

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Appendix A: Summary of Submissions and Responses to Issues Raised in Submissions

Issue no.	Key Issues Summary	Lendlease Response
City Of Sydney Council		
1	The City has no commentary to make on the abovementioned SSD DA.	Noted.
NSW Department of Primary Industries		
2	Lend Lease (Millers Point) Pty Ltd does not require a licence under Part 5 of the Water Act 1912, provided less than 3 ML per annum of groundwater is extracted during the remediation process as outlined in the supporting documentation. However, the proponent has applied for a licence, and this will assist in avoiding delays should larger than anticipated volumes of groundwater be encountered.	Noted.
NSW Environmental Protection Authority		
<i>Air Quality Impact Assessment</i>		
3	EPL conditions and limits would need to be established upon final design stage, and prior to construction and implementation. The project would need to be supported by a detailed air quality management and monitoring program. This would include continuous emission monitoring of emission controls systems. The project would need to be designed to minimise fugitive emissions. If the ex-situ option is required, the ventilation system design must be adequate to maintain negative pressure with the remediation enclosure. Given the proximity to receptors a relatively high ventilation rate may be required. The	It is noted that the maximum permissible emissions will be established by the EPA based upon the final methodology for remediation and these limits will become a condition of the development consent.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	design of the in-situ option would need to consider the outcomes of the remediation trials conducted or to be conducted on the site.	
4	Prior to project approval, the AQIA be revised with consideration to the following: 1. For the preferred in-situ option: - The provision of additional information or data to support the speciation of in-stack VOC's for the preferred remediation option; - Providing a clear demonstration of compliance with the Clean Air Regulation emission limits; and - The provision of predicted impacts at the proposed emission limits.	An Amended AQIA has been prepared and is provided as Appendix E (Section 5.5.1). The AQIA has been updated to respond to the EPA's requirements. For VOC monitoring, as previously agreed with the EPA for Block 4 and 5 Remediation, it is proposed that monitoring will be by hand-held measurements (daily photoionisation detection (PID)), rather than continuous monitoring, as PID measurements are more reliable
5	2. For the ex-situ option: - Further analysis of predicted exceedances must be conducted, including an analysis of source contributions where concurrent activities are likely to occur and contribute to predicted impacts; - Where sources identified in the additional analysis are found to significantly contribute to the predicted cumulative impacts, and are associated with the proposal, further investigation into mitigation options must be conducted; and - Where there is potential for activities to be undertaken outside of an emissions control enclosure, due to technical constraints, the assessment must include a scenario that evaluates the impacts from external activities.	An Amended AQIA has been prepared and is provided as Appendix E (Section 6.1). The specifications within this section have been updated to respond to the EPA's requirements. The amended AQIA notes that: - No exceedances of the EPA criteria were predicted to occur at any sensitive receptor location assessed for TSP, air toxics or odour. - The proposed remediation is not anticipated to significantly contribute to cumulative emissions. - In response to queries about the potential for activities to occur outside the excavation tents, an analysis of the overall project has been undertaken to identify whether any tasks may be carried out not within the tents. These are outlined in Section 2.2.2 of the Response to Submissions.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
<i>Chemicals and Risk</i>		
6	EPA recommends that the proponent: - provides EPA additional information and clarification demonstrating the potential air impacts associated with offsite ex-situ treatment, in particular potential emissions generated during the treatment and disposal of contaminated materials, have been adequately considered and assessed; and - demonstrates contingencies are in place, for example to store contaminated material in excavation enclosures, in the event the treatment and/or disposal of highly contaminated materials from Hickson Road is not, or cannot, be undertaken in an environmentally acceptable manner.	Section 2.3.2 of the Response to Submissions outlines the relevant requirements of the selected off-site treatment and disposal facility. Assessment of the off-site facility is not a relevant consideration for this EIS. The selected licensed facility will be responsible for compliance with any license conditions regarding emissions or other potential impacts. Contaminated material will not be excavated unless there is an off-site facility available that can lawfully receive it, or there are suitable enclosures in place on Block 4/5 that could allow temporary storage.
7	EPA recommends that the proponent further considers the potential environmental impacts associated with the transport of liquid waste offsite.	Section 3.3.4 of the updated AQIA (Appendix E) confirms that all liquid wastes will be sealed before being transported off site.
8	Odour suppressant foam is proposed, it is not possible to further assess the suitability of the Rusmar product for its intended use at the Project. EPA recommends that the proponent revises the Project AQIA to include the Rusmar product guides in AQIA Appendix 1.	The Rusmar product guides have been added to an appendix in the updated AQIA (Appendix E), as a guide to the potential odour suppressant to be used.
9	Remediation works outside the excavation enclosure/s involving contaminated material represent a potential significant risk with respect to adverse air impacts. EPA recommends that the proponent clarifies if the Preliminary Hickson Road Perimeter Retention Wall Odour Control Plan referenced in the EIS, HIA and Preliminary Methodology for OSTT is the same as the plan in Table 2 of the AQIA.	The Perimeter Retention Wall Odour Control Plan referenced in the EIS, HIA and Preliminary Methodology for OSTT is the same as the plan in Table 2 of the AQIA.
10	The timing of retention wall construction should be clarified and the Project should consider potential ways to utilise where possible air quality	The timing of any retention wall construction for the Hickson Rd works is subject to final methodology/design, however is currently anticipated for the 1st half of 2017.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	management options that may be available due to other Barangaroo remediation Projects. EPA recommends that the proponent clarifies the timing of construction activities and considers potential synergies that may exist (and be utilised) between the Hickson Road, Block 4, and Block 5 (and other future) Barangaroo remediation projects.	It is proposed that air quality management for any Hickson Rd retention walls will be as per the Perimeter Retention Wall Odour Control Plan, per Table 2 of the AQIA. Thus, synergies in management measures implemented may be achieved. Noting that the works are not reliant on Block 4 and 5 works, sufficient controls are proposed that are independent of these works. During detailed design, Lendlease may consider any synergies that could be utilised between the Hickson Rd and Block 4/5 remediation projects.
11	Project air quality management (and related) plans should consider other means to prevent or mitigate air emissions where possible. EPA recommends that: - The AQMP must consider and include potential emissions from all works that are not addressed in the Hickson Road PRW – Preliminary Odour Control Plan. - The proponent incorporates and implements best practice emission controls and process design, including consideration of movement of contaminated material immediately into an enclosure (where possible) and other contingency measures, to ensure emissions generated outside the excavation enclosure/s are minimised to the maximum extent practicable. - The Conditions of Approval include a requirement for the proponent to develop and implement a comprehensive air quality and odour management plan for the Project.	An Air Quality Management Plan (AQMP) relevant to the works will be prepared prior to commencing works. This AQMP will include include potential emissions from all works that are not addressed in the Hickson Road PRW – Preliminary Odour Control Plan. Industry practice emission controls and process design, including consideration of movement of contaminated material immediately into an enclosure (where possible) and other contingency measures will be incorporated in to the AQMP and implemented to ensure emissions generated outside the excavation enclosure/s are minimised to the maximum extent practicable.
12	The proposed environmental control measures outlined in the Preliminary Methodology for Offsite Transport and Treatment of Hazardous Waste	A RAP Addendum (Appendix C) has been completed to address off-site transport and treatment, and is issued with this RtS to replace

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	(Preliminary Methodology for OSTT) are generally robust however further consideration of potential mitigation measures will be required when the relevant Project details and management plans are developed and finalised. The Preliminary Methodology controls for OSTT do not apply to contaminated soil generated prior to the installation of an emission enclosure. Consequently other management controls such as those outlined in Section 3.4 of the Preliminary Methodology for OSTT will be required. However due to the proximity of the Hickson Road remediation works to offsite receptors, and the potentially highly odorous nature of generated contaminated soil, these controls will need to be carefully and stringently applied to ensure emissions will not cause any adverse offsite impacts. EPA recommends that the proponent further considers strategies and measures to manage contaminated materials generated outside excavation enclosures, and includes these in the relevant Project management Plan - such as the Hickson Road Perimeter Retention Wall (PRW) - Preliminary Odour Control Plan, and/or Project Air Quality Management Plan.	the previous AECOM OSTT Letter. Note that there are no significant changes in the proposed measures, but rather the document is now a formalised a RAP Addendum. An auditor review (Appendix D) of the RAP Addendum is also included. The Amended AQIA (Appendix E) has been updated to address the EPA's comments, this is outlined in Section 2.3.2 of the Response to Submissions. The amended AQIA considers air quality impacts generated outside the enclosures.
13	EPA recommends that the proponent considers strategies and measures to assist in the management of potential emissions during and following tipping of contaminated material at offsite treatment and disposal facilities	Refer to Issue 6 above.
14	Appropriate management strategies and control measures must be designed and implemented to capture any asbestos emissions generated within the emission enclosure/s. Asbestos containing materials are considered to be likely within fill materials within the Declaration Area. EPA recommends that the proponent: - clarifies that appropriate best practice emission controls and management practices will be implemented to ensure asbestos emissions are prevented or appropriately controlled.	The amended AQIA notes (Section 3.6 of Appendix E) that asbestos was not assessed in this AQIA. Asbestos encountered on the site would be managed to ensure asbestos emissions are prevented or appropriately controlled, works would be in accordance with the site Asbestos Management Plan to be prepared for the works, which would include monitoring works. It should be noted that the Odour Control Structures proposed to be used for excavation of contaminated materials would be designed to capture odorous emissions, not asbestos fibres.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	EPA recommends that Conditions of Approval include the requirement for the proponent to develop and implement a comprehensive asbestos management plan for the Project. The plan must include measures that will ensure any asbestos encountered inside the Project emission enclosure is managed in a way that prevents the generation of airborne asbestos fibres.	
15	Additional information and clarification is required to demonstrate potential receptors located within the Barangaroo site have been adequately considered. EPA recommends that the proponent clarifies the locations of the additional receptors assessed in the AQIA, and to demonstrate all potential sensitive receptors have been adequately considered in assessment of air impacts.	Refer to Figure 6 in the amended AQIA (Appendix E) which shows the general location of the receptors included in the modelling.
16	Clarification is required regarding the management of soil generated outside enclosures. The HIA appears to lack clarity with respect to the management of soil generated during in-situ remediation works, or during works conducted outside an excavation enclosure for the alternative selective excavation remediation method. EPA recommends the proponent clarifies how material generated outside enclosures will be managed for each relevant activity.	Due to the limited potential for odour generation, all activities associated with the In-situ remediation option will be undertaken outside an odour enclosure. Potential odour generation activities (although limited) have been identified, and associated odour control measures will be employed, as follows: - Installation of groundwater control walls on 36 Hickson Rd boundary, where required Emissions will be controlled per the Perimeter Retention Wall Preliminary Air Quality and Odour Control Plan (Table 2 and Appendix H). - Drilling to install wells and undertake sampling.- emissions will be controlled as per actions outlined in the Hickson Rd ISCO Ground Breaking Works - Preliminary Air/Odour Control Plan (refer Appendix G). - Services investigation / pot-holing works. - Shallow excavation/trenching as required

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
17	Additional information and details of the final Project design and Project operation elements are required to ensure Project air impacts have been adequately assessed and appropriate mitigation methods and management strategies will be implemented. EPA recommends that the proponent provides when available: - details of all proposed mitigation methods, management strategies and contingencies to ensure the effective control of Project air emissions; - details of the final design of each Project element with respect to controlling air emissions; - additional information and clarification to demonstrate any revised Project design is sufficient to effectively control air emissions and prevent offsite impacts; and - further assessments of Project impacts if needed, EPA recommends the DP&E note that further assessment of impacts may be required if the Project design plans change significantly during their development or implementation.	The final Project design and Project Operation elements will be subject to further design development, and will be available following procurement (and prior to commencing works). Notwithstanding this, the AQIA considers potential worst-case impacts based on proposed methodologies. The requested further design details and methodology will be provided to the EPA for review and comment, prior to commencing works. This is consistent with the consent conditions on SSD 5897 and SSD 6533 for Block 4 and Block 5 Remediation Works.
18	The soil vapour extraction (SVE) system must be appropriately designed and operated to ensure emissions generated during ISCO works are appropriately captured and controlled. EPA recommends that the proponent provides details of the SVE and associated emission control system for EPA review and comment, when available, and prior to project commencement.	Information relating to the SVE System will provided as required by the EPA, prior to the commencement of works.
19	EPA recommends the proponent clarifies that a comprehensive monitoring strategy, consistent with the monitoring requirements outlined in the HIA, will be implemented, and documented in Project work plans.	A comprehensive monitoring strategy, consistent with the monitoring requirements outlined in the HIA, will be implemented, and documented in the relevant Project work plans.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	EPA recommends that a Condition of Approval includes the requirement for the proponent to develop and implement a comprehensive air quality and odour management plan for the Project that must include: a) the implementation of best available control technology and best environmental practice to ensure emissions are being reduced to the maximum extent achievable for all air pollutant generating activities; b) an ambient air monitoring program and reactive management strategy, including real-time meteorological monitoring, continuous particulate and VOC monitoring for management purposes, fit for purpose odour monitoring, and the implementation of appropriate triggers to further develop the reactive management strategy for air pollution mitigation; c) details of all proposed air quality emission control measures including: - timeframe for implementation of all identified emission controls; - key performance indicator(s) for emission controls; - monitoring method(s) including location, frequency and duration; - response mechanisms; - responsibilities for demonstrating and reporting achievement of key performance indicator(s); -record keeping and complaints response register; and -compliance reporting.	The proponent will develop and implement a comprehensive air quality and odour management plan for the Project that must include: a) the implementation of industry available control technology and industry environmental practice to ensure emissions are being reduced to the maximum extent achievable for all air pollutant generating activities; b) an ambient air monitoring program and reactive management strategy, including real-time meteorological monitoring and continuous particulate monitoring for management purposes, fit for purpose odour monitoring, and the implementation of appropriate triggers to further develop the reactive management strategy for air pollution mitigation. For VOC monitoring, as previously agreed with the EPA for Block 4 and 5 Remediation, it is proposed that monitoring will be by hand-held measurements (daily photoionisation detection (PID)), rather than continuous monitoring, as PID measurements are more reliable; c) details of all proposed air quality emission control measures including: - timeframe for implementation of all identified emission controls; - key performance indicator(s) for emission controls; - monitoring method(s) including location, frequency and duration; - response mechanisms; - responsibilities for demonstrating and reporting achievement of key performance indicator(s); -record keeping and complaints response register; and -compliance reporting.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
20	Additional information and clarification is required to address issues identified in the AQIA. EPA recommends the proponent provides clarification regarding the appropriateness of the assumptions used to calculate odour emission rates for enclosed excavation works at Block 4, Block 5 and Hickson Road. The comparison of soil vapour recovery unit emissions against POEO limits lacks clarity. The concentrations in AQIA Table 24 are incorrect, most likely due to a transcription error. EPA recommends that the proponent corrects the error in AQIA Table 24 and clarify that soil vapour recovery unit emissions will meet the limits specified in the Protection of the Environment Operations (Clean Air) Regulation 2010.	The Amended AQIA (Appendix E- Section 5.5.1) has been updated to address the points raised by the EPA in this regard.
21	The Block 4 odour control structure (OCS) stack emission rates appear to be inconsistent with those previously used. EPA recommends that the proponent provides clarification that the total emission rates used to model the OCS stack emissions for Block 4 PM10, TSP and combustion VOCs are correct.	AECOM has confirmed that there was a typographical error in the report text, however correct data used in the model. Refer amended AQIA (Appendix E) Section 5.5.2.
22	The Project air impacts modelled in the assessment of Stage 1C basement are not provided. EPA recommends the proponent provides additional information to demonstrate the predicted impacts modelled for Stage 1C works have been appropriately included in the Hickson Road AQIA.	The Amended AQIA (Appendix E) has been updated to now include Stage 1C in the modelling.
23	Project work descriptions require clarification. The AQIA does not clarify if the alternative ex-situ remediation proposal includes an option to pump and	The EIS, at 7.3.1, confirms that liquid waste, where required, may be pumped and tankered offsite for disposal. Also refer to Section 3.3.4 of the Amended AQIA (Appendix E).

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	tanker offsite highly contaminated liquid waste, similar to the preferred in-situ remediation method option. EPA recommends the proponent clarifies that contaminated liquid waste, where required, may be pumped and tankered offsite for disposal.	
24	Clarification of the odour mitigation capture efficiency analysis is required. The AQIA refers to a sensitivity analysis on odour emissions from the filters on the excavation enclosure stacks conducted as part of the AQIA submitted for the Block 4 Remediation and Page 18 Landforming works. Model runs were performed for odour reduction efficiencies at the excavation enclosure stacks of 99%, 95% and 90% - down from the 99.8% assumed in the Block 4 AQIA. All reduction efficiencies considered resulted in odour concentrations below the 2 OU criterion at all assessed sensitive receptor locations. However it is unclear if a reduced odour reduction efficiency, of for example 90%, would ensure predicted 99th percentile odour concentrations remain below the project criteria, when cumulative odour impacts from concurrent remediation projects are considered. EPA recommends that the proponent: - provides additional information on the odour mitigation capture efficiency analysis to clarify reduced capture efficiencies will not result in potential adverse offsite impacts; and/or - conducts performance testing on the excavation enclosures filters to demonstrate they provide an adequate level of capture efficiency for odour – consistent with the 99.8% assumed in the Project AQIA; and - conducts additional performance testing on the excavation enclosures to, where possible, demonstrate and ensure the assumed filter efficiencies for NOx, PM10, TSP and VOCs (in	Information relating to the odour mitigation measures and excavation enclosures will be provided as required by the EPA, following procurement and detailed design, prior to commencement of works. Section 6.1.2 of the amended AQIA (Appendix E) outlines that provided the level of reduction efficiency remains above 96% for all three odour control stacks then compliance with the odour criteria (2OU) is expected to be maintained. It is further noted that a minimum typical odour capture efficiency of 98-99% is common with activated charcoal and it is expected that a minimum capture efficiency of 96% should be able to be achieved. With regards to the EPA comments on performance testing, the amended AQIA (6.1.2), recommends that odour sampling be undertaken to demonstrate compliance with the modelling rather than performance testing to demonstrate reduction efficiencies, given the reliance of the modelling on odour concentration rather than reduction efficiency.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	addition to odour) are the same as those used in the Hickson Road and other Barangaroo AQIAs.	
25	The Project air quality monitoring program requires amendment. The AQIA includes some details of the proposed air quality monitoring program to be undertaken for the Project. The AQIA states the plan will include “an ambient monitoring program and reactive management strategy, including real-time meteorological monitoring, particulate and VOC monitoring for management purposes...” (AQIA, Section 6.5). However the proposed ambient monitoring agenda for Hickson Road remediation works which includes details of relevant monitoring (AQIA, Table 37) does not include continuous VOC monitoring. EPA recommends that the proponent revises the ambient monitoring agenda to include details of continuous VOC monitoring.	The continuous monitoring of VOC is not proposed for the site. This has been discussed with EPA in relation to previous stages of work completed for Stage 1A, and approved works for Block 4 and Block 5. As per Issue 19 above, VOC monitoring by hand-held measurements (daily photoionisation detection (PID)), is proposed rather than continuous monitoring, as PID measurements are more reliable
26	There appears to be a discrepancy regarding stack source characteristics. The Hickson Road excavation enclosure stack is 11 metres high (AQIA, Table 12), which is 3 metres lower than the Block 4 (Table 14) and Block 5 (Table 16) stacks. It is unclear why this apparent discrepancy exists.	AECOM confirms that the modelled stack heights are the same (it is the tent heights that may be different).
27	Inhalation of soil and groundwater derived vapours not clearly considered in the Project HIA. EPA recommends the assessment of health impacts considers potential risks associated with vapour intrusion from all sources.	To address the risk of inhalation of vapours from vapour intrusion the exposure pathway table within the HIA has been amended. The amended HIA (Appendix F) includes in a requirement for ambient vapour monitoring.
28	It is unclear if all relevant possible or potential hazardous or emergency scenarios have been identified and considered in the EIS. EPA recommends additional information is provided to clarify that hazardous and emergency scenarios with the potential to result in offsite impacts have	The EIS considered potential hazardous and emergency scenarios based on the potential methodologies that may be used. The final assessment and detailed Environmental Management and Safety Plans are prepared following contractor selection and detailed methodology.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	where possible been appropriately identified and considered in the Project EIS.	Accordingly, if additional scenarios that have the potential to result in off-site impacts are identified following method selection and detailed design/procurement, further assessment will be provide to the EPA, prior to commencing works.
29	Additional information and clarification is required to address minor issues identified in the EIS. EPA notes the following minor issues: a. AQIA Section 3.7: link error in text under Table 4. b. AQIA Section 3.9: Remediation and earthworks associated with Stage 1C is listed twice. c. AQIA Section 5.4.3: Table 16 label should be above the table – not at the bottom of the previous page. d. HHERA_VMP Section 5.3.2: Referencing error. EPA recommends that the proponent notes the issues above.	Typographical errors within the exhibited AQIA have been addressed within the Amended AQIA (Appendix E).
<i>Noise Impact Assessment</i>		
30	Besides restriction of works to standard construction hours, unless appropriately justified, all feasible and reasonable mitigation measures need to be implemented in these circumstances. The NIA outlines such measures and refers to management plans where more detail is provided. EPA acknowledges that this approach is in accordance with guidance in the Interim Construction Noise Guideline (ICNG). Consent conditions relating to noise control should reflect those as for previous Barangaroo projects, but with particularly close adherence to Noise and Vibration Management Plans to ensure that impacts are minimised.	Noted.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
<i>Waste and contamination</i>		
31	The 'ex-situ' remediation option is not clear and appears to be conflicting. The EIS (page 37) indicates that contaminated material will be treated offsite at a licensed facility, followed by disposal to a lawful facility. The EPA supports this option. However, the EIS (page 63) appears to indicate that material treated offsite will be 'reused onsite where possible'. The regulatory mechanism that facilitates this is the resource recovery order and resource recovery exemption framework. It is EPA's position that hazardous waste treatment by stabilisation or solidification followed by reuse for land application is not considered to be eligible for a resource recovery order and exemption given the contamination is not removed or destroyed, and will require ongoing monitoring.	Treated waste material will not be re-used at Barangaroo. The Project Waste Management Plan has been updated to clarify this (refer to Appendix G).
32	Similarly, AECOM 2015 (page 10, section 2.2) indicates that material requiring offsite treatment (including Hazardous Waste, and 'highly contaminated material') will be disposed offsite to a lawful facility following treatment. The EPA supports this. However, AECOM 2015 (page 16, section 5.1) indicates that 'for the ex-situ option... wherever possible, this material will be reused for backfilling works onsite'. Section 5.1 appears to be inconsistent with section 2.2.	As above
33	The proponent will need to: (i) clarify the remediation strategy; (ii) consider disposal for all materials after treatment; and (iii) amend the appropriate sections of the EIS and AECOM 2015.	As Above

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
<i>Surface and groundwater discharges</i>		
34	EPA recommends that a surface and groundwater management plan be prepared following the trial to incorporate a consolidated set of analytes; trigger values and licence limits for various aspects of the works including: surface water discharges, analytes and trigger values for groundwater at the site boundary, water treatment plant commissioning monitoring, and reuse criteria.	If the In-situ method is selected, a Surface and Groundwater Management Plan will be prepared for the In-Situ method, following the trial and prior to the commencement work works.
35	The preliminary work plan (Appendix Z) states that Darling Harbour is classified in ANZECC (2000) as a 'highly disturbed system'. This is a misinterpretation of the ANZECC (2000) guideline. ANZECC does not classify the current state of ecosystems but provides levels of protection as goals for a system. The goal selected by the community for Darling Harbour is slightly to moderately disturbed.	The ISCO workplan has been updated to correct the reference to the ANZECC Guidelines.
36	There are inconsistencies between the in-situ and ex-situ water management and monitoring procedures (Appendices O and P) that are not related to differences in both methods. A consolidated approach is required in the final design phase and surface and groundwater management plan(s).	An updated Stormwater and Groundwater Management Plan will be prepared as part of detailed design, prior to commencing works. The Plan will be based on the selected method and contractor methodology and will remove any inconsistencies between the exhibited plans.
37	Table 6 in the EIS provides goals for groundwater quality leaving the EPA Declaration Area following remediation. The marine water quality criteria in Table 6 have a number of errors and a range of key contaminants for the site are not included, e.g. a range of PAHs such as benzo(a)pyrene; and cyanide. The contaminant list and criteria should be justified or amended. The criteria that should be reviewed are as follows: - Benzene: 500 µg/L is the default marine trigger value (ANZECC (2000) Table 3.4.1)	The groundwater quality goals in Table 6 of the EIS, are based on criteria previously agreed between the EPA and Site Auditor, and included in the Remedial Action Plan, for remediation of the Declaration Area. As the RAP has been approved by the EPA and Site Auditor, no change to the criteria is proposed In this EIS.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	- Ethylbenzene: 5 µg/L is the marine low reliability trigger value (ANZECC (2000) Table 8.3.14) - Ammonia-N value appears to be pH corrected, however, the pH of the receiving waters (tidal water in the groundwater) should be used and therefore the default trigger value of 910 µg/L appears to be more appropriate.	
38	Naphthalene: the default marine trigger value is 50 µg/L (ANZECC (2000) Table 3.4.1). Section 4.2.1, paragraph 2 of the "In Situ Soil and Water Impact Assessment" states that "...can be managed such that they are harmless to the environment..." Further clarification is required about this statement. The concentrations of chemicals being injected and the resultant concentrations expected in groundwater should be assessed against acute/chronic toxicity levels and/or any guideline trigger values and appropriate monitoring trigger values for action and management actions documented in a surface and groundwater management plan.	Section 4.2.1 of the In-Situ Soil and Water Impact Assessment has been updated to address the EPA's request for clarification. The amended document is provided as Appendix I.
39	The proponent needs to clarify whether or not the quality of water being fed into the WTP is expected to remain consistent beyond one month, or is it expected to get progressively more contaminated (increasing concentrations of COPCs). Commissioning monitoring should be representative of highest risk periods for the selected remediation methodology.	It is expected that the quality of water being fed into the potential WTP may vary over time, depending on the area where water is being extracted. However, as the target areas are limited in extent, it is anticipated that some of the highest contamination would be removed initially, as gasworks tar is encountered. Accordingly, the current proposed commissioning monitoring is considered representative. Notwithstanding the above, any WTP will be subject to future detailed design (including commissioning monitoring details), subject to NSW EPA review, prior to commencement.
40	It is not clear how all injection wells along site boundaries will have down hydraulic gradient monitoring, e.g. Figure 4 (page 34) of the EIS shows monitoring locations along the boundary of the south west part of Hickson	It is noted that the location of injection wells as shown within the ISCO Workplan are indicative, and the final location and number of

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	Road and it is unclear which sites will monitor down hydraulic gradient to assess risk of contaminant moving out of the declared area and towards Darling Harbour.	injection wells will be determined following the pilot trial and detailed contractor design, with review by the NSW EPA. In terms of down hydraulic gradient monitoring to assess risk of contamination migrating from the declared area for the In-situ method, the following is noted: - The final extent and locations of downgradient monitoring will be detailed in the future Groundwater Monitoring Plan (GMP) - which is a requirement of the RAP – and the contractor's Detailed ISCO Workplan, prior to commencing In-situ works. These documents will be issued to the Site Auditor and EPA for review, prior to implementation; and - perimeter retention walls are proposed to be installed on the western (down-gradient boundary) as part Block 4 and Block 5 Remediation (under approved DAs SSD 5897 and SSD 6533), prior to commencing in-situ remediation works for SSD 6617. These will be considered in assessing appropriate locations and requirements for downgradient monitoring as part of the works.
41	Section 6.15 of Soil and Water Impact Assessment (Ex-situ Method), use of sediment basins. Clarification is required if the sediment basins (if used) would require use of any flocculants and/or coagulants. Use of any such chemicals should include an assessment of risk if released into the harbour.	Sediment basins are not proposed for the works.
42	Appendix B of "In Situ Soil and Water Impact Assessment" cites the limit of reporting (LOR) of PAHs as 1 µg/L. Table 8-2 (Ex-situ method) proposes a limit of 2 µg/L for PAHs based on a LOR of 2 µg/L. The reason for this discrepancy should be clarified.	The In Situ Soil and Water Impact Assessment has been updated to clarify appropriate LORs. Most laboratories have a standard LOR for PAHs of 1 µg/L for all compounds except benzo(a) pyrene which is 0.5 µg/L. LORs for PAHs analysed by ultra-trace methods are lower, at 0.1 µg/L and 0.05 µg/L for benzo(a)pyrene. Appendix B has been updated with ultra-trace LORs for PAH compounds (0.1 µg/L) and

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
		benzo(a)pyrene (0.05 µg/L) so that the LOR's are less than the ANZECC criteria. The above will also apply to the Ex-situ Method, so it is confirmed that the same LOR will apply for either method.
43	The groundwater discharge study (Appendix II) should account for potential increased groundwater movement due to injection and potential increased groundwater movement due to injection and chemicals following preferential pathways.	The In-Situ Soil and Water Impact Assessment has been updated to note that throughout chemical injections, the progression and extent of the injection front would be followed closely through groundwater monitoring, sampling and laboratory analysis of groundwater from monitoring wells on the Site specifically those located between the Harbour and Site Remediation Area. Additionally, Perimeter Retention Walls are proposed to be installed on the western (down-gradient) boundary as part of the Block 4 and Block 5 Remediation Works (under approved DAs SSD 5897 and SSD 6533), prior to commencing in-situ injections.
44	For any surface water discharges to stormwater or Darling Harbour the WTS must be designed to meet the concentrations limits that were attached to Environment Protection Licence (EPL) 13336 prior to licence variation Notice number 1530261 (see attachment "B"). The WTS must be used to treat all contaminated water (including surface water and extracted groundwater) on-site prior to any discharge. The proponent must ensure that the special conditions (attachment C) relating to the Barangaroo Water Treatment Plant, are complied with and appropriate monitoring is in place to characterise the new wastewater stream. This characterisation must be representative of the potential wastewater, e.g. wastewater from a more highly contaminated area should be used in the commissioning monitoring. It is recommended that the limits in "B" attached and conditions in "C" attached are included in the consent conditions for potential surface water discharge points from the site.	Any surface water discharges to stormwater or Darling Harbour, the WTS will be designed to meet the concentrations limits that were attached to Environment Protection Licence (EPL) 13336 prior to licence variation Notice number 1530261 (see attachment "B"). Where discharge of collected water to the harbour is proposed, the WTS must be used to treat all contaminated water (including surface water and extracted groundwater) on-site, prior to any discharge the harbour, in accordance with an approved EPL variation. Lendlease will ensure that the special conditions (attachment C) relating to the Barangaroo Water Treatment Plant, are complied with and appropriate monitoring is in place to characterise the new wastewater stream. This characterisation must be representative of the potential wastewater, e.g. wastewater from a more highly contaminated area should be used in the commissioning monitoring.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
45	Following the completion of the approved pilot trial and selection of remediation technology, EPA recommends that all surface water discharge and groundwater environmental monitoring elements are consolidated into a single document and submitted to the EPA for review.	Noted
46	EPA recommends also that any consent conditions include a requirement for a Surface Water and Groundwater Management Plan. The Plan must be developed in consultation with the EPA and submitted to the EPA for review and comment following the in-situ trial and prior to commencing the injection and system operation phase.	Noted
NSW Health		
47	The applicant is required to provide the undersigned with all air quality monitoring results throughout the remediation works.	Noted
48	The applicant is required to provide the undersigned with the water quality monitoring results throughout the remediation works.	Noted
49	In the event of a public health emergency, the South Eastern Sydney Local Health District - Public Health Unit be contacted on 02 93839333 or 0411 458 814 of details of the event and rectification actions put in place to protect the health of the surrounding residents and the public.	Noted
50	That the Public Health Unit be included in any external communications such as Community leaflets/newsletters in relation to the works, which should be emailed to santo.cannata@sesiahs.health.nsw.gov.au	Noted
51	In relation to the remediation works we have reviewed the development application and note a trial for the in-situ methods is to occur. It would be appreciated if a copy of the results from the trial be forwarded to the Public Health Unit.	Noted

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
Port Authority of NSW		
52	24 hour access must be maintained on Hickson Road with any proposed lane diversions having a suitable geometry to accommodate unimpeded two way traffic for fully-laden 19m articulated trucks.	Noted
53	Port Authority requires a minimum of three months notification or road changes and closures in relation to the proposal so that we can inform the relevant Overseas Passenger Terminal (OPT) stakeholders and any necessary arrangements can be made in relation to the land-side logistics requirements for vessel visits during the period of disruption.	Noted
54	Port Authority requires that there are no major works on Hickson Road requiring temporary road closures scheduled to occur on cruise ship days at the OPT.	Noted
55	Port Authority is to be consulted with in respect to any proposed traffic changes on Hickson Road which may impact on traffic flows and access on Hickson Road.	Noted
56	The Traffic Impact Assessment does not address the traffic impacts of the George Street Light Rail project on the traffic flows associated with OPT via Hickson Road due to the George Street road closures nor does it consider the Sydney Metro station works may overlap with remediation works. If sufficient information of construction works associated with the light rail on George Street is available, Port Authority suggests that the cumulative traffic scenario is updated to fully consider the implications of this project on SSD 6617.	A supplementary traffic statement was prepared by Arup (refer to Appendix B). The supplementary ARUP report is based upon additional traffic counts that were undertaken in November 2015. The traffic surveys demonstrate that the partial closure of George Street (along with other changes in the road environment) has not resulted in any increases in traffic volumes along the Hickson Road corridor. Traffic volumes have instead declined – despite the reduced road capacity of George Street. Further, at the time of writing, no details with regards to the construction impacts of the Sydney Metro station at Barangaroo are available. It is expected an EIS for the project will be placed on public exhibition in mid-2016.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
57	Port Authority considers that the traffic assessment modelling and intersection analysis should be re-done based on current traffic numbers, not relying on traffic counts done in July 2013.	As described above and in Appendix B traffic numbers used within the Traffic Impact Assessment have been verified and found to be conservative.
NSW Roads and Maritime Services		
58	RMS requests that a Construction Traffic Management Plan be prepared, prior to issue of a Construction Certificate, which includes consideration of the impacts on site access and traffic movements along Hickson Road from new signalised intersections and traffic signals.	A Construction Traffic Management Plan (CTMP) will be prepared prior to commencing works.
59	The impacts on site access and traffic movements along Hickson Road from the new signalised intersection of Sussex Street, Hickson Road and Napoleon Street and any other new traffic signals along Hickson Road should be included and addressed by the proponent in the CTMP.	The impacts on site access and traffic movements along Hickson Road from the new signals along Hickson Road will be included in the CTMP.
60	A Road Occupancy License should be obtained from Transport Management Centre for any works that may impact on traffic flows on classified road network and signalised intersections along Hickson Road during construction.	Noted
SafeWork NSW		
61	Further consideration of all the hazardous chemicals rather than a focus on those that are dangerous goods so that a comprehensive chemical management plan can be implemented to mitigate risks during the lifecycle of all the chemicals on the site.	Following selection of the preferred method, and prior to commencing works, a detailed Hazardous Chemical Management plan will be prepared to include consideration of SafeWork NSW comments

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	As the hazardous chemicals will be on site for an extended time consideration needs to be given to the following:	
62	a. The quantities of hazardous chemicals proposed to be used handled and stored exceed the thresholds for manifest quantities (as per Schedule 11 of the Work Health & Safety Regulation 2011 [Regulation]). The site is therefore a manifest quantity workplace (MQW). For example:- i. The quantity of class 5.1 PG11 (oxidant and peroxide) of 11,000L exceeds the manifest level of 2,500L. ii. The quantity of class 8 PG 11 (Sodium hydroxide and hydrochloric acid) also exceed the manifest quantity	Where the in-situ method is to be utilised, and following detailed design, the PHA will be updated to confirm final proposed quantities. Where the site is confirmed to be a manifest quantity workplace following detailed design, a site-specific Site Manifest will be prepared in accordance with Safework NSW requirements.
63	b. As a MQW the following is required: i. Development and maintenance of a site manifest in accordance with clause 347 and Schedule 12 of the Regulation to be kept in a place that is readily acceptable to emergency services and available for inspection. Preferably this would be kept in a red waterproof cabinet secured with a 003 key and with white lettering HAZMAT. ii. Notification to SafeWork NSW using the on-line notification form. iii. Develop and maintain a site emergency plan and lodge this with FRNSW on their website. A copy of the confirmation needs to be kept as evidence this has been submitted.	As above
64	c. Other requirements relating to hazardous chemicals at the site: i. Placards: An outer warning placard will be required ii. Bulk placards will be required for all bulk storages of hazardous chemicals. Placards for packaged stored above placard levels. Refer to the guide. Placarding for Hazardous Chemicals Guide Catalogue	Hazardous chemical placarding and registers will be included on the Site as required.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
	iii. Hazardous chemical register and up to date Safety Data Sheet for all hazardous chemicals including waste.	
65	d. Packaging - all dangerous goods must be transported and stored in approved packages including IBC. Bulk plastic tanks used to store hazardous chemicals must comply with the relevant standards.	All dangerous goods will be transported and stored in approved packages, in accordance with relevant standards.
66	e. Labelling- all hazardous chemicals including those in any pipe works during the remediation process will need to be appropriately labelled.	Hazardous chemicals will be appropriately labelled, per Safework NSW requirements.
67	f. Spill containment - bulk storage spill containment bunds need to be designed so that they have the appropriate capacity, can capture the spill (consideration of crest locus requirements) and do not allow incompatible chemicals to come together. Spill kits need to be appropriate for chemicals used, maintained and workers need to be trained in their use	Bulk storage spill containment bunds will be designed so that they have the appropriate capacity, can capture the spill) and will not allow incompatible chemicals to come together. Spill kits will be appropriate for chemicals used, maintained and workers will be trained in their use
68	g. Separation distances- need to be maintained not only to the boundary but also between incompatible chemicals as per the SDS and relevant Australian Standards	Separation distances will be maintained to the boundary and also between incompatible chemicals as per the SDS and relevant Australian Standards.
69	h. Hazardous areas- (Surfactant) A hazardous area diagram needs to be developed to clearly show all hazardous areas (stage and transfer). Consideration of the prevention of ignition sources from on and off site need to be considered an procedures implemented. It is not sufficient to consider only the introduction of ignition sources from cigarette butts from the rock wall.	A hazardous area diagram will be developed to clearly show all hazardous areas, and procedures implemented for prevention of ignition sources, based on the final system layout. It is noted that cigarette butts from the rock wall are one, but not the only, potential ignition source.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
70	i. Transfer operations- As well as the controls described, there should be consideration of overfill protection/systems. Where safety showers have been provided they will need to be inspected tested and maintained in accordance with the Australian standard or equivalent level of safety.	Appropriate overfill protection/systems will be included where required in any final design, and safety showers inspected, tested and maintained in accordance with Australian standards.
71	j. Protection from damage- all storage of hazardous chemicals need to be protected from damage such as vehicular impact. It is recommended a traffic management plan be developed and consideration given to impact protection in particular for bulk storage.	All stored hazardous chemicals will be protected from damage by vehicular impact, using appropriate traffic barriers.
72	k. Contaminants- consideration of the possible worker exposure to other hazardous chemicals in particular the toxic and potentially carcinogenic compounds typically found during gas work remediation such as benzene, naphthalene, PAH etc. However it is noted this may be covered in other documentation.	Consideration of potential worker exposure to other hazardous chemicals has been documented separately in the Health Impact Assessment.
Sydney Water		
73	The use of Sydney Waters wastewater system may be required as a disposal option for the onsite waste treatment facility. Any trade waste license request will need to meet Sydney Water's requirements before approval	Noted
74	The developer will need to obtain formal requirements for protection and monitoring to build near or over Sydney Water assets, including SPS 1129. An Environmental Management Plan, structural assessments, geotechnical studies and supporting information will need to be submitted as part of the appropriate Sydney Water application.	Noted

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
75	Any approval for a connection will depend on the current capability of our systems, which may need to be amplified or extended at the applicants cost. Access to our assets will need to be maintain at all times for standard and emergency operational needs. The environmental approval for any works associated with Sydney Waters systems will need to be covered under the Environmental Impact Assessment approval.	Noted
Mills Oakley Lawyers		
76	On behalf of the adjacent Landowner, Miller Commercial Group, Mills Oakley consider it reasonable that Lend Lease: - Compensate adjacent land owners for financial losses that may be incurred as a direct result of the remediation works; - Obtain land owners consent and provide compensation for access to land, if required for the remediation works; and - Assess the impacts to adjacent land where it will be impacted by earthworks and/or construction undertaken for the purposes of the remediation works – this includes consolation with land owners regarding impacts and the proposed mitigation measures. - Remediation works are likely to impact on the rootball of Tree 45. A condition should be included requiring its protection. Independent engineering advice from Cardno supports these recommendations – confirming that regardless of the methodology used, given the location of Tar Tank, excavation is likely to be required at the front of the property to enable remediation works on the Tar Tank to be carried out. It is likely that backfill material around the tank (near the property boundary) will require temporary support or restraint.	Section 2.8 of the Response to Submissions provides a comprehensive response to this submission. Hickson Rd Remediation works undertaken adjacent to 36 Hickson Rd may include groundwater cut-off walls or temporary retention to support excavations, as required. Cut-off walls or temporary retention will be subject to future detailed design, however no anchoring into the adjoining 36 Hickson Rd is proposed. An Arboricultural Impact Assessment was prepared by Tree Wise Men and was appended to the EIS (Appendix V). The Arboricultural Impact Assessment concluded that under either remediation option (i.e. in-situ or ex-situ remediation) Tree 45 would be retained and protected.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
Transport for NSW		
77	TfNSW recommends the following conditions of approval: Prepare a Construction Pedestrian and Traffic Management Plan (CPTMP) prior to commencement of construction, Prepare a Construction Pedestrian and Traffic Management Plan (CPTMP) prior to commencement of construction, which takes into account cumulative works at and around Barangaroo, including Wynyard Walk and Barangaroo Ferry Wharf. The CPTMP should demonstrate that the construction impacts on the road network, bus operation and pedestrian and cyclist safety can be managed. A Road Occupancy Licence will be required for works that will impact on traffic movements on Hickson Road.	A CTMP will be prepared prior to commencement, which takes into account cumulative works at and around Barangaroo, including Wynyard Walk and Barangaroo Ferry Wharf. Where required, a Road Occupancy Licence will be obtained for works that will impact on traffic movements on Hickson Road.
Jemena		
78	The remediation strategy put forward to the EPA and the consent authority is based on the Human Health and Environment Risk Assessment (HHERA) prepared by AECOM (Appendix L of the EIS). The HHERA identifies the nearest ecological receptor as being groundwater dependent ecosystems (GDEs) between the down gradient boundary of the Declaration Area and Darling Harbour. There is no evidence of GDEs in this area. The HHERA describes the human health risk from the contamination as being a risk to intrusive maintenance workers undertaking works without protective equipment. The risks to intrusive maintenance workers are able to be controlled by a site management plan in a similar way to the way the paved open space at 36 Hickson Road is currently managed by a site management plan authorised by a site auditor.	The presence of GDEs in the area has been assumed, this assumption is based on the application of the Precautionary Principle. Appendix J contains a summary of the policy and guideline considerations involved in the assessment of potential GDEs. AECOM considers it appropriate that GDEs was included in the VMP HHERA(AECOM, 2012), further that consideration of GDEs is undertaken in accordance with guidance available at the time the risk assessment was completed, and current guidance.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
79	There is no technical evidence presented in the EIS that suggests that any contaminants are migrating into Darling Harbour in excess of marine water quality criteria. In fact, the evidence is to the contrary (see Appendices C and D to the Remediation Extent Document – Appendix H of the EIS). In any event, barrier walls are being constructed as part of the broader Barangaroo development and other remediation works (see for example the PDA HHERA which is Appendix L to the Block 4 bulk excavation and remediation EIS). It is not clear from the EIS how the specific remediation works on Hickson Road, when taken in conjunction with the installation of the perimeter groundwater retention walls being installed on the broader site, will improve aquatic ecosystems in Darling Harbour.	In response to Jemena’s claim that contaminated lands in Hickson Road are isolated from Darling Harbour by previous and future works to Stage 1 of Barangaroo the following is noted: - As per response to Issue 78 above, the presence of GDEs has been assumed, and accordingly Darling Harbour is not the nearest sensitive receptor to the contaminated area; and - The aim of the proposed remediation is to allow the EPA Declaration to be removed, this would be required notwithstanding any other development works to land at Barangaroo (or anywhere else). The development works previously approved at Barangaroo South is therefore not a material consideration for the proposed remediation of Hickson Road.
80	Clause 12 of SEPP 55 requires the consent authority to consider whether there would be a more significant risk of harm to human health or some other aspect of the environment from the carrying out of the work than there would be from the use of the land concerned (in the absence of the work) for any purpose for which it may be lawfully be used. The EIS identifies significant risks associated with the proposed chemical use and the excavation of the material which is currently located in situ under an operational paved public road. These risks of disturbing the contamination need to be balanced against the risks of harm to human health and the environment from the contamination based on the use of Hickson Road as a public road. The EIS does not provide sufficient justification to demonstrate that the risks from the current contamination based on the use of Hickson Road as a public road or to surrounding areas would be greater than the proposed intrusive remediation works.	The remediation of Hickson Road EIS and this Response to Submissions demonstrate that undertaking the works the subject of SSD 6617 would not result in a more significant risk of harm than if the works were not carried out. In particular the proposed remediation works: - Comply with the relevant guidelines including: - ANZECC, 1992. Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. - NEPC, 2013. National Environment Protection (Assessment of Site Contamination) Amendment Measure. - NSW Office of Water and the Office of Environment and Heritage, 2012. Risk assessment guidelines for groundwater dependent ecosystems.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
		▪ Address the significant risk of harm to human health and the environment identified by the EPA Declaration through the remediation of contaminant mass. ▪ Contribute to a long term improvement of ground water quality which is leaving the Site and provide for an improvement to the environmental conditions in the vicinity of the site. ▪ Result in a net public interest benefit in the long term through the sufficient removal of historical contamination to allow for the removal of the EPA declaration at the Site.
81	The contamination under Hickson Road is able to be managed to address the human health and environmental risks arising from the use of the land as a public road and potential risks to surrounding areas in a less environmentally intrusive manner (e.g. cap and contain) which would be more consistent with the principles of ecologically sustainable development.	A Long Term Environmental Management Plan (LTEMP) would be required and such an approach is inconsistent with the preferred order of options for remediation and management of contaminated sites described by the ANZECC (1992) <i>Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites</i> . Further, in order to fully implement the LTEMP it would have to be assumed that any workers accessing the contaminated areas were fully protected.
Residents Submission 1		
82	Concerns over air quality management. In the event of pollutants or dangerous vapours escaping into the air there appears to be no emergency warning system in place that could warn the local community to remain indoors/close doors and windows or in fact to evacuate people who may be present in a determined risk area. Although unlikely but not impossible, if a catastrophe occurred on site which enabled dangerous vapours to escape a warning system (i.e. special sound alarm) would assist the local community in taking protective action.	Detailed site management and air quality monitoring processes are proposed to be in place at the site, which will be subject to final review by the EPA, prior to commencing works. Protocols for hazard and emergency scenarios will be finalised prior to construction and will be provided to the relevant Government Agency when available, including community consultation as required.

Remediation of Hickson Road, Part of EPA Remediation Site 21122, Barangaroo Central (SSD 6617)



Response to Submissions, February 2016

Privileged and Confidential

Issue no.	Key Issues Summary	Lendlease Response
83	Concerns over construction noise and vibration. Specifically, that there is no mention that the noise assessments undertaken have considered low frequency noise, which we recognise as a special environmental noise issue. According to the contents of the Construction Noise and Vibration Assessment Report (Appendix R) related to this SSD we see that no testing has been undertaken that would relate to low frequency noise or that testing has occurred at the elevated area east of Hickson Road and close to our building. It is paramount that the impact of overnight low frequency noise is factored into any decisions made on the noise mitigation measures and choice of equipment. This includes noise from self-powered lights, pumps, generators and fans.	Additional commentary on the issue of low frequency noise has been prepared by Wilkinson Murray and is provided as Appendix K. The commentary confirms that 'low frequency noise' is not normally associated with the works in question. Acoustic Monitoring will be undertaken as part of the ongoing site management for Barangaroo South.
Public Submission 2		
84	This submission is in support of the remediation works deeming the process well overdue. It is considered the safest method that causes the least disruption should be implemented.	Noted.