are not within that part of the existing 3 storey radiotherapy oncology building that will be demolished,<br><br>(c) one brachy-therapy device that contains a sealed source will shift to the NCCC, and<br><br>(d) given the linear accelerators are not rated above 10 megavolts, there is only a small chance that reinforcing steel may have been activated during their use.<br><br>The proponent should commit to consulting with Workcover NSW concerning the removal and handling of any asbestos waste on the premises.<br><br>The proponent should commit to satisfying the requirements of the Protection of the Environment Operations ('Waste Regulation) 2005 with particular reference to 'special wastes' (clause 42).<br><br>The proponent should commit to a more detailed investigation of site contamination prior to and throughout the demolition and site preparation phases.<br><br>The proponent should commit to a detailed | contains an inventory of sealed radioactive sources. These sources will be relocated to a new store in the NCCC as part of the commissioning of stage 1. A detailed radiation/contamination survey will be performed in consultation with the Radiation Safety Officer and comply with EPA regulations on decommissioning of these rooms to ensure no sources are left behind, as well as ensuring that no sealed-source leakage has taken place. The store and hot lab do not reside in the part of the building 3 that will be demolished; therefore the survey will serve the purpose of decommissioning that space as a radioactive material store.<br><br>- The only brachytherapy sealed source device that contains a sealed source of Iridium-192 will be relocated to the NCCC. A survey will be completed in accordance with the EPA recommendation of the brachytherapy suite to ensure no radioactive material remains.<br><br>- There are three linear accelerators, one orthovoltage apparatus, one simulator and one planning CT scanner residing in the current Department of Radiation Oncology. These apparatus contain no radioactive material, however in the case of the linear accelerators there is a small, but non-zero chance that some activation of materials may have taken place. It should be noted that none of the linear accelerators in the Prince of Wales Hospital inventory exceed the 10 MV accelerating potential, which is the threshold to which activation has been observed, however a detailed survey will be performed on the decommissioning and removal of the apparatus to account for the possibility that activation may have taken place and reported accordingly. Should any activation remain, this part of the LINAC or bunker where the linac was housed will be isolated, removed and stored in the new Hot Lab as a radioactive source prior to decommissioning.<br><br>Please see attached a letter from the South Eastern Sydney Local Health District setting out this information and proposed action to |

| | Issues Raised | Proponent's Response |
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| | radiation/contamination survey of -<br>(a) areas previously occupied by the radioactive materials store and 'hot lab' to ensure no sources are left behind and no sealed-source leakage has occurred,<br>(b) the brachy-therapy suite before demolition to ensure no residual radioactive material remains, and<br>(c) areas of the building housing the linear accelerators to ensure pre-demolition that no activation of the building fabric has occurred. | undertake relevant surveys.<br>Radiation Services Group has reviewed this information and concurs with its comments, noting that existing levels of radiation and related contamination are variously very low and minor and that no significant action is required as a result of any previous uses. The Local Health District's proposed actions are supported in this regard. |
| | **Waste Control and Management**<br>The proponent should manage waste in accordance with the waste management hierarchy. The waste hierarchy, established under the Waste Avoidance and Resource Recovery Act 2001, is one that ensures that resource management options are considered against the following priorities:<br>**Avoidance** including action to reduce the amount of waste generated by households, industry and all levels of government.<br>**Resource recovery** including reuse, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources.<br>**Disposal** including management of all disposal options in the most environmentally responsible manner.<br>All wastes generated during the project must be properly assessed, classified and managed in accordance with the EPA's guidelines to ensure proper treatment, transport and disposal at a landfill legally able to accept those wastes.<br>The EPA further anticipates that, without proper site controls and management, mud and waste may be tracked off the site during the course of the project. | Prince of Wales and the Sydney Children's Hospitals both operate under an adopted Waste Management Plan (WMP) – September 2011. This is appended for review.<br>The WMP adopts the same (or similar) priorities as set out in the EPA submission. Section 1.6 of the WMP sets out the many relevant guidelines and policies and legislation which are to be adhered to. The WMP is updated from time to time, as necessary.<br>Sediment, Erosion and Dust Controls will be covered in detail in the Contractors Construction Management Plan (CMP). The CMP will reference the Contractors mitigation and response to "NSW Groundwater Policy Framework Document and NSW Groundwater Quality Protection Policy". The mitigation and response outlined in the CMP will address the potential sources of contamination to the watercourse during construction. An erosion and sediment control plan is appended to this document. The documentation will be carried out with reference to "Managing Urban Stormwater – Soils and Construction Volume 1 2004 Landcom". |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | The proponent should commit to ensuring that :<br>(1) all waste generated during the project is assessed, classified and managed in accordance with the *"Waste Classification Guidelines Part 1: Classifying Waste"* (Department of Environment Climate Change and Water, December 2009);<br>(2) the body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to prevent any spill or escape of any dust, waste, or spoil from the vehicle or trailer; and<br>(3) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site, is removed before the vehicle, trailer or motorised plant leaves the premises. | |
| | **Dust Control and Management**<br>The EPA considers dust control and management to be an important air quality issue during site clearance and preparation, and subsequent construction. Bulk earthworks inevitably generate dust as a result of-<br>(a) the excavation, processing and handling of excavation spoil,<br>(b) wind action on spoil stock piles, and<br>(c) wind action on and plant movement across areas bare of vegetation or other cover.<br>The proponent should commit to:<br>(a) minimising dust emissions on the site, and<br>(b) preventing dust emissions from the site. | Noted as above.<br>The nature of the on-site excavation in sandstone will require dust control, likely through the use of sprinklers and other water sources include ground water seepage and rainwater. In the Geotechnical report prepared by Douglas Partners (refer Project 72505.00, August 2011, section 6.5) the following measures are recommended to deal with ground water; "it is anticipated that a system of collector drains and sump-and-pump techniques may be required around the perimeter of the excavation(s)". Therefore during construction SKM propose to provide perimeter drainage channels to drain the ground water and rainwater entering the excavation to a temporary sump. The flow entering the sump will be pumped to a sedimentation tank at ground level, before the water is discharged to the council system. It is not envisaged that drilling to depth to dewater the perimeter of the site will be required. The permanent drainage solution for the basement is to follow a similar concept to the temporary system and is to utilise a perimeter drained cavity falling to a sump in the west of the excavation. The flow entering the sump will be pumped directly to the existing hospital drainage system which in turn drains to the Council system. It is anticipated that the temporary sump will form the basis |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | | of the sump for the final condition. It is expected that the excavation will be carried out in stages and that during each stage the base of the excavation will be temporarily shaped with falls to the West to enable flow entering the excavation to be collected and pumped out.<br><br>Sediment, Erosion and Dust Controls will be covered in detail in the Contractors Construction Management Plan (CMP). The CMP will reference the Contractors mitigation and response to "NSW Groundwater Policy Framework Document and NSW Groundwater Quality Protection Policy". The mitigation and response outlined in the CMP will address the potential sources of contamination to the watercourse during construction. An erosion and sediment control plan is appended to this document. The documentation will be carried out with reference to "Managing Urban Stormwater – Soils and Construction Volume 1 2004 Landcom". |
| | **Erosion and Sediment Control**<br><br>The Managing Urban Stormwater Soils and Construction, 4th Edition published by Landcom (the so-called 'Blue Book') provides guidance material for achieving effective erosion and sediment control on construction sites.<br><br>The EPA emphasises the importance of -<br><br>(a) not commencing earthmoving or vegetation removal until appropriate erosion and sediment controls are in place, and<br><br>(b) daily inspection of erosion and sediment controls which is fundamental to ensuring timely maintenance and repair of those controls. | Noted - as above. |
| | **Noise and Vibration**<br><br>The EPA considers that the project is likely to generate significant noise and vibration impacts on surrounding residences and other noise sensitive land uses during demolition and construction (including site preparation. The EPA provides guidance material available on its web site, including downloadable copies of -<br><br>• the Interim Construction Noise Guideline (2009), and | Acoustic Logic has been engaged to address the EPA's comments.<br><br>Acoustic Logic has accordingly prepared a Construction Noise and Vibration Management Plan which details:<br><br>- The nature of the works<br>- Likely sensitive receivers<br>- Hours of work – more of which is discussed below |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | • Assessing Vibration: a technical guideline (2006).<br>The proponent be required to -<br>(a) identify surrounding noise sensitive land uses, and<br>(b) undertake a comprehensive noise and vibration impact assessment of construction activities,<br>especially any such activities -<br>(i) likely to generate noise with annoying or intrusive characteristics, or<br>(ii) proposed to be undertaken outside the recommended standard hours discussed in Table 1 to the *Interim Construction Noise Guideline.*<br><br>Section 3.6 of the 'DA Noise Impact Assessment' prepared by Acoustic Logic suggests construction hours inconsistent with the recommended standard hours of construction in Table 1 to the *Interim Construction Noise Guideline* (ICNG). And, in particular suggests construction will be undertaken after 1.00 pm on Saturdays. The EPA is unaware of any justification for regular work outside the recommended standard hours.<br>Whilst ICNG recommended standard hours for construction (outside of which long experience shows increasing levels of community concern about construction noise impacts) the EPA accepts that certain emergency work may need to be undertaken urgently (other than during the standard recommended hours) in order to avoid -<br>• loss of life,<br>• damage to property, or<br>• environmental harm.<br>ICNG section 4.5 specifies construction activities proven to be particularly annoying and intrusive to nearby residents and occupants of other noise sensitive receivers (including the hospital, child care centres and the local school). The EPA | - The noise and vibration objectives and goals under relevant guidelines<br>- An assessment of the likely noise sources and levels and recommended mitigation measures<br>- As assessment of vibration impacts<br>- General mitigation methods that could be employed to manage both noise and vibration emissions.<br><br>Please refer to Acoustic Logic's report dated 15 January 2014, as appended.<br><br>With respect to the proposed hours of works we note that Modification 1 of the Stage 1 determination extended the approved construction hours from 7am – 5pm Monday to Friday to 6:30am – 6:30pm Monday to Friday, and from 8am – 5pm Saturdays to 7am – 4pm.<br><br>We note these hours have not generated any complaint from nearby uses or residences. The extended hours also ensure a more efficient construction program and one that is accordingly reduced in duration. |

| | Issues Raised | Proponent's Response |
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| | anticipates that those activities generating noise with particularly annoying or intrusive characteristics would be subject to a regime of intra-day respite periods where –<br>(a) they are only undertaken over continuous periods not exceeding 3 hours with at least a 1 hour respite every three hours, and.<br>(b) 'continuous' means any period during which there is less than an uninterrupted 60 minute respite between temporarily halting and recommencing any of the work referred to in ICNG section 4.5.<br><br>The proponent should be required to :<br>(a) comply with the standard construction hours as recommended in Table 1 Chapter 2 of the Interim Construction Noise Guideline, July 2009; and<br>(b) schedule intra-day 'respite periods' for construction activities identified in the Interim Construction Noise Guideline as being particularly annoying to surrounding residents and other noise sensitive receivers.<br><br>The EPA has identified the noise from 'beeper' type plant movement alarms to be particularly intrusive and is aware of feasible and reasonable alternatives. Transport for NSW (nee Transport Construction Authority), Barangaroo Delivery Authority/Lend Lease and Leighton Contractors (M2 Upgrade project) have undertaken safety risk assessments of alternatives to the traditional 'beeper' alarms. Each determined that adoption of 'quacker' type movement/reversing alarms instead of traditional beepers on all plant and vehicles would not only maintain a safe workplace but also deliver improved outcomes of reduced noise impacts on surrounding residents.<br>Interim Construction Noise Guideline Appendix C provides additional background material on this issue. | |

| | Issues Raised | Proponent's Response |
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| | The proponent should commit to undertaking a safety risk assessment of construction activities to determine whether it is practicable to use audible movement alarms of a type that would minimise the noise impact on surrounding noise sensitive receivers, without compromising safety.<br><br>The EPA understands from section 3.4 of the 'DA Noise Impact Assessment' prepared by Acoustic Logic that the EPA's *Assessing Vibration: a technical guideline (2006)* was not used to assess vibration impact assessment.<br><br>The EPA is particularly concerned that predicted vibration impacts on human comfort have not been explicitly reported against the relevant criteria in the above mentioned technical guideline. | |
| | **3. Operational Phase** | |
| | **Noise and Vibration**<br><br>The Amended Director General's Requirements require:<br><br>• "Identify … any noise sources during operation, including the new generator and ventilations [sic] system and accumulative [sic] impact of all plant and equipment operating simultaneously"; and<br><br>• "Identify residential effected [sic] residential premises and outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land."<br><br>The Amended DGRs also refer to the long defunct Environmental Noise Control Manual but do not refer to the EPA's Assessing Vibration: a technical guideline (2006).<br><br>Section 4 of EIS Appendix L ('DA Noise Impact Assessment' prepared by Acoustic Logic) addresses operational noise impacts of Stage 2. The EPA considers that Appendix L does not provide sufficient information concerning the operational noise impacts of the proposal for it to make any meaningful comments about those impacts. And, in particular the EIS | Acoustic Logic has been engaged to address the EPA's comments. Acoustic Logic has indicated that the only potential operational noise impact associated with Stage 2 of the project is that associated with the operation of mechanical and hydraulic plant.<br><br>The potential noise emissions can only be determined in detail once plant selection has been made and finalised. A detailed mechanical noise assessment will be conducted at that stage.<br><br>The report sets out the recommended acceptable noise levels in terms of the EPA's Intrusiveness and Amenity criteria having considered existing background noise levels. With suitable noise control methods and acoustic treatments to selected plant and equipment noise emissions can be reduced to meet the relevant criteria levels.<br><br>Please refer to Acoustic Logic's report dated 15 January 2014, as appended. |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | does not:<br>1. offer evidence that existing background or ambient noise levels were measured at receiver locations (per the 'long method' outlined in the Industrial Noise Policy) in the vicinity of the project,<br>2. derive Project Specific Noise Levels in accordance with the New South Wales Industrial Noise Policy; and<br>3. make any quantitative predictions of operational noise impacts on sensitive receivers.<br>Accordingly, feasible and reasonable noise mitigation and management measures required to minimise or mitigate operational noise impacts are not able to be adequately determined.<br>The EPA is prepared to assist the Department in progressing this aspect of the environmental impact assessment of the project. | |
| | **Clinical and related waste**<br>EIS sections 3.8.2, 6.15.1, 6.16 and Appendix 0 briefly discuss operational waste management but offer little detail and no reference to the Protection of the Environment Operations (Waste) Regulation 2005.<br>The EIS anticipates that the proposed facilities will generate 'clinical and related waste' which are defined under the Protection of the Environment Operations Act 1997. Clinical and related waste includes clinical waste; cytotoxic waste; pharmaceutical, drug or medicine waste; and sharps waste.<br>Clinical and related waste has been pre-classified as a 'special waste'. This allows the EPA to set more stringent and specific requirements for the transport and management of the waste to minimise the risk to the environment and human health. Clause 43 to the Protection of the Environment Operations (Waste) Regulation 2005 prescribes requirements for managing certain clinical and related waste. | Section 5 of the adopted Waste Management Plan (WMP) – September 2011 sets out the procedures employed for handling clinical and related waste.<br>As noted in Section 1.6 of the WMP, many legislative requirements are to be adhered to in the operation of the hospitals, especially in relation to the handling and disposal of this type of waste. See appended WMP.<br>Any draft conditions on this will need to be carefully reviewed with the operators of the NCCC. |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | Waste managers/operators who transport, store, treat or dispose of clinical and related waste should check the details of the Protection of the Environment Operations Act and the Protection of the Environment Operations (Waste) Regulation 2005 for licensing and generic requirements in relation to clinical waste.<br><br>The proponent be required to undertake proper assessment, handling, storage, transport, treatment and disposal of clinical and related waste arising from operation of the new facilities to ensure compliance with Protection of the Environment Operations Act 1997 and the Protection of the Environment Operations (Waste) Regulation 2005. | |
| | **Radiation Control Act and Regulation**<br><br>The EPA administers the Radiation Control Act 1990 (and Radiation Control Regulation 2013) and anticipates that 'regulated material' will be stored and possessed on the hospital campus. 'Regulated material' means -<br><br>(a) radioactive substances,<br><br>(b) ionising radiation apparatus,<br><br>(c) non-ionising radiation apparatus of a kind prescribed by the regulations, and<br><br>(d) sealed source devices.<br><br>A 'person responsible' within the meaning of section 6 of the Radiation Control Act 1990 is obliged to hold an appropriate 'radiation management licence' in respect of regulated material at the hospital campus. The licence holder is obligated to comply with all relevant conditions of their Management licence and all other relevant requirements of the Radiation Control Act and Regulations.<br><br>A natural person who uses regulated material at the hospital campus must hold a 'radiation user licence' and must comply with any conditions to which the licence is subject. | POWH holds a current Radiation Management Licence under the *Radiation Control Act 1990* – see attached. This licence covers both existing uses on the campus and the future use of the NCCC facility.<br><br>Whilst this is strictly not a planning matter as it is covered by other relevant legislation, licencing and auditing processes, we assume any compliance would be noted as an Advisory Note only.<br><br>Notwithstanding, the Local Health District will meet the EPA requirements by:<br><br>- Firstly, carrying out a detailed radiation/contamination survey of the hotlab and all radiation stores and manage any contamination in consultation with the Radiation Safety Officer and comply with EPA regulations;<br><br>- Secondly, the brachytherapy suite uses a sealed source of Ir-192 and if there was contamination present, it would be more of a concern regardless of it being moved. Nevertheless, a radiation survey will be carried out in accordance with the EPA recommendations; and<br><br>- Thirdly, a radiation/contamination survey will be performed in all linear accelerator bunkers after the linacs are removed. |

| | Issues Raised | Proponent's Response |
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| | Waste containing radioactive material whether natural or artificial must be classified in accordance with the guidance material provided *Waste Classification Guidelines Part 3: Waste Containing Radioactive Material'*<br><br>The proponent be required to consult with the Environment Protection Authority in regard to a 'radiation management licence' in respect of regulated material on the hospital campus and the management and handling of waste containing radioactive material.<br><br>Notes:<br><br>The Management Licence holder has the obligation to comply with relevant conditions of their management licence and all other relevant requirements of the Radiation Control Act and Regulations.<br><br>A natural person who uses regulated material must hold a radiation user licence and must comply with any conditions to which the licence is subject. | |
| | **Energy and Water Conservation**<br><br>The EPA acknowledges that EIS Section 3.6, 6.3 and 6.18 discusses Ecologically Sustainable Development including energy and water conservation and efficiency.<br><br>The EPA considers energy and water conservation are essential components of ecologically sustainable development particularly pursuant to the principle of inter-generational equity.<br><br>Hospitals are typically heavy users of electricity which in NSW is for the most part generated by burning non-renewable fossil fuel resources.<br><br>Hospitals are also typically heavy consumers of potable water which is expensive and energy intensive to deliver on demand at quality consistent with NHMRC Drinking Water Quality Guidelines.<br><br>The EPA considers the design stage of the project to be the | The NCCC & AATC project will be compliant with the BCA Section J requirements. The objective of Section J is to reduce green-house gas emissions. To that end, Section J requires buildings to be capable of efficiently using energy and obtaining heating from a low intensity energy sources, on-site renewable energy or heat reclaimed from another process.<br><br>Performance requirement JP1 of the NCC Section J requires a building and its services to have, to the degree necessary, features that facilitate the efficient use of energy, appropriate to the function and use of the building and services, the internal environment, the geographic location, effects of nearby permanent features, solar radiation, sealing of the building envelope, utilisation of air movement and energy source of the services.<br><br>Performance requirement JP2 of the NCC Section J requires buildings to have, to the degree necessary, features that facilitate the maintenance of systems and components, appropriate to function and |

| | Issues Raised | Proponent's Response |
|---|---|---|
| | optimum time to integrate measures to achieve<br>• energy efficiency (with resultant running cost savings),<br>• water conservation through stormwater collection, treatment and re-use for non-potable purposes such as grounds maintenance, and<br>• water efficiency<br>The proponent be required to clearly identify, evaluate and implement practical measures to minimise energy and water use and to integrate those measures into the design of the hospital re-development and its supporting infrastructure. | use of the building.<br>Performance requirement JP3 of the NCC Section J requires the heating for a conditioned space, to the degree necessary, to be generated using a low intensity greenhouse gas source (not exceeding 100 g CO2-e/MJ of thermal energy load) or from an on-site renewable energy source, or a reclaimed energy.<br>Further to the above, Water Sensitive Urban Design (WSUD) is to form part of the development. The guideline draws a requirement that the WSUD be in accordance with the general principles outlined in the references listed (i.e. WSUD- Melbourne Water 2005, Australian Runoff Quality- A guide to water sensitive urban design, etc). The guideline which encourages protection of the receiving waters and possible retention of the stormwater on site has been considered in the detailed storm water design. The incorporation of the WSUD in the detailed design will be co-ordinated with the landscaping design of the overall development to allow possible reduction or removal of pollutants in a storm event. A GPT has been provided to treat the run off. This is because the storm water drainage system proposed for stage 1 & 2 will be connected to the existing underground drainage infrastructure of RCC. Additionally, the consultants are required to undertake careful selection of fittings and fixtures to ensure that water and energy efficient options are selected where practical in accordance with the facilities use as a health care facility. |

# Waste Management Plan

*Prince of Wales Hospital & Sydney Children's Hospital Randwick*

Appendix B

# Prince of Wales & Sydney Children's Hospital

# WASTE MANAGEMENT PLAN

**3rd Edition**
**September 2011**

# Contents

# 1 Introduction

## *1.1 Aim & Objectives*

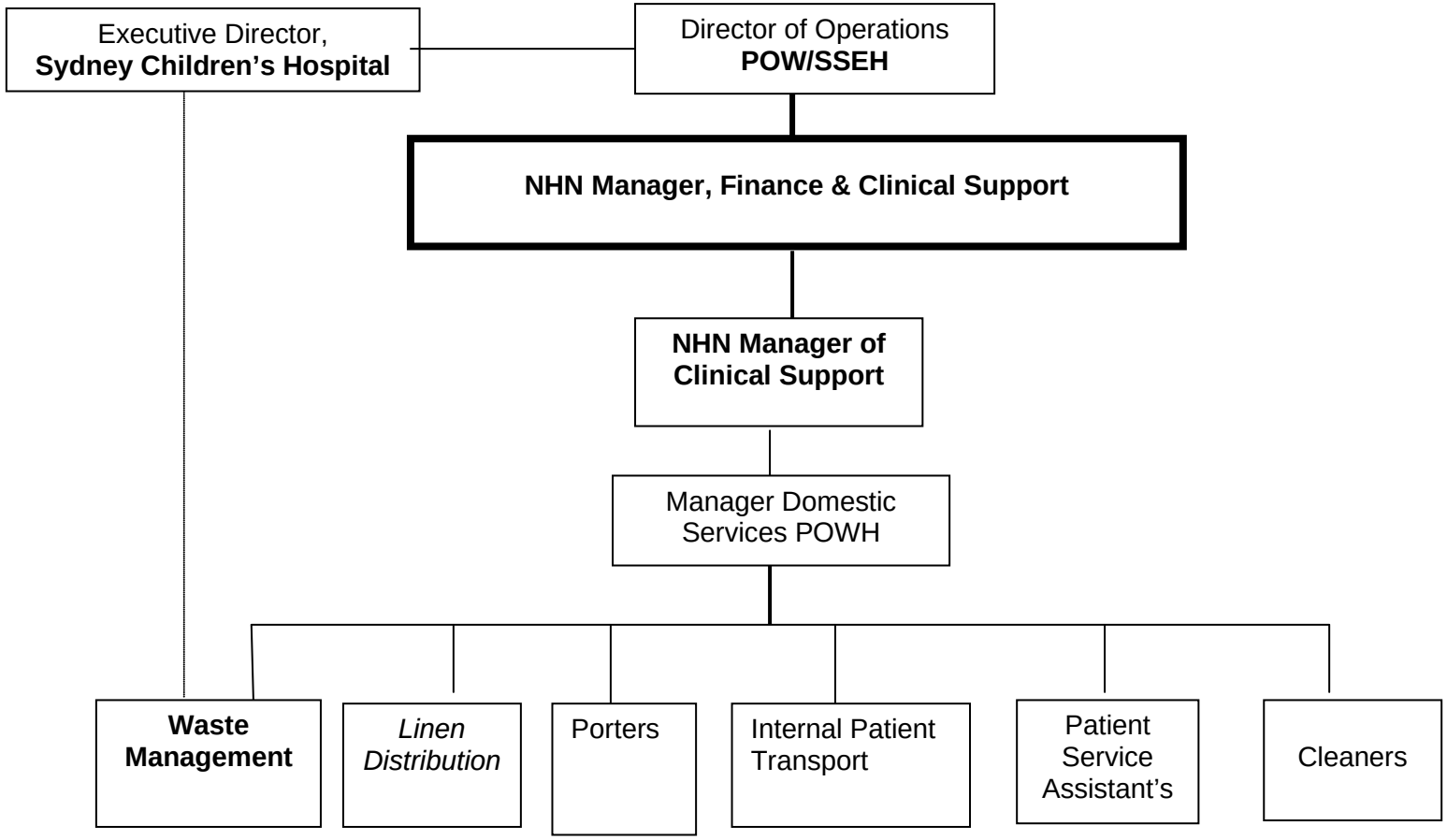
In accordance with SESIAHS policy SESLHNPD/72 May 2006 revised: March 2011. The Prince of Wales & Sydney Children's Hospitals are committed to providing a clean and safe environment for all staff, patients, visitors and contractors.

The purpose of the ***Waste Management Plan*** is to provide guidelines to:

- reduce potential hazards
- reduce waste
- increase segregation
- increase recycling
- increase environmental awareness.
- Reduce environmental impact

## *1.2 Randwick Clinical Support Organisational Structure – Which Incorporates Waste Management*

***ORGANISATIONAL CHART FOR WASTE MANAGEMENT***



## *1.3 Waste Management Committee*

### 1.3.1 Terms of Reference

#### 1.3.1.1 Main Purpose Statement

- Provide a forum for discussion, monitoring, decision-making and evaluation of systems and processes related to the efficiency and effectiveness of Waste Management across the Campus.

#### 1.3.1.2 Strategies and processes to assist the Committee to achieve its aims

- Report, monitor and evaluate performance in regard to Waste Management across the Campus.
- Initiate, receive and act on reports related to the functioning of Waste Management
- Develop, implement, monitor and evaluate operational policies, business plans and key performance indicators related to service provision.
- To provide a reporting mechanism to the Director of Operations
- To maintain compliance with the EQuIP Waste Management Guidelines

#### 1.3.1.3 Reporting lines and relationships to other committees

Minutes and Reports of the Waste Management Committee will be included in the report to Randwick Campus Finance & Budget Committee.

Membership of the Waste Management Committee includes:

- Manager of Clinical Support Services (Chairperson)
- Waste Management Coordinator — Prince of Wales Hospital Campus
- Domestic Services Manager — Prince of Wales Hospital
- Domestic Services Manager — Sydney Children's Hospital
- Representative, — Prince of Wales Private Hospital
- Representative, — Property Building & Maintenance Service
- Representative — Mental Health Services
- Representative, — Northern Network OH&S
- Representative, — CHESS
- Representative, — Nursing
- Representative, — S.E.A.L.S.
- Representative, — Health Support (Food Services)
- Quality Manager — Prince of Wales Hospital
- Quality Manager — Sydney Children's Hospital

Other persons may be co-opted as required.

##### *1.3.1.3.1 Chairperson*

Manager Clinical Support Services.

##### *1.3.1.3.2 Secretary*

Secretarial support will be provided by Clinical Support Services.

##### *1.3.1.3.3 Quorum*

A quorum will be 50% plus one, other than when it is agreed by the Chairperson that the meeting should proceed with a reduced number

#### *1.3.1.3.4 Frequency and duration of the meetings*

Meetings will be held bi-monthly on the second Tuesday at 10:30am for up to one hour.

#### *1.3.1.3.5 Distribution of minutes and business papers*

Agenda items should be forwarded to the Chairperson at least one week prior to the scheduled meeting. Business papers will be circulated 3 days prior to the meeting. Minutes will be distributed two weeks after the meeting.

Copies of minutes will be distributed to:

- Prince of Wales Hospital Executive Unit
- Sydney Children's Hospital Executive Unit
- Members, Waste Management Committee

#### *1.3.1.3.6 Reporting Standards*

An Action Table is to be maintained for all committees and should form part of the agenda.

| ***No.*** | ***Action*** | ***Responsible Officer*** | ***Status/Due*** |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

Minutes will follow standard meeting procedures and be ratified at the next meeting. Minutes that have not been ratified by the appropriate committee should be identified as such when distributed. The general order of business for all committee meetings will be:

Item 1: Present/Apologies
Item 2: Confirmation of Previous Minutes
Item 3: Action Table
Item 4: Business Arising
Item 5: General Business
Item 6: Business without Notice.

#### *1.3.1.3.7 Evaluation*

The effectiveness of the Committee should be evaluated annually using KPI's agreed from time to time by the Committee. As a minimum, these should include:

- The number of meetings (6) held throughout the year and the attendance record (80%) of members of the Committee.
- The number of agenda and action items listed in the business papers that were successfully resolved by Committee members.
- The level of satisfaction with the functionality and effectiveness of the Committee by its membership.
- The extent to which the Committee can demonstrate it has achieved its aims by comparison to the appropriate ACHS and Numerical Profile Standards.

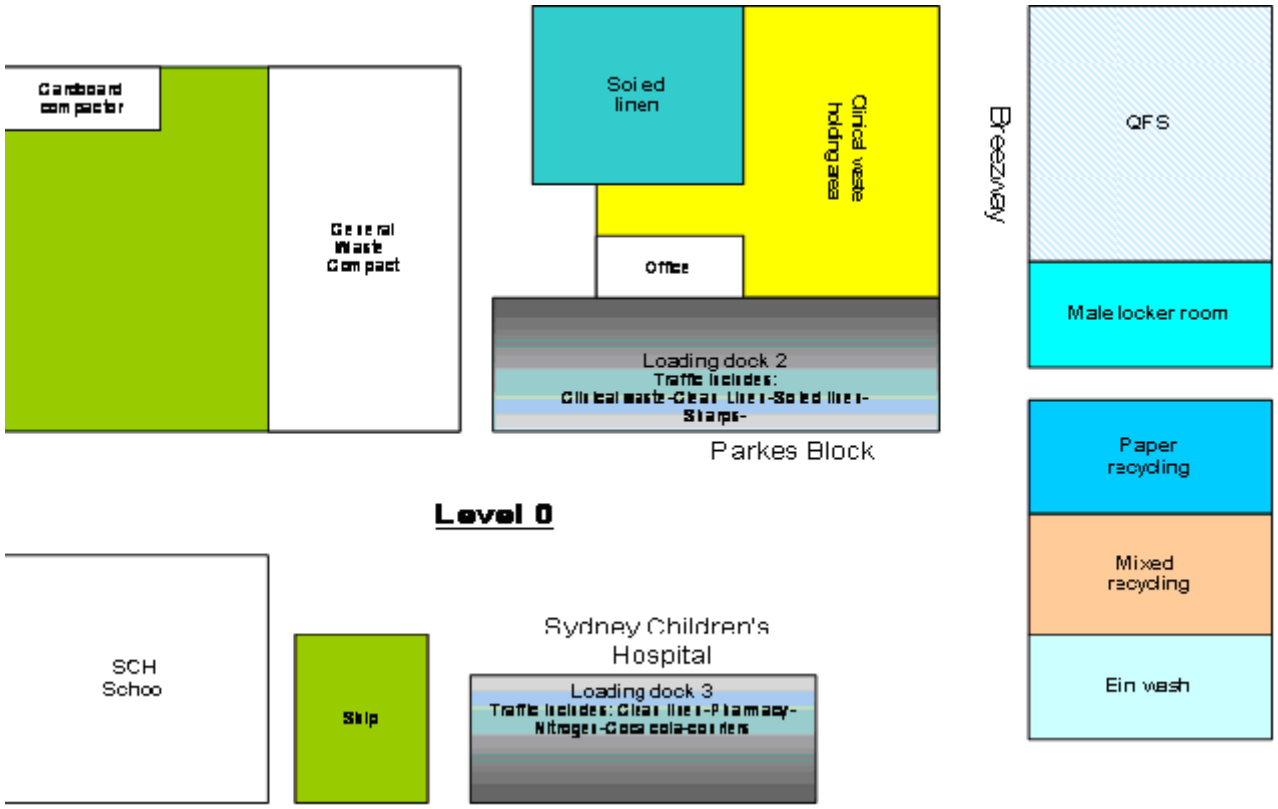
Terms of Reference Ratified

Chairperson: _____
Date: _____ Review Date: _____

## *1.4 Waste Management at Glance*

## *1.5 The Waste Centre*

The Waste Centre is the area located on Level 0 Parkes Building and loading dock 2 and is divided into several sections for storage of the different waste streams prior to collection by Waste Contractors.




Clinical and cytotoxic wastes are collected and transported externally by a NSW Health Department appointed contractor. General waste and recyclable materials are collected and transported externally by the SESIAHS appointed contractor. Unwanted hospital equipment is donated to charity. Discarded items such as desks, cabinets and folders are available for reuse by staff. Contact the Waste Management Coordinator Ext. 22815 if you are interested in any items.

## *1.6 Relevant Regulations & Guidelines*

There are many guidelines and regulations, which determine the waste management practices, which we must follow.

**Legislation:**

- NSW Occupational Health & Safety Act 2000
- NSW Occupational Health & Safety Regulation 2001
- Poisons and Therapeutic Goods Regulation 2002
- NSW Radiation Control Act 1990 and Amendment Act 2002
- NSW Radiation Control Regulation 2003, (s.27)
- Energy Administration Amendment (Water & Energy) Act 2005

**NSW Environmental Legislation:**

- Protection of the Environment Operations Act 1997
- Waste Avoidance and Resource Recovery Act 2001
- Environmental Guidelines: Assessment Classification, & Management of Liquid and Non Liquid Wastes, 1999

**External References:**

o **WorkCover NSW**

- WorkCover NSW Code of Practice for Control of Workplace Hazardous Substances
- WorkCover NSW Storage and Handling of Dangerous Goods Code of Practice, 2005
- WorkCover NSW Cytotoxic Drugs & Related Waste Risk Management Guide, 2008

o **Guidelines:**

- NHMRC: National Health and Medical Research Council, National Guidelines for Waste Management in the Health Care Industry, (1999)
- NSW Department of Energy, Utilities and Sustainability

o **Standards and Policy**

- ISO1401 – Environmental Standard
- Australian Standards, AS/NZ: 3816, Management of Clinical and Related Wastes, June 1998
- Australian Standards, AS/NZ: 4031, Non-reusable Containers for the Collection of Sharp Medical Items in Healthcare Areas. 1992
- Australian Standards, AS/NZ: 4261, Re-usable Containers for the Collection of Sharp items in Human and Animal Medical Applications, 1994
- Australian Council Healthcare Standards EQUIP Mandatory criteria 5.1.9
- NSW Government Waste Reduction and Purchasing Policy (WRAPP) November 2004

o **Codes of Practice:**

- Code of Practice for the Management of Clinical and Related Waste, 4th Edition 2004

- **NSW Health Policy Directives:**

- NSW Policy Directive PD2005 132 “Waste Management Guidelines for Health Care Facilities 1998”
- NSW Health Policy Directive PD2005 247 “Infection Control Policy”
- NSW Health Policy Directive PD2005 409 “Workplace Health and Safety – Policy and Better Practice Guide”

- **Internal References**

- Area Waste Management Policy SESLHNPD/72
- Area Infection Control Manual – Occupational Exposure Procedure, Section 01
- Area Policy Directive PD 069 Emergency Management
- Area Policy Directive PD 042 Privacy Policy
- Area Policy Directive PD 076 Contractor Management
- Area Policy Directive PD 082 Dangerous Goods and Chemicals
- Area Internal Disaster Management Procedures – Code Yellow.

If you would like to know any details contained within the above documents, contact the Waste Management Coordinator. Ext 22815, or the relevant publisher of the document.

# 2 Roles & Responsibilities

## *2.1 Management Responsibility*

Management includes directors, department heads, unit managers, supervisors etc.

**Refer to:** OH&S Act 2000

**Responsibilities:**

- Ensure safe handling, storage and transport of wastes
- Provide information, instruction, training and supervision necessary to ensure the health and safety of staff relating to waste management activities including the display of safe handling and spill clean-up procedures in a prominent place in risk areas
- Provide and maintain personal protective equipment (PPE), equipment and systems of work that minimise safety/health risks to staff
- Forward completed Incident Report Form of all accident/incidents to the OH&S Coordinator, following signature by a senior manager.

All regulations associated with OH&S procedures must be adhered to by all Hospital and contract staff, who handle, store or transport waste. This includes the requirements relating to manual handling and hazardous substance management.

**Actions:**

- **Ensure waste bins are located to ensure safe disposal and encourage proper segregation –** e.g. where possible both general waste bin and clinical waste bin available in clinical areas; general waste bin, mixed recycling container and paper/cardboard recycling containers available at workstations and tearooms where space permits.
- **Ensure staff are adequately trained in safe waste management practices** by arranging in-services or attendance at mandatory education sessions

## *2.2 Staff Responsibility*

"Staff" refers to everyone who works at Prince of Wales & Sydney Children's Hospitals everyone generates waste! – including Management, Administrative, Clerical, Medical, Nursing, Allied Health, Maintenance, Kitchen, Cleaning

**Responsibilities:**

- Safely handle, store and transport wastes
- Actively participate in receiving information, instruction, training and supervision
- Use the personal protective equipment (PPE), equipment and systems provided for safe work conditions (refer to Section 2.4)
- Report all accidents/incidents to management including completion of Incident Report Forms

All Hospital and Contract Staff, who handle, store or transport waste, must adhere to all legislation and associated guidelines for OH&S procedures. This includes the requirements relating to manual

handling and hazardous substance management.

**Actions:**

- place all wastes in appropriate bags or containers –

  **COLOUR CODING OF WASTE**

| | | |
|---|---|---|
| *General Waste* | = | *Clear bags / dark green bins* |
| *Clinical Waste* | = | *Yellow bags / bins* |
| *Cytotoxic Waste* | = | *Purple bags / bins* |
| *Anatomical Waste* | = | *Yellow bags / Burgundy bins* |
| *Paper / Cardboard Recycling* | = | *Paper Recycling Boxes / Blue bins* |
| *Confidential Paper* | = | *Blue / Red bins (with securable lids)* |
| *Mixed Recycling* | = | *Clear bags / Orange bins* |

  Sharps must be discarded in designated Sharps Containers

- seal waste bags & sharps containers securely when 3/4 full
- ensure waste wheelie bins are not overfilled
- hold waste bags away from body when transferring to a wheelie bin, (if the bag is heavy, bring the wheelie bin to the bag)
- seal clinical waste bags immediately after discarding wet items and place in yellow wheelie bin
- seal cytotoxic waste bags immediately after use and place in purple wheelie bin
- ensure clinical / cytotoxic & anatomical waste bin lids are locked at all times when transporting.

## *2.3 Cleaning Staff Responsibility*

**Responsibilities:**

- Safely handle, store and transport wastes
- Actively participate in receiving information, instruction, training and supervision
- Use the personal protective equipment (PPE), equipment and systems provided for safe practices (refer to Section 2.4)
- Report all accidents/incidents to management including completion of the Incident Report form.

All Hospital and Contract staff who handle, store or transport waste, must adhere to all regulations associated with OH&S procedures. This includes the requirements relating to manual handling and hazardous substance management.

**Actions:**

As per 2.2 above

- All Wastes are to be transported along a route that gives minimum exposure to the public and maximum safety to staff

- Where it is unavoidable to carry bags of waste it is essential to hold the bag away from the body

- Clinical cytotoxic waste must be taken directly from the generating clinical area to the clinical/cytotoxic waste bin. It must not be stored in any other areas

- Clinical and cytotoxic waste must be kept separate from all other kinds of waste when stored,

handled and transported

- All waste must be in the designated receptacles when deposited at the Waste Centre

- Ensure Waste Centre is secure and tidy at all times. Clinical Waste Bay must be locked at all times when not in use.

- Thoroughly clean trolleys used for collection of wastes weekly, or as required.

- Notify domestic services supervisor of any spills and assist with clean up using spills kit (refer to Section 2.5 – Location of Spills Kits) Complete IIMS report form including all details of spill.

- Report any problem with waste equipment to the Waste Management Coordinator Ext 22815 or the Domestic Services Supervisor.

## *2.4 Personal Protective Equipment*

**Refer to:**

- NSW Health Department Infection Control Policy Circular 2002/45
- The Prince of Wales & Sydney Children's Hospitals – Infection Control Manual
- WorkCover NSW (2008) Guidelines for Handling Cytotoxic Drugs and Related Waste in Health Care Establishments.

### 2.4.1 Handling and Disposal of Wastes:

**Gloves must be worn at all times when handling all wastes. Hands are to be cleaned thoroughly before and after handling waste bags and/or bins.**

**Health Care Workers** must wear non-sterile disposable gloves when handling materials contaminated with blood or body substances.

**Cleaning Staff** must wear non-sterile disposable gloves when handling all waste.

**Waste Handlers** must wear leather gloves when transporting all wastes on trolleys or in bins to the Waste Centre. Non-sterile disposable gloves must be worn when handling waste for collection.

**Additional PPE must be worn when:**

- **there is a risk of splash with blood or body fluids**
  **Health Care Workers must wear:**
  - gloves
  - gown/apron
  - facial protection

- **handling cytotoxic waste**
  **Cleaning staff must wear:**
  - chemotherapy Nitrile gloves or purpose manufactured gloves
  - closed footwear

- **picking up sharps**
  **Workers must wear**:

- Puncture-proof gloves (Turtle Skin or similar) when collecting sharps which have been discarded outside of sharps bins i.e. outdoor areas

## *2.5 Location of Spill Kits*

**Clinical/General Waste**
Each domestic services room (located all over the hospital) contains a yellow bucket, mop with yellow handle for use in clinical spills (involving blood &/or body fluid), and a bucket and mop for general spills. Gloves, paper hand towels, clear and yellow bags, disinfectant and a general purpose detergent are also available from domestic service rooms for use in spills.

If you notice a spill of any kind, contact the domestic services supervisors for your area.

**Cytotoxic Waste**

Cytotoxic spill kits are kept in:

- Pharmacy
- The Waste Centre
- Ward areas (all wards using cytotoxics must have cytotoxic spill kit)

**Mercury**
Mercury spill kits are kept by Security. If you have a mercury spill (e.g. from a broken thermometer or sphygmomanometer), evacuate immediate area, prevent further access to the area, and contact:
After Hours contact Security on Ext 22847, and request that they bring the mercury spill kit (refer to Section 5.4.2. for procedure).
Monday – Sunday 0600-1430 contact Cleaning supervisor on Ext 22884 to assist in the spill cleanup
**Chemical**
Chemical spill kit is held in the maintenance department. If you have a chemical spill evacuate immediate area, prevent further access to the area, and contact:
After Hours contact Security on Ext 22847, and request that they bring the chemical spill kit (refer to Section 5.3.1. for procedure).
Monday – Sunday 0600-1430 contact Cleaning supervisor on Ext 22884 to assist in the spill cleanup

## *2.6 Education*

Staff education is an important part of achieving a successful waste management program. There are several different means of education available to staff.

**Orientation**
All new staff who attend orientation will attend at least one session on waste management. Contact the orientation coordinator for details regarding when the orientation program is next running.

**Mandatory Program**
The Mandatory Program is now online. The session on waste management covers waste segregation, the hospital waste management program, relevant requirements and the reasons behind waste management. All staff should complete this program annually.

**In-Service Program**
The Waste Management Coordinator Ext 22815 is available to give in-service to individual areas requiring specific waste management training.

**Educational Materials**
Education materials such as this manual, stickers and posters are available from the Waste Management Coordinator Ext. 2281.

# 3 Recycling

Many familiar items can be recycled. The Prince of Wales & Sydney Children's Hospitals has a commingled and separate paper product recycling service, which is explained in more detail in the following pages.

There are two main types of recycling:

## *3.1 Paper & Cardboard Recycling*

Paper to be recycled is placed in the appropriate desk side boxes marked as paper recycling.

These boxes are emptied by the individual staff member who sits at that desk, into the blue paper recycling bin located in their department (this is not the role of the PSA/cleaner).

Cardboard boxes must be broken down flat and left next to the blue recycle bin for collection.

Confidential Paper is a separate waste stream requiring a locked bin.

**What is it?**

Used paper and cardboard is a valuable resource. It is not waste until it becomes part of the rubbish stream.

If you're not sure whether the item can be recycled, check on the Paper and Cardboard Recycling List

**Where will it go?**

All paper and cardboard is taken to one of the main paper mills where it is remade into paper with recycled content or cardboard, saving the virgin raw material which is trees.

**What to do:**

- **Separate paper waste** using a desktop or desk side container. Label these containers "Recyclable Paper". It's best if paper is left flat and not crumpled.

- **Transfer paper waste to paper and cardboard recycling blue bin.** This is the responsibility of the staff member at the desk (this is not the role of the cleaner/PSA).

- **Collapse / flatten corrugated cardboard boxes** and place next to the paper recycling bin. Each person should flatten the box they discard to fully utilise the space available in the area and assist in the collection process.

**What else can I do?**

1. **Save Your Paper**
2. **Remember Reduce, Re-use, and Recycle**

**Ask yourself questions:**

- Do you need to keep extra "hard copies" of documents (perhaps a back-up disk is better)?
- Can I inform people using a circular/e-mail rather than individual copies of memos etc?
- Can I print or photocopy onto both sides of the paper?
- Can I reduce the size of the print to fit it all onto one piece of paper?
- Do you have to print the e-mail?

## Paper & Cardboard Recycling List **(Blue Bins)**

| **These paper products are recyclable** | **These are NOT recyclable** |
|---|---|
| **Photo copier paper** | **Carbon paper** |
| **Writing paper** | **Thermal fax paper** |
| **Note paper/ pads** | **Waxed paper and cardboard** |
| **Reports** (remove binders and plastic sleeves) | **Plasticised paper** (eg sterile pack wrapping, kimguard) |
| **Envelopes** (including window envelopes) | **Label backing paper** |
| **Books** (can they be reused) | **Lunch & sweet wrappers and bags** |
| **Manila folders** | **Facial tissues and paper hand towels** |
| **Computer paper & print outs** | **Plastic sheet protectors** (reuse or general waste) |
| **Index cards** | **Plastic covers and binders** (reuse or general waste) |
| **Telephone books** | **Milk & drink cartons*** (liquid paper board) |
| **Newspapers** | **Plastic bottles*** |
| **Magazines** | **Glass bottles*** |
| **Cardboard boxes corrugated** (flattened / collapsed) | **Aluminium & steel cans*** |
| **Thin cardboard boxes** (medicine boxes) | |

**These items can go in the Orange Recycling Bins*

## *3.2 Confidential Document Management*

**What is it?**

Many documents generated within the hospital are classified as confidential. The paper recycling system available throughout the hospital does not offer sufficient confidentiality for documents that

should have restricted access. The Safety and Security Manual (NSW Department of Health August 1996) defines Confidential Documents to be those which when disclosed could cause:

- embarrassment
- disruption to the efficient operations of the facility
- financial loss
- loss of privacy for patients or staff

**This includes any file notes that contain an identifiable name, address, phone number and personal details about a patient or staff member.**

Regular staff memos are not generally considered confidential, these should be torn in half 3 or 4 times and placed in the Paper and Cardboard Recycling bins,.

Records containing confidential information must be stored and locked in sturdy steel filing cabinets. The documents must then be disposed in the confidential paper waste stream. Several areas have their own paper shredder for this purpose, and the shredded paper can be placed in a blue bin for recycling. However, when large volumes of paper are involved, a specialised service for the destruction of confidential documents is available, confidential document disposal bins are located in administrative areas of the hospital.

Medical Records **must never** be disposed of in this system.

**What to do:**

The Patient Matters Manual Part 1 (NSW Dept of Health) sets out the Disposal Schedule for NSW Hospitals for various confidential documents.

Remove any plastics or folders (e.g. lever-arch folders) from the confidential documents, as these are not able to be shredded and can sometimes be reused within the hospital. The confidential documents should either be placed in cardboard boxes and sealed or arrangements can be made with the Waste Management Coordinator to supply a locked Confidential Document Bin to your area prior to document collection.

## *3.3 Mixed Recycling (Commingled Recycling)*


**What is it?**

Mixed recycling (sometimes called commingled) allows those materials, which are able to be recycled to be placed into a single bin (orange). These items are normally food and drink containers and made of material which, can be remanufactured into new products, saving virgin raw material such as oil, power and water.

**Where will it go?**

The recycling Contractor collects from dock 2 and takes it all to a Material Recovery Facility (MRF) and places contents onto a conveyer belt where people do the final sorting of the materials. One person might pick out all the aluminium cans which are then crushed and sent off to Comalco or Alcan, another person may pick out all the glass jars and bottles which are then sent off to ACI etc.

**What to do?**

The Prince of Wales & Sydney Children's Hospitals has Mixed Recycling for many familiar items including:

- Glass Jars and Bottles
- Tin and Steel Cans
- Aluminium Cans
- Plastics with triangle and a number
- Liquid Paper Board (or tetra pak or milk and juice cartons)

All these items should be collected placing them in the Orange Recycling Containers. They do not need to be separated into different bins for each item.

NB: Please ensure that no rubbish is put in with the recycling. For example, polystyrene cups used for hot drinks are not recyclable, plastic sandwich containers are not recyclable. These wastes must be put into a general waste bin.

Ensure no food waste is included with the recyclable materials by emptying all containers first, and rinsing where possible.

### 3.3.1 Glass Recycling

**Glass Recycling List**

| **These glass items can be recycled** (empty & without lids) | | **These items are NOT recyclable** |
|---|---|---|
| **Glass Fruit juice bottles** | | **Glass I.V. bottles containing antibiotics, albumin etc.** (these are unable to be emptied. Dispose of as clinical waste) |
| **Glass jars** | | **Injectable drug vials** |
| **Glass medicine bottles** | | **Ampoules a broken glass vials** (dispose of as sharps) |
| **Beer bottles** | | **Drinking glasses** |
| **Wine bottles** | | **Plate glass** (window / mirror) |
| | | **Pyrex laboratory glass** |
| | | **Crockery** (ceramic cups / mugs / plates etc.) |

**What to do:**

- **Remove lids** and dispose of lid as general waste
- **Empty contents** of container and rinse if likely to become offensive
- **Place in a Recycling Container** marked specifically for recycling and/or clear plastic bag.

### 3.3.2 Tin and Steel Can Recycling

**What is it?**

Food and drink tins such as:
- nutritional supplement cans e.g. ISOCAL cans
- tins from fruit, baked beans etc.

**What to do:**

- Empty contents of container
- Rinse container to prevent foodstuffs remaining from becoming offensive
- Place lid inside container to avoid accidental injury
- Place in a Recycling Container marked specifically for recycling and/or clear plastic bag

### 3.3.3 Aluminium Can Recycling

**What is it?**
e.g.: Soft Drink Cans

**What to do:**
- Empty contents of container
- Place in a Recycling Container marked specifically for recycling and/or clear plastic bag

### 3.3.4 Plastics Recycling

**What is it?**
Any material marked with a triangle and a number

**What to do:**

- Remove lids unless they too have a 1 or 2 plastics recycling symbol
- Empty contents of container and rinse if likely to become offensive (such as milk and fruit juice containers)
- Place in a Recycling container marked specifically for recycling.

### 3.3.5 Liquid Paper Board Recycling

**What is it?**
Liquid Paper Board also goes under the names of Liquid Cardboard and Tetra-Pak cartons. They are the 'cardboard-like' containers used for milk and fruit juices. These items cannot be placed in the blue paper and cardboard recycling bins because the actual package contains a plastic coating or is a mixture of paper and plastic which makes it water-proof.

**What to do:**
- Empty contents of container
- Rinse container to prevent foodstuffs remaining from becoming offensive
- Place in a Recycling Container and/or Clear Plastic Bag

## *3.4 Reusable items*

### 3.4.1 China Cups

**What is it?**

Foam, plastic or cardboard disposable cups are NOT RECYCLABLE.
Therefore every time one is used, it must be thrown into general waste. This creates a large volume of general waste, which is sent to landfill. Once in the landfill, disposable cups can take hundreds of years to biodegrade. When they are broken crockery goes to General waste.

**A china cup can be reused many times.** This is much better for the environment, and more cost effective. Dishwasher in the Kitchen washes ceramic cups at over 90 deg C to kill any bacteria or viruses.

**What to do:**

- Use china cups when drinking in the cafeteria
- Bring your own mug with you if you are taking tea/coffee away
- Provide access to china/reusable cups for patients and visitors – ensure facilities are available to adequately clean all cups first.

### 3.4.2 Dietary Supplement Cups

# 4 General Waste

## *4.1 General Waste*

**What is it?**
A process of exclusion defines General Waste! If the waste does not fit into any other category of waste, it is general waste.

e.g.: Paper towel waste after hand washing
Gloves not contaminated with blood or body fluids
Paper not able to be recycled
Plastic not able to be recycled
Packaging not able to be recycled
Others wastes that are not recyclable

Figure 5.1 General Waste/Litter Bin

**Where will it go:**

All general waste goes directly to landfill, it is not treated in any way.

**What to do:**

- General waste must be kept separate from other waste
- Place in clear bag and then into a green wheelie bin/general waste bin
- Staff must wear gloves when sealing general waste bags and when transporting general waste in bags/containers or bins.

**General Waste Tracking:**

Labels indicating the place of origin must be attached to all containers and waste bags. This must be attached before use. Labels are available from Domestic Services.

The Prince of Wales & Sydney Children's Hospitals conducts general waste tracking audits.

The results from these are available from The Waste Management Coordinator Ext 22815

# 5 Clinical or Biomedical Waste

## *5.1 Clinical Waste*


**Refer to:**

- NSW Health Waste Management Guidelines for Health Care Facilities, August 1998
- NSW Health Infection Control Policy Circular 95/13
- The Prince of Wales & Sydney Children's Hospitals and Community Health Service – Infection Control Manual

**What is it?**

Clinical Waste is material which has the potential to cause injury, infection or offence. (There are special procedures for sharps, cytotoxic and radioactive substances – see relevant sections)

E.g.:
- Urinary and Wound Drainage Bags and Containers including tubing
- Microbiological and Pathological waste
- Materials visibly stained with blood/body fluids and visibly blood stained disposable material and equipment
- Bottles and vials that have contained antibiotics, pharmaceuticals or products from human sources

Disposable Nappies and Incontinence Pads may be disposed of as general waste, if only lightly soiled. However, where they are generated in bulk, or are heavily soiled or infectious, they should be handled, stored and disposed of as Clinical Waste.

**What to do:**

- Gloves must be worn when handling clinical waste
- Gloves, gown/apron and facial protection must be worn if there is risk of splash with blood or body fluid
- Place all Clinical Waste in Yellow Plastic Bag with the 'bio-hazard' symbol
- Empty bulk body fluids, blood, suctioned fluids, excretions and secretions into the sluice when it is safe to do so (see Safe Work Practice in Infection Control Manual)
- Securely seal the bag when it is 3/4 full
- Place sealed bag in Yellow Wheelie Bin marked with the bio-hazard symbol (do not carry bag though hospital corridors – bring bin to bag)
- Yellow Clinical Waste Containers / Wheelie Bins must be locked at all times during transport

Cleaning staff must wear gloves (refer to Section 2.4) when handling Yellow Bags and Wheelie Bins and transporting them to the Waste Centre

Waste Contractors provide clean clinical waste containers and remove full clinical waste bins for disposal six (6) days per week

### 5.1.1 Clinical Waste Tracking

Labels indicating the place of origin must be attached to all sharps containers and waste bags. This must be attached before use. Labels are available from Domestic Services.

The Prince of Wales & Sydney Children's Hospitals conducts clinical waste tracking audits.

The results from these are available from The Waste Management Coordinator Ext 22815.

# 6 Cytotoxic Waste


**Refer to:**

- The Prince of Wales & Sydney Children's Hospitals – Safe Handling of Cytotoxic Drugs and Related Waste, Information Package for Registered Nursing Staff and Cleaning Staff
- Workcover NSW – Guidelines for handling cytotoxic drugs and related waste in Health Care Establishments 2008

Any queries about cytotoxic waste can be referred to Clinical Nurse Consultant, Haematology/Oncology.

**What Is It?**

Cytotoxic waste is material contaminated with drugs which are poisonous to cells and are largely used in the treatment of cancer.

E.g: Packaging in which cytotoxic drugs have been delivered.
Syringes used for cytotoxic administration (without needles attached)
Syringe caps
Urinary and Wound Drainage Bags and Tubing contaminated with body waste from a patient receiving cytotoxic substances
Gloves and disposable personal protective equipment used for administration of cytotoxic substances

**What To Do?**

- **Gloves must be worn**
  * chemotherapy Nitrile gloves, tyvek gown and goggles/glasses must be worn if there is risk of splash with blood or body fluid

- **Place all Cytotoxic Waste in Purple Bag** marked with the cell in telophase symbol and labelled with the word 'Cytotoxic'

- **Seal the bag with tie**

- **Place sealed bag into Purple Wheelie Bin** marked with the cell in telophase symbol and labelled with the word 'Cytotoxic' (do not carry bag though hospital corridors – bring bin to bag)

- Cytotoxic waste containers are to be locked at all times during transport.

**Cleaning Staff** must wear full PPE when collecting purple wheelie bins and transporting them to the Waste Centre

NB: Refer to instructions in the Cytotoxic Spill Kit for cytotoxic spill clean-up procedures

### 6.1.1 Pharmaceutical Waste

**Refer to:**

- **Poisons and Therapeutic Goods Act 1966**
- **Guidelines for the Handling of Medication in NSW Public Hospitals, Circular 95/37**

**What Is It?**

Waste generated from pharmaceuticals or other chemical substances specified as regulated goods in the Poisons and Therapeutic Goods Act. Because of advances in technology and more cost effective methods of treatment, such as shredding and decontamination, it is necessary to separate bulk pharmaceutics from other clinical waste. Because anything in the purple (cytotoxic) bin will be incinerated, bulk pharmaceuticals must be placed in purple bins.

Eg.: expired pharmaceuticals
discarded pharmaceuticals

**What to do:**

- place bulk pharmaceuticals in purple bins for disposal
- ensure pharmaceuticals are not discharged to the sewer, or released into the environment
- participate in pharmaceutical recycling schemes where available.

**Cleaning Staff** must wear gloves (refer to Section 2.4) when handling Purple Wheelie Bins and transporting them to the Waste Centre. Waste Contractors remove waste for incineration six days per week.

## *6.2 Sharps*

**Refer to:**

- NSW Health Waste Management Guidelines for Health Care Facilities, August 1998
- NSW Health Infection Control Policy Circular 2002/45
- The Prince of Wales & Sydney Children's Hospitals – Infection Control Manual

**What is it?**

A Sharp is defined as any object capable of inflicting a penetrating injury.

e.g.
- Scalpel blades
- Wires
- Trocars
- Autolancets
- Syringe with needle attached
- Hypodermic needles
- Suture needles
- Stitch cutters
- Intravenous sets
- Pasteur pipettes
- Broken glass
- Glass slides
- Hollow bore needles
- Staplers

**What to do:**

- **Gloves must be worn**
- Gloves, gown/apron and facial protection must be worn if there is risk of splash with blood or body

fluid
- Place waste sharps **ONLY** in the sharps container
- Place non sharp waste into relevant bin (eg Interlink system, bloodied tubing into clinical waste, unsoiled packaging into general waste)
- Only fill sharps containers to 3/4 full. This is a staff safety measure to ensure that all sharps fit safely inside the container
- When full, a trained member of staff, seals the sharps container it is then collected by Domestic Services Staff.
- Sharps must be discarded into designated, puncture resistant containers

**NB: Sharps must be discarded into Yellow Sharps Containers (disposable/reusable)**

**Disposable Sharps Containers (Clear/translucent lid)**
(See Figure 5.2.1)
- Seal lid of container when 3/4 full to ensure no sharps can escape during transportation
- Place sealed yellow disposable sharps containers into a clinical waste bin
- Waste handling staff will remove clinical wast e bins as required.

## 6.2.1 Reusable Sharps Containers

**What is it?**

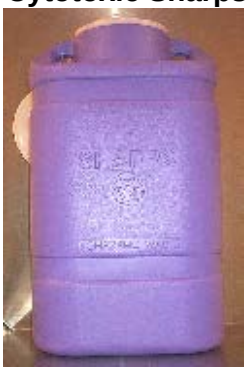
Designated, puncture resistant yellow sharps containers with a swing tray opening and a handle on the lid (see figure 5.2.1)

**What to do:**

- Gloves must be worn - *Gloves, gown/apron and facial protection must be worn if there is risk of splash with blood or body fluid.
- Place waste sharps in the sharps container
- Only fill containers 3/4 full. This is a staff safety measure to ensure that all sharps fit safely inside the container. Check when the container is 3/4 full by using the clear viewing window on the side. When container is 3/4 full, nursing staff must:
  Close the lid of the sharps container
  Slide the front lock of the container to the right
  Slide the side locks of the container to the front into the 'Lock' position
  Place sealed Resusable Sharps Container in Utility Room or Waste Collection Room for collection by the waste handling staff.
- Waste handling staff must ensure that the front and side locks are engaged before collecting the sharps containers
- Waste handling staff must wear gloves (refer to Section 2.4) when handling Sharps Containers and transporting them to the Waste Centre
- Waste handling staff will remove full sharps containers as required.
- Empty containers are obtained on production of a sharps exchange docket. These containers can be reused in excess of 100 times, saving an enormous amount of plastic from landfill.

**Figure 5.2.1 Sharps Container**


**Figure 5.2.2 Cytotoxic Sharps Container**



## 6.2.2 Cytotoxic Sharps Containers

**What is it?**

Designated, puncture resistant purple sharps containers with a Clear/translucent lid opening and a handle on the lid (see figure 5.2.1)

**What to do:**

- **Gloves must be worn**
  * Chemotherapy Nitrile gloves, tyvek gown and goggles/glasses must be worn if there is risk of splash with blood or body fluid

- **Place all Cytotoxic sharps in Purple sharps container** marked with the cell in telophase symbol and labelled with the word 'Cytotoxic'
- Cytotoxic waste containers are to be locked at all times during transport.

*Reusable sharps containers are NOT used for cytotoxics sharps.

## *6.3 Chemical Waste*

**Refer to:**

- Material Safety Data Sheets (MSDS) for further information on the handling, storage, disposal and spill clean up procedures
- Chemwatch for details regarding particular chemicals

**What is it?**

E.g.: Cyanide
Azides
Formaldehyde
Soluble Oils
Alcohols etc.

**What to do:**

**For all chemical wastes regardless of whether it is a small or large quantity, regularly or irregularly produced, the process is to:**

- **Gloves must be worn**
- contact the Waste Management Coordinator for details of the EPA licenced Chemical Waste Collection contractor.
- ensure the EPA docket brought by Chemical Waste Contractor is completed accurately with The Prince of Wales & Sydney Children's Hospitals written in as the generator, your department and a contact name and number should also be provided.
- obtain a completed copy of the docket and forward to the Waste Management Coordinator for record keeping and invoice approval.

  Note: chemical waste must be double contained (that is inside two sealed containers) when it is being transported though the hospital to prevent a spill

**This is The Prince of Wales & Sydney Children's Hospital's 'proof' of appropriate disposal – it is a legal requirement that proof of correct disposal is kept. Waste chemicals must NOT be disposed of in any drain or waste receptacle, unless it is stated to be safe to do so on the MSDS or approval is obtained from relevant government authority.**

### 6.3.1 Chemical Spill Clean-Up Procedure

When chemical is spilled, prompt action to clean up the spill is essential.

- Gloves must be worn
- refer to the Material Safety Data Sheet (MSDS) for directions to safely manage the spill
- contain the spill (stop it going into the earth, air or sewer or stormwater system etc)
- clean up the spill (using mops, buckets, bags and containers for spilt chemical, soiled cloth etc.
- complete the IIMS Form
- contact your Manager or the after hours senior nurse manager who will notify the OH&S Coordinator and the Facility Manager.

### 6.3.2 Mercury Spill Clean-Up Procedure

This refers to small spills e.g. from thermometers or sphygmomanometers on hard floors

**SPILL**

**STEP 1:** Ensure area is well ventilated and prevent access to spill. Remove patient/s from immediate vicinity

**STEP 2:** Call Cleaning Supervisor on Ext 22884 between 0600-1430 for Mercury (Hg) Spill Kit. nominate that there is a mercury spill and your location.

**STEP 3:** Call Security 2100-0600 on Ext 22847 between 0600-1430 for Mercury (Hg) Spill Kit. nominate that there is a mercury spill and your location

**STEP 4:** Security to fill out Mercury Spills Register in Mercury Spill Kit

**<u>Procedure</u>**

1. **Do not attempt to clean up unless safe to do so!**
2. Remove gold or silver rings and bracelets (Mercury bonds to metals). Put on disposable gloves, safety glasses and disposable shoe covers from Spill Kit.

3. Remove any broken glass, place in rigid container (e.g. empty spill kit container)

4. Sprinkle chemical Hg Absorb powder on spill (use twice the volume of powder as there is mercury)
5. Sprinkle powder with water and work into a paste.
6. Use dustpan & scraper to collect Hg compound into provided bag and seal (use clean sample jar if extra container required) Place used bag, dustpan and scraper back in kit.
7. Shine a torch over the area to check that no beads of mercury have been left (repeat steps 3 to 5 if more mercury is found)
8. Mop area with water and disinfectant
9. Place used kit, shoe covers and gloves in yellow bag. Dispose of bag to Yellow Clinical Waste Bin. Mop to be thrown in general waste.
10. Wash hands
11. Ward staff to fill out Incident Report Form and forward to OH&S Coordinator

For spills in crevices or on carpet, remove as much mercury as possible using a syringe (minus the needle) or pipette. Add Hg Absorb Powder, isolate area, and contact the Waste & Environmental Services Manager.

**NOTE: Vacuum Cleaners must not be used to clean up mercury spills.**

## *6.4 Radioactive Waste*

**Refer to:**

- National Health and Medical Research Council (1985) Code of Practice for the Disposal of Radioactive Waste by the User
- Radiation Control Act 2001 and regulations
- The Prince of Wales & Sydney Children's Hospitals Radiation Safety manual 1998

**Any queries about radioactive waste, or any requests to dispose of radioactive waste, referred to The Prince of Wales & Sydney Children's Hospitals Radiation Safety Officer. The Radiation Safety Officer can be contacted for any urgent matter through the Prince of Wales & Sydney Children's Hospitals Switchboard.**

**What is it?**

Radioactive waste is material contaminated with a radioactive substance.

E.g. tissues and swabs used during injection of a radiopharmaceutical
unused stock vials of radioactive substances
soiled bed linen from patients who have received a radiopharmaceutical
pipette tips used in radioimmunoassays

**What to do:**

- **Do not attempt to clean up unless safe to do so!**
- Disposable Gloves and Lab Coat/Long Sleeved Gown must be worn
  *****Overshoes are to be worn if cleaning up a spill
- Place any material that has been in contact with a patient in a Yellow Clinical Waste Bag, and seal the bag
- Place this Yellow Bag inside a Red Radioactive Waste Bag marked with the 'radiation' symbol and

writing in black type and label the bag with the maximum external dose rate, the radionuclide(s) and the date. The bag must then be stored in lead shielded cabinets or transported to the Radioactive Waste Store

- Place any other material in a General Waste bag, and seal the bag
- Place this General Waste Bag inside a Red Radioactive Waste bag and label the bag with the maximum external dose rate, the radionuclide(s) and the date. The bag must then be stored in lead shielded cabinets or transported to the Radioactive Waste Store.
- All radioactive waste bags stored in the Radioactive Waste Store must be recorded in the Radioactive Waste Record Book kept by Nuclear Medicine

# 7 Other Wastes

## *7.1 X-ray Recycling*

**What is it?**

X-Rays contain confidential information and they must be disposed of accordingly. The developing processes also leaves silver on the X-ray, which can be recovered before disposal.

**What to do:**

- All X-Rays that are no longer required should be returned to the Radiology Department for periodical destruction and silver recovery.

## *7.2 Large Metal Items Recycling*

This includes metal beds beyond use, trolleys beyond repair, cabinets etc.

**What to do**

- Contact the Waste Management Coordinator Ext 22815 who will identify if the item can be used for spares or direct that the item has no further use and be taken to an approved metal recycling centre.

## *7.3 Furniture, Medical and Office Equipment Recycling*

**What is it?**

Unwanted furniture, medical equipment and office equipment can sometimes be donated to charities, such as Australian Friends of Asia and the Pacific, for distribution to underprivileged nations.

e.g.:
- Beds, bedside cabinets, overbed tables etc.
- mattresses
- filing cabinets
- out of date medical supplies (not medicines)

**What to do:**

Contact the Waste Management Coordinator on ext. 22815 or pager 47296 to arrange inspection and evaluation.

## *7.4 Printer & Photocopier Toner Cartridge Recycling*

**What is it?**

Plastic toner cartridges can be recycled. They can be refilled for reuse or disposed of in an environmentally responsible manner. When a quantity has been collected from the hospital, they are

sent for recycling.

**What to do:**

- Bring used toner cartridges to the Barker Street or High Street Reception or Waste Management Centre.

## *7.5 Battery Recycling*

**What is it?**

**Nickel Cadmium Batteries** sold under Saft, Sunica, Nife, Alcad and Saft-Nife are able to be 'recycled'.

**Sealed Lead Acid Batteries** which are used in medical equipment (and are usually rechargeable) have reached the end of their life they are also able to be 'recycled'.

**Most regular batteries (**alkaline etc.) are to be disposed of as general waste as there is currently no better alternative.

**What to do:**

- Take Nickel Cadmium and Sealed Lead Acid Batteries ONLY to Waste Management Centre who will store them (in separate boxes) until there is a sufficient quantity to call the recyclers for collection.

## *7.6 Electrical Component Recycling*

**What is it?**

**Light Globes, Florescent Tubes, lighting transformers** are able to be 'recycled'.

**Computer components** (less the hard drives), which have reached the end of their life are also able to be 'recycled'.

**What to do?**

- *Take Light Globes, Florescent Tubes, lighting transformers to Maintenance Supervisor who will store them (in separate boxes) until there is a sufficient quantity to call the recyclers for collection.*
- Take computers to the ISD support staff who will remove the hard drive (for data security purposes), computers will then be stored by the Waste Management Coordinator until there is a sufficient quantity to call the recyclers for collection.

## *7.7 Storm Water Waste*

**What is it?**

Contaminated water must be prevented entering stormwater drains through large stormwater grates e.g. in the wash down area near Dock 2 Parkes Building.

**What to do?**

- Take preventative action to ensure that potential contaminants including leaves, oils, papers, cigarette butts etc. are removed on a daily basis from areas forming stormwater drain catchment.
- Hard surfaces within the stormwater catchment are not “hosed down” as a cleaning method to remove rubbish and other contaminates

## *7.8 Liquid Trade Waste*

All substances entering the sewerage system through sinks or toilets must be in quantities and/or concentrations acceptable to Sydney Water (the authority monitoring this method of waste disposal). For all chemicals, check disposal requirements on the Material Safety Data Sheets and if in doubt contact the OH&S Coordinator on ext. 22328.

**A relevant excerpt from Sydney Water:**

> "Spent solvents, preservatives, and other chemicals used in hospital laboratories and research units, other than residues washed off glassware etc. are not to be disposed to the sewer. These materials must be collected in suitable containers and taken off site for disposal in an enviornmentally acceptable manner. If a collected waste chemical such as formalin is treated by an inactivation ("neutralisation") system approved of by Sydney Water, permission may be sought to discharge this in accordance with a written protocol by annexure to this permit.
>
> Spent instrument solutions, including those based on gluteraldehyde may be discharged to sewer without treatment by flushing with copious quantities of water to achieve a dilution 1:100 or more.
>
> If a safe and practical inactivation system for gluteraldehyde becomes available this should be introduced in lieu of dilution. Gluteraldehyde contaminated with heavy metals or other primary pollutants must not be flushed down the drain but removed from the site by an authorised contractor.
>
> In all situations, due care must be exercised to ensure the health and safety of sewerage system workers is not placed at risk".

When liquid and/or hazardous wastes are pumped out and taken off site for specialised treatment, a copy of the EPA Docket must be forwarded to the Waste Management Coordinator for record keeping. Types of wastes included under this system include:

- Grease Trap Wastes
- General Purpose Tanks
- Drummed or Bottled Chemical Wastes

**Under no circumstances are liquid, sludge or solid wastes to be flushed through the stormwater system (down outside drains or in the gutter) as this goes directly into our waterways with no treatment.**

# 8 Records

The following records will be maintained by the Waste Manager:

1. Clinical Waste – records of destruction
2. Chemical Waste – records of destruction
3. Weight of waste by waste stream
4. Cost of waste by waste stream
5. Reportable Incidents – Pollution Incidents

# 9 Pollution Incidents – Notification

Leaks, spills and other pollution incidents can harm the environment. Pollution incidents causing or threatening material harm to the environment **must** be notified under section 148 of the Protection of the Environment Operations Act 1997 (POEO Act). A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.

Notification must be given immediately, i.e. promptly and without delay, after the person becomes aware of the incident.

The Pollution Incident Notification process including definitions and contact details is outlined in the following pages.

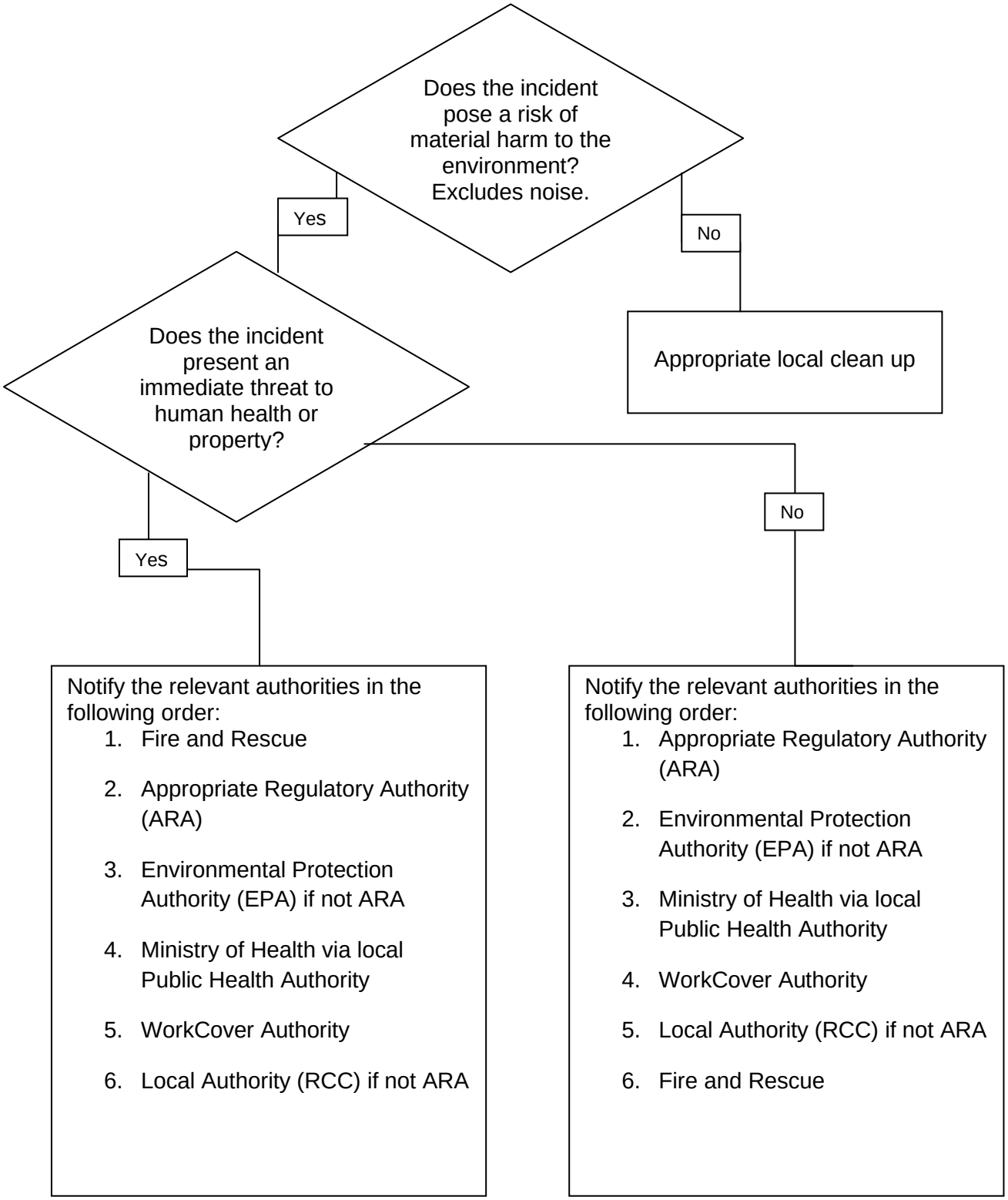
For further information refer to the following links:

http://www.environment.nsw.gov.au/legislation/poefaqsnotify.htm

http://www.environment.nsw.gov.au/pollution/notificationprotocol.htm

http://www.environment.nsw.gov.au/resources/legislation/201200227egpreppirmp.pdf

## Notification Flow Chart



## 9.1 Pollution Incidents – Contact Numbers

| Pollutant | Authority | | Contact Number |
|---|---|---|---|
| Air | Randwick City Council in hours | | 9399 0999 |
| Air | Randwick City Council out of hours | | 1300 722 542 |
| Chemical Spill | Fire and Rescue | | 000 |
| Fertilisers | EPA | 24/7 | 131 555 |
| Herbicides | EPA | 24/7 | 131 555 |
| Liquid Waste | EPA | 24/7 | 131 555 |
| Pesticides | EPA | 24/7 | 131 555 |
| Sewer Overflow | Sydney Water | 24/7 | 132 090 |
| Solid Waste | EPA | 24/7 | 131 555 |
| Stormwater | Sydney Water | 24/7 | 132 090 |

| Authority | | Contact Number |
|---|---|---|
| EPA | 24/7 | 131 555 |
| Fire and Rescue | 24/7 | 000 |
| Ministry of Health via Public Health Unit | In hours | 9382 8333 |
| Ministry of Health via Public Health Unit | Out of hours | 9382 2222 – page Public Health Officer on call |
| Randwick City Council | In hours | 9399 0999 |
| Randwick City Council | Out of hours | 1300 722 542 |
| Sydney Water | 24/7 | 132 090 |
| WorkCover | 24/7 | 131 050 |

## 9.2 Pollution Incidents – Information Required

**What information do I need to provide to authorities when notifying them of a pollution incident?**

Under section 150 of the amended POEO Act, the information about a pollution incident that must be notified is:

- The time, date, nature, duration and location of the incident
- The location of the place where pollution is occurring or is likely to occur
- The nature, the estimated quantity or volume and the concentration of any pollutants involved, if known
- The circumstances in which the incident occurred, including the cause of the incident, if known
- The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known
- Other information prescribed by the regulations.

## 9.3 Pollutions Incidents - Definitions

**147 Meaning of material harm to the environment:**

1) For the purposes of this Part:

   a) Harm to the environment is material if:

      i) It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

      ii) It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and

   b) Loss includes the reasonable cost and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

2) For the purposes of the Part, it does not matter that harm to the environment is caused only in the premises where the pollution incident.

**Pollution Incident**

Pollution Incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstance involving only the emission of any noise.

## Appendix 1: References


AS/NZS 3816: 1998 Management of Clinical and Related Wastes

AS/NZS 4261:1994 Reusable containers for the collection of sharp items used in human and animal medical applications

AS/NZS 4031:1992 Non-reusable containers for the collection of sharp medical items used in health care areas

Australian Cleaning Standards

EMIAA (Environment Management Industry Assoc. of Australia Ltd) National Medical Waste Industry Group (1998) Industry Code of Practice for the Management of Clinical and Related Waste

EPA NSW (1998) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes

EPA NSW (1994-1995) Industrial Waste Recycling Directory

EPA NSW – Special Conditions Applicable to the Transportation of Trade Waste being contaminated wastes generated in Hospitals, Nursing

EPA NSW – Special Conditions Applicable to the Storage of Trade Waste being Contaminated Wastes generated in Hospital, Nursing Homes, Pathology Laboratories, Veterinary premises and other Health Care Facilities

Material Safety Data Sheets

National Health and Medical Research Council (1995) National Guidelines for the Management of Clinical and Related Wastes

National Health and Medical Research Council (1993) Management Guidelines for the control of infectious disease hazards in health care establishments

National Health and Medical Research Council (1985) Code of Practice for the Disposal of Radioactive Wastes by the user

NHS Estates / Department of Health, London (1995) Health Facilities Notes Environmental Management in Health Care

NSW Health Department (1998) Waste Management Guidelines for Health Care Facilities

NSW Health Department (June 1995) Infection Control Policy

NSW Health Department Safety and Security for Health Care Facilities – Minimising the risks

NSW Health Department – Safety and Security A Checklist for Management Minimising the risks

Occupational Health & Safety (Hazardous Substances) Regulation 2001
Prince of Wales Hospital (1998) Radiation Safety Manual

The Prince of Wales Hospital Infection Control Manual

The Prince of Wales Hospital Occupational Health and Safety Policy Statement 2008

The Prince of Wales Hospital (July 1996) – Safe Handling of Cytotoxic Drugs and Related Waste, Information Package for Registered Nursing staff.

Sydney Water (1996) Trade Waste Policy and Management Plan

Waste Minimisation and Management Act 1995 and Regulations

Water Board (Corporatisation) Act 1994

Water Board (1994) Guidelines for the On-site Treatment of Trade Wastewater Dischargers

WMA NSW (1990) Office Paper Recycle It

WorkCover NSW (2008) Cytotoxic Drugs and Related Waste Guide (risk management).

WorkCover NSW (1995) Guidelines for Handling Cytotoxic Drugs and Related Waste in Health Care Establishments, 2nd Edition

WorkCover NSW (1995) Handling Cytotoxic Drugs in Health Care Establishments – Training Competencies, 1st Edition

# Construction Noise and Vibration Management Plan

*Acoustic Logic*

Appendix C

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# Prince of Wales, NCCC and AATC - Stage Two

# Construction Noise and Vibration Management Plan

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**TABLE OF CONTENTS**

# 1 EXECUTIVE SUMMARY

The Management Plan outlines the development of controls and safeguards that would be applied to all activity on the NCCC and AATC site during the demolition, excavation and construction phases. The objective of these controls is to ensure that all work is carried out in a highly controlled and predictable manner that will minimise emissions and protect the amenity of the sensitive receivers surrounding the site including the residential and commercial development to the north of the site, and the Our Lady of Sacred Heart School further to the north of the site. All other receivers of construction noise and vibration are located internally within the Prince of Wales Hospital.

Further reviews would be undertaken through the demolition, excavation and construction period, as required, in response to revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts. This management plan outlines the procedures that would be adopted by the contractor during the detailed demolition, excavation and construction planning and execution phases.

# 2 INTRODUCTION

This document presents the demolition and construction noise and vibration plan that will be used to manage noise and vibration from the demolition of the existing structures, excavation of footings and construction of new structures.

# 3 PROJECT DESCRIPTION

## 3.1 GENERAL

The NCCC and AATC comprises Stage Two of the construction after the completion Stage One radiotherapy bunkers. Stage Two works involve the demolition of the existing Radiation Oncology building, and construction of the new NCCC and AATC facility within the existing building footprint. The new building will retain existing physical and service linkages with the Prince of Wales Hospital, Royal Hospital for Women and Sydney Children's Hospital, via links at Level 1 and 2.

## 3.2 THE SITE AND POTENTIALLY MOST IMPACTED RECEIVERS

The proposed NCCC & AATC Project is located within the Randwick Hospital precent on corner of High Street and Avoca Street. Stage 2 of the NCCC & AATC is constructed on the site of the site of the existing Institute of Oncology Treatment wing to the west of the Stage One development.

The expected activities can be expected to include:

1. Partial demolition of existing buildings.
2. Removal of infill material.
3. Excavation of soft sand stone.
4. Construction of the proposed development NCCC & AATC for Stage 2.

The Stage 2 building comprises nine levels divided into the following tenancies:

- Four additional levels of NCCC & AATC;
- Two levels of AATC development; and
- Three base building shell floors for future expansion.

The nearest potentially affected receivers of construction noise and vibration are as follows:

- Residential receivers to the north of the site;
- Commercial receivers to the north of the site; and
- Our Lady of Sacred Heart School located approximately 150m to the north.

Figure 1 below details the proposed site location as well as the potentially affected surrounding receivers within the vicinity of the site.

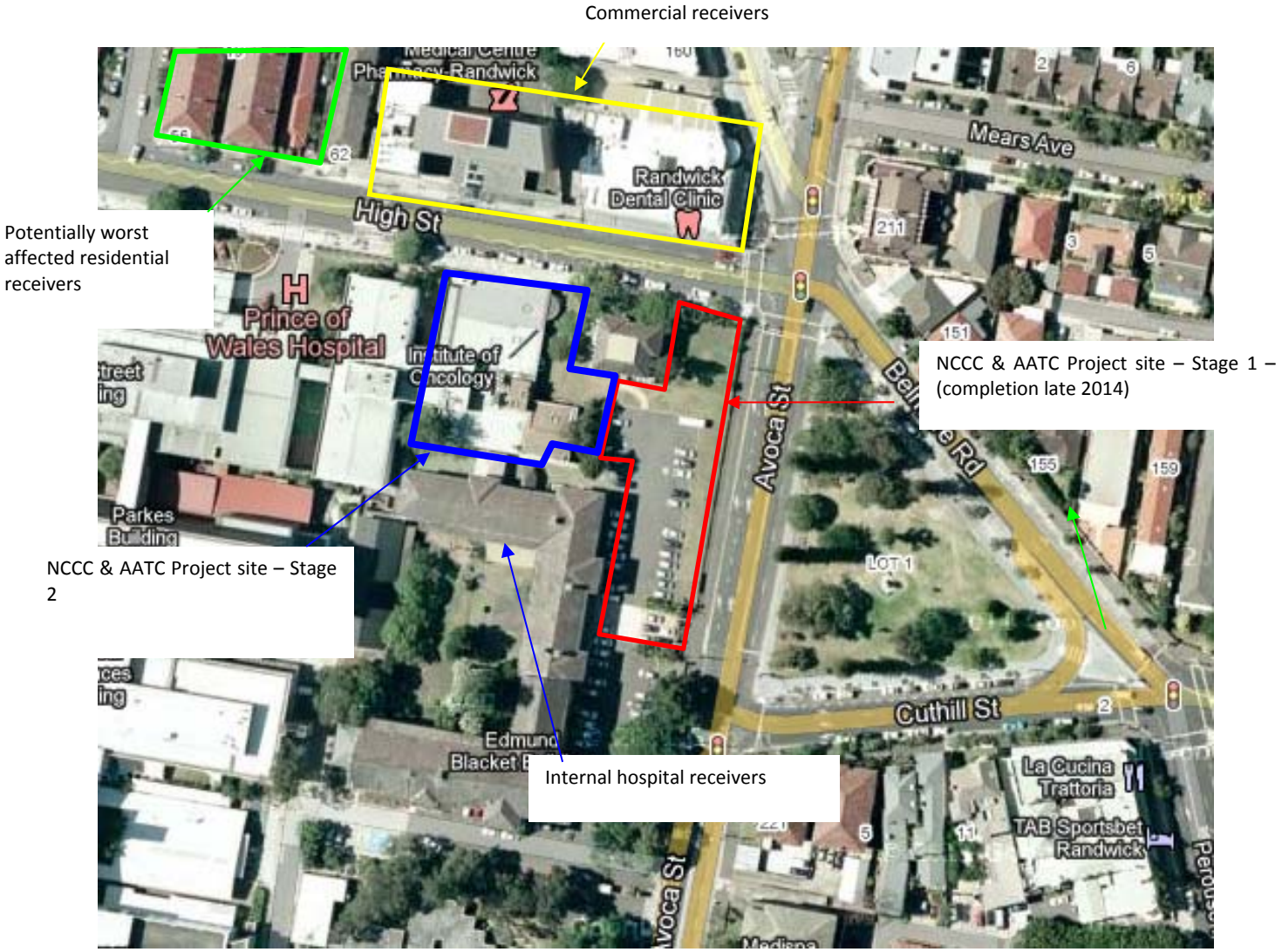



**Figure 1 – Site Location and Surrounding Receivers**

# 4 HOURS OF WORK

The proposed hours of work are:

- Monday to Friday 7am to 5pm.
- Saturdays 8am to 5pm.
- No work on Sundays or public holidays.

The reasons for the proposed construction hours are:

- The proposed construction hours are based on precedence set within condition D1 of the Stage One consent (SSD-5036-2011).

- The construction of Stage One has been undertaken within these hours without compliant from surrounding occupancies or residences.

- Adopting the proposed hours will allow for efficient construction on Saturdays and the entire construction timetable will be expedited which will benefit the surrounding community. Not only will the surrounding residential and commercial areas be without any construction noise and vibration impact sooner, but future patients of the NCCC and AATC will have access to these facilities earlier when work is undertaken during the proposed hours.

# 5 CONSTRUCTION NOISE AND VIBRATION GOALS

## 5.1 NOISE

The applicable guidelines and standards are:

- EPA Interim Construction Noise Guideline. This guideline nominates a methodology for assessing and managing construction noise (and vibration) impacts.

  A quantitative assessment is undertaken involving the prediction of likely noise levels from activities at sensitive receivers, and these noise levels are compared to noise "goals". This process identifies the processes causing emissions that may exceed the goals, so that feasible and reasonable management of those processes can be assessed and implemented to these processes.

- Australian Standard 2436-2010 "Guide to Noise Control on Construction Maintenance and Demolition Sites".

  AS 2436 states that care shall be taken in applying criteria that normally would be used to regulate noise emitted from industrial, commercial and residential premises to construction, particularly for those activities which are transitory and of short duration. The principles of AS2436 are as follows:

  - A reasonable suitable noise criterion is established;
  - All practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes on parts of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours.
  - The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the building site.

AS 2436 and the EPA largely adopt the same broad objectives, except that the EPA Guideline is more detailed in its recommendations. Based on these the following procedure will be used to assess noise emissions:

- Develop noise management levels for sensitive receivers around the site to broadly achieve EPA guidelines and objectives.

- Assess noise levels produced by construction activities at the sensitive receivers.

- If noise levels exceed EPA "Noise Affected" Management Level (NAML) (rating background noise level + 10 dB(A) for residential receivers) investigate and implement all reasonable and feasible techniques to limit noise emissions.

- If noise levels exceed EPA "Highly Noise Affected" Management Level (HNAML) (75dB(A) for residential receivers) after applying all practical engineering controls to limit noise emissions investigate time management and other techniques to further mitigate noise emissions.

Noise monitoring has been conducted on site during the Stage One construction between December 2012 and October 2013 (11 months). The background noise level for the daytime period has been determined based on days without construction activities included in the data (RDOs,

etc) Measurements were conducted using an ARL Precision Noise Logger. The equipment was calibrated at the beginning and end of the measurements using a Norsonic 1252 calibrator; no significant drift was detected. Measurements were taken on A-weighted fast response mode.

Noise emissions from the site during these proposed hours of construction will be assessed to comply with the BG + 10dB criterion.

Background noise levels at residential receivers are as follows:

**Table 1 – External Noise Objectives**

| Time | Measured Daytime (7am – 5pm) Background Noise Level dB(A) $L_{90(15minutes)}$ | Noise Goal dB(A) $L_{10\ (15minutes)}$ |
|---|---|---|
| 7am to 5pm | 48 | BG +10 = 58 |

As per the EPA Interim Construction Noise Guideline, the external noise management level for commercial / retail outlets should be 70 dB(A) $L_{eq}$ externally. The internal noise level within the Our Lady of Sacred Heart School should be 45dB(A) $L_{eq}$.

## 5.2 VIBRATION

It is proposed to adopt the following vibration guidelines, namely:

- German Standard DIN 4150-3 (1999-02): *"Structural Vibration – Effects of Vibration on Structures"* – which will be used to assess and limit building damage risk.

- EPA Interim Construction Noise Guideline – which contains guidelines to assess and limit impacts on building occupant's amenity based on the "Assessing Vibration: A Technical Guide".

The criteria and the application of this standard are discussed in separate sections below.

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 2.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

**Table 2 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration**

| TYPE OF STRUCTURE | | PEAK PARTICLE VELOCITY ($mms^{-1}$) | | | |
|---|---|---|---|---|---|
| | | At Foundation at a Frequency of | | | Plane of Floor of Uppermost Storey |
| | | < 10Hz | 10Hz to 50Hz | 50Hz to 100Hz | All Frequencies |
| 1 | Buildings used in commercial purposes, industrial buildings and buildings of similar design | 20 | 20 to 40 | 40 to 50 | 40 |
| 2 | Dwellings and buildings of similar design and/or use | 5 | 5 to 15 | 15 to 20 | 15 |
| 3 | Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order) | 3 | 3 to 8 | 8 to 10 | 8 |

### 5.2.1 Assessing Amenity - EPA NSW "Assessing Vibration: A Technical Guideline"

EPA NSW "Assessing Vibration: A Technical Guideline" (Feb 2006) is based on the guidelines contained in BS 6472:1992. This guideline provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings.

The recommendations of this guideline should be adopted to assess and manage vibration from the site. Where vibration exceeds, or is likely to exceed, the recommended levels then an assessment of reasonable and feasible methods for the management of vibration should be undertaken.

**Table 3 – EPA Recommended Vibration Criteria**

| | | RMS acceleration ($m/s^2$) | | RMS velocity (mm/s) | | Peak velocity (mm/s) | |
|---|---|---|---|---|---|---|---|
| Place | Time | Preferred | Maximum | Preferred | Maximum | Preferred | Maximum |
| Continuous Vibration | | | | | | | |
| Residences | Daytime | 0.01 | 0.02 | 0.2 | 0.4 | 0.28 | 0.56 |
| Offices | | 0.02 | 0.04 | 0.4 | 0.8 | 0.56 | 1.1 |
| Workshops | | 0.04 | 0.08 | 0.8 | 1.6 | 1.1 | 2.2 |
| Impulsive Vibration | | | | | | | |
| Residences | Daytime | 0.3 | 0.6 | 6.0 | 12.0 | 8.6 | 17.0 |
| Offices | | 0.64 | 1.28 | 13.0 | 26.0 | 18.0 | 36.0 |
| Workshops | | 0.64 | 1.28 | 13.0 | 26.0 | 18.0 | 36.0 |

# 6 ASSESSMENT OF POTENTIAL NOISE EMISSIONS

## 6.1 INTRODUCTION AND INTENT

The purpose of the assessment of noise emissions is to highlight those activities that have the potential to exceed the NAML, so that management of those activities can be assessed in accordance with the ICNG. **The noise levels presented in the assessment are worst case noise levels without any management that may be possible (eg physical controls, time scheduling, selection of alternative process, etc that are proposed as part of this management plan).**

It is noted that this is a preliminary construction noise and vibration management plan and a full analysis will be conducted once construction processes become more defined and a contractor with construction methodology is engaged.

## 6.2 NOISE SOURCE LEVELS

The A-weighted sound power levels for typical equipment/processes anticipated to be used during these works are outlined in Table 1 below.

**Table 2 - Sound Power Levels**

| EQUIPMENT /PROCESS | SOUND POWER LEVEL dB(A)** |
|---|---|
| Excavator/ Bulldozer | 114 |
| Concrete crusher | 114 |
| Bobcat | 105 |
| Hydraulic Hammer on 5t Excavator | 123* |
| Rock/Masonry Saw on Excavator | 110 |
| Piling Rig | 114 |
| Rock Anchor Drill Rig | 110 |
| Pneumatic Hammer | 115* |
| Concrete Pump | 105 |
| Concrete Truck | 110 |
| Truck | 108 |
| Angle grinders | 118* |
| Electric Saw | 116* |
| Drilling | 94 |
| Site Crane | 105 |
| Impact drill | 105 |
| Remediation Plant | 115 |
| Concrete Float/Vibrators | 105 |

* - includes 5 dB(A) addition for characteristics of noise source.

** - The noise levels presented in the above table are derived from on-site measurements, Table A1 of Australian Standard 2436-2010 and data held by this office from other similar studies.

## 6.3 POTENTIALLY AFFECTED RECEIVERS

A survey of potentially affected sensitive commercial and residential receivers has been conducted and the following locations have been identified:

- Residential receivers to the northwest on High St (approximately 50m);
- Commercial receivers to the north of the site (approximately 25m); and
- Our Lady of Sacred Heart School (approximately 150m).

## 6.4 PREDICTED NOISE LEVELS

Noise levels have been predicted at various locations representing the range of potentially affected receivers around the site.

The predicted noise levels assume that the activity will be occurring continuously. As plant items will generally be spread around the site, and the plant will not operate continuously for the entire day, the upper limit noise levels indicated in the tables would generally only be reached for limited periods and represent the absolute worst case.

The predictions take into account the nominated sound power levels, corrected for distance losses, air absorption, screening (where applicable) façade loss (where internal levels are calculated.

Noise impacts on nearby development will be dependent on the activity and where on the site the activity is undertaken. Excavation works tend to be the loudest typical activity. Work close to the northern boundaries will have greatest impacts on surrounding residential residents.

The potentially worst case activities are identified and discussed below:

- Excavation and Demolition phase – Primary noise emissions occur during excavation and demolition, with equipment items typically having sound power levels (SWL) of approximately 123dB(A)$L_{10(15min)}$. Excavators (dozers with bucket, saws or hammers) and piling works are typically the loudest activity during construction. Noise levels of between 60-75 dB(A) at the boundaries of residential & commercial receivers on High Street may be generated. Noise levels within the school are predicted to be less than 35dB(A) $L_{eq}$ (assuming windows open).

- During erection of structure, the use of hand tools (angle grinders, jack hammers etc.) and concrete pumps are the loudest typical activity (sound power levels of approximately 105dB(A)$L_{eq(15min)}$). Noise levels of between 55-70 dB(A) at the boundaries of residential & commercial receivers on High Street at the boundary of residential receiver may be generated.

- Once construction of the building shell is complete, noise from hand tools will be relatively low, as the new building construction will provide considerable noise attenuation for internal fitout. Once the building shell is largely complete, use of hand tools in internal areas is unlikely to be audible at the surrounding receivers.

- Noise levels generated by the construction activities will generally comply with the noise management levels at the boundaries of residential and commercial receivers. Some exceedances of the noise management level may occur as a result of hydraulic hammering

during the demolition and excavation phase. A secondary review of the construction management plan will be required to be provided once a building contractor is appointed as part of the construction approval process.

## 6.5 DISCUSSION

Predicted worst case noise levels at various potentially affected receivers are presented above.

Residential premises surrounding the site will receive noise levels marginally exceeding the noise management level. These are primarily as a result of excavator mounted hydraulic hammers. Other operations would generally comply with the noise affected management levels at all times at the residential receivers surrounding the site.

Specific treatments to items of plant will be developed in conjunction with the engaged contractor in an ongoing acoustic review of construction methodology. These reviews will be undertaken regularly and when more detailed planning regarding including possible actual plant locations, actual plant being used, etc are known.

The following potential site specific treatments are being proposed at this stage, however these will be updated as details about construction planning are available:

- During the undertaking of remediation soil treatment works on site, the treatment processes will typically be undertaken within enclosures (where practicable) which will aid in noise reduction.

- The utilisation of 2.4m high solid Class-A perimeter hoardings intermittently around the site will act as appropriate noise screens and barriers for lower level receivers.

- As the excavation reaches depths, the surrounding retention systems will act as barriers to noise generation equipment within the excavation.

- Where practicable, positioning major mobile temporary plant such as concrete crushers, concrete pumps, concrete trucks and the like as far as possible from sensitive receptors. The strategic positioning of these items can result in construction noise levels not exceeding the NAML around the site.

- Where feasible, begin morning site works at the southern boundary of the site furthest from the residential receivers and progressively advance towards the residential receivers throughout the day. In this way, noise emissions from the site will be least whilst residents are at home.

The noise and vibration assessment indicates that exceedances of the noise and vibration management goals would primarily be caused by excavator-mounted hydraulic hammer operations. Hence these activities should be managed as follows:

- Hammering should only be undertaken where non-percussive extraction method is not feasible or reasonable.

- Where hammering is undertaken it should be performed using the smallest equipment as is practical provides benefits in terms of the noise/time to complete balance. (In other

words a smaller hammer may be quieter but may result in significantly extended period of operation, leading to no overall benefit.)

## 6.6 RECOMMENDATIONS

Demolition and excavation activities are typically the loudest construction activities on site.

We note the following:

- While the demolition and excavation period may potentially generate higher noise levels than those recommended in Section 5, the period of the proposed works are relatively modest.
- The equipment to be used (excavator and bored piles) means the noise generated will be quieter than that often generated in excavation/typical piling.
- Given the nearest development is multistorey (and therefore will overlook the site) acoustic treatments such as noise screens will not be feasible.
- Substantial restrictions on times of use are likely to be of little benefit:
    - It would prolong the overall excavation/demolition period.
    - Respite periods are likely to be of relatively minimum benefit as this will provide little benefit to residential receivers during the day.
- In order to benefit the retail and commercial receivers to the north of the site which are closer in proximity than the residential receivers, it is recommended that a respite period of 12pm to 1pm be applied for use of the hydraulic hammer mounted on the excavator. This respite period will be of benefit to commercial and retail receivers during the lunchtime period.

# 7 ASSESSMENT OF VIBRATION

As the proposed piling method is bored piling, the only activity that has the potential to produce significant ground vibration would be the excavation of rock using hydraulic hammers. Due to the significant distance separation between the activities and most sensitive structures or occupancies and the nature of the works being undertaken, predictions indicate that the EPA recommended vibration levels will not be exceeded and additional mitigation methods will not be required.

Sensitive equipment to be located within Stage One will have operational and damage vibration limits more stringent than EPA guidelines and vibration monitoring should be conducted during the initial stages of demolition and construction to ensure these vibration limits are not exceeded.

## 7.1 IMPACT TO SURROUNDING PRINCE OF WALES HOSPITAL BUILDINGS

As part of the NCCC & AATC, Stage 2 project detailed communication and investigations into the surrounding operations of other hospital building will be conducted. Suitable noise and vibration management controls will be adopted as part of the construction of the project to ensure no structural, architectural or operation issues occur during the construction phase of the project.

The proposed acoustic criteria and resulting treatments and controls will be approved with the Prince of Wales Hospital prior to construction works commencing.

# 8 GENERAL MITIGATION METHODS THAT WOULD BE APPLIED TO MANAGE NOISE/VIBRATION EMISSIONS

The procedures that will be applied to regulate noise and vibration impacts are summarised in the following flow chart.

## 8.1 NOISE CONTROL METHODS

The determination of appropriate noise/vibration control measures will be dependent on the particular activities and demolition appliances. This section provides an outline of available methods.

### 8.1.1 Selection of Alternate Appliance or Process

Where a particular activity or demolition appliance is found to generate noise levels that exceed the criteria, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. By carrying out this activity by use of pneumatic hammers or pulverising techniques lower levels of noise will result.

### 8.1.2 Acoustic Barriers

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver.

The placement of barriers at the source is generally only effective for static plant (tower cranes). Placing barriers at the source cannot effectively attenuate equipment which is on the move or working in rough or undulating terrain.

Barriers can also be placed between the source and the receiver. The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15dB(A) can be effected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where the barrier does not obstruct line of sight, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 12mm plywood would be acceptable for the barriers.

### 8.1.3 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

### 8.1.4 Reversing Alarms

Subject to a review of safety and feasibility, alternatives to “beeping” reversing alarms can be investigated such as use of white noise alarms.

### 8.1.5 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

### 8.1.6 Treatment of Specific Equipment

In certain cases it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

### 8.1.7 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

### 8.1.8 Introduction of Construction Joints

Construction joints will prevent the direct transmission of vibration from work spaces to sensitive spaces. It is noted that transmission of vibration may still occur via other connections and less direct structural paths.

### 8.1.9 Strategic Positioning of Processes On-Site

Where practicable, particular processes of activities can be located in particular positions on site to minimise noise to surrounding sensitive receivers.

For example, stationary plant may be positioned where direct line of sight shielding can be achieved using natural barriers, or may maximise the distance to the nearest sensitive receiver. This may also be applicable to the demolition of building structures where the façade closest to residential receivers is left until last to provide barrier screening for the demolition of the other parts of the building.

### 8.1.10 Combination of Methods

In some cases it may be necessary that two or more control measures be implemented to minimise noise emissions.

### 8.1.11 Establishment of Direct Communication with Affected Parties

In order for any construction noise management programme to work effectively, continual communication is required between all parties that may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process that allows for the adjustment of control methods and criteria for the benefit of all parties.

The objectives of the consultation process are to:

- Inform and educate the groups about the project and the noise controls being implemented.
- Increase understanding of all acoustic issues related to the project and the options available.
- Identify group concerns generated by the project, so that they can be addressed.

### 8.1.12 Management Training

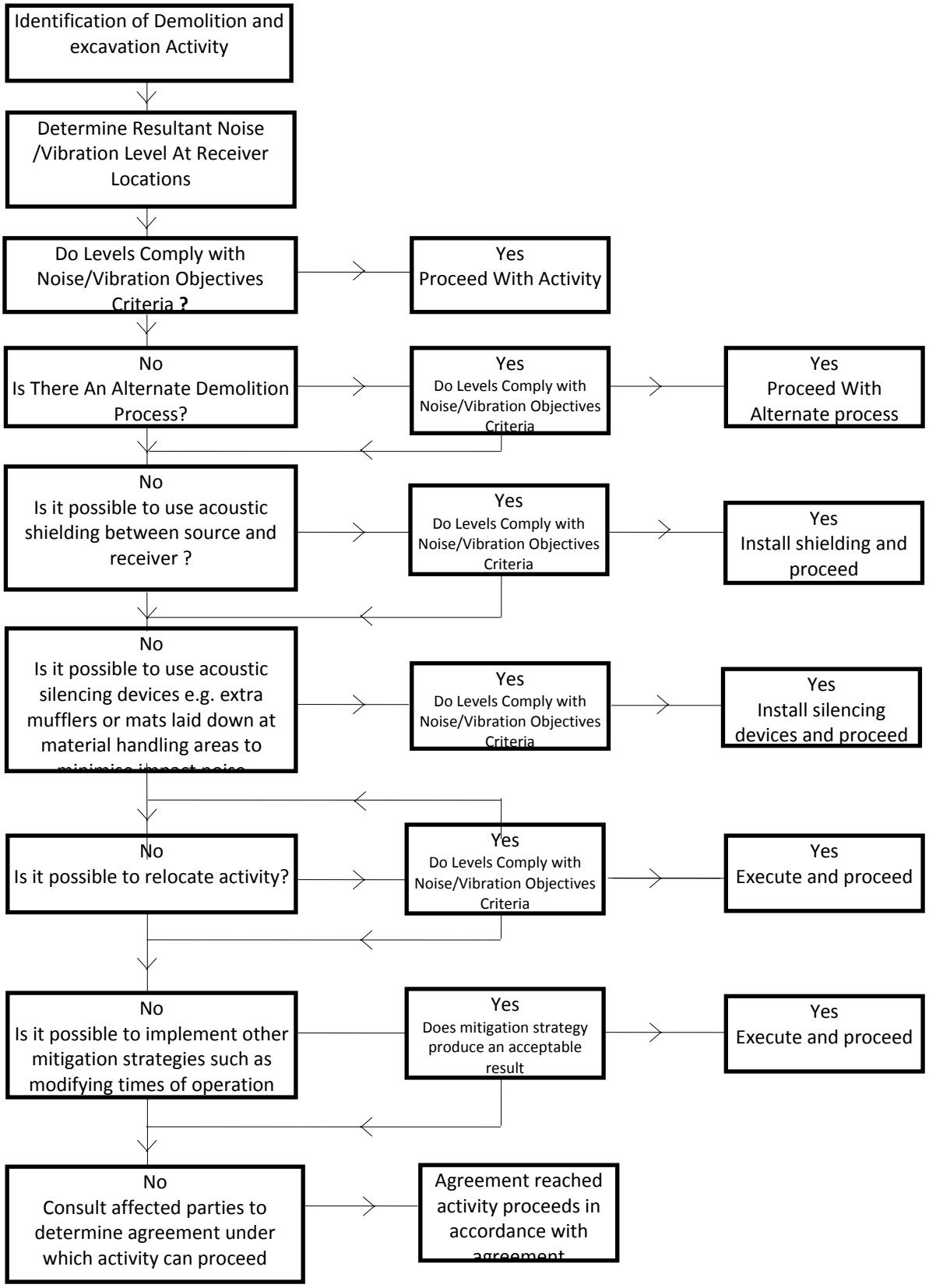
All site managers should be made aware of noise and vibration limits, applicable control measures and methods. They should ensure that all agreed noise and vibration measures are carried out by employees and sub-contractors.

## 8.2 NOISE AND VIBRATION MONITORING

Noise and vibration monitoring will be undertaken to determine the effectiveness of measures which are been implemented. The results of monitoring can be used to devise further control measures.

The positions of vibration monitors will be determined based on the location of sensitive equipment. It is envisaged that the linear accelerometers within Stage One will be required to be monitored during the initial stages of demolition and excavation.

**CONTROL OF NOISE FLOW CHART**



# 9 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

## 9.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation processes is to:

- Inform and educate the groups about the project and the noise controls being implemented;
- Increase understanding of all acoustic issues related to the project and options available;
- Identify group concerns generated by the project, so that they can be addressed; and
- Ensure that concerned individuals or groups are aware of and have access to the Complaints Register which will be used to address any construction noise related problems should they arise.

An additional step in this process is to produce a newsletter informing nearby residents of upcoming activities that are likely to generate higher noise/vibration levels.

## 9.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- noise measurements at the affected receiver;
- an investigation of the activities occurring at the time of the incident;
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

# 10 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process

2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.

3. Implement additional acoustic treatment in the form of localised barriers, silencers etc. where practical.

4. Selecting alternative equipment/processes where practical

5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise /vibration and dust generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

# 11 CONCLUSION

A demolition, excavation and construction noise and vibration management plan has been developed that will be used by the contractor to manage impacts from the Stage Two NCCC and AATC activities.

The assessment of noise and vibration emissions indicates that:

- For at least part of the site demolition and excavation period, some processes are likely to generate noise levels that will require additional management according to the procedures outlined in the Management Plan. Adoption of the elements of the Noise and Vibration Management Plan will ensure that noise and vibration impacts will be minimised.

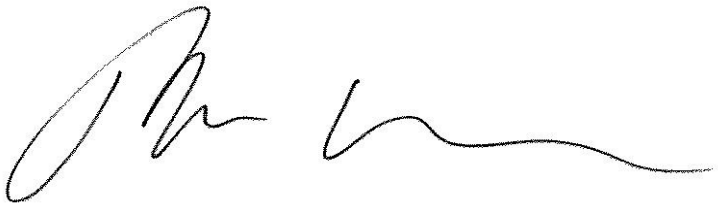
- Recommendations are made to safeguard existing structures and equipment immediately adjacent to the site.

The management plan outlines the development of controls and safeguards that would be applied to all activity on the site. The objective of these controls is to ensure that all work is carried out in a highly controlled and predictable manner that will minimise emissions and protect the amenity of the sensitive receivers surrounding the site.

The controls and safeguards implemented as a result of the analysis recommended in the Plan would be reviewed at a number of stages as required to respond revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts. This management plan outlines the procedures that would be adopted during the planning and execution phases by the contractor.

Further reviews would be undertaken through the demolition and construction period, as required, in response to revised methods and equipment, as well as in response to the monitoring and evaluation of actual impacts.

Prepared by



ACOUSTIC LOGIC CONSULTANCY PTY LIMITED
Tom Aubusson

# Operational Noise Emissions

*Acoustic Logic*

Appendix D

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MATTHEW PALAVIDIS
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BEN WHITE

20120199.6/1501A/R0/TA

15/01/2014

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Email: accounts@hinfra.health.nsw.gov.au

**ATTN: AMANDA BOCK**

# Prince of Wales, NCCC & AATC Stage Two - Operational Noise Emissions

## 1 INTRODUCTION

This letter has been prepared in response to the NSW EPA letter with reference SSD 13_6180. Comments raised by the EPA in relation to operational noise emissions are as follows:

1. *Offer evidence that existing background noise or ambient noise levels were measured at receiver locations (per the "long term" method outlined in the Industrial Noise Policy) in the vicinity of the project.*

2. *Derive project specific noise levels in accordance with the NSW Industrial Noise Policy; and*

3. *Make any quantitative predictions of operational noise impacts on sensitive receivers.*

The only potential operational noise impact associated with Stage Two of the NCCC and AATC is noise emissions associated with the operation of mechanical and hydraulic plant. Potential noise emissions from these sources are addressed in this report.

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# 2 OPERATIONAL NOISE EMISSIONS

## 2.1 BACKGROUND NOISE LEVELS

Ambient noise monitoring was conducted on site on the roof of the existing radiation oncology building within the Prince of Wales Hospital. The monitor was placed on site between December 2012 and October 2013 (11 months). Two weeks of this data is presented in Appendix One. Noise monitoring was conducted using an Acoustic Research Laboratories Pty Ltd 315 noise logger. The noise monitor has been programmed to store 15-minute statistical noise levels throughout the monitoring period. All measurements were taken on A-weighted fast response mode.

The background noise levels for the EPA day, evening and night period have been determined from this data. It is noted that in the determination of the daytime background noise level, only days without construction activities have been assessed (RDOs, site holiday shutdown, etc).

These background noise levels are presented in Table 1.

**Table 1 – Measured Background Noise Levels dB(A) $L_{90}$**

| Time | Measured Background Noise Levels dB(A) $L_{90}$ |
|---|---|
| Day (7am to 6pm) | 48 |
| Evening (6pm to 10pm) | 48 |
| Night (10pm to 7am) | 42 |

## 2.2 NOISE EMISSION CRITERIA

The Environmental Protection Authority (EPA) Industrial Noise Policy provides guidelines for assessing noise impacts from development sites. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The EPA's Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion. In addition, the EPA in its Environmental Noise Control Manual states that noise controls should be applied with the general intent to protect residences from sleep arousal.

## 2.3 EPA INTRUSIVENESS CRITERION

The EPA guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the $L_{eq}$ descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Based on the background noise monitoring conducted on site and the EPA intrusiveness criterion, the following noise emission goals have been formulated:

**Table 2 – EPA INP Intrusiveness Criterion dB(A) $L_{eq\ (15\ min)}$**

| Type of Receiver | Time of day | Measured Background Noise Level dB(A) $L_{90}$ | Recommended Acceptable Noise Level dB(A) $L_{eq\ (15\ min)}$ |
|---|---|---|---|
| Residential | Day | 48 | 53 |
| | Evening | 48 | 53 |
| | Night | 42 | 47 |

## 2.4 EPA AMENITY CRITERION

The EPA guideline is intended to limit the absolute noise level from all industrial noise sources to a level that is consistent with the general environment.

The EPA's Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table 6 of the INP provides the recommended ambient noise levels for the suburban residential receivers for the day, evening and night periods.

**Table 3 – EPA INP Amenity Criterion dB(A) $L_{eq\ (period)}$**

| Type of Receiver | Time of day | Recommended Acceptable Noise Level dB(A) $L_{eq\ (period)}$ |
|---|---|---|
| Residential (Suburban) | Day (7am to 6pm) | 55 |
| | Evening (6pm to 10pm) | 45 |
| | Night (10pm to 7am) | 40 |
| Commercial | When in Use | 65 |

## 2.5 MECHANICAL AND HYDRAULIC PLANT TREATMENTS

As mechanical/hydraulic plant selections have not been conducted at this time, a detailed acoustic assessment of noise impact cannot be conducted. A detailed mechanical noise assessment will be conducted once plant selections and services drawings have been finalised as part of the construction documentation to ensure noise levels comply with the criteria detailed in this report.

Plant items will include:

- Ventilation fans and air handling plant units.
- Cooling tower plant.
- Cooling plant.
- Generating plant
- Pumps
- Emergency and standby plant
- Air distribution systems.

Noise and vibration emissions from these sources can be reduced to below the receiver noise criteria using a combination of the following noise control methods:

- Selection of quietest available plant.
- Load matching using speed controllers.
- Enclosing the plant in plant rooms or sound rated proprietary enclosures.
- Addition of acoustic treatment such as lined ducting, duct silencers, acoustic louvres, etc.
- Limit velocities in air distribution systems and terminal units.
- Providing appropriate anti-vibration mounts to vibrating equipment, and to piping attached to that equipment.

### 2.5.1 Chillers / Air Handling Units

Units can be located on roof tops with an acoustic screen or in basement areas, with acoustic treatment to intake and exhaust as necessary. These units would predominantly operate during the day, with the potential to operate with extended hours. Acoustic treatment to these units may be required to ameliorate noise impact to the surrounding residents and to comply with the criteria specified in this report and verified at CC stage.

### 2.5.2 Supply / Exhaust fans

Supply and exhaust fans may be located within the underground plant rooms or in rooftop plant areas. These units typically emit high noise levels and require acoustic treatment such as silencers and internal lined ductwork. Silencer requirements would be determined once fan selections have been completed at CC stage.

### 2.5.3 Condenser Units

Condensing units typically emit relatively low noise levels and with careful selection, it is possible that no further acoustic treatment would be necessary.

### 2.5.4 Minor Plant

Other minor plant items, such as bathroom or kitchen exhaust fans, will be required. These items typically emit relatively low noise levels and may require minimal acoustic treatment of a standard nature, such as internally lining of ductwork.

# 3 CONCLUSION

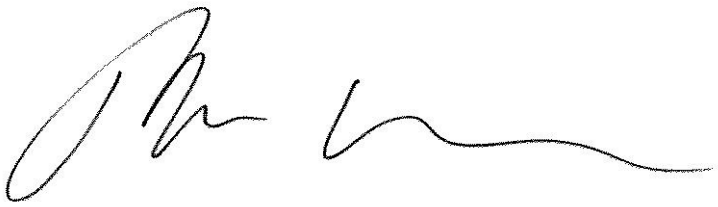
This report has been prepared to address comments raised by the EPA with respect to operational noise emissions from Stage Two of the NCCC and AATC.

This report has:

- Provided the results of the long term monitoring conducted on site;
- Provided project specific noise emission criteria; and
- Provided comment on the operational noise emissions from Stage Two.

We trust this information is satisfactory. Please contact us should you have any further queries.

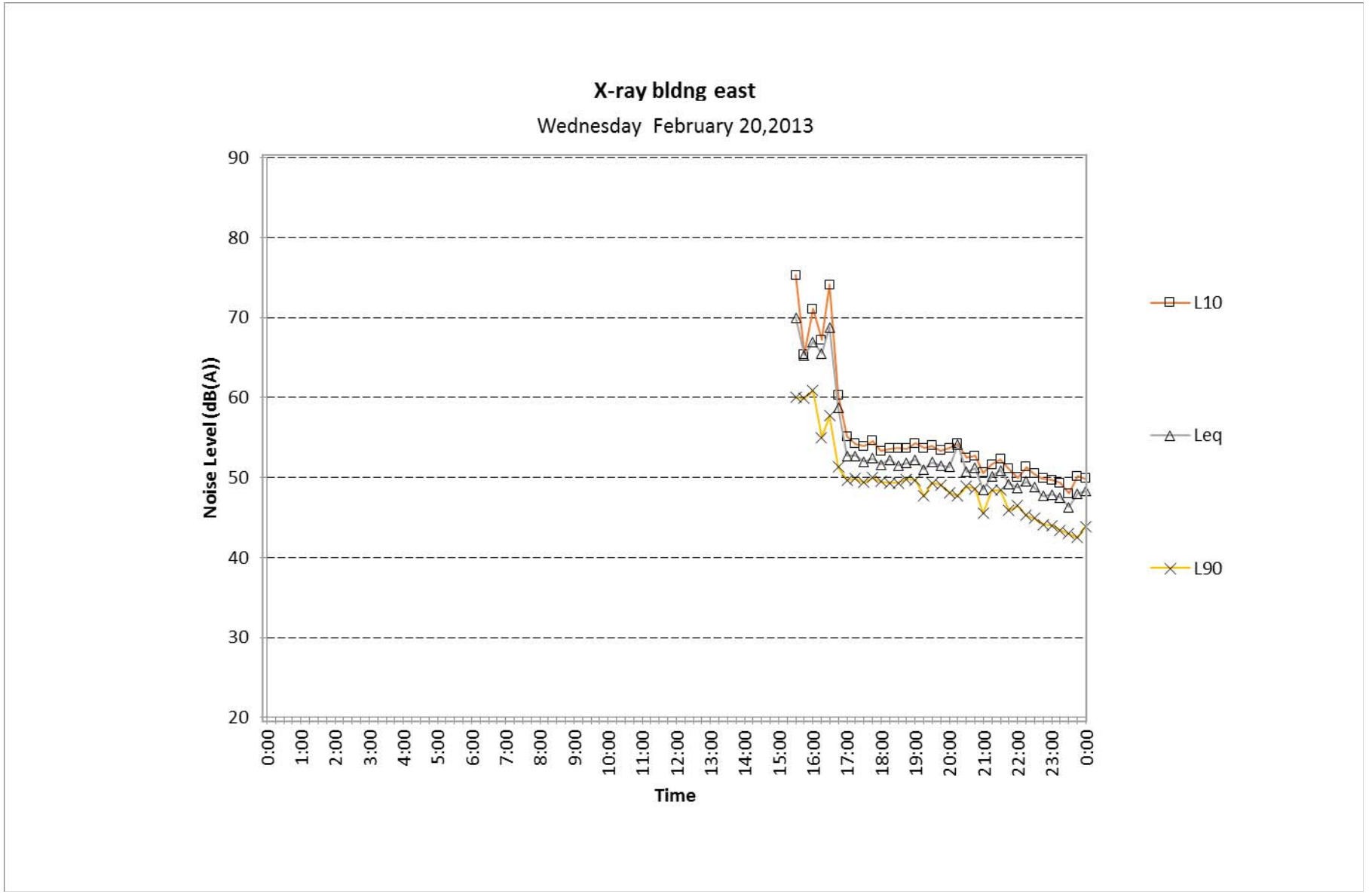
Yours faithfully,



Acoustic Logic Consultancy Pty Ltd
Thomas Aubusson

# APPENDIX ONE

# BACKGROUND NOISE MONITORING


X-ray bldng east
Wednesday February 20,2013
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
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9:00
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11:00
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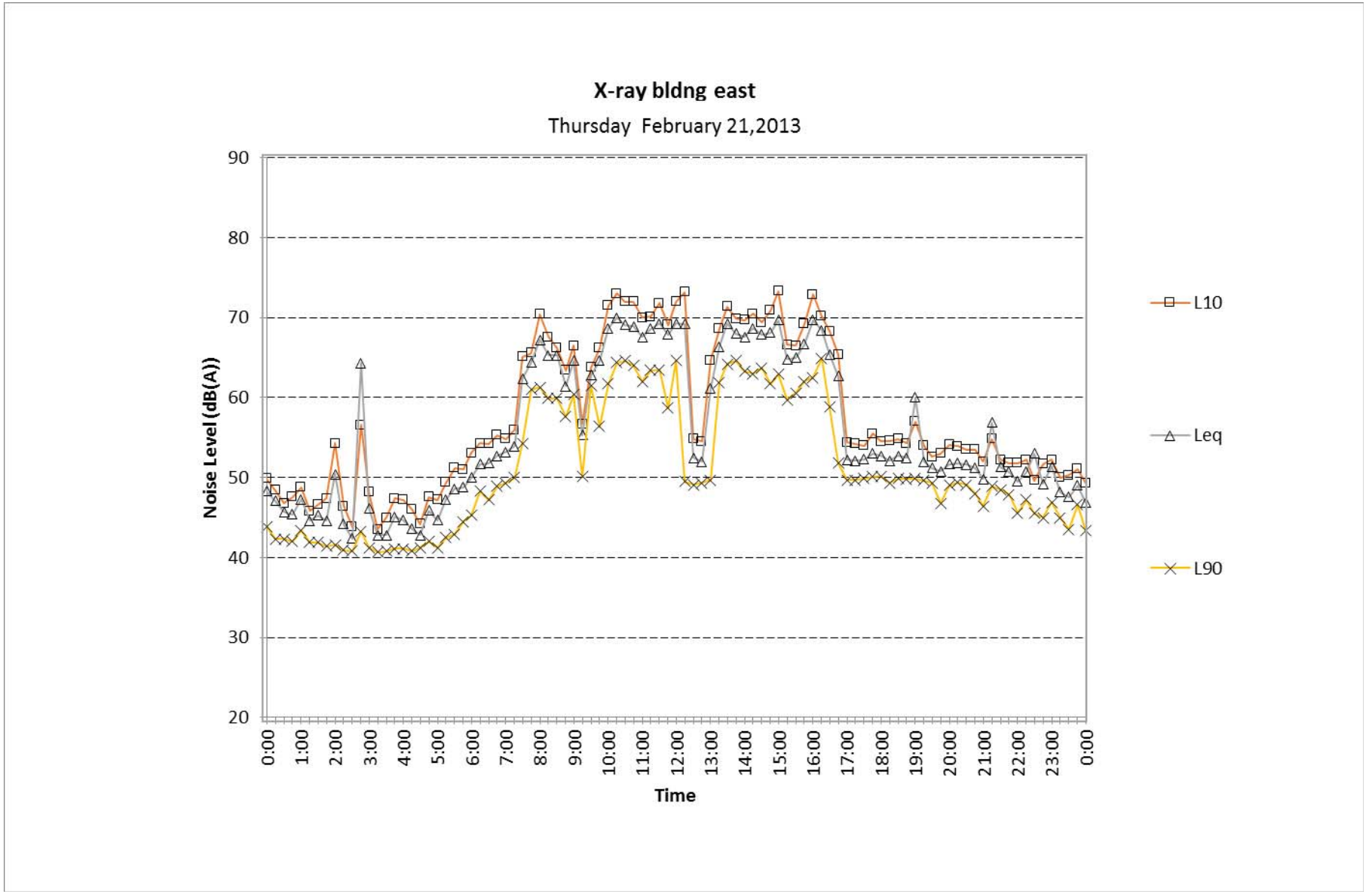
X-ray bldng east
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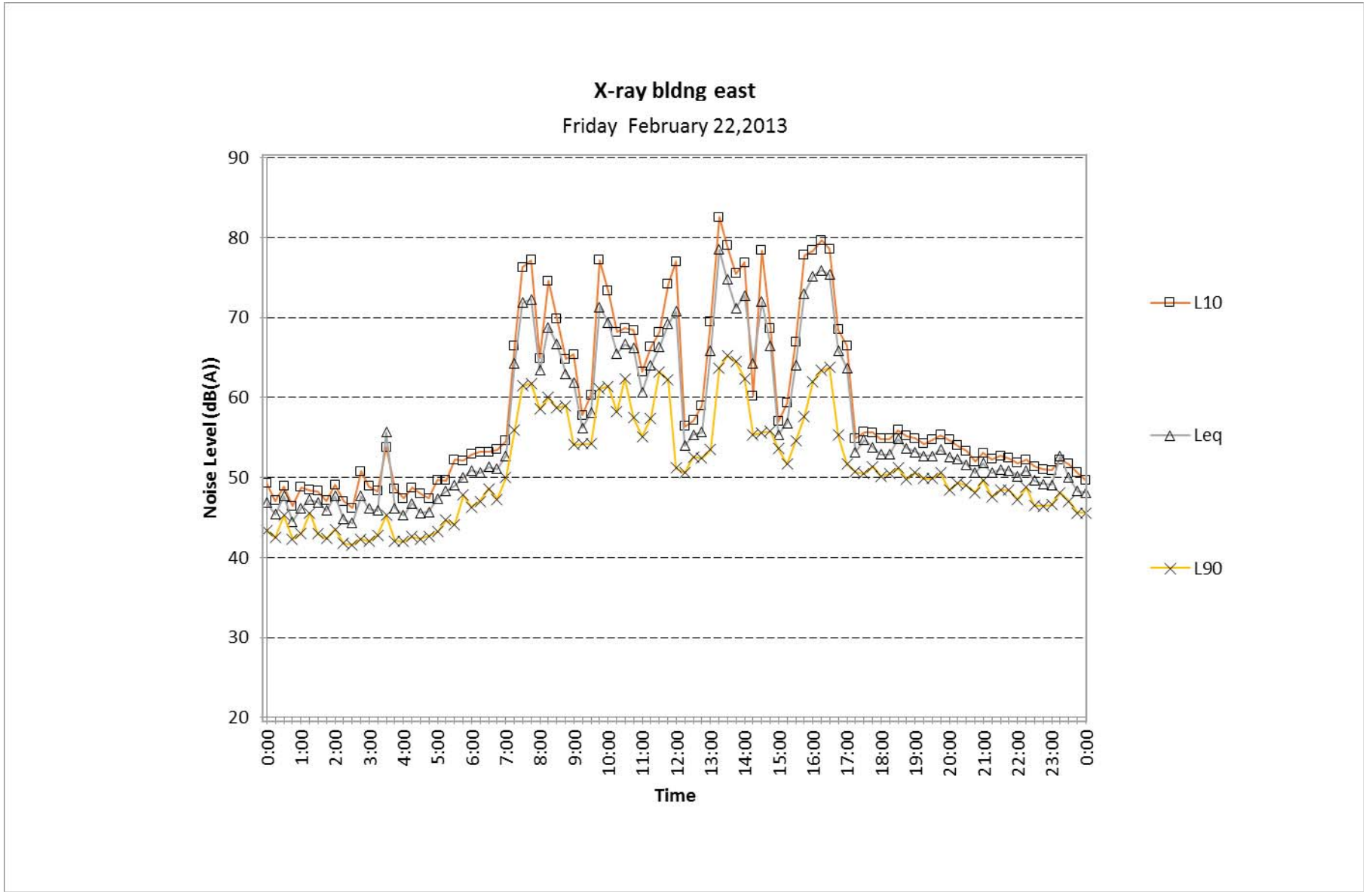
X-ray bldng east
Friday February 22,2013
Noise Level (dB(A))
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80
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2:00
3:00
4:00
5:00
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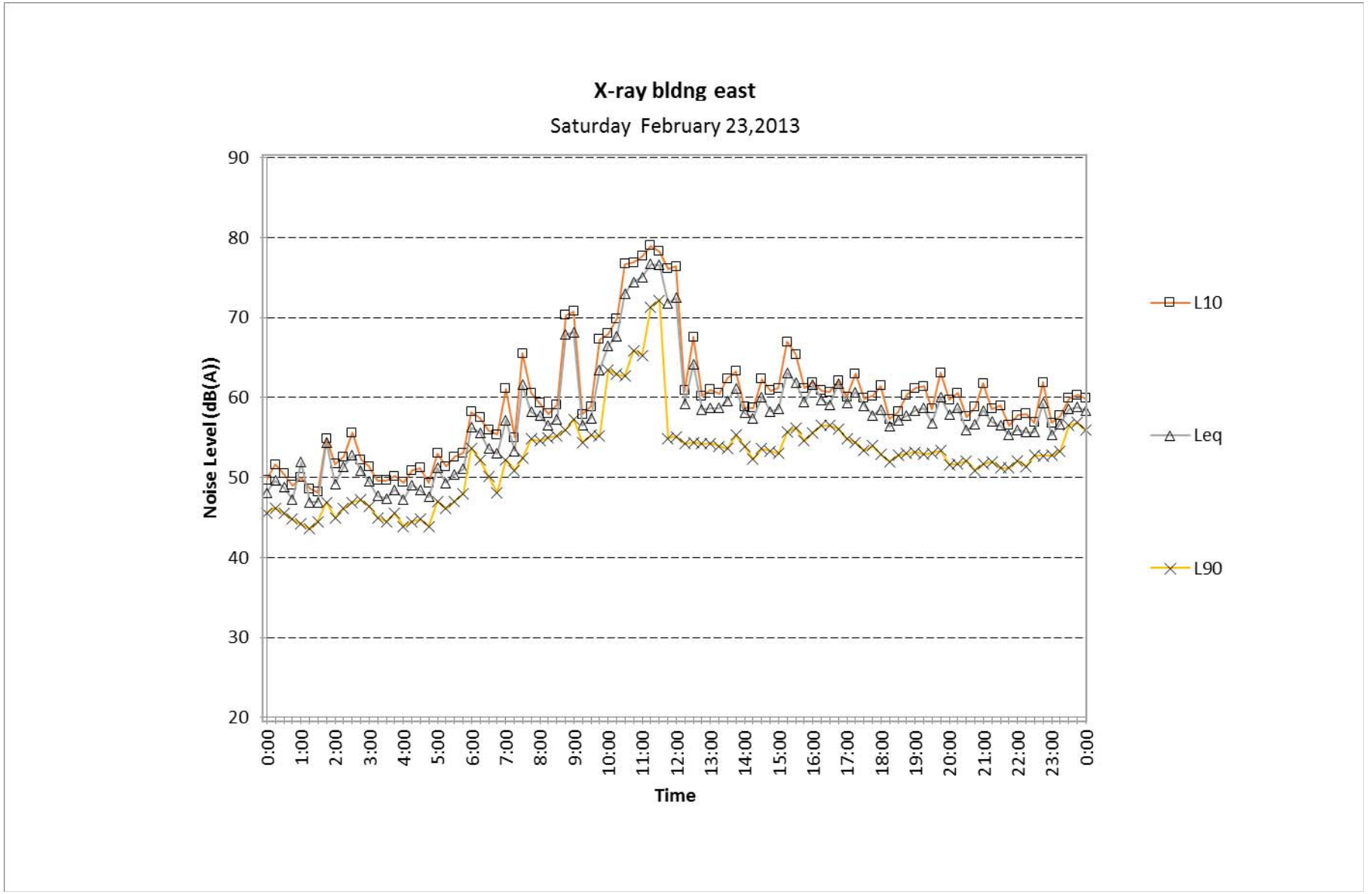
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Noise Level (dB(A))
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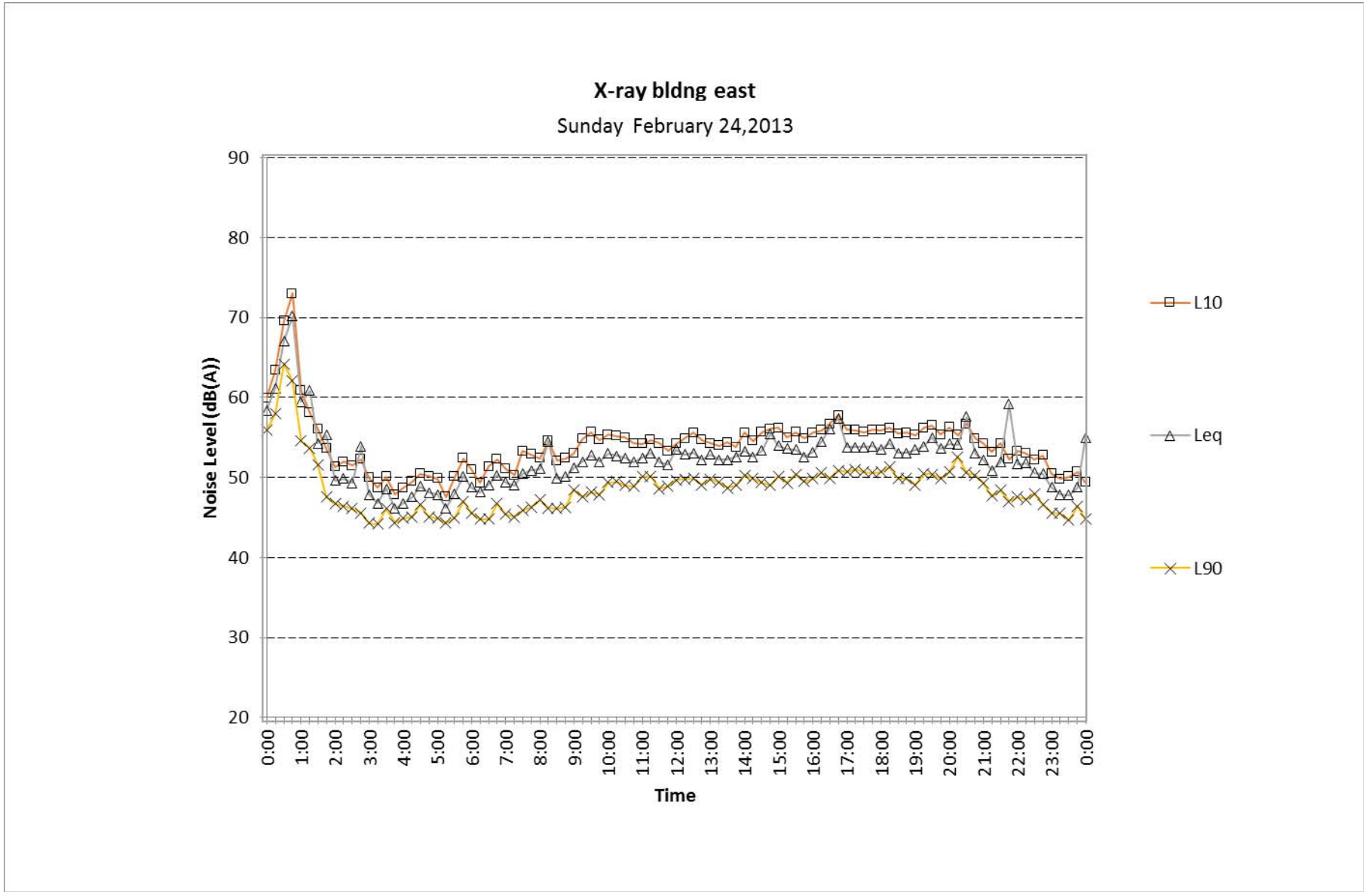
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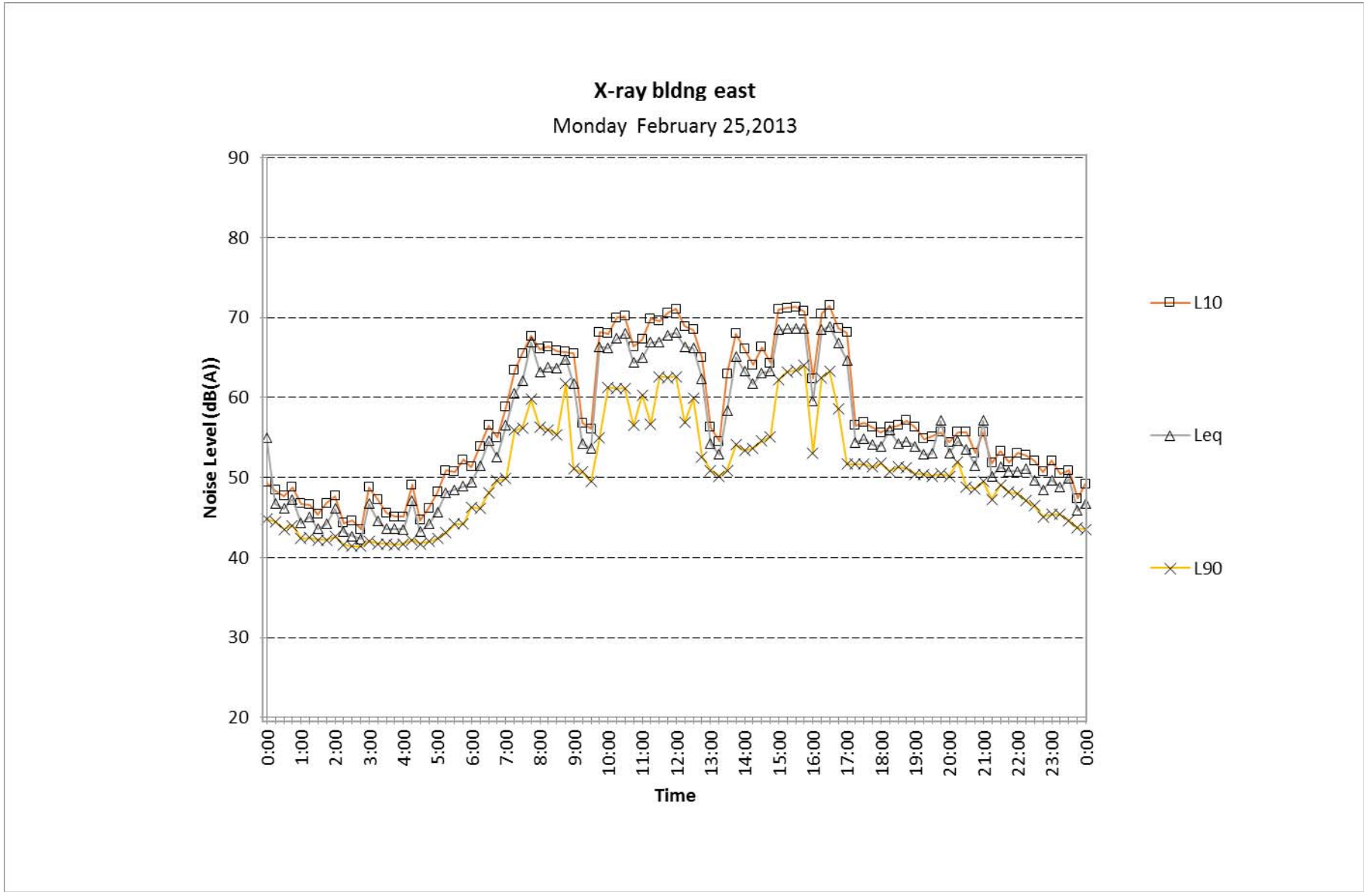
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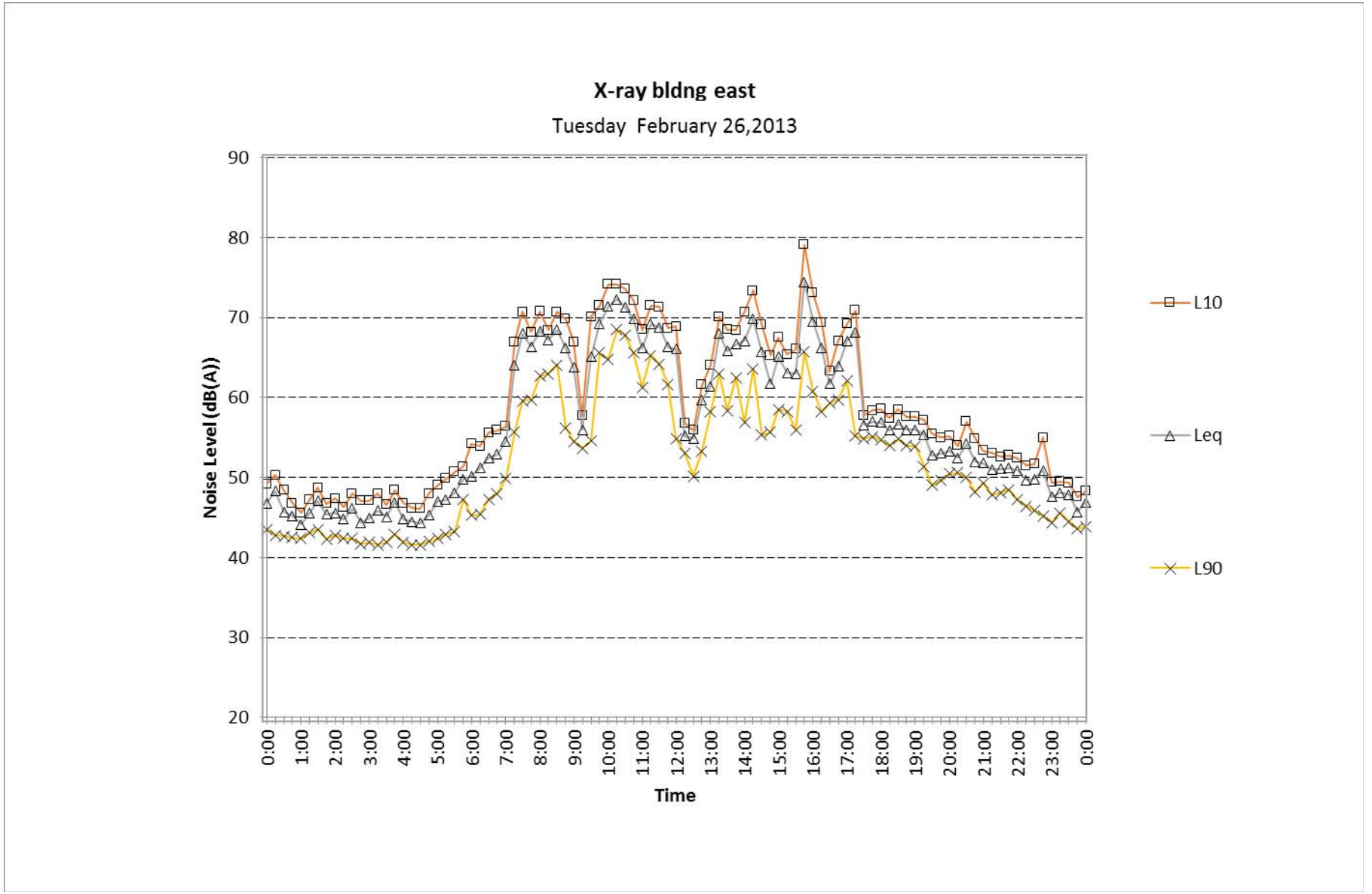
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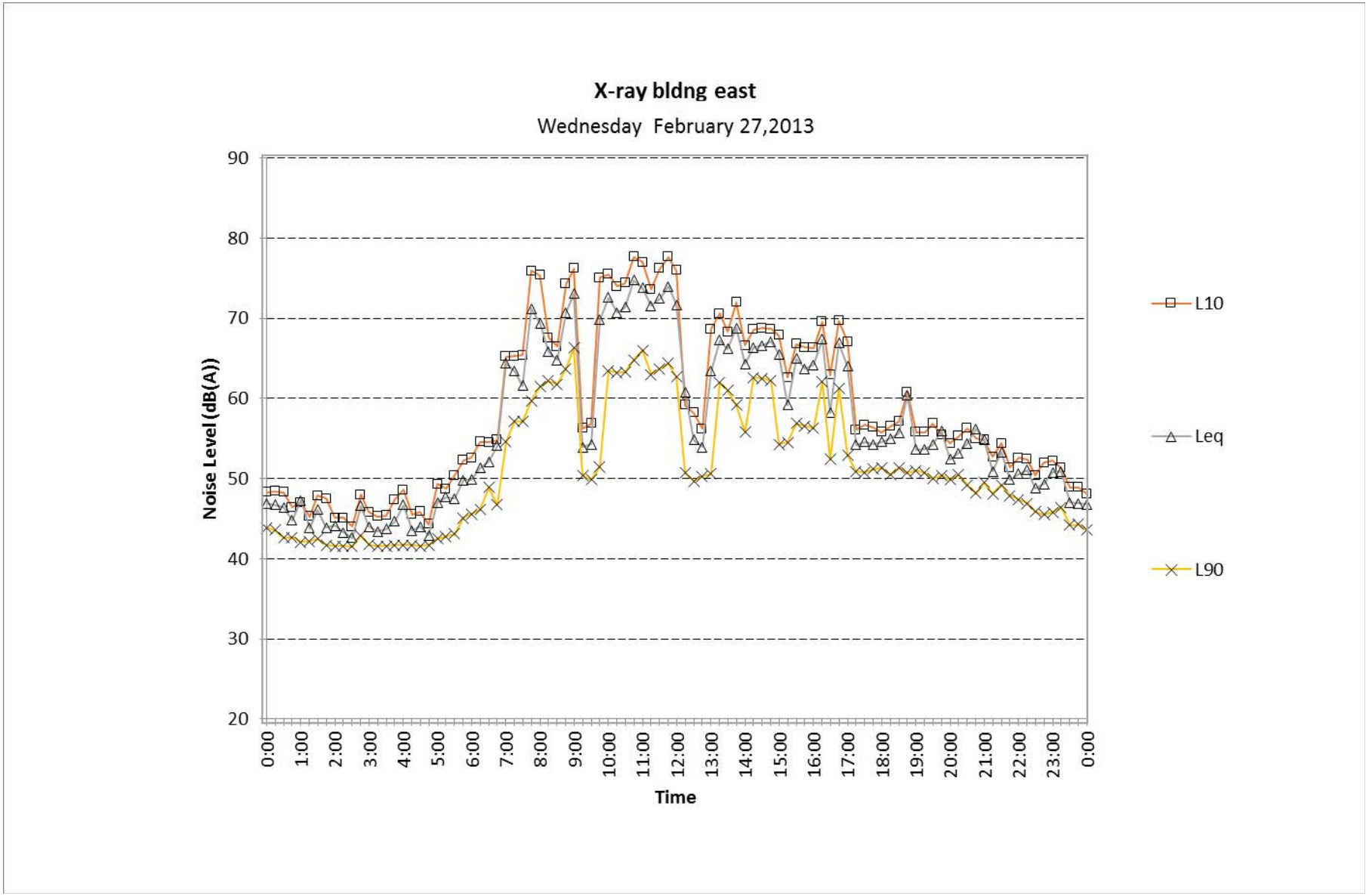
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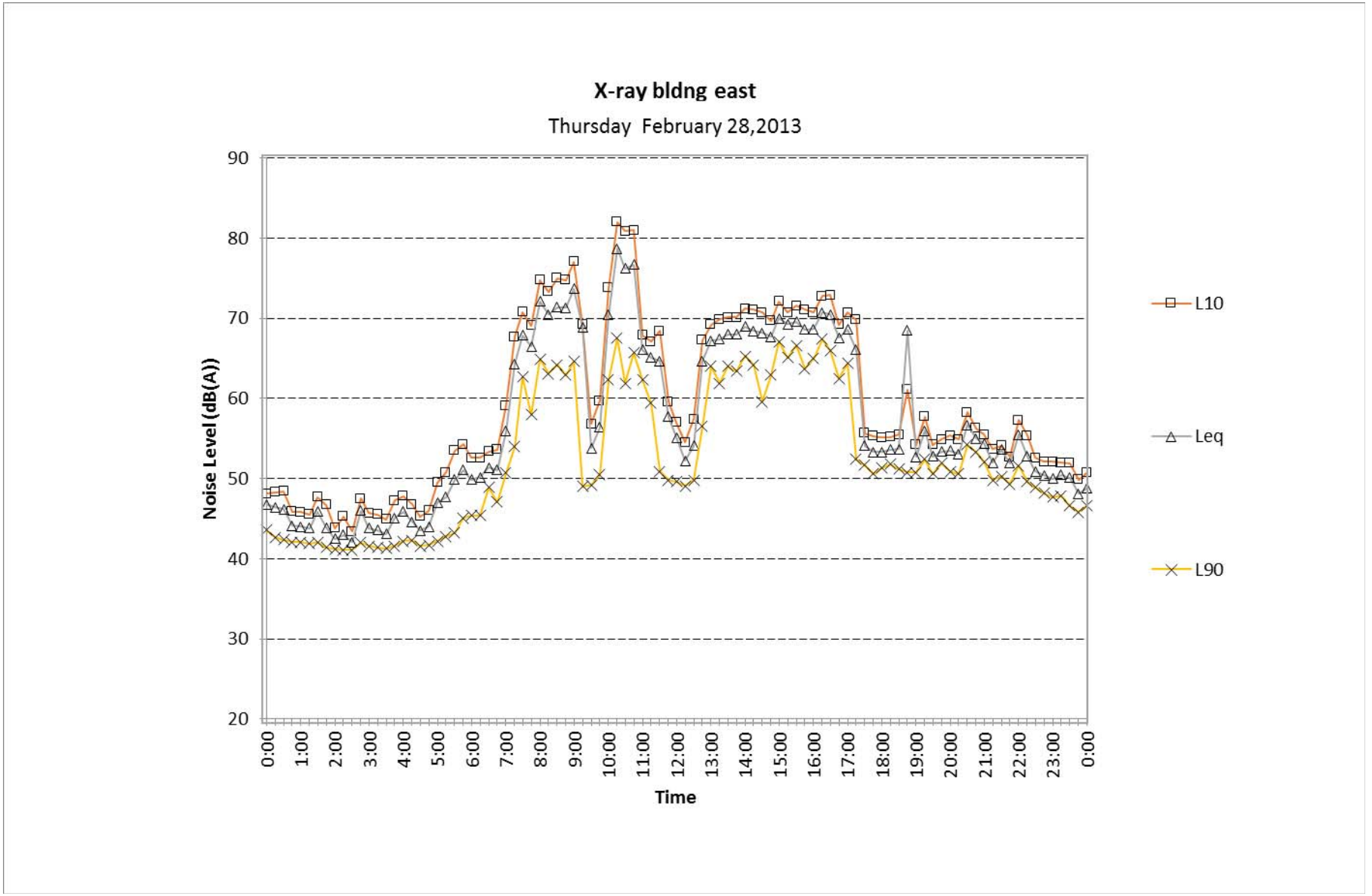
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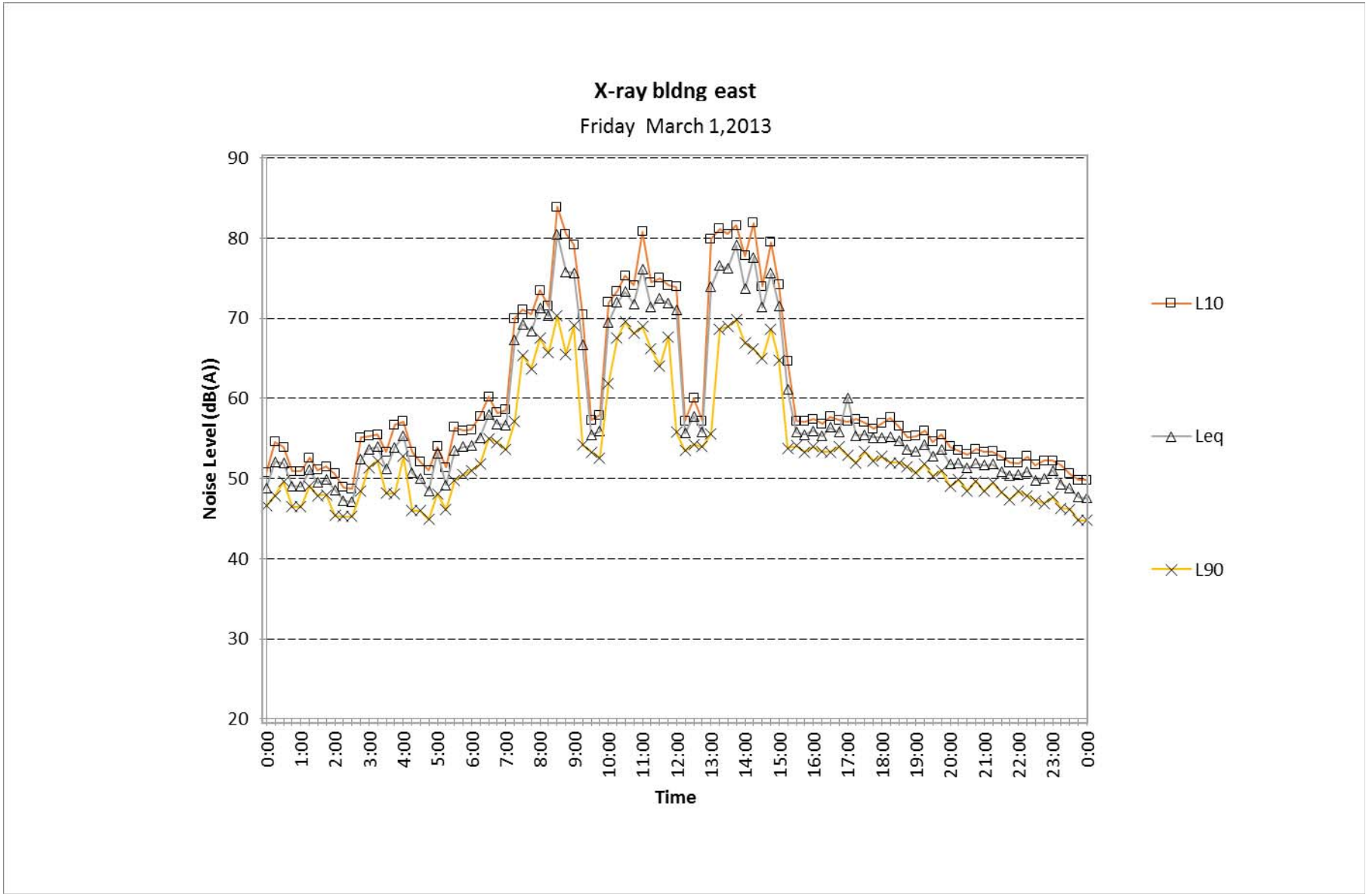
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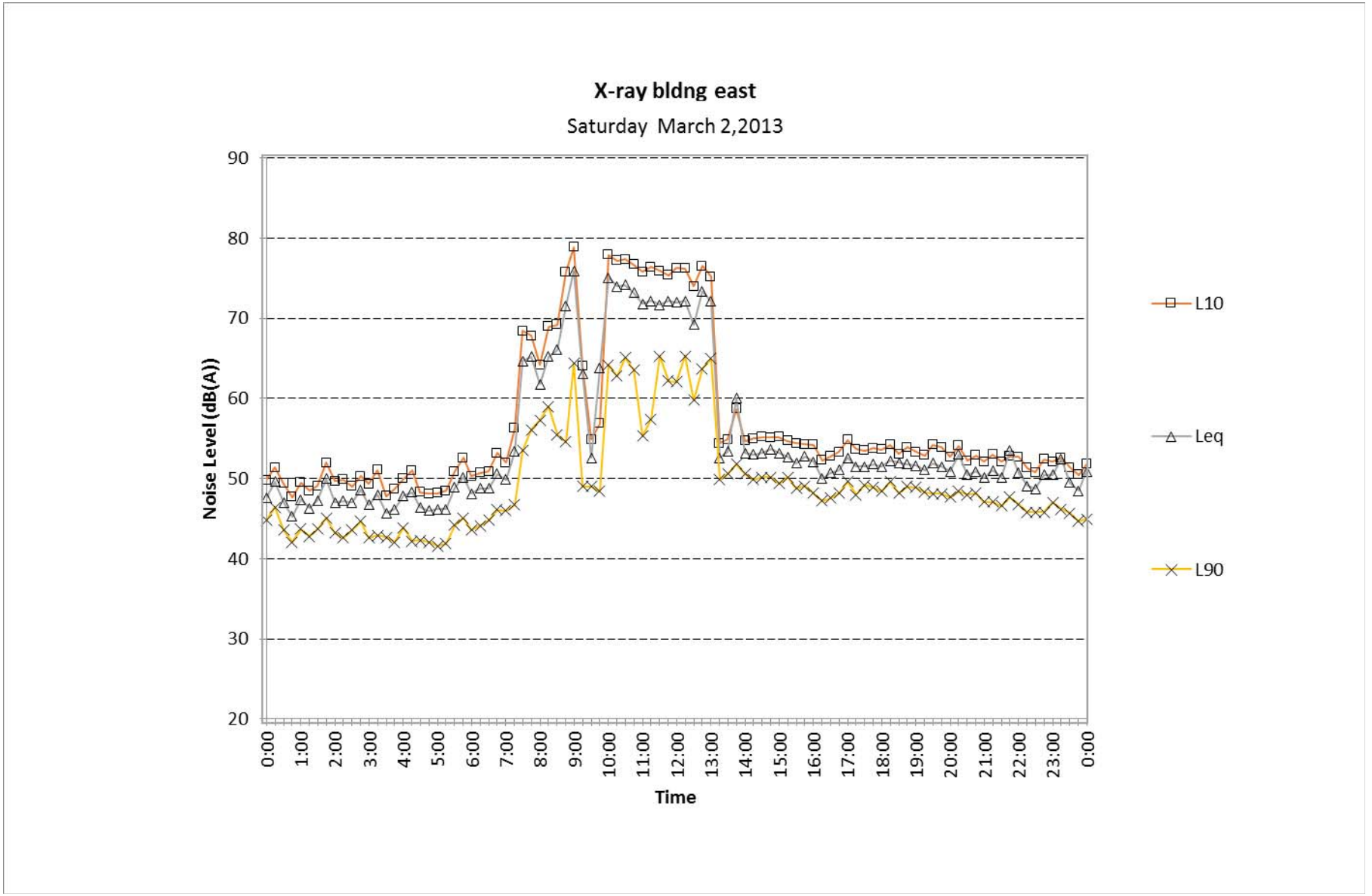
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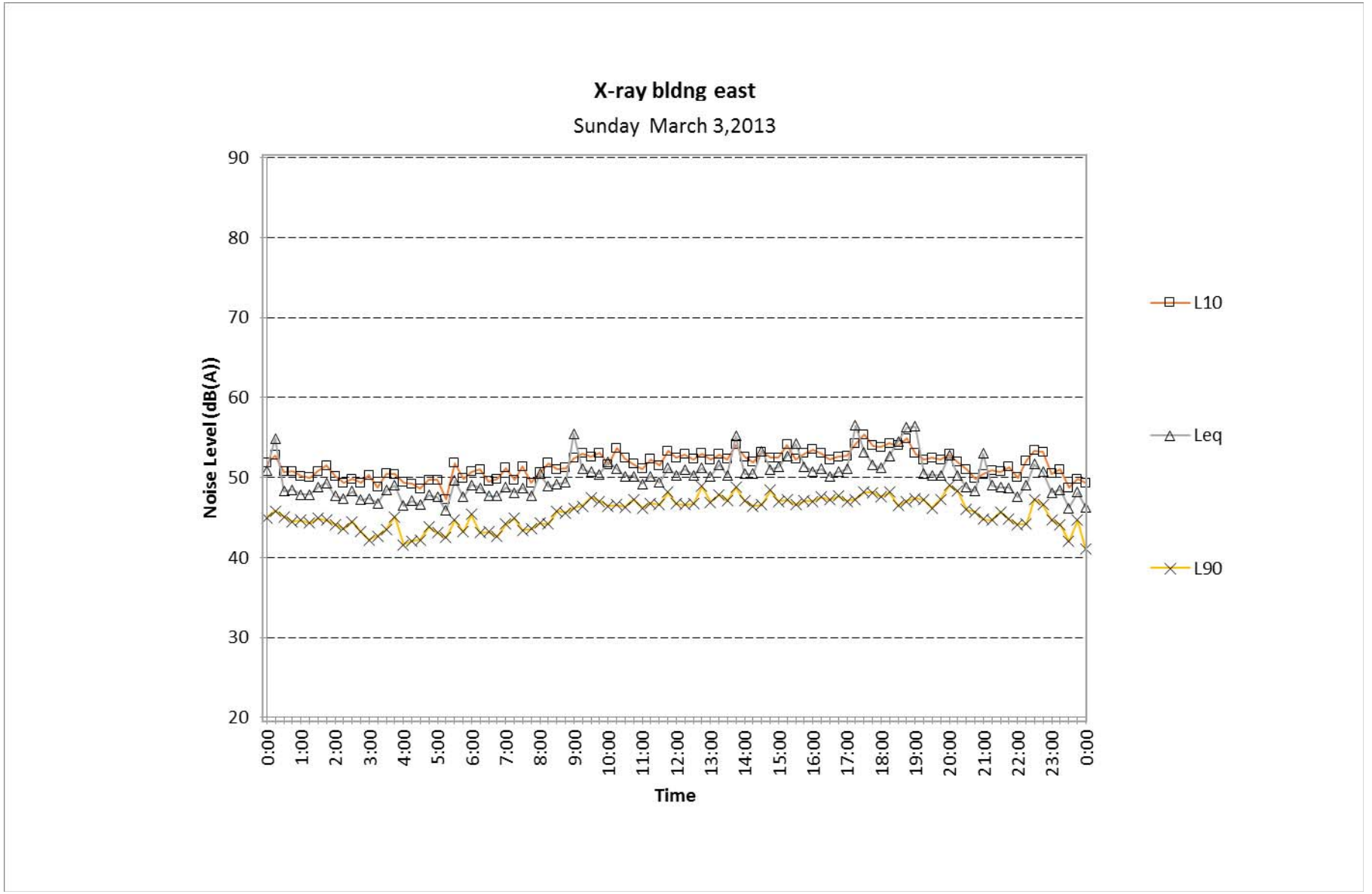
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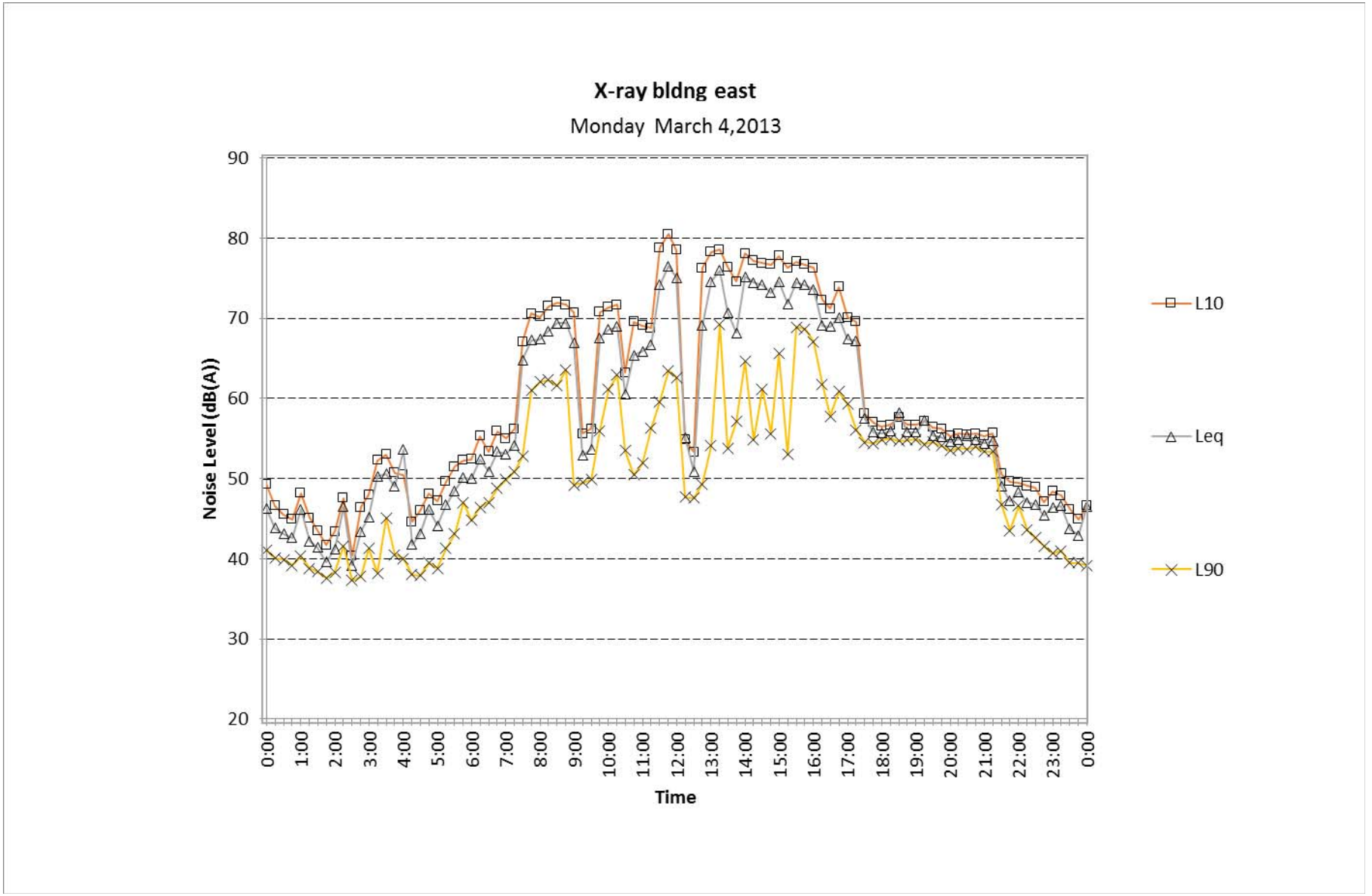
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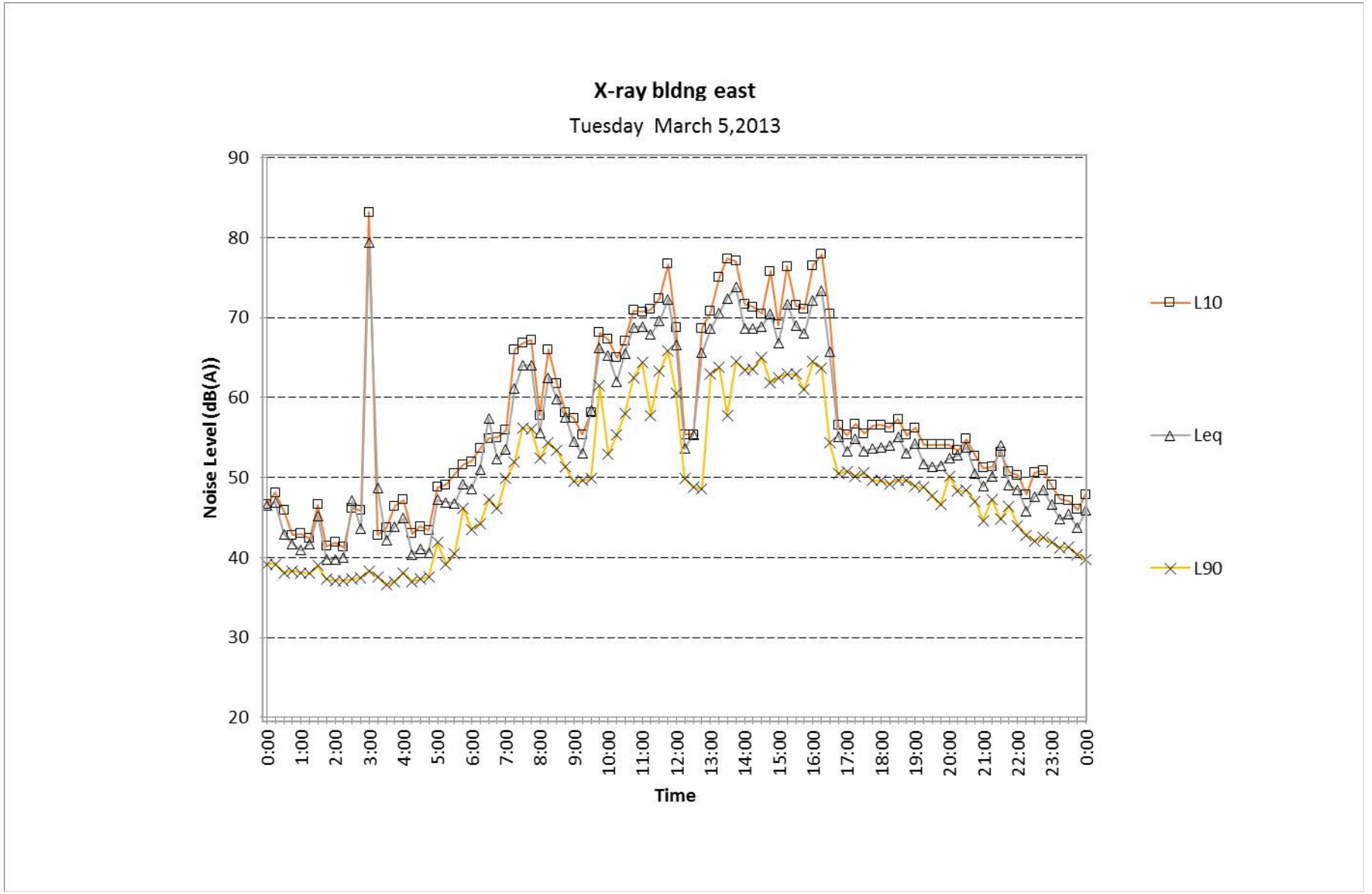
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# Radiation Management Licence

*NSW EPA*

Appendix E

Radiation Control Act 1990

# Radiation Management Licence

17/12/2013

Contact: Mr Brent Rogers
South Eastern Sydney Local Health District
Prince of Wales Hospital
Barker Street
RANDWICK NSW 2031

## LICENCE DETAILS

| | | | |
|---|---|---|---|
| Licence Number: | **RML42850** | Type: | **Radiation Management Licence** |
| Class: | **General Management Simple** | Expiry date: | **01 February 2015** |
| Amount paid: | | Receipt number(s): | |

Subject to the renewal of the licence before the expiry date and to any condition(s) endorsed hereunder, South Eastern Sydney Local Health District is hereby licensed under the Radiation Control Act, 1990 by the Environment Protection Authority.

The regulated material(s) listed in the attached schedule are included in this licence. The conditions of this licence are attached. Separate to the requirements of this licence, general obligations of licensees are set out in the Radiation Control Act ("the Act"), the Regulations made under the Act and any Codes of Practice referred to therein.

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA. The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

The licensee is responsible for the renewal of this licence before the expiry date and for ensuring that the mailing address is current. Penalties apply for using or selling regulated material without holding a current and appropriate licence.

This licence will remain in force until it expires or is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

**The Manager Hazardous Materials, Chemicals and Radiation**

**Management Licence Conditions**

1. **General**
   1.1. These conditions apply in addition to the obligations that a person responsible for regulated material has under the Act and Regulation
   1.2. The licensee commits an offence and may be subject to penalties if the licensee fails to comply with these conditions
   1.3. The licensee must notify the Authority within 14 days in writing of any change of the following information:
      1.3.1. the registered office address of the licensee
      1.3.2. the contact person for licence inquiries delegated by the licensee
      1.3.3. the site contact person nominated by the licensee (where applicable)
   1.4. All notifications required by these conditions must be sent to:
   The Manager
   Hazardous Materials, Chemicals and Radiation Section
   NSW Environment Protection Authority
   Department of Premier and Cabinet
   PO Box A290
   SYDNEY SOUTH NSW 1232
   Or a PDF file may be sent to radiation@epa.nsw.gov.au
2. **Safety information – radioactive substances**
   2.1. The licensee must ensure that a notice is displayed near to the radiation warning sign at the entrance to the premises (room, store, laboratory) where radioactive substances are kept or used that includes the following information:
      2.1.1. the licensee's name,
      2.1.2. the licence number,
      2.1.3. the name and telephone number of the licensee's contact in the event of an emergency affecting the premises, and
      2.1.4. the emergency service and telephone number to call in the event of an emergency affecting the premises.
   2.2. The licensee must ensure that a summary of procedures relating to the safe use of a radioactive source is displayed at the premises where the regulated material is kept.
   2.3. The licensee must ensure that detailed procedures to be followed in the event of a radiation accident are kept at the premises
3. **Compliance certification – general**
   3.1. The licensee must ensure that any ionising radiation apparatus (used or intended to be used for any medical, veterinary or dental diagnostic purpose) and sealed source devices which are fixed radiation gauges, referred to in Conditions 4 and 5 of the Management Licence Conditions remain under an unbroken state of compliance certification during the transition from the requirements of the Radiation Control Regulation 2003 to the Radiation Control Regulation 2013.
4. **Compliance certification – diagnostic imaging apparatus**
   4.1. The licensee must ensure that diagnostic imaging apparatus of the type listed in Column 1 of Table 1 for which the licensee is responsible, is certified by a consulting radiation expert accredited by the Authority as complying with the requirements for registration in Schedule 1 of the corresponding Part of Radiation Guideline 6 - Registration requirements & industry best practice for ionising radiation apparatus used in diagnostic imaging, NSW EPA March 2004 (listed in Column 2), as published by the Authority from time to time:
      4.1.1. before the apparatus is used, or
      4.1.2. within two years of the anniversary of initial compliance certification - for mammography apparatus, fluoroscopy apparatus, computed tomography apparatus, and for apparatus that may be used for both fluoroscopy and radiography, or
      4.1.3. within five years of initial certification - for dental radiography apparatus, radiography apparatus, and bone mineral density apparatus, or
      4.1.4. if modifications have been made that affect the compliance of the apparatus with the requirements of Schedule 1 of the relevant Guideline, or
      4.1.5. if the apparatus has been relocated and reassembled, or
      4.1.6. where the purpose for which the apparatus is used has changed, or
      4.1.7. in addition, in the case of mammography apparatus, an annual certificate is required in relation to mean glandular dose requirements or following any service or modification that may affect patient dose.

| Table 1 | |
|---|---|
| Column 1 | Column 2 |
| Apparatus for mammography | The requirements specified in Schedule 1, Part 1 Mammography |
| Apparatus for fluoroscopy or radiography | The requirements specified in Schedule 1, Part 2 Fluoroscopy and radiography |
| Apparatus for dental diagnostic purposes | The requirements specified in Schedule 1, Part 3 Dentistry (including maxillofacial) |
| Apparatus for veterinary | The requirements specified in Schedule 1, Part 4 Veterinary science |

| | |
|---|---|
| purposes | |
| Apparatus for computed tomography or bone mineral densitometry | The requirements specified in Schedule 1, Part 5, Computed tomography and bone mineral densitometry |

4.2. If a consulting radiation expert certifies that radiation apparatus generally complies with mandatory requirements, but has specified that minor repairs are necessary so that the requirements of Schedule 1 of the relevant Part of Guideline 6 are met, the licensee must:

4.2.1. ensure that these repairs are carried out within the timeframe specified by the consulting radiation expert, and

4.2.2. adhere to any restrictions on the use or operation of the apparatus specified by the consulting radiation expert until the repairs have been carried out.

**5. Compliance certification – fixed radiation gauges**

5.1. The licensee must ensure that a sealed source device which is a fixed radiation gauge for which the licensee is the person responsible is certified compliant by a consulting radiation expert accredited by the Authority with the mandatory requirements published by the Authority:

5.1.1. before it is used, and

5.1.2. every two years before the anniversary of its initial compliance certification

**6. Working life of sealed radioactive sources**

6.1. The licensee must ensure that a sealed radioactive source for which the licensee is the person responsible is not used:

6.1.1. beyond the manufacturer's recommended working life for the source, or

6.1.2. if the manufacturer has not recommended the working life of the source, beyond 15 years after the date of manufacture of the source, or

6.1.3. unless the Authority has approved the use of the source for a further period and the licensee complies with any conditions for continued use set down by the Authority.

6.2. A sealed radioactive source that has been granted an extension of working life can only continue to be used if the following conditions are met:

6.2.1. Wipe tests of the source or nearest practical point to the source must be collected and analysed for contamination biannually or until suitable disposal is effected. The first wipe test should be conducted as soon as possible and copies of all results must be retained. The wipe test must be in accordance with Appendix 1 – Wipe Tests on Fixed Radiation Gauges, EPA Guideline No. 3 – "Recommendations for Minimum Standards & Safety Requirements for Fixed Radiation Gauges (Sealed Radioactive Sources) February 1995".

6.2.2. The Authority must be notified immediately if the radioactivity measured on the wipe medium is greater than 20 Bq. Repeat wipe tests must then be conducted, at intervals to be specified by EPA, in order to determine whether the activity detected by a wipe test increases with time. If necessary the Authority may require that a gauge be withdrawn from service immediately and that the source encapsulation be subjected to appropriate tests contained in ISO 9978:1992 -Radiation Protection - Sealed Radioactive Sources - Leakage Test Methods.

6.2.3. The source is not to be removed and used in another device without permission being obtained from the Authority.

6.2.4. All documentation of inspection and compliance must be retained for a minimum period of 5 years, and be readily available to be produced to the Authority's officer upon request.

6.2.5. The Authority must be contacted prior to the approved extended working life being reached to seek further extension of working life or consent to dispose of the source.

**7. Notification of receipt and transfer of regulated material**

7.1. The licensee must notify the Authority of the receipt or transfer of possession of regulated material (whether by sale or giving away) within seven days of receipt or transfer occurring, by completing the form published by the Authority and returning the form as instructed.

7.2. The licensee must notify the Authority within seven days if fixed radiation apparatus for which the licensee if the person responsible is relocated.

Note: This provision (7.1) does not apply to radioactive substances that are not in sealed source form.

**8. Consent to dispose of radiation apparatus**

8.1. The licensee may dispose of radiation apparatus, for which the licensee is the person responsible, but only if:

8.1.1. The radiation apparatus has been rendered permanently inoperable, and

8.1.2. The licensee notifies the Authority within seven days using the approved form

**9. Records**

9.1. The following records must be kept in relation to regulated material for which the licensee is the person responsible:

9.1.1. Maintenance reports and summaries of quality assurance and / or wipe tests undertaken on any sealed radioactive source or sealed source device

9.1.2. Reports and certificates of compliance issued by a consulting radiation expert in relation to any radiation apparatus or fixed radiation gauge

9.1.3. The source certificate for any sealed radioactive source
9.1.4. Details of the movement and location of any radioactive substance
9.1.5. Details of an annual stocktake of all radioactive substances kept or used
9.1.6. Details of all instances where the categories of regulated material used or kept change, as determined by Part 2, Cl.14 of the Regulation, and advise the EPA of any such change in writing within 14 days

9.2. The licensee must:
9.2.1. Maintain records in legible form or in a form that can be readily reproduced in a legible form,
9.2.2. Keep all records relating to regulated material for a period of two years after disposal, and
9.2.3. Provide all records relating to regulated material to the person to whom the regulated material is transferred, in the case of sale or giving away

**10. Storage**

10.1. Ensure that regulated material for which the licensee is responsible is safely and securely stored if it is not required for immediate use and that:
10.1.1. The store is constructed of durable materials
10.1.2. The store is lockable
10.1.3. Radiation levels in any accessible area outside the store do not exceed the dose limits for exposure in Schedule 5 of the Regulation
10.1.4. Any radioactive substances are not stored with explosives, combustible or corrosive materials

**11. Whole body scanning**

11.1. The licensee must ensure that computed tomography apparatus for which the licensee is responsible is not used for screening for early signs of illness in patients who have no symptoms or disease risk factors, except at the written request of an independent medical practitioner and where the licensee has obtained the informed consent of the patient in writing.

Note: Informed consent requires that the patient has been informed of the scale of radiation dose from the procedure and the risks involved, including that persons under the age of 50 years are more at risk of developing cancers as a result of the procedure.

**12. Cyclotron**

12.1. The licensee must, prior to commencement of commissioning of the facility, submit a radiation protection plan to the Authority for its approval.
12.2. The licensee must, prior to commencement of normal operations, submit a copy of the acceptance test documentation, providing certification that design features for hazard control are in place and operational, to the Authority for its approval.
12.3. The licensee must, if there is any variation to working procedures, engineering protective measures, or radiation monitoring plans, submit an amended radiation protection plan to the Authority for its approval.
12.4. The licensee must submit to the Authority a report on the operation of the cyclotron and ancillary facilities, as they relate to safety and radiation control issues for the first three months of its routine operation, and subsequently annually.

**13. Guidelines**

13.1. The licensee must comply with the obligations of 'responsible persons' in the following documents, to the extent that they apply to the licensee's radiation practice, as published by the New South Wales Environment Protection Authority (NSW EPA) from time to time
13.1.1. Radiation Guideline 6 - Registration requirements & industry best practice for ionising radiation apparatus used in diagnostic imaging, NSW EPA March 2004:
Part 1: Mammography
Part 2: Fluoroscopy & radiography
Part 3: Dentistry (including maxillofacial)
Part 4: Veterinary science
Part 5: Computed tomography & bone mineral densitometry
Part 6: Test protocols for parts 2-5

Note: Appendix A of Guideline 6, Parts 2-5 Policy on x-ray protective clothing (2004) has been superseded by Policy on x-ray protective clothing, NSW EPA, Nov 2009.

**14. Codes**

14.1. The licensee must comply with the obligations of 'responsible persons' in the following documents, to the extent that they apply to the licensee's radiation practice, as published by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) from time to time:
14.1.1. RPS 2. Code of Practice for the Safe Transport of Radioactive Material, ARPANSA Jan 2008
14.1.2. RPS 5. Code of Practice and Safety Guide for Portable Density/Moisture Gauges containing Radioactive Sources, ARPANSA, May 2004
14.1.3. RPS 8. Code of Practice for the Exposure of Humans to Ionizing Radiation for Research Purposes, ARPANSA, May 2005
14.1.4. RPS 10. Code of Practice and Safety Guide for Radiation Protection in Dentistry, ARPANSA, Dec 2005
14.1.5. RPS 13. Code of Practice and Safety Guide for Safe Use of Fixed Radiation Gauges, ARPANSA, Jan 2007

14.1.6. RPS 14. Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation, ARPANSA, May 2008

14.1.7. RPS 17. Code of Practice and Safety Guide for Radiation Protection in Veterinary Medicine, ARPANSA, July 2009

14.1.8. RPS 19. Code of Practice for Radiation Protection in the Application of Ionizing Radiation by Chiropractors, ARPANSA, Nov 2009

14.1.9. RHS 9. Code of practice for protection against ionizing radiation emitted from X-ray analysis equipment, ARPANSA, 1984

14.1.10. RHS 28. Code of practice for the safe use of sealed radioactive sources in bore-hole logging, ARPANSA, 1989

14.1.11. RHS 31. Code of practice for the safe use of industrial radiography equipment, ARPANSA, 1989

**15. Definitions**

**Person responsible** has the same meaning as in section 6 of the Act

**Act** means the Radiation Control Act 1990

**Diagnostic imaging apparatus** means:

A. Any ionising radiation apparatus used or intended to be used for any medical diagnostic, veterinary diagnostic or dental purpose,

A. Any ionising radiation apparatus used or intended to be used for radiotherapy or radiotherapy planning purposes, or

**Fixed radiation gauge** means a sealed source device which is in a fixed position.

**Regulation** means the Radiation Control Regulation 2013

**Regulated material** has the same meaning as in section 4 of the Act

**Occupationally exposed** has the same meaning as in clause 3 of the Regulation

**Radiation accident** has the same meaning as in clause 37 of the Regulation

**Sealed source device** has the same meaning as in section 4 of the Act.

# Radiation Assessment Advice

*Radiation Services Group / South Eastern Sydney Local Health District*

Appendix F

14 January 2014

Ms Megan Fu
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Dear Ms Fu,

**Re: SSD 13_6180 – Proposed STAGE 2 EIS – NCCC and AATC at Prince of Wales Hospital**

I write in reply to the letter dated 13 December 2013 from Mr Garofalow (NSW EPA) regarding the proposed Stage 2 Environmental Impact Statement for Nelune Comprehensive Cancer Centre (NCCC) and Australian Advanced Treatment Centre (AATC) at Prince of Wales Hospital (reference EF 13/9342).

Upon completion of construction and implementation of stage 1 of the NCCC, a **portion** of **building 3** (not building 2) of the Prince of Wales Hospital will be demolished. The space being demolished is part of the current Radiation Oncology Department which provides radiotherapy treatment to cancer patients. In response to Item 2.1 Site investigation and remediation and the resulting demolition waste please note the following:

- **No** diagnostic Nuclear Medicine procedures take place either currently or historically in the Radiation Oncology Department and therefore there will be no unsealed radionuclides to account for on decommissioning
- There is a radioactive material store and a hot lab that contains an inventory of sealed radioactive sources. These sources will be relocated to a new store in the NCCC as part of the commissioning of stage 1. A detailed radiation/contamination survey will be performed in consultation with the Radiation Safety Officer and comply with EPA regulations on decommissioning of these rooms to ensure no sources are left behind, as well as ensuring that no sealed-source leakage has taken place. The store and hot lab do not reside in the part of the building 3 that will be demolished; therefore the survey will serve the purpose of decommissioning that space as a radioactive material store.
- The only brachytherapy sealed source device that contains a sealed source of Iridium-192 will be relocated to the NCCC. A survey will be completed in accordance with the EPA recommendation of the brachytherapy suite to ensure no radioactive material remains.
- There are three linear accelerators, one orthovoltage apparatus, one simulator and one planning CT scanner residing in the current Department of Radiation Oncology. These apparatus contain no radioactive material, however in the case of the linear

**Nelune Comprehensive Cancer Centre**
**Prince of Wales Hospital & Community Health Service**
Cancer Services, Level 1, South Wing, Edmund Blacket Building
Avoca Street, RANDWICK NSW 2031
P: (02) 9382 8873 F: (02) 9382 8885

accelerators there is a small, but non-zero chance that some activation of materials may have taken place. It should be noted that none of the linear accelerators in the Prince of Wales Hospital inventory exceed the 10 MV accelerating potential, which is the threshold to which activation has been observed, however a detailed survey will be performed on the decommissioning and removal of the apparatus to account for the possibility that activation may have taken place and reported accordingly. Should any activation remain, this part of the LINAC or bunker where the linac was housed will be isolated, removed and stored in the new Hot Lab as a radioactive source prior to decommissioning.

The Prince of Wales Hospital holds an EPA Radiation Management Licence (RML 42850) with the nominated 'responsible person' being the POWH Radiation and Laser Safety Officer. The work that is currently occurring and that will continue to occur in the NCCC will be performed in accordance with the conditions of this licence.

If you require any further information please do not hesitate to contact

Yours sincerely

Brent Rogers CMLSO MARPS MACPSEM
Radiation and Laser Safety Officer, POWH

Simon Downes
Chief Radiation Oncology Medical Physicist, POWH

**Nelune Comprehensive Cancer Centre**
**Prince of Wales Hospital & Community Health Service**
Cancer Services, Level 1, South Wing, Edmund Blacket Building
Avoca Street, RANDWICK NSW 2031
P: (02) 9382 8873 F: (02) 9382 8885

# RADIATION SERVICES GROUP

Incorporating

**RADIATION SERVICES AUSTRALIA PTY LTD** & **RADIATION SERVICES CONSULTING PTY LTD**

Radiation Shielding Suppliers ABN 14 002 813 309 Radiation Shielding Consultants ABN 17 488 139 862


JOHNSTAFF


**T:** 02 8256 0500
**F:** 02 8256 0501
Level 12, 70 Pitt Street,
Sydney NSW 2000
**W:** johnstaff.com.au


Attn: Rosie Beckett

Dear Rosie,

RSC agree with the assessment of Simon Downes and Brent Rogers. The surveys/wipe tests they have planned sound entirely appropriate. A few notes:

- As only 'low energy' (i.e. accelerators have existed in the bunkers in the recent past, there is almost zero chance of concrete/steel activation in the existing linac bunkers.
- As sealed sources are used in the brachytherapy room, contamination here is very unlikely.
- As any activation (referring to the linac bunkers) and contamination (referring to the Hot Lab/Source Storage Areas/Brachytherapy areas) would be concentrated towards the interior faces of the walls and work surfaces, if surveys (all rooms) and wipe tests (potentially contaminated areas) yield satisfactory results, I would not consider it necessary to monitor the material throughout demolition.

If you wish to discuss please don't hesitate to contact me.

Regards,

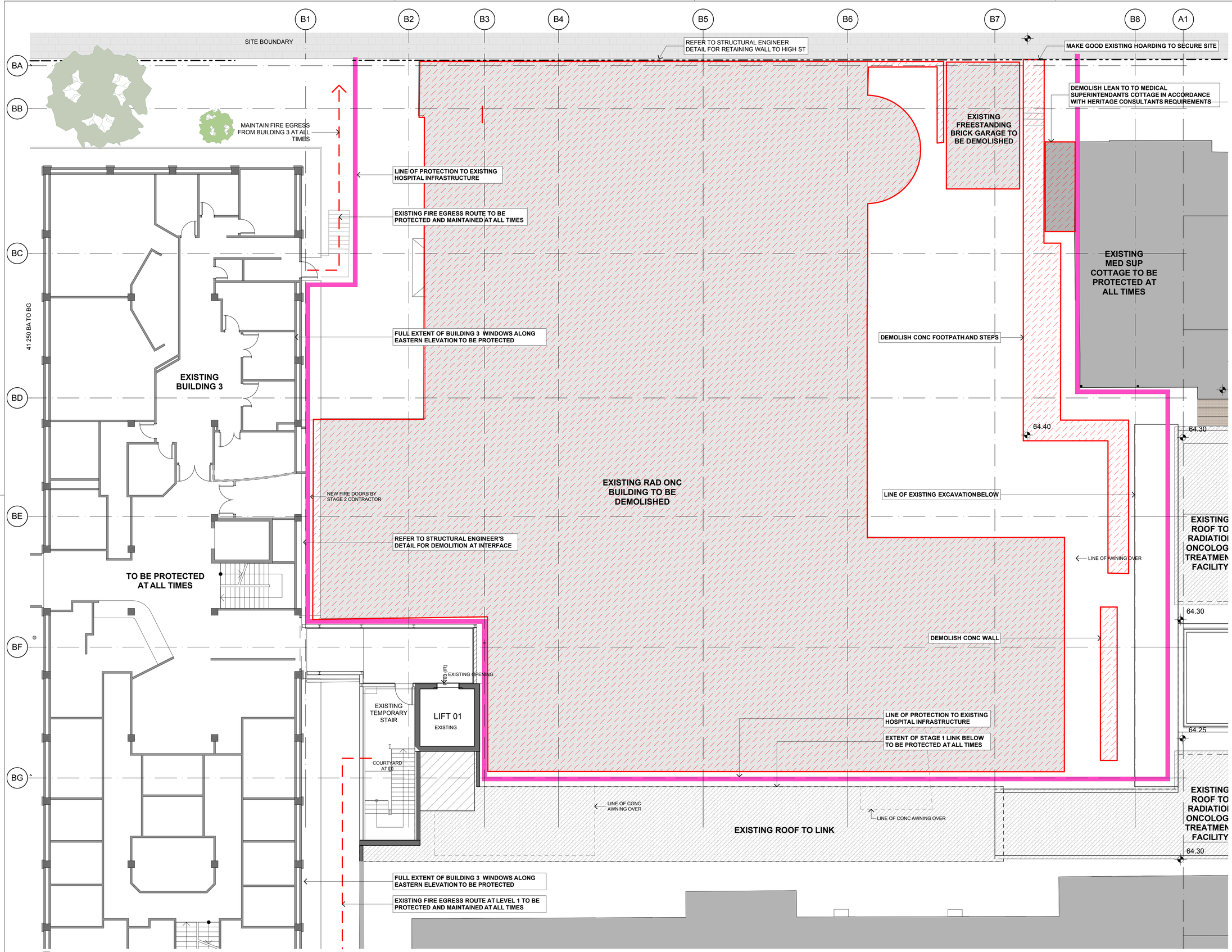
Greg Deeley
**Radiation Services Consulting Pty Ltd.**

# Demolition Plan

*HDR Rice Daubney*

Appendix G

JBA | 11422




1 PLAN
LEVEL 2 DEMO PLAN 1:100 @A1

**100 % DESIGN DEVELOPMENT**

NORTH POINT



KEY PLAN

| REV | DESCRIPTION OF CHANGE | DRAWN | CHECK | DATE |
|---|---|---|---|---|
| A | DESIGN DEVELOPMENT STAGE 2 80% | AB | KB | 01.03.13 |
| B | DESIGN DEVELOPMENT STAGE 2 100% | JL | KB | 28.03.13 |

SCOPE OF DEMOLITION WORK

PLEASE NOTE : DRAWING TO BE READ IN COLOUR

CLIENT
HEALTH INFRASTRUCTURE
NSW GOVERNMENT | Health Infrastructure
77 PACIFIC HIGHWAY
NORTH SYDNEY
NSW 2060
P: 02 9978 5402
F: 02 8904 1377
W: www.hinfra.health.nsw.gov.au

PROJECT MANAGER
THINC HEALTH
LEVEL 3
8 SPRING STREET
SYDNEY NSW 2000
P: 02 9256 4700
W: www.thinc.com.au

ARCHITECTS
RICE DAUBNEY
ANALYSING CREATING AND IMPLEMENTING ARCHITECTURE
110 WALKER STREET | NORTH SYDNEY 2060
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rd@ricedaubney.com.au | www.ricedaubney.com.au
the rice daubney group (nsw) pty ltd - abn: 77 001 350 769
rice daubney trading trust - abn: 56 880 304 993

PROJECT:
PRINCE OF WALES HOSPITAL
NCCC & AATC STAGE 2
Randwick Hospital Campus
Sydney, NSW, 2031

DRAWING TITLE:
SITE PLANS
DEMOLITION PLAN LEVEL 02

| SCALE: | CHECKED: |
|---|---|
| AS SHOWN @A1 | KB |

| PROJECT NUMBER: | DRAWING NUMBER: | ISSUE: |
|---|---|---|
| 11507 | AR_02_10005 | B |