

Barangaroo Part 3A Project Application



HEADLAND PARK AND NORTHERN COVE
MAIN WORKS RESPONSE TO SUBMISSIONS

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GLOSSARY

AQMP	Air Quality Management Plan
The Authority	Barangaroo Delivery Authority
CoS	City of Sydney
CPT	Cruise Passenger Terminal
CTMP	Construction Traffic Management Plan
DECCW	Department of Environment, Climate Change and Water
DGRs	Director General's Requirements
EA Report	Environmental Assessment Report
ECMP	Environmental Construction Management Plan
EP&A Act	<i>Environmental Planning and Assessment Act, 1979</i>
HCT	Harbour Control Tower
HIS	Heritage Impact Statement
HHERA	Human Health Risk Assessment and Ecological Risk Assessment
ICNG	Interim Construction Noise Guideline
Main Works EA	Barangaroo Headland Park and Northern Cove Main Works Environmental Assessment
Minister	Minister for Planning
Minister's Terms of Approval	Approval issued on 9 February 2007 by the Minister for the Barangaroo Concept Plan and as modified on 16 February 2009, 11 November 2009 and 16 December 2010
NVA	Noise and Vibration Assessment
NVMP	Noise and Vibration Management Plan
PECMP	Preliminary Environmental Construction Management Plan
RAP	Remediation Action Plan

RTA	NSW Roads and Traffic Authority
RWP	Remediation Works Plan
SEPP	State Environmental Planning Policy
SPC	Sydney Ports Corporation
SPS	Sewage Pumping Station
SoC	Statement of Commitment

1 INTRODUCTION

1.1 Background

In June 2010 a Project Application for Early Works to the Headland Park and Northern Cove was submitted for the Minister for Planning's approval. The application sought approval for site establishment works, demolition, site investigations, environmental protection measures, service modifications, removal and storage of Sydney Water Sewage Pumping Station (SPS) superstructure, sandstone extraction and receipt, management and placement of up to 150,000m³ of fill from Stage 1.

The Early Works Project Application was approved by the Minister for Planning on 8 November 2010.

A Project Application and accompanying Environmental Assessment Report (EA Report) for the Barangaroo Headland Park was subsequently submitted to the Department of Planning in October 2010. The Project Application seeks approval for the Main Works required to form and construct the Headland Park and Northern Cove following on from the Early Works. The scope of the Main Works includes:

- land formation utilising fill from Stage 1, ranging from the 150,000m³ identified in the Early Works application to approximately 230,000m³ (additional 80,000m³) along with excavated material from the Headland Park site itself (120,000m³) to build the headland up to finished levels for a nominal one metre topsoil layer (total fill of 350,000m³).
- construction of structural earth retaining walls utilising sandstone based materials
- creation of a naturalistic shoreline and northern cove through excavation and formation of retaining walls using boulders etc
- general landscaping and planting
- construction of a network of pedestrian pathways connecting the foreshore walkway and surrounding areas
- construction of a shoreline promenade (dual use pedestrian path and cycleway)
- jetty / viewing platform and public wharf extending into the Northern Cove from the southern shoreline
- construction of a car park totalling up to 300 spaces within the headland with vehicular access from Towns Place and pedestrian access from various locations within Headland Park
- location and adaptive reuse of the former Sydney Water Sewage Pumping Station for the purposes of an amenities building
- construction of a space for a future use (cultural facility) comprising initially 75,000m³ and ultimately up to 100,000m³,
- installation of relevant services and infrastructure;

- construction of the services and piping/pumping infrastructure associated with the air conditioning system (cooling water inlet/ outlet) for the future cultural facility and car park; and
- site remediation for limited contamination of fill material previously identified on the Headland Park site.

The area the subject of the Main Works Project Application is shown outlined yellow in Figure 1. The area of the project has been changed slightly since the initial Preliminary Environmental Assessment to exclude Munn Street Reserve as no works are proposed in the Reserve at this time.

As detailed in the Main Works EA, the Headland Park and Northern Cove are within the RE1 Public Recreation zone under the State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP). The proposed use may be characterised as a “recreation area” which is permissible with development consent in the RE1 zone. Under the *Standard Instrument – Principal Local Environmental Plan* (refer clause 2(2), Part 12, Schedule 3 of Major Development SEPP) recreation area is defined as:

... a place used for outdoor recreation that is normally open to the public, and includes:

- (a) a children’s playground, or*
- (b) an area used for community sporting activities, or*
- (c) a public park, reserve or garden or the like,*
- and any ancillary buildings, but does not include a recreation facility (indoor), recreation facility (major) or recreation facility (outdoor).*

It should be noted that since exhibition of the Main Works EA, the zoning for Barangaroo has been amended, as shown in Figure 2. However, the Headland Park and Northern Cove continue to be zoned RE1 Public Recreation under the amended zoning. The objectives of the RE1 zone are:

- (a) to enable land to be used for public open space or recreational purposes,*
- (b) to provide a range of recreational settings and activities and compatible land uses,*
- (c) to protect and enhance the natural environment for recreational purposes,*
- (d) to ensure the vitality and safety of the community and public domain,*
- (e) to promote and maintain public access to and along the foreshore,*
- (f) to allow land beneath the finished surface of the public domain to be used for car parking associated with development on land within Zone B4 Mixed Use if it can be demonstrated that any such use will not detract from the primary use of the land for public open space or recreational purposes,*
- (g) to allow the public domain to be enhanced by a variety of compatible land uses in a manner that contributes positively to, and does not dominate, the primary use of the land for public open space or recreational purposes,*
- (h) to allow land to be used in conjunction with the transportation of passengers by water.*



FIGURE 1: EXTENT OF PROJECT AREA

1:1500 @ A3

0 10 20 30 50



BARANGAROO HEADLAND

PWP Landscape Architecture
739 Allston Way, Berkeley, California 94710
Johnson Pilton Walker
Level 10, Plaza Building Australia Square, 95 Pitt Street, Sydney NSW 2000

MAIN WORKS APPLICATION BARANGAROO HEADLAND PARK HEADLAND PARK PLAN

MW-PWP-L-S3-1002

REV. 00

28th September 2010

The project is consistent with these objectives in that it provides for a major new public open space with a range of recreational activities and settings. It will promote public access to and along the foreshore and contribute to the vitality and safety of the northern end of the Barangaroo site. Further, the project will transform the existing concrete apron into a more natural landscaped environment, inspired by the site's original profile and shoreline.



Figure 2: Current Zoning under Major Development SEPP

1.2 Summary of Submissions

The EA Report was exhibited for 30 days from 10 November to 10 December 2010. In response to the public exhibition, 15 submissions were received from the public and professional organisations and seven submissions were received from agencies.

This Submissions Report has been prepared on behalf of the Barangaroo Delivery Authority (“the Authority”) following the exhibition of the EA Report to respond to issues raised in submissions.

Submissions were received from the following government authorities or agencies:

- City of Sydney (CoS)
- Department of Environment, Climate Change and Water (DECCW)
- Department of Industry and Investment
- NSW Maritime
- Sydney Ports Corporation (SPC)
- Sydney Water Corporation
- Housing NSW

Submissions received from nearby residents raised concerns primarily in relation to noise and vibration, traffic, access and parking, and contamination. Submissions were also received from other individuals and professional organisations generally raising concerns relating to the park design, heritage impacts, accessibility and parking, and the design and use for the future cultural space.

The key matters raised in submissions can be summarised under the following headings:

- Noise and vibration impacts
- Air quality impacts
- Contamination
- Traffic, access and parking
- Park design and operations
- Heritage impacts
- Water management
- Future cultural facility

The Authority’s response to the key issues raised in submissions is addressed in Section 2 of this report. Section 3 outlines proposed changes to the Statement of Commitments.

A summary of all submissions has been prepared, together with proposed responses, and is included at Appendix 1.

This report should be read in conjunction with the EA Report dated October 2010 and supporting documentation.

2 RESPONSE TO KEY ISSUES

The main issues raised are addressed below.

2.1 Noise and Vibration

Concern was raised in the public submissions regarding the potential noise and vibration impacts of the proposed works as well as future noise impacts associated with the park's operations. The Department of Environment, Climate Change and Water (DECCW), Housing NSW and Sydney Ports Corporation (SPC) also raised a number of issues relating to the noise and vibration.

Noise and vibration impacts were addressed in the Main Works EA Report and in the Main Works Noise and Vibration Assessment and Preliminary Noise and Vibration Management Plan prepared by Acoustic Logic Consultancy (October 2010). A further Noise and Vibration Assessment Addendum Report has been prepared by Acoustic Logic Consultancy in response to submissions and is provided at Appendix 2.

The Addendum Report notes that the Noise and Vibration Assessment considered the potential noise and vibration impacts of the proposal based on DECCW and City of Sydney (CoS) guidelines. The assessment identified the potentially most impacted sensitive receivers around the site, developed noise and vibration management levels and limits based on the prevailing ambient noise level at the receivers and the DECCW Interim Construction Noise Guideline (ICNG).

For residential receivers two goals were set – a noise affected management level and a highly noise affected management level. The ICNG and the Preliminary Noise and Vibration Management Plan outline the responses to be undertaken where noise levels exceed these levels. Where noise levels exceed the noise affected management level then all feasible and reasonable measures are taken to minimise noise emissions. These measures are detailed in the Preliminary Noise and Vibration Management Plan and include selection of alternative machinery, acoustic barriers, silencers on equipment and rubber matting over handling areas.

Where, after the application of these measures, noise levels exceed the highly noise affected management level then additional measures such as time management need to be introduced. There is a clear commitment and procedure established in the Preliminary Noise and Vibration Management Plan to minimise impacts to surrounding receivers.

The purpose of the assessment was to identify those activities that may produce noise and vibration that may exceed the management goals. Appropriate mitigation of these sources or the investigation of alternative methods could then be undertaken during the detailed project development phase using the framework established in the Preliminary Noise and Vibration Management Plan.

The Preliminary Noise and Vibration Management Plan also recommends that monitoring be undertaken to verify and respond to complaints, and that extensive consultation with the local community occurs.

In summary, with the exception of the residences in Merriman Street, and noise generated from rock hammering at controlled times, noise emissions will largely remain within the noise affected management level.

The Addendum Report notes that the Noise and Vibration Assessment highlighted that the residences in Merriman Street would be the location most impacted by noise emissions. As a result, the Preliminary Noise and Vibration Management Plan identifies a range of measures and commitments to minimise noise impacts, including provision for respite periods in the event that the highly noise affected management level of 70 dB(A) is exceeded. Other measures to minimise noise impacts include:

Rock Hammering

- Hammering should only be undertaken where non-percussive extraction method is not feasible or reasonable;
- Where hammering is undertaken it should be performed according to the following:
 - Using the smallest equipment as is practical and 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.);
 - Using hammers with low-noise heads or wrapping the head to minimise radiated noise;
 - Consider the erection of barriers where these are practical and provide useful sound attenuation;
 - Where noise emissions exceed the “highly noise affected management level” the duration of this activity throughout the day should be assessed to provide respite periods, or avoiding periods that might be particularly sensitive;
 - The local community should be informed via a liaison committee (or other method as appropriate) as to the nature, period and times of hammering;
 - Undertake vibration monitoring to establish safe working distances prior to working near and vibration structures/receivers.

Excavators and Earthmoving Equipment

- Using the smallest equipment as is practical and provides benefits in terms of the noise/time-to-complete balance.
- Selecting lowest noise levels plant available and/or fitting high performance mufflers/noise reduction kits.
- Erecting barriers where these are practical and provide useful sound attenuation.

Housing NSW raised concern regarding the noise and vibration impacts on its properties within vicinity of the site, particularly those along Merriman Street. In particular, it has requested that hours of construction be reduced or provision is made for respite from noisy, vibration intensive activities. DECCW has also recommended restrictions on rock hammering to provide respite periods.

In relation to noise generated from hydraulic rock hammering, the intention is to limit this by using rock sawing and only using the hammering to break the cut rock free. Therefore, the anticipated methodology will provide some respite periods. Secondly, it is stressed that the noise levels presented in the assessment from hammering are worst case noise levels, and there will be significant periods when operating close to the base of the cliff when noise levels will be significantly reduced.

It should also be noted that noise generated from rock hammering will vary significantly depending on the location of the hammering on the site. Recent noise monitoring indicates that hammering would only marginally exceed the noise affected management level when this occurs at the base of the rock face. Higher noise levels would be expected when operating away from the rock face due to the reduction in acoustic screening.

Further, it may be possible to erect a temporary screen along the Merriman Street boundary to further reduce noise levels. The Preliminary Noise and Vibration Management Plan also requires that the use of hammering be limited to the extent possible. If blanket restrictions are applied now, then this will restrict works in areas of the site that may cause minimal impacts, or fail to take into account additional mitigation works such as a barrier.

With respect to construction hours, it should be noted that both DECCW and the CoS permit work on Saturday. DECCW normally permits works to 1pm and Council to 5pm. In its submission, DECCW noted that the additional construction hours (over and above standard ICNG hours) is reasonable however it requested that the proposed additional hours between 1-3pm be reduced in the event of “unresolved, community concern”.

Given that the CoS guidelines allow for construction work to take place on Saturdays until 5pm and that it is not proposed to carry out the louder activities (such as rock hammering) between 1pm and 3pm on Saturdays, the Authority considers the restrictions proposed by DECCW are not necessary. It should be noted that the limit on carrying out loud activities between 1-3pm Saturdays is already provided for in the Preliminary Noise and Vibration Management Plan.

The Preliminary Noise and Vibration Management Plan enables a flexible response to assessing the effect on noise emissions from alternative processes, mitigation and minimisation of loud activities. Once this has been done, the need for any additional measures such as respite periods, exclusion of hammering during 7am to 8am period, etc can be assessed. In this way, controls are targeted and address impacts without unnecessarily restricting the works and extending construction periods.

In its submission, Housing NSW raised concern that there does not appear to be any hotline for residents to call in circumstances where noise levels are excessive. The Authority is committed to ensuring effective communication and complaints handling with neighbours. Notification and complaints handling procedures are detailed in Section 5.3 of the Preliminary Environmental and Construction Management Plan, provided in Appendix 26 to the Main Works EA. These procedures will include a widely advertised

phone number that will be available for residents to call during each and every hour that construction is in operation.

In relation to noise and vibration impacts from construction traffic, most construction traffic will access the site from Hickson Road or from within the site (in the case of trucks carrying fill) and a maximum of 7 trucks per hour are expected to access the site via Towns Place. The noise addendum report confirms that this level of traffic will have minimal impact on nearby residences in terms of noise and vibration impacts.

SPC has raised concern that the proposed development will generate noise exceedances above acceptable agreed levels and that no commitment has been made to implementing specific noise mitigation measures detailed in the Preliminary Noise and Vibration Management Plan. However, this is not correct. Noise management limits have in fact been set for the Harbour Control Tower (HCT) and for the interim Cruise Passenger Terminal (CPT) when being used to process passengers. These noise limits are not to be exceeded. Lower noise management goals have also been set for these buildings and the objective is to achieve these goals where reasonable and feasible. For the Moores Wharf building management limits have been recommended as for other commercial buildings in the vicinity.

SPC has also raised concern that the Noise and Vibration Assessment predicted that vibration amenity criteria at both the HCT and Moores Wharf facility would be exceeded and that no mitigation measures have been adopted to manage this potential impact. It states that effective mitigation measures should be addressed prior to the Project Application being determined.

In relation to the HCT, the Noise and Vibration Assessment confirms that amenity criteria will not be exceeded.

For the Moores Wharf building, vibration levels at the upper end of the predicted range may exceed the DECCW amenity goals. Notwithstanding this, even at the higher end of the predicted range vibration levels will be barely perceptible so that, even if these levels are not able to be mitigated, amenity would not be significantly impacted.

It is important to stress that the assessment of the effectiveness of noise and vibration mitigation measures can only be determined once the final work methodologies are established and that this will only be done when the construction contractor is appointed. Once the methodologies are confirmed, a further assessment will be undertaken of the potential likelihood of exceedances occurring and appropriate mitigation measures will be implemented in accordance with the Preliminary Noise and Vibration Management Plan which will in turn be updated as the detailed design progresses. The Authority is committed to working closely with DECCW and SPC to ensure that noise and vibration impacts are minimised as far as practicable.

Where there is the potential for noise or vibration criteria to be exceeded, it is intended that permanent monitoring will be undertaken. This will include SPC facilities.

Housing NSW, SPC and a number of the public submissions raised concern regarding potential structural impacts on buildings arising from vibration impacts from the excavation and construction works. It is noted that the Minister's Terms of Approval for the Early Works requires that the Authority engage a qualified engineer to prepare a Pre-Construction Dilapidation Report (also known as Property Condition Surveys) detailing the current structural condition of all existing and adjoining buildings, infrastructure, roads and public domain areas. The Terms of Approval also require the preparation of Dilapidation Surveys for heritage items in the vicinity of the Early Works. It is envisaged that the Pre-Construction Dilapidation Report and Dilapidation Surveys undertaken for the Early Works will extend to the Main Works activities. However, it is possible that the extent of potential impact from the Main Works may be different in some areas to the Early Works. The Authority will therefore ensure that the Pre-Construction Dilapidation Report and Dilapidation Surveys also encompass areas potentially affected by the Main Works.

Noise impacts associated with the use of the parkland for passive open space purposes are not anticipated to be significant. The exact nature of other future uses, such as the proposed cultural facility, is not known at this stage therefore it is not possible to undertake an assessment of any associated noise impacts. Such uses would be subject to separate applications as required.

Other noise and vibration issues raised in submissions are addressed in the Addendum Report at Appendix 2.

In summary, the construction of the Headland Park will by necessity involve noise and vibration impacts. The objective is to minimise those impacts as far as is feasible and reasonable. The Main Works Noise and Vibration Assessment and Noise and Vibration Addendum Report at Appendix 2 have identified (as is typical for major projects in urban areas) that some processes are likely to generate noise levels that will require additional management according to the procedures outlined in the Preliminary Noise and Vibration Management Plan. The objective of the controls and safeguards in this Plan 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.

It is also stressed that the Preliminary Noise and Vibration Management Plan will be refined once the site contractor is appointed and at appropriate stages during construction in response to revised methods and equipment, or monitoring and evaluation of actual impacts. Neighbours will also be notified of noisy activities.

Finally, it should be noted that the Protection of the Environment Operations (Noise Control) Regulation 2008 applies to the site and provides a means of managing and regulating noise exceedances that are not otherwise separately approved.

2.2 Air Quality

A number of the public submissions raised general concerns about air pollution and airborne contamination as a result of the proposed works. As noted in the response to submissions advice prepared by JBS (refer Appendix 3) impacts relating to air pollution created by contaminated material during remedial works will be managed through the implementation of an Environmental Management Plan (EMP). The Air Quality and Health Assessment included in the Main Works EA (Appendix 21 to EA) recommended that measures to be incorporated into the EMP include:

- application of water sprays to disturbed area;
- reduced material handling during poor meteorological conditions;
- minimisation of the quantities of impacted materials and stockpiles;
- the installation of an odour suppression system; and
- ongoing air monitoring works.

Provided that these measures are successfully carried out, the report concluded that the works will not pose an unacceptable level of air quality or health impact, and will meet the adopted air quality and human health risk criteria.

The Statement of Commitment on air quality has been expanded to include reference to the EMP as follows:

Air control emissions (mitigation measures) and Air Monitoring Program as recommended in the Air Quality and Health Assessment Main Works prepared by JBS Environmental (October 2010) will be incorporated into the detailed Environmental Construction Management Plan for the proposed works and implemented during all works on site. Air control emissions (mitigation measures) and Air Monitoring Program as recommended in the Air Quality and Health Assessment Main Works prepared by JBS Environmental (October 2010) will be incorporated into the detailed Environmental Construction Management Plan for the proposed works and implemented during all works on site.

In terms of public agency submissions SPC has raised concerns in relation to the impact of exceedances of airborne benzene in the early morning as predicted in the Main Works EA and has requested continuous air quality monitoring at the HCT, Moores Wharf and the interim CPT in response to predicted exceedances of PM10 (24 hours) and odour. In response to the concern raised over airborne benzene exceedances, JBS has undertaken a risk assessment to indicate the degree of risk posed to crew members and security on cruise ships (refer Appendix 3). JBS notes that:

... the air quality management plan [AQMP] will contain provision for continuous monitoring of volatile compounds. Action levels built within the AQMP will identify levels of total VOCs that are indicative of unacceptable levels of benzene. A range of control methods will be provided in the AQMP to reduce/eliminate VOC emissions where these criteria are exceeded.

However, Sydney Ports should be aware that the assessment of the potential exposure to benzene is based on toxicological data and exposure parameters that are consistent with chronic timeframes. This causes the action levels as based on the toxicological values to be very low. With this, slight or momentary exceedances of these action criteria do not imply an acute risk. It should be considered that the use of chronic based toxicological values to derive these criteria has incorporated a substantial safety factor. If action criteria were based on acute exposure criteria, then they would be substantially higher than the values being adopted. As such, brief exceedances of the stated criteria are not deemed to pose an immediate risk; however, they should prompt the use of methods outlined in the AQMP to manage air quality and lower emissions.

The risk assessment concludes that the predicted levels of benzene will not pose an unacceptable level of risk or hazard to users of the interim CPT. There will be continuous air quality monitoring as outlined below.

In relation to the SPC's request for continuous air quality monitoring for predicted exceedances of PM10 (24 hours) and odour, JBS has recommended that monitoring be undertaken at the HCT, CPT and Moores Wharf as requested (refer Appendix 3). Exceedances should be responded to by implementing the control measures outlined in the Air Quality Management Plan (refer discussion below). Where these fail to lower the concentration of PM10, works should cease pending more favourable meteorological conditions. A commitment to this effect has been included in the revised Statement of Commitments (refer Section 3).

DECCW has raised a number of technical matters in relation to the air quality modelling parameters, including peak to mean factors, odour exceedances, the particulate matter assessment, PM10 24-hour and annual average, deposited dust, benzene assessment, and chromium criteria. In this regard JBS has advised in its letter (refer Appendix 3) that, as recognised by DECCW itself, a more precise estimate of the potential odour and related speciated chemical generation of the works cannot be obtained in lieu of the environmental standards for the receipt of material onto the Headland Park site. Subsequent to derivation of environmental criteria and application of criteria to the proposed filling and associated earthworks on the Headland Park, as per the draft Human Health Risk Assessment and Ecological Risk Assessment (collectively referred to as the HHERA), and a more precise estimate of odour, particulate and chemical constituent emission rates will be able to be completed in a revised air quality assessment. The draft HHERA has now been provided to the Site Auditor for approval. Each of the issues, with regard to the modelling and presentation of results, as raised by DECCW has been addressed in the HHERA. Copies of the HHERA are provided at Appendix 4.

To address air quality and odour concerns an Air Quality Management Plan (AQMP) AQMP has been prepared. The AQMP:

- Identifies air quality goals for the range of potential emissions from the Headland Park site to be applied to receptors in proximity of the site;

- Contains detail of modelling of air emissions from construction works on the Headland Park site in accordance with emissions consistent with the HHERA and RAP;
- Contains detail of air quality controls to be applied to reduce air emissions at adjoining receptors / properties consistent with DECCW criteria and acceptable levels of hazard and risk; and
- Controls detail on an air quality monitoring program to assess / demonstrate compliance with air quality goals.

A copy of the AQMP is provided at Appendix 5.

The odour control provisions contained therein will be confirmed on revised air dispersion modelling from the HHERA.

Further the suggestion by DECCW that tarpaulins be included as an odour control measure to stockpiled soils / non active excavation faces is accepted and will be included in the AQMP.

In summary, following exhibition of the Main Works EA and consideration of submissions, the draft HHERA and draft Remedial Action Plan (RAP) have now been revised. The draft HHERA and draft RAP address the issues raised by DECCW. Copies of the draft HHERA and draft RAP have been provided to the Site Auditor and DECCW. These documents require approval from the Site Auditor prior to undertaking air quality modelling for the Headland Park works. The AQMP will be finalised following endorsement of the HHERA and RAP by the Site Auditor. Accordingly a commitment to this effect has been included in the revised Statement of Commitments at Section 3.

Commitments:

1. Continuous air quality monitoring is to be undertaken for predicted exceedances of PM10 (24 hours) and odour at the Harbour Control Tower, CPT and Moores Wharf. Exceedances will be responded to by implementing the control measures outlined in the draft AQMP. Where these fail to lower the concentration of PM10, works will cease pending more favourable meteorological conditions.
2. The AQMP will be updated following endorsement of the Headland Park HHERA and RAP by the Site Auditor.

Having regard to the environmental assessment contained in the Main Works EA, this Response to Submissions Report and the relevant mitigation measures proposed, it is considered that the impact of the proposed development on air quality and odour will not be significant and will not result in an unacceptable impact on human health.

2.3 Contamination

A number of public submissions raised general concerns regarding contamination. In particular, concerns related to the transportation, storage and use of remediated fill within the headland and potential health impacts.

Contamination issues are primarily governed by the *Contaminated Land Management Act 1997* and State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55). Whilst technical contamination issues have been addressed in detail in the Main Works EA and accompanying draft RAP for the site, in summary the EA notes that contaminated material will be managed in accordance with the legislative framework and that any material retained on site will be required to meet Site Acceptance Criteria established for the site in accordance with these controls. Any material which does not meet the site acceptance criteria including high impacted material from the Declaration Area will not be accepted onto the site.

As evidence of the ability of the development to comply with relevant regulations, an Overarching RAP for the entire Barangaroo site was submitted with the Early Works Project Application and a draft RAP for the Headland Park site has been submitted with the Main Works application. The draft Headland Park RAP prepared by JBS clearly illustrates that while impacted materials will be retained on site these will only be accepted if they meet the site acceptance criteria established in the HHERA.

Following consideration of submissions to the Main Works EA, the draft Headland Park RAP and the draft HHERA have now been revised. A copy of the draft RAP is provided at Appendix 6 and a copy of the draft HHERA is provided at Appendix 4. The draft Headland Park RAP and the draft HHERA have also been submitted to the Site Auditor for approval.

JBS has also provided additional advice in relation to the concerns raised in public submissions about the use of contaminated fill (refer Appendix 3). In summary JBS has advised the use of contaminated fill is considered not to pose a health risk to humans based on extensive modelling of contaminants during the completion of the draft HHERA, using industry accepted modelling practices, on the Headland Park site. This modelling has helped to develop criteria to determine the acceptability of given concentrations of contaminants on the site. All material to be placed on the site will be subject to the Site Acceptance Criteria outlined in the final HHERA, while any materials not meeting the criteria will be disposed of appropriately off-site. In addition, all materials placed on the site are expected to be covered by a layer of clean fill to between 0.8 and 1.5 m depth, acting as a growth medium for indigenous plants, and preventing direct access to soils. While these provisions for management are undertaken, the use of fill on the Headland Park site is considered not to pose a risk to human health.

Further, JBS has advised that the estimated amount of materials on the Headland Park site requiring remediation is now approximately 1,100m³, significantly reduced from the original estimate of 20,000m³. This advice is provided in the letter from JBS dated 9 February 2011 provided at Appendix 7.

In addition to public submissions a number of public agencies raised specific issues in relation to contamination. SPC requested a copy of the HHERA and Remediation Works Plan (RWP) prior to the application being determined. In response to submissions from SPC and others, copies of the HHERA and RAP, as well as the RWP, are provided at Appendices 4, 6 and 15.

In its submission to the Main Works EA DECCW noted that whilst the general remediation and material placement approach may be appropriate, significant detail was missing, namely the HHERA. DECCW noted that it could not comment on the detail of the Draft RAP until the HHERA was available and that it was critical that DECCW review these documents prior to project approval, or before implementation as a condition of approval.

As noted elsewhere, the draft HHERA and draft RAP have now been submitted to the Site Auditor for approval. In response to the issues raised by DECCW, copies of the draft HHERA, draft RAP and draft RWP have also been provided to DECCW. In addition, although the Site Auditor's approval of the RWP is not required, the Authority will be submitting the draft RWP to the Site Auditor for information.

DECCW has also raised a number of minor matters relating to detail contained in the contamination reports. These matters have been addressed in the Summary of Submissions Table at Appendix 1.

As noted above, the draft RAP for the Headland Park has now been completed and has been submitted to the Site Auditor and is provided at Appendix 6. While the draft RAP is still to be approved by the Site Auditor, it is considered that the Main Works Project can be approved subject to conditions requiring:

- approval of the RAP and HHERA by the Site Auditor;
- forwarding a copy of the RWP to the Site Auditor for information; and
- forwarding of a copy of the Final RAP and HHERA, as approved by the Site Auditor (including any amendments as required by the Site Auditor) as well as the final RWP to DECCW prior to implementation.

2.4 Traffic, Access and Parking

The majority of public submissions raised concern regarding traffic, access and parking arrangements, both during and after construction. Comments were also received from the City of Sydney and Sydney Ports Corporation (SPC), particularly relating to construction traffic management.

A report responding to the traffic issues in submissions has been prepared by Halcrow and is provided at Appendix 8. A summary of the key issues and responses is provided below.

Construction Traffic

A number of submissions raised concern regarding the proposed use of Towns Place for construction traffic. However, as detailed in the Traffic Impact Assessment and Construction Traffic Management Plan prepared by Halcrow for the Main Works EA (Appendix 20 of Main Works EA), general access for construction traffic is proposed off Hickson Road. The Towns Place site access will only be used as a secondary access for incidental work at the northern end of the site, for sandstone extraction and for site compound access.

It should be noted that the majority of trucks associated with the construction of the Headland Park will be those bringing fill from Barangaroo South or concrete from off site. The movement of trucks carrying fill (estimated maximum 144 truck movements per day at peak) will be confined to within the site and therefore will not impact on the surrounding road system. Trucks carrying concrete (estimated maximum 174 truck movements per day at peak) will access the site via Hickson Road and not Towns Place. The remainder of truck movements are minor as follows:

- Delivery of earthmoving and compacting vehicles – 10 rigid trucks and semi trailers movements on one day.
- Delivery of site compound buildings – 2 rigid trucks movements on one day.
- Transportation of sandstone for saw cutting – 17 truck movements per day.
- Other deliveries – 2 truck movements per day.
- Sewer construction from Gate 5 on Hickson Road to Towns Place – 2 truck movements per day.

The Traffic Impact Assessment indicates that there will be a maximum of seven truck movements per hour east of Dalgety Road and south of Towns Place. This compares with an estimated maximum of 26 construction vehicles per hour along Hickson Road. The construction traffic impacts on Towns Place/Dalgety Road are therefore not expected to be significant and can be accommodated within the existing road network.

The recommendation of the CoS to confine access to the site from Hickson Road is therefore not supported.

The CoS raised concern regarding construction vehicles using Harrington St/Argyle St and Dalgety Road to access the site. However, this is not the intention and the Authority shares the City's concern that this route would adversely impact on residents in the area. Rather, it is proposed that construction traffic coming from the north will do so via Sydney Harbour Bridge, York Street, Margaret Street, Napoleon Street, Sussex Street and Hickson Road. It is considered that this route provides the highest level of amenity to the residents of the northern CBD and has negligible impact on traffic flows and is preferred.

Another issue raised by the CoS is the potential for queuing of trucks in Hickson Road before 7am. The Halcrow Response to Submissions (Appendix 8) indicates that this is not expected to be a major issue as truck queuing is normally of greatest concern for projects that involve a major extent of excavation. In this case the production rate of sandstone to be taken away will not be so great as to generate significant truck queuing issues. Trucks bringing fill material into the site will for the most part come from excavation works at Barangaroo South and their times and concentrations will be controlled by filling rates at that end rather than discharge rates at the Headland Park end. This would reduce the potential for truck queuing on Hickson Road prior to 7:00am at the Headland Park gates. It is thus considered that operational constraints would prevent truck queuing on Hickson Road prior to 7:00am at the Headland Park gates.

In terms of cumulative impacts, the cumulative construction traffic impacts of the Lend Lease Barangaroo South construction are assessed in the Traffic Impact Assessment and Construction Traffic Management Plan for this project. This finds that the combined traffic generation would have an acceptable impact on the local road system.

SPC raised concern in its submission regarding traffic flows along Hickson Road and potential impacts on the operations of the interim CPT. In response, further analysis was undertaken by Halcrow to assess potential impacts on the interim CPT operations (refer Appendix 8). The analysis concludes that the interim CPT access will continue to operate satisfactorily with Headland Park and Northern Cove construction traffic using Hickson Road.

SPC has also raised concern regarding potential truck queuing along Towns Place and requested that a drawing be provided to demonstrate where truck queuing will occur on site. While the Authority confirms that truck queuing will occur on site and not along Towns Place, the exact location will depend on construction staging therefore it is not possible to provide a plan at this stage. The Authority also advises that in the unlikely event that trucks are unable to queue on site, they will be directed to queue on Hickson Road and not Towns Place.

The SPC has requested that it has the opportunity to review and approve the Construction Traffic Management Plan and Waste Traffic Management Plan prior to construction commencing. The Authority is committed to continuing to closely liaise with the SPC on the management of traffic related to construction activities. In this regard, it may be appropriate for the Department of Planning to convene a coordination committee to liaise and manage overall traffic aspects during construction in the area. Likely participants would be the CoS, SPC, RTA, Barangaroo Delivery Authority, Bovis Lend Lease and the Headland Park construction contractor.

Other issues raised in relation to construction traffic are discussed in the Halcrow Response to Submissions at Appendix 8.

Proposed Car Park Access and Traffic Impacts

A number of submissions, including those from the public as well as the City of Sydney, raised concern regarding the proposed car park entry/exit driveway location at the intersection of Towns Place and Dalgety Road and its impact on residential amenity in particular.

The grounds for locating the car park access off Towns Place are detailed in the Traffic Impact Assessment and Construction Traffic Management Plan (Appendix 20 to Main Works EA). These include:

- Minimisation of impacts on the future light rail on Hickson Road
- Avoidance of pedestrian and bicycle conflicts with vehicles along the foreshore
- Reduced amenity for the northern cove and built space on the site, and
- Reduced driveway length.

Analysis indicates that while there would be more traffic on Towns Place and Dalgety Road, the future levels would be within normal environmental limits for a suburban location let alone a CBD location.

The CoS notes that there is no evaluation of potential future access to the park from the south within the site. In response, Halcrow has advised that there is insufficient space between the Northern Cove and the most northerly cross street to accommodate both a connecting road and a suitable open space connection around the eastern side of the Cove. In addition, the intersection of any new connecting road with the northerly cross road would be too close to the intersection of the northerly cross road and Hickson Road.

In view of these considerations the proposed location of the car park access is considered to be acceptable.

Both the CoS and SPC questioned the safety of the proposed roundabout at the junction of Dalgety Road and Towns Place. In response, Halcrow has advised that an intersection is required at this location for safety reasons; the sharp bend at the junction of Dalgety Road and Towns Place has limited sight distance and would make the provision of the necessary sheltered right turn lane at an un-signalised intersection very awkward to provide.

In addition concerns have been expressed in submissions from the public regarding the safety hazard presented by the junction in its present form even without a car park entrance coming off it. A roundabout would slow traffic and generally make the two roads safer for both pedestrians and motor vehicles.

The final design for the roundabout will be developed in consultation with council engineers to promote both pedestrian safety/amenity and traffic safety/efficiency.

Submissions from the public and the CoS raised concerns regarding traffic impacts associated with the proposed car park, including cumulative impacts.

The traffic impacts associated with the proposed car park were previously addressed in the original Barangaroo Concept Plan and subsequent Concept Plan Section 75W Modification for the Headland Park and Northern Cove, approved on 9 February 2007 and 11 November 2009 respectively. Traffic from the car park was included in the detailed traffic modelling and assessment that informed these approvals. Thus cumulative traffic impacts have been considered.

In relation to the role of Towns Place it is a critical part of the local road system in what has historically been a significant port area not a quiet residential precinct. The revitalisation of the former port area together with the previous development of the Millers Point arts precinct mean that Towns Place will retain its role as an important part of the local road system. As such it needs to be managed to carry a reasonable amount of traffic. In this regard achievement of a traffic level that is consistent with RTA guidelines is considered to be reasonable.

As noted in the Halcrow Response to Submissions, appropriate measures will be put in place to ensure the car park will not be used by commuters.

Other issues raised in relation to traffic are addressed in the Halcrow Response to Submissions at Appendix 8.

2.5 Heritage and Archaeology

The CoS has raised a number of issues in relation to heritage. It highlighted the importance of heritage interpretation issues informing the urban and landscape design of the Headland Park and of ensuring that heritage interpretation and public art are considered together.

The Authority acknowledges the importance of heritage interpretation issues in the design of the park and the associated public art strategy. To ensure that this occurs, it proposes that a draft interpretation plan be prepared prior to the commencement of the main works. However, during the course of the construction works archaeological and other heritage issues may emerge and the Authority is keen to ensure that these issues are integrated into the final interpretation plan where appropriate. For this reason, finalisation of the draft interpretation plan is only proposed once the construction works are well advanced i.e. six months prior to completion. This approach has been clarified in the draft Statement of Commitments (refer Section 3).

The CoS has also raised concern that the proposed headland park design is not consistent with the Australian ICOMOS Burra Charter 1999 and that the design of the Headland Park should be amended “so as to create a contemporary landscape setting that acknowledges, incorporates and interprets the significant cultural landscape of the Millers Point promontory”.

The Authority acknowledges that the proposal dramatically changes the existing cultural landscape but notes that the major features of this landscape are those created in only recent times and that they are grossly unsympathetic to the original landscape and extremely inhospitable as an area for public recreation. Further the proposed ‘naturalistic’ (as opposed to ‘natural’) landform is derived from careful analysis - the intention with the design is to develop a more naturalistic shape *inspired by* the original shoreline as well as the other headlands of Sydney Harbour. This is consistent with the Minister’s Terms of Approval for the original Concept Plan. It was never intended that the design comply with the Burra Charter; this is an interpretation, not a reconstruction (nor for that matter a conservation exercise). Nonetheless by physically separating the park ‘structure’ from the exposed sandstone cliff (which is to be retained) the proposal attempts to reduce its impact on the cultural landscape as it currently stands.

In general it is believed that the design complies with the CoS’s objectives, particularly in its recommendation that the escarpment and rock faces remain visible, are interpreted and incorporated into the design in a meaningful manner. These are, and will remain, central parts of the design.

Another issue raised by the CoS relates to the impact of the raised headland on Merriman Street heritage character and views as well as that of the Clyne Reserve. It is agreed that the existing setting of Merriman Street will change. This existing setting has developed since the 1960s when the docklands below were cleared and further excavated and filled to reach their present form. Prior to that, the Merriman Street terraces would have had a more intimate, less exposed streetscape context. The proposed works and plantings will provide a sense of enclosure on the west that has not existed in recent decades.

As noted in the Headland Park Visual Impact and Views Analysis prepared by Johnson Pilton Walker and PWP Landscape Architecture (Appendix 24 to Main Works EA) the upper areas of the park will be approximately at the level of Merriman Street. The view from the street will now be out across broad expanses of green parkland. Existing views from Clyne Reserve and the northern end of Merriman Street will remain more or less as at present, although there will be more trees in the foreground and the view to the north west will be over parkland.

The Clyne Reserve is a relatively recent (1953) public park in inner metropolitan Sydney and the design team have discussed the proposal with the original designer of the Reserve and will continue to make contact with her as the design extends to incorporate the reserve itself. There will be some impacts on views from Clyne Reserve however this should be weighed up against the very significant expansion of public domain parkland which in turn will allow for a much wider range of views over Sydney Harbour than is currently the case. The City of Sydney's recommendations regarding increased physical connections between the reserve and the park are noted and these will be assessed as the design progresses, having regard also to the submissions received from surrounding residents expressing a desire for fewer rather than more connections between the park and Merriman Street.

With respect to the City of Sydney's comments relating to the heritage significance of the Sydney Harbour Control Tower and the need for it to be retained, this issue was addressed in the Barangaroo Concept Plan Section 75W Modification for the Headland Park and Northern Cove and approval was granted for demolition of the Tower. However, at this stage the future of the Tower has not yet been finalised and it has therefore been incorporated into the design. Appropriate adaptive reuse of the tower will be considered if the tower becomes redundant and will be subject to community consultation.

Other heritage issues raised by the City of Sydney are addressed in the Summary of Submissions at Appendix 1.

The National Trust's submission provided detailed comments on a number of inaccuracies in the historic evidence provided in the Heritage Impact Statement prepared by Conybeare Morrison (Appendix 5 to the Main Works EA). These comments are accepted however the Authority does not consider that these errors have any significant bearing on the overall conclusions of the assessment.

The National Trust notes that the heritage analysis deals only with those structures and works which are already identified as heritage items and "does not adequately reflect the

full range of heritage values of Millers Point". It should be pointed out that the broader heritage impact assessment for the site was undertaken as part of the original Barangaroo Concept Plan application (*Heritage Impact Statement*, City Plan Heritage, March 2007). It was not the intention to revisit the overall heritage assessment which has already been done.

However, having regard to the comments of National Trust and others, the scope of the Heritage Impact Statement has now been expanded to consider a broader range of items and places. The updated Heritage Impact Statement also provides further assessment on the Merriman Street cliff face. A copy of the updated Heritage Impact Statement is provided at Appendix 9.

In relation to the Sewage Pumping Station (SPS), three options were considered, including Option 1 to retain the decommissioned structure in situ (albeit buried under the headland) as an archaeological resource. This option would be likely to cause the building to deteriorate and conceal it from public view. The Authority considers the relocation and reuse of the building's superstructure is the best heritage outcome in response. Missing and damaged elements of the superstructure will be reconstructed in accordance with the Conservation Management Plan.

It should also be noted that approval is only being sought at this stage for the relocation and use of the SPS. The actual works to the building will be subject to a future application. An interpretation strategy for the SPS will be submitted with that application.

The National Trust also submitted that there remains a large section of the 1904 concrete sea wall along the northern side of Millers Point and that the proposed removal of this sea wall is potentially a serious adverse impact. This issue is addressed in the Archaeologist's Response provided in Appendix C to the updated Heritage Impact Statement (Appendix 9 of this Report) which indicates that a "serious adverse impact" is not likely.

2.6 Headland Park Design

The CoS and a few of the public submissions raised issues in relation to the design of the Headland Park and Northern Cove, including detailed comments on public domain treatment and landscaping. These issues are addressed in the *JPW Response to Submissions* (Johnson Pilton Walker, February 2011) provided at Appendix 10 as well as in the discussion below.

Headland Park Design

As noted above, the CoS raised concern about the overall headland park profile, particularly having regard to the heritage significance of the site. The concerns raised by CoS have been addressed in Section 2.5 above. The submission from Jane Irwin Landscape Architecture also argued that the proposed design of the northern cove forces a disconnection with Barangaroo South.

The design of the Headland Park and Northern Cove is in direct response to the Minister's Terms of Approval for the original Barangaroo Concept Plan which required more detailed design work to achieve, amongst other matters, the following objectives:

- the reinstatement of a headland at the northern end of the site with a naturalised shape and form including a build up of height and a generous landscaped connection to physically link Clyne Reserve, to allow direct pedestrian access from Argyle Place and appreciation of the landform of the former headland; and
- an enlargement of the northern cove to achieve a greater naturalised shape, form and edges.

The Authority does not agree with the view that the enlargement of the northern cove has forced a disconnection with Barangaroo South. Rather, it considers that the foreshore promenade provides a strong physical connection throughout the site and that there are also powerful visual connections. In this way, the Authority believes the design achieves both objectives of enlarging the cove and continuing to provide connectivity between north and south.

Urban Design and Public Domain

In its submission, the CoS raised the following urban design issues:

- Connectivity with Millers Point
- Cultural building and car park
- Park amenity and useability
- Heritage interpretation
- Public art
- Harbour Control Tower.

The issues raised by the CoS in relation to heritage interpretation and the Harbour Control Tower are addressed in Section 2.5. The future cultural facility and associated car park design are addressed in Section 2.10.

In relation to connectivity with Millers Point, the CoS raised concern that the park is physically separated from Millers Point by the proposed cuttings and 'light wells'. This is correct but it is also deliberate for two reasons. The first is the design team's primary aim to expose and celebrate the visual strength of the exposed sandstone cliffs and to use the gap to draw light and air into the internal spaces for ESD reasons. It is important to note, as does CoS in its submission, that the rock face is a landscape item of heritage significance and therefore that it should remain exposed in its entirety.

Secondly there has been a very strongly expressed desire by the local residents for fewer direct connections between the park and the local area. The submission is incorrect in suggesting that the rationale behind the limited entry points is for

perimeter control during major events. Neither is there any intention to 'segregate the new park from the existing Millers Point public domain'.

In the recommendations the CoS suggested that the connections to Clyne and Munn Reserves should be land bridge treatments to give a seamless transition. Aside from the residents' desires for more limited access there are physical problems with this given the existing levels in the Reserves and the need to provide for accessible slopes within the park.

It should be noted that the detail of the edge condition at Merriman Street and adjacent areas (eg fence details and so on) has not yet been fully developed however this detail will be provided and discussed with Council in due course during design development and documentation.

It is noted that the CoS is currently undertaking an urban design study of Millers Point and the Authority and its consultant team look forward to engaging with the CoS in this endeavour. It is also noted that the CoS recommends that the brief for the park be expanded to include areas adjacent to the park in Millers Point and it should be noted that this has occurred since the submission of the Project Application. The Authority is currently carrying out design studies of Towns Place, Dalgety Road, Munn Reserve and Argyle Place.

In relation to detailed public domain treatments, the Authority advises that Public Domain Design Guidelines are to be prepared, which will address materials, finishes, signage, planting and so on. The Public Domain Design Guidelines are to be prepared in consultation with key stakeholders, including the City of Sydney. A new Statement of Commitment to this effect is proposed, as detailed in Section 3.

In terms of park amenities, the SPS is intended to be relocated to the northern end of the park and adaptively reused for toilet facilities. Other toilet facilities are to be provided within the future cultural facility. Facilities such as kiosks and cafes etc will be located in Barangaroo Central where there will be a greater concentration of people, making such amenities more viable.

The CoS also raised concern regarding the draft public art strategy, arguing that a detailed Public Art Strategy responding to the site specific landscape and heritage conditions of the Headland Park should be provided at this stage.

As noted in the Draft Public Art Strategy provided at Appendix 29 to the Main Works EA, there is a comprehensive strategy in place to guide the design and provision of public art for the Headland Park and Northern Cove. An Art Panel will be appointed to oversee the development of the public art strategy and a specific public art team will be established for the park which will fill the role of the Public Art Curator. The Authority considers that it is critical that a holistic and coherent focus on public art is developed for the whole site. This will be achieved through:

- The Barangaroo Public Art Plan,

- The Public Domain Plan which will articulate guiding themes and potential locational responses across the three precincts (Barangaroo South and Central as well as the Headland Park),
- Early establishment of a significant art and cultural program of sponsorship, exhibition and learning,
- The work of the Art Panel and the Authority's advisors in further developing this strategy,
- The respective building and external integrated art plans for Barangaroo South and Barangaroo Central, and
- The Art Panel's review of specific project briefs.

The Authority considers it premature at this stage to finalise a detailed public art strategy for the Headland Park until key aspects of the overall approach to public art at Barangaroo are confirmed.

Accessibility

The CoS recommended in its submission that the access strategy for the park be reviewed to:

- provide a map at the lift at the south end of the park so that disabled visitors are aware of alternate routes,
- review access points through the sandstone wall along the foreshore path to ensure accessible ramps are included at appropriate locations, and
- investigate providing an accessible path to allow disabled users to get closer to tidal pools.

In response Morris Goding Accessibility Consulting has advised as follows (refer Appendix 11):

- wayfinding maps will be provided at northern and southern access points of the park so that visitors may choose between the alternate accessible routes, that being, the northern 1:20 pathways or the southern passenger lift.
- directional signage will be employed at relevant points along the foreshore pathway indicating the location of the accessible points/routes.
- Continuous accessible path of travel will be provided in accordance with AS1428.1-2009 at points of public access between the foreshore pathways. This will occur during design development stage. In addition, accessible paths of travel will be provided to allow access to view the tidal pools. This will occur during design development stage.

Landscaping

Both the CoS and Jane Irwin Landscape Architecture raised issues regarding the detailed landscape design for the park.

Overall, the landscape design is not intended to create a bushland environment but rather to create a park that is useable (i.e. with grass and shade) similar to the area around Lady Macquarie's Chair.

It should be noted that details of the proposed planting design have developed considerably since the Main Works EA was submitted and the design team has been assisted by a specialist arborist/horticulturalist (Stuart Pittendrigh) and a soil scientist (Dr Simon Leake). A contract will be let in 2011 to grow and supply advanced plants to be planted at the appropriate time before the completion of the park. Specifications for the plants, growing media etc will be developed as part of this strategy.

Specialist soil science advice has been sought and will be incorporated into the proposals. The specialist advice is that topsoil does not need to be 1.0m deep as suggested by the CoS. Topsoil depth for trees will be sufficiently deep to provide optimal growing conditions. All of the specialist reports can be made available to Council. A management plan will be prepared in due course. Irrigation will be provided using water recycled from the site (i.e. no mains water will be used).

In relation to concern regarding the planting of palm trees, it should be noted that these are proposed to be *Livistona australis*, a native species which was common around the harbour on sites like this before they were largely removed.

As a point of clarification, it is not intended to provide either an amphitheatre or spray fountain in the Headland Park. These facilities, if provided, could be located in Barangaroo Central.

In its submission, the Sydney Harbour Association argued that planting within the park should be rearranged to enable direct views to Mel Mel (Goat Island). There will be direct views of Mel Mel from the majority of the foreshore and from the northern parts of the site (including the northern slopes). However, from the upper bluffs and the bush walk the views will be filtered through the trees, as they are on similar sites such as Balls Head. Providing a variety of views is considered to be a desirable design objective.

2.7 Water Management

DECCW raised a number of issues in its submission regarding water management. In general, DECCW noted that there are a number of uncertainties in relation to proposed water management measures that it could not comment on until it is provided with a copy of the HHERA. The Authority notes that DECCW is unable to provide advice on water re-use suitability in the context of site contamination until the HHERA is reviewed. The HHERA has now been submitted to DECCW and the Authority will continue to consult with DECCW to ensure that the approach to water management on the site meets all legislative requirements.

DECCW also recommended that all water management information be consolidated into one Soil and Water Management Plan which would be updated in accordance with the staging of works. The Authority agrees with this recommendation.

In relation to water quality monitoring during construction, the Authority will undertake water quality monitoring in accordance with DECCW requirements.

A number of detailed technical issues raised by DECCW in relation to water management are addressed in the letters from Warren Smith and Partners Pty Ltd provided at Appendices 12 and 13.

2.8 Park Use

The CoS made a number of comments in its submission regarding the future use and operation of the park. It noted that the Headland Park 'does not cater for nor does it meet the many pressing needs of the local and regional community for facilities such as a regional playground, skate park and recreational centre'. However, this has never been the intention for the Headland Park which instead was identified at the outset as a park for passive recreation and on occasion, events, whereas Barangaroo Central is to provide active recreation facilities.

As noted in the Main Works EA the governing principles for the Headland Park envisage a naturalistic headland that will cater primarily for informal recreational activities. The combination of headland, foreshore and 'natural' settings in the park, and its location adjacent to the Sydney central business district and situated on Sydney Harbour, offer unique and significant opportunities for a range of activities to be enjoyed by a wide spectrum of users. Indeed, the Headland Park will make an important contribution to satisfying the demonstrated informal recreation needs of the City's increasing number of residents, workers and visitors.

Further, the Authority considers that Barangaroo Central is a more appropriate setting for a regional playground or a skateboard park if further detailed studies indicate they would be appropriately located in Barangaroo. Planning and design of Barangaroo Central has only recently been commenced and will proceed through 2011 and 2012.

The CoS has stated that the park should be open 24 hours a day, seven days per week. The Authority agrees with this view, as noted in Section 6.2.2 of the Main Works EA.

The CoS has also requested that a Plan of Management for the park be prepared, addressing all operational and management procedures to be employed including those related to the future cultural facility, and that the Plan of Management be forwarded to the City for comment. The Authority has already committed to the preparation of a plan of management prior to the park's opening (refer Statement of Commitments at Section 3). The plan of management will be prepared in consultation with the CoS. The Statement of Commitment has been updated to reflect this undertaking.

2.9 Marine Environment and Design

NSW Maritime queried in its submission the depth of the Northern Cove and stated that it would be preferable for it to be of sufficient depth to allow some navigation of the area. It also noted that there is potential to provide further protection for the shoreline

by building out part of the shoreline and that cutting the existing caissons to just below the tide level, rather than the bed level of the cove itself has the potential to create a significant navigation hazard.

In response, Hyder Consulting (refer Appendix 12) has advised that the harbour floor of the Northern Cove is at a level that will allow access for powered vessels up to 25 metres at all times. A cross section showing the depth of Northern Cove is provided in the Hyder report.

The Authority is continuing to liaise closely with NSW Maritime during the design development of the shoreline and associated infrastructure.

SPC notes in its submission that the navigation impact of the proposal has not been assessed. However, all excavation, demolition and construction will be land based from the Barangaroo site and within the site boundary. There will be no water based construction such as dredges or barges involved in the project. A large proportion of the work will be carried out behind the existing caissons with the caisson demolition down to AHD RL -4.0 being one of the last activities in construction of the seawall. A turbidity curtain will be installed to the perimeter of the site.

There will be no change to the existing port navigational functionality.

The SPC has also objected to use of the area west of the Moore's Wharf for kayaking (or any other form of boating) access and notes that no assessment of the risk has been undertaken.

The Authority advises that the Moore's Wharf cove has been redesigned and confirm that there will be no kayaking launching facility in this cove. Further NSW Maritime will be consulted as to the appropriate signage for recreational craft in this area.

In its submission, the SPC also raised concerns regarding construction impacts on Moores Wharf. It notes that the EA did not assess the impact on the proposed shoreline construction works on the Moores Wharf site and requests that this assessment be undertaken prior to the Project Application being determined.

In response, Hyder Consulting notes that the environmental impact of the wall construction is minimal as there is only a small amount of material removed from the pile hole. The excavation for the Moores Wharf Cove will be land based and there will be no water based construction activities such as dredging or barging of materials. All material excavated will remain on the site for use as fill. A turbidity curtain will be installed to the perimeter of the site. There are no other environmental effects or impacts on port safety and operational functions. Further detail is provided in the Hyder response at Appendix 12.

The Hyder report also addresses issues raised in public submissions. One public submission raised concern about the ability of the Northern Cove to effectively flush water. A flushing analysis has been carried out for the Northern Cove using NSW Public

Works Manly Hydraulic Laboratory data for Port Jackson. The flushing time for Northern Cove is approximately 2.2 days. It should be noted that the Northern Cove is a small cove, has a relatively wide opening entrance (approximately 80m), is immediately adjacent to deep (15m) water and is close to the main harbour channel. Further the cove is shallow so that at each tidal change there is significant new water entering the cove.

2.10 Future Cultural Facility

A number of submissions raised concern about the future cultural facility. The CoS raised concerns with respect to access to the facility, safety and security, amenities and the need for the facility to integrate with the park design, particularly to enhance activation and vibrancy in the park itself. Jane Irwin Landscape Architecture argued that the facility is both disrespectful of Aboriginal people and of the community more broadly because of its lack of physical presence and connection to the landscape, and that it lacks a generous public address and raises significant ESD issues.

In response, the Authority advises that the design and future use of the cultural facility and carpark is still under way and it is therefore too early to address the issues raised by the CoS and others in any detail. As noted in the Main Works EA, a separate Project Application will be submitted for the future cultural facility once the design and use are confirmed. However it is agreed that the cultural facility needs to engage with the park at different levels and in different locations and these principles will guide the facility's design. Its future use is also subject to consultation with a range of stakeholders, including the indigenous community.

With respect to safety and security, the park will be well lit at night and the design incorporates CCTV cameras for security. A deliberate decision has been made not to light the 'bush walks' since, as the CoS submission points out, the dense naturalistic planting presents a security hazard, with no lighting it will be clear to park users that they should not enter these paths after dark.

The major stairways will be lit.

Further, the Authority agrees that all facilities should be highly accessible. However, it is not agreed that there should be direct pedestrian access to the cultural facility from Walsh Bay since this, in effect, would be via the 'back door' (i.e. the northern end of the cultural facility will be taken up with back of house type facilities). Further, current design proposals are aimed at creating a major entry plaza to the park at the Hickson Road entry and this could potentially link to other major cultural facilities in Barangaroo Central, as well as the light rail.

Pedestrian entry to the car park can be gained from Towns Place. The design of this has not yet been fully developed but the City's comments are noted.

The design of the light well elements has not yet been resolved as they are closely associated with the design of the internal space which is still in progress.

With respect to the comments from Jane Irwin Landscape Architecture, the Authority agrees that the facility should have an appropriate physical presence. Whilst the use of the space has yet to be determined its design will allow for its entry to be expressed with appropriate significance - the immediate entry 'forecourt' is approximately 35m x 35m.

ESD is an important element in the design. Light will not only be brought into the facility through the lightwells but also via the 'slot' along Merriman Street.

The comment that the facility should be located above ground is noted but the Authority believes that it can have an equally 'strong, generous, expressive and accessible public identity' in its proposed location.

2.11 Other Issues

Other issues raised in submissions are addressed in the Summary of Submissions Report at Appendix 1.

3 REVISED STATEMENT OF COMMITMENTS

The Approved Concept Plan for Barangaroo includes a Statement of Commitments which details a range of measures to be undertaken by the Authority and other agencies to ensure the development of Barangaroo achieves the objectives set out in the report. The Statement of Commitments is in addition to the Minister's Terms of Approval for the development.

For the subject proposed Main Works Project Application further commitments are proposed that relate specifically to the scope of the works. A number of changes are proposed to address specific issues raised in submissions, as discussed above. The Statement of Commitments below supersedes that provided for in the Main Works EA.

Main Works Statement of Commitments

SUBJECT	COMMITMENTS	TIMING
Contamination	1. Remediation works the subject of the Remediation Action Plan will not commence until the RAP and HHERA are approved by the Site Auditor and a Site Audit Statement has been issued in respect of the RAP.	Issue of Site Audit Statement
	2. A Part B Site Audit Statement will be provided to the Department of Planning prior to the commencement of remediation works	Prior to the commencement of remediation works
	3. A Remediation Environmental Management Plan (REMP) will be prepared to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed;	Prior to mobilisation onto the site for remediation works
	4. A Remediation Occupational Health and Safety Management Plan (ROHSMP) will be prepared to document the procedures to be followed to manage the risks posed to the health of the remediation workforce	Prior to mobilisation onto the site for remediation works
	5. The Remediation Work Plan (RWP) will be submitted to the Site Auditor for information	Prior to commencement of remediation works
	6. The REMP and the ROHSMP will contain a plan addressing plausible contingencies and both Plans are required to be certified by an independent, expert person and submitted for acceptance by the BDA prior to mobilisation onto the Headland Park Site.	Prior to mobilisation onto the site for remediation works

SUBJECT	COMMITMENTS	TIMING
	7. Upon completion of the works on the Headland Park Site, a validation report and an ongoing Long Term Environmental Management Plan (LTEMP) for impacted materials retained beneath Headland Park will be submitted by the Remediation Consultant to the Site Auditor for certification that the Headland Park Site is suitable for the proposed uses, subject to implementation of the LTEMP.	Prior to occupation of the site by future users
Acid Sulphate Soils	8. Any activities involving the disturbance of acid sulfate soils will be undertaken in accordance with the requirements of the Acid Sulfate Soils Management Plan – Main Works Application (JBS Environmental Pty Ltd, October 2010)	During excavation works
Hydrology, Soil and Water Management	9. The proposed development will be undertaken in accordance with the mitigation and monitoring requirements for surface and groundwater hydrology and quality, including water quality of the Harbour outlined in the Soil and Water report (WSP Environment and Energy, October 2010). 10. All water management information will be consolidated into one Soil and Water Management Plan which will be updated in accordance with the staging of works.	During construction works and during the operational phase Prior to commencement of construction works
Navigation	11. Any new navigational aids will be determined in consultation with Sydney Ports Corporation, NSW Maritime and Sydney Ferries	Prior to the installation of new navigational aids
Noise and Vibration	12. Noise and vibration on site will be managed in accordance with the <i>Preliminary Noise and Vibration Management Plan</i> prepared by Acoustic Logic Consultancy dated 19 October 2010	During proposed works
	13. The Preliminary Noise and Vibration Management Plan will be finalised in accordance with the recommendations of the Main Works Noise and Vibration Assessment once the Site Contractor is engaged	Following appointment of Site Contractor
Traffic, Parking and Access	14. Prior to the commencement of works on site a detailed CTMP will be prepared which is generally consistent with the <i>Traffic Impact Assessment and Construction Traffic Management Plan</i> prepared by Halcrow Pty Ltd (October 2010)	Prior to commencement of works on site
	15. Prior to the commencement of works on site a Traffic Control Plan (or series of plans) in accordance with RTA requirements, would be prepared for the proposed work round, past or through work sites	Prior to commencement of works on site
	16. The detailed CTMP will address traffic issues relating to Moores Wharf, the CPT and the Harbour Control Tower in consultation with Sydney Ports Corporation.	Prior to commencement of works on site
Air Quality, Health and	17. Air control emissions (mitigation measures) and Air Monitoring Program as recommended in the Air Quality and	Prior to commencement and during-works on site

SUBJECT	COMMITMENTS	TIMING
Odour	Health Assessment – Main Works will be incorporated into the detailed Environmental Construction Management Plan for the proposed works and implemented during all works on site.	
	18. Continuous air quality monitoring is to be undertaken for predicted exceedances of PM10 (24 hours) and odour at the Harbour Control Tower, CPT and Moores Wharf. Exceedances will be responded to by implementing the control measures outlined in the draft AQMP. Where these fail to lower the concentration of PM10, works will cease pending more favourable meteorological conditions.	Continuously during the relevant works.
	19. The AQMP will be updated following endorsement of the Headland Park HHERA and RAP by the Site Auditor	Upon finalisation of the HHERA and RAP
	20. Following approval by the Site Auditor, copies of the final Headland Park RAP and HHERA will be provided to Sydney Ports Corporation for information	Upon finalisation
Heritage	21. A detailed interpretation strategy is to be prepared for the Sewage Pumping Station and Sandstone Seawall as part of the overall site interpretation. In regard to the seawall this Plan will address the heritage values of the sandstone blocks to be relocated and demonstrate how, when and why these sandstone blocks were originally laid.	Within 6 months of completion of construction works
	22. The proposed retaining wall on the western side of the Moore's Wharf building will be designed to protect and enhance the significance of this building. Consideration will be given to designing the retaining wall as a gentle curve offset from the building.	Prior to construction of the retaining wall on the western side of the Moore's Wharf Building
	23. A structural audit of all heritage items in proximity to the works will be completed	Prior to the commencement of construction works
	24. A draft interpretation plan for the Headland Park and Northern Cove will be prepared prior to the commencement of the main works. To ensure that any archaeological and other issues that emerge during the course of construction works are integrated into the interpretation plan, the interpretation will be finalised only once construction works are well advanced.	Draft interpretation plan will be prepared prior to the commencement of the main works. Final interpretation plan will be completed no later than 6 months prior to construction completion.
Archaeology	25. An archaeological excavation will be undertaken in accordance with the methodology and recommendations (relating to testing methodology, site interpretation, research questions) contained in the <i>Research Design and Archaeological Excavation Methodology</i> (Austral Archaeology, October 2010).	Prior to the excavation of the Northern Cove and Moore's Wharf inlet.
Accessibility	26. The proposed development will be undertaken in accordance with the recommendations of the Access Review Report	During construction.

SUBJECT	COMMITMENTS	TIMING
	prepared by Morris-Goding Accessibility Consulting (October 2010)	
Environmental Management	27. The proposed development will be undertaken in accordance with the Preliminary Environmental and Construction Management Plan prepared by the Barangaroo Delivery Authority (October 2010) or the subsequent more detailed plan to be prepared by the construction contractor once appointed.	During construction
Waste Management	28. The proposed development will be undertaken in accordance with the Waste Management Plan prepared by JBS Environmental (October 2010).	During the construction and operational phases of the development
ESD	29. The proposed development will be undertaken in accordance with the recommendations of the ESD report prepared by prepared by WSP Lincolne Scott Pty Ltd (October 2010).	During the construction and operational phases of the development
Plan of Management	30. A plan of management will be prepared to guide the ongoing operations and management of the Headland Park. The plan of management will be prepared in consultation with the City of Sydney.	Prior to opening of the park to the public.
Public Domain	31. Public Domain Guidelines for the Headland Park will be prepared in consultation with key stakeholders, including the City of Sydney	During preparation of Guidelines

4. CONCLUSION

The Authority is seeking the Minister for Planning's approval for main works to the Headland Park and Northern Cove involving:

- land formation utilising fill from Stage 1, ranging from the 150,000m³ identified in the Early Works application to approximately 230,000m³ (additional 80,000m³) along with excavated material from the Headland Park site itself (120,000m³) to build the headland up to finished levels for a nominal one metre topsoil layer (total fill of 350,000m³);
- construction of structural earth retaining walls utilising sandstone based materials;
- creation of a naturalistic shoreline and northern cove through excavation and formation of retaining walls using boulders etc;
- general landscaping and planting;
- construction of a network of pedestrian pathways connecting the foreshore walkway and surrounding areas;
- construction of a shoreline promenade (dual use pedestrian path and cycleway);
- jetty / viewing platform and public wharf extending into the Northern Cove from the southern shoreline;
- construction of a car park totalling up to 300 spaces within the headland with vehicular access from Towns Place and pedestrian access from various locations within Headland Park;
- location and adaptive reuse of the former Sydney Water Sewage Pumping Station for the purposes of an amenities building;
- construction of a space for a future use (cultural facility) comprising initially 75,000m³ and ultimately up to 100,000m³;
- installation of relevant services and infrastructure;
- construction of the services and piping/pumping infrastructure associated with the air conditioning system (cooling water inlet/ outlet) for the future cultural facility and car park; and
- site remediation for limited contamination of fill material previously identified on the Headland Park site.

Submissions received as a result of the public exhibition of the application for the Main Works have been assessed in this report as required under Section 75H(6) of the EP&A Act. No changes are proposed to the project as a result of the review of submissions. It is the Authority's view that the impacts from the main works can be appropriately managed through the range of measures detailed in the EA Report and in the updated specialist reports and management plans. However, the Statement of Commitments proposed in the EA Report has been expanded to address issues raised in submissions and arising from the additional technical work undertaken following exhibition.