ATKINS
The official engineering design services provider for the London 2012 Games

London 2012 Olympic Park

Follow-on Project (Stage 2) Consolidated Validation Report – Planning Delivery Zone 8

February 2013

Notice

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PART III

1. Introduction

1.1 Scope

The aim of this Stage 2 Consolidated Validation Report (CVR) is to provide a high level summary of the approved Follow-on Project (FoP) remediation related documentation pertaining to Planning Delivery Zone 8 (PDZ8) of the London 2012 Olympic Park, London. These remediation works were completed as part of the Olympic Delivery Authority (ODA) redevelopment of the Olympic Park. This FoP (Stage 2) CVR provides a summary of the ODA FoP earthworks, which have been completed following on from creation of the site platform by the Enabling Works project. The Enabling Works validation scope has been reported separately within the Enabling Works (Stage 1) CVR (Ref. 1). The Enabling Works (Stage 1) and FoP (Stage 2) CVRs, form the complete consolidated validation reporting for ODA works within each PDZ.

This FoP (Stage 2) CVR is produced on the basis that the individual FoP remediation and validation reports have previously been approved by the Local Planning (now the London Legacy Development Corporation Planning Policy and Decisions Team (PPDT) formerly the ODA PDT). Therefore, this report does not reproduce or re-evaluate any of the detailed testing, results, or assessments that have been previously reported and are contained therein. This document provides a summary of existing FoP validation information: no new information is presented herein.

This document has been prepared to discharge the ODA's obligation under Condition OD.0.36 ('Protection and Validation of Remediation') of the 2007 Olympic, Paralympic and Legacy Transformation Planning Applications: Facilities and Their Legacy Transformation Planning Application (Ref. 2) as well as a number of related Slot-In validation Planning Conditions, as outlined in Section 1.3 below.

1.2 Report Objectives

As the focus of the CVRs is to discharge the relevant Planning Conditions associated with validation reporting on the Olympic Park, the CVRs are to be issued in stages to provide clarity and ensure progressive regulatory approval is achieved. The staged process is set out below and shall discharge the planning obligations as follows:

- **Stage 1** – *submitted separately via the Enabling Works CVR* (Ref. 1) - comprises Part I (Background) and Part II (Implementation of Design – Site Preparation (Enabling Works)). Part I sets out the completed remediation works within the context of the preceding remedial design. Part II discusses the implementation and validation works completed by the Enabling Works Team. The objective of this CVR (Stage 1) is to fully discharge the ODA's obligations under Condition SP.0.35 of the Olympic, Paralympic and Legacy Transformation Planning Applications: Site Preparation Planning Application (Ref. 3).

- **Stage 2** – *this document* - comprises Part III (Implementation of Design – Olympic Development (Follow-on Projects). Part III presents the ODA completed construction and remediation works

as required to facilitate the development aspects of the works i.e. infrastructure, venues and landscaping. This CVR is submitted to discharge the ODA's obligation under Condition OD.0.36 of the Olympic, Paralympic and Legacy Transformation Planning Applications: Facilities and Their Legacy Transformation Planning Application (Ref. 2) and subsequent applicable Slot-In Planning Conditions for Permissions relating to construction variations.

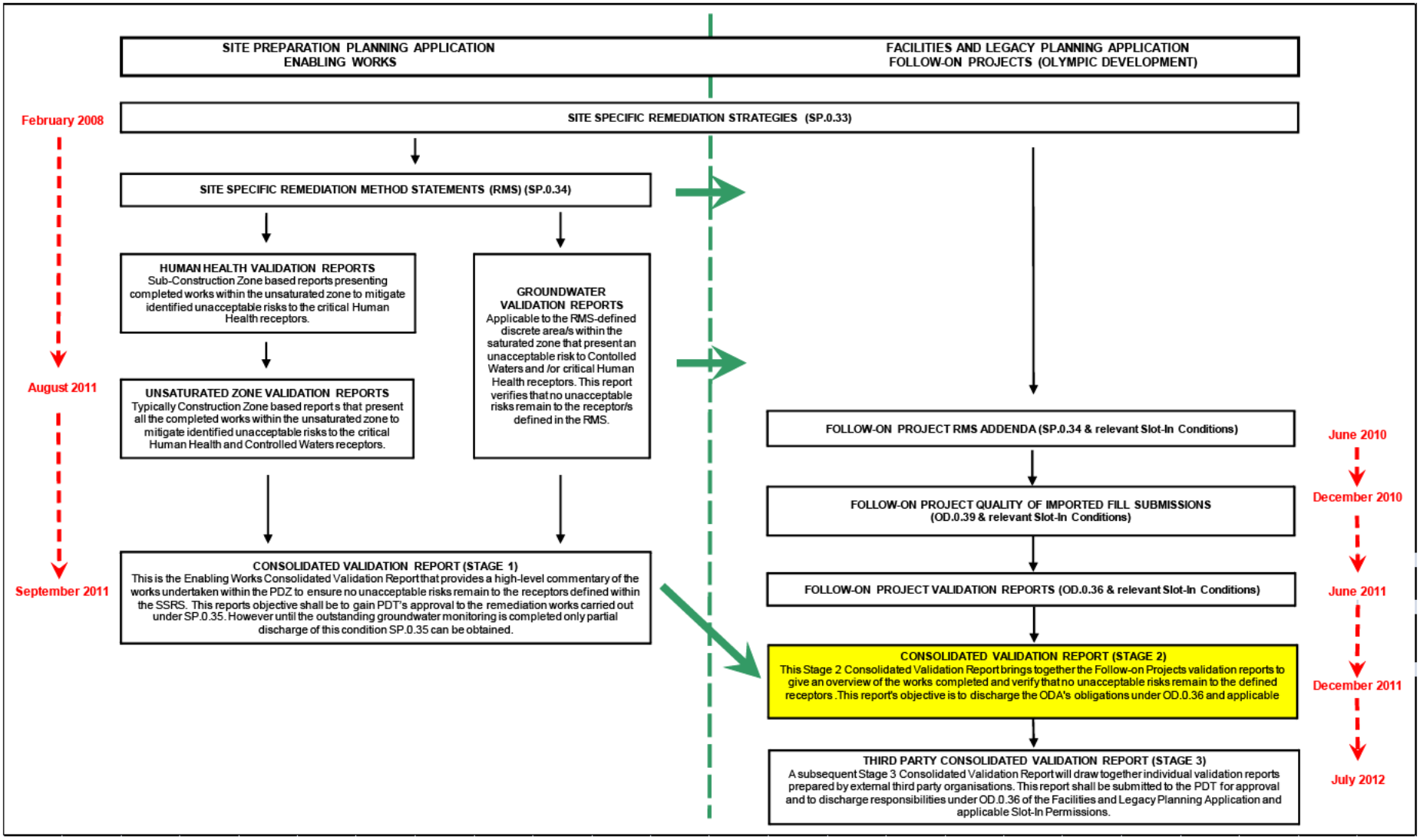
- **Stage 3 -** will be required in instances where completion of the Human Health Separation Layer (HHSL) and other overlay / completion works will be carried out by external third party organisations, most notably the London Organising Committee of the Olympic and Paralympic Games (LOCOG). In such circumstances, it will be the responsibility of these third parties to prepare, submit and obtain PPDT approval of their works by way of separate validation reports. As a consequence of further works in PDZ8, another CVR (Stage 3) will require submittal under Condition OD.0.36 of the Olympic, Paralympic and Legacy Transformation Planning Applications: Facilities and Legacy Transformation Planning Application (Ref. 2). This Stage 3 CVR will be prepared and submitted independently, by LOCOG, and will include the Games time overlay works in PDZ8.

This Stage 2 CVR also provides a summary of the Enabling Works residual actions which have been closed out by the FoPs, and those which remain to be addressed. Together with the Enabling Works (Stage 1) CVR and the Stage 3 CVR, this report is intended to inform future developers / owners / operators at the site, including the London Legacy Development Corporation (LLDC), of the remediation and validation works completed. In addition, these reports will look to highlight any residual actions / issues which need to be considered as part of on-site future development.

Future stages of CVR production will likely be required to capture post Games Transformation and Legacy re-development works in PDZ8.

The PDZ8 validation reporting sequence presenting the three current stages of the Consolidated Validation Reporting process is presented in Table 1.1 below.

Table 1.1: PDZ8 Validation Reporting Structure



NOTE: Please refer to Appendix B for a summary of the applicable PDZ8 reports and the development of the remedial design, implementation and validation.

1.3 Relevant Planning Conditions

The reporting boundary for this PDZ8 (Stage 2) CVR is presented on the attached Figure 1.

This document is submitted to PPDT for discharge of Planning Condition OD.0.36 of the 2007 Olympic, Paralympic and Legacy Transformation Planning Applications: Facilities and Their Legacy Transformation Planning Application (No. 11/90313/VARODA) (Ref. 2), which states:

> *'Validation of the Remediation Works for the purposes of human health protection must be provided within two months of completion of the Final Build Layer within any Construction Zone. When all works for the protection of human health are completed within each Planning Delivery Zone, a consolidated validation report, drawing together the Construction Zone validations, shall be submitted to the Local Planning Authority. This shall include topographic mapping of the final finished ground levels'.*

In addition, this document seeks to discharge validation Planning Conditions from a number of subsequent Slot-In Planning Applications relating to specific variations in the construction of certain infrastructure, buildings and landscaping from those set out in the original 2007 Application. These Conditions have similar wording to OD.0.36 above and are written so as to dovetail with this Condition. These validation Slot-In Conditions are listed below, with Table 2.3 providing further details.

- Infrastructure (Outer Perimeter Security Fence [OPF]) – 08/90151/FULODA (Condition 26);
- Infrastructure (OPF, Pudding Mill Lane [PML]) – 09/90109/FULODA (Condition 19);
- Infrastructure (Underpass U03/U07) – 09/90387/FUMODA (UOD.21);
- Infrastructure (Southern Sponsors Coach Park [SSCP] PDZ8) – 10/90211/FUMODA (Condition 30 and 32);
- Infrastructure (Underpass U06) – 09/90022/FULODA (UOD.27 and UOD.28);
- Infrastructure (Secondary Access Roads) – 09/90298/FUMODA (Condition 22);
- Landscape and Public Realm (LPR) (Parklands and Public Realm [PPR]) – 10/90566/FULODA (Conditions 23 and 24);
- Infrastructure (Southern Access Security Plaza VSA) - 10/90558/FUMODA (SOD 18 and 32)
- Infrastructure (Southern Pedestrian Screening Area / Vehicle Screening Area (PSA / VSA) – 10/90626/FULODA (POD.27 and POD.28); and
- Utilities (Utilities Corridor) – 08/90377/FULODA (Condition 16).

1.4 Site Location

PDZ8 comprises three portions of land (Construction Zones (CZ) 8a, CZ8b and CZ8c), separated by the existing road and surface water network. In combination the three construction zones total an area of approximately 10 hectares. The wider Olympic Park development is

present to the north, north-west and east (of CZ8c), and residential and commercial buildings are present to the south and south-west.

The site layout and location are presented on Figure 1.

For a summary of the wider site context / background of PDZ8, including the history, geology, hydrogeology, hydrology and site investigations completed, please refer to the Enabling Works (Stage 1) CVR (Ref. 1).

1.5 Olympic and Legacy End Use

The Olympic and Legacy end uses for PDZ8, as defined by the Designers, are as follows:

Olympic Mode (see Figure 2): The majority of PDZ8 comprises hard standing. CZ8a comprises the Southern Sponsors Coach Park (SSCP). CZ8b an "Accreditation Checking Area" the Southern Vehicle Screening Area (SVSA) and a small area in the north designated as an internal shuttle bus terminal. Similarly, CZ8c contains an accreditation area along with spectator services and the Southern Pedestrian Screening Area (SPSA).

Legacy Mode (see Figure 3): CZ8a will include office buildings with commercial / employment land uses including amenities for the surrounding employment premises. The northern portion of CZ8b comprises an area designated for the Crossrail DLR expansion and the remainder of the site will be used for office buildings and a car park. CZ8c will consist of residential mixed use development, which may also comprise areas of Soft and Hard Landscaping including allotments. The Crossrail DLR expansion of Pudding Mill Lane Station is located in the northern section of CZ8c.

1.6 Outstanding / Excluded Works

All ODA validation reports for PDZ8 have achieved PPDT approval and are summarised herein. Certain third party / non ODA works have been completed in PDZ8 for Games time, which are not summarised herein. These include the temporary back of house and overlay structures, to facilitate running the Olympic Games, which were completed by LOCOG. As discussed in Section 1.2 above it will be the responsibility of these third parties to prepare, submit and obtain PPDT approval of their works by way of separate validation reports, which will be summarised within a Stage 3 CVR.

1.7 Report Limitations

This CVR is based on FoP information, which is assumed to be accurate and complete.

This CVR does not present new information or re-evaluate any of the data previously assessed within the approved documents summarised herein. Neither does this document present information from third parties working within the Planning Boundary, but whose works are outside of ODA's control or scope. Where applicable, these works will be detailed within separate validation reports and summarised within a subsequent CVR stage.

This CVR should be read in light of the legislation, statutory requirements and / or industry good practice applicable at the time of the works being undertaken. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in the light of these circumstances.

2. Basis of Remedial Design and FoP Amendments

2.1 Background

The FoP works comprised construction of the principal infrastructure, including services / utilities, roads and underpasses, the key permanent and temporary venues and the hard and soft landscaping for the London 2012 Games. This infrastructure was built on a platform constructed by the Enabling Works project whose remit comprised site clearance, demolition, earthworks and remediation works. The objective of the earthworks is to ensure the site has been remediated to a standard protective of both human health and controlled waters receptors as defined by the Olympic and Legacy Masterplans.

The remedial strategy for the Park was set out in a series of increasingly focussed documents which commenced with a Global Remediation Strategy (GRS) (Ref. 4). The GRS was further developed by the Site Specific Remediation Strategies (SSRSs), which were informed by site investigation works completed in accordance with the Intrusive Investigation Method Statement (IIMS) (Ref. 5). The design documentation was further refined in a series of SSRS Addenda, to ensure the remedial works were reflective of the encountered ground conditions. These documents are all discussed in further detail within the Enabling Works (Stage 1) CVR (Ref. 1).

Within the SSRS and SSRS Addenda, a Conceptual Site Model (CSM) was developed for PDZ8, presenting potential sources, pathways and receptors. These are schematically presented on drawings within the SSRS documents, and listed in the Stage 1 PDZ8 CVR (Ref. 1). Individual contaminant concentrations protective of either controlled waters or human health, termed Site Specific Assessment Criteria (SSAC), were derived through the SSRS risk assessment process.

The development of the remedial design for the three PDZ8 individual construction zones commenced progressively from early 2008 culminating in a series of SSRSs for CZ8a (Refs. 6, 7, 8), CZ8b (Refs. 9, 10, 11) and CZ8c (Refs. 12 and 13). The objective of these SSRSs was to design a reflective remediation strategy to practicably minimise the risks to the identified human health and controlled waters receptors.

The risk assessment and remediation for PDZ8 was divided into CZ8a, 8b and 8c as a result of phased vacant possession and the construction programme. Consequently, the CSM was developed on an individual Construction Zone basis.

The risk assessment process identified unacceptable risks to both human health legacy and controlled waters receptors in CZ8a, 8b and 8c that required excavation, treatment and / or further investigation / delineation.

The remedial design was developed in tandem with remedial works in PDZ8 as more data from further site investigation became available. In accordance with good practice and to ensure a robust CSM was maintained, the design documentation was further refined to ensure the remedial works were reflective of the encountered ground conditions.

Following on from this, the Enabling Works Tier 1 Contractor (BAM Nuttall) issued a series of Remediation Method Statements (RMSs) to PDT for their approval. These RMSs detailed how the design would be implemented and subsequently validated to achieve planning discharge. The physical completion of the Enabling Works scope was in mid-2010.

Residual actions transferred to the FoPs from Enabling Works are outlined in Table 3.1. All Enabling Works validation reports are summarised within the Enabling Works (Stage 1) CVR (Ref. 1) and the process is presented graphically within the flow chart in Table 1.1.

2.2 FoP Design

Guidance to assist the FoPs with remedial works and production of planning related documents was produced by the PDT (Ref. 14) and CLM / ODA (Ref. 15). These guidance documents provided a framework for the FoPs to follow when considering their remedial requirements, set out the anticipated contents of remedial planning submissions and included templates / tools to support the completion of these documents.

At completion of the Enabling Works phase of the programme all identified remedial hotspots within PDZ8 had been addressed through appropriate removal or risk assessment such that the FoPs were not required to complete hotspot remediation. A number of residual remedial issues were, however, identified by Enabling Works which required consideration / action by the FoPs and / or future parties working on the site as detailed in the Enabling Works (Stage 1) CVR (Ref. 1) and further reviewed in Section 3.2 and Table 3.1.

In broad terms the FoP remedial design comprised completion of the remedial cover system, placement of compliant fill materials and validation of localised excavations to facilitate construction e.g. service corridors and foundation excavations. The remedial cover system comprised Human Health Separation Layer (HHSL) and a Marker Layer, demarcating the 'clean' soil of the HHSL (see Sections 3.3 and **Error! Reference source not found.**) from the underlying 'general fill' and / or *in-situ* soils. Further, where projects encountered *in-situ* soils there was a requirement for the FoPs to further assess what remediation and validation would be required to ensure the areas were suitable for Legacy use.

A summary of the scope of the FoP works, comprising infrastructure, landscaping, utilities and venues, is provided within Table 2.1. The spatial coverage of the FoP works is shown in Figure 4.

Table 2.1: Summary of FoP Scope within PDZ8

Project	Task	Description	Permanent	Temporary	Scope of Key Earthworks	Works to be Completed (unless otherwise indicated "others" refers to subsequent FoPs)
Infrastructure (Nuttall Structures, Bridges and Highways (SBH))	Underpass U06	Connecting southeast of CZ3b and the northwest of CZ8b	All areas	N/A	• Excavation for construction of U-trough and surface water drainage trenches • Placement of Marker Layer at base of U-trough and drainage trenches • Backfill of drainage trenches • Construction of five manhole chambers • Construction of U-trough structure, reinforced concrete slab and retaining walls • Road surfacing on top of reinforced concrete slab	To be completed by others: • Not applicable

Project	Task	Description	Permanent	Temporary	Scope of Key Earthworks	Works to be Completed (unless otherwise indicated "others" refers to subsequent FoPs)
Infrastructure (Nuttall SBH)	Surface Water Drainage Outfall S08-02 and U07 Underpass eastern approach ramp	Outfall S08-02 in the southwest of CZ8c	All	N/A	• Sheet pile cofferdam • Excavation of cofferdam and backfill with mass concrete • Placement of precast outfall chamber • Excavation of surface water trench, line with Marker Layer, backfill • Minor shaping works and placement of Marker Layer at U07 approach ramp • Construction of five concrete staircases and pedestrian walkways	To be completed by others: • Placement of Marker Layer and HHSL in area of S08-02 outfall chamber and surrounding cofferdam, where currently omitted, will be completed during Legacy Transformation • Walkway tie-in Marker Layer and HHSL in Transformation phase • (To be completed by LLDC)
Infrastructure (Nuttall SBH)	Outer Perimeter Security Fence	Fence line around the perimeter of the Olympic Park (in portions of CZ8a and CZ8b)	N/A	All areas	• Installation of fence posts including augering and backfill with concrete • Placement of 300 mm layer of gravel between and around the fence posts	For completion post Games: • Marker Layer and / or HHSL to be placed (added as residual item to Table 4.1)
Infrastructure (SISK SBH)	Operational Area 8a: Southern Sponsors Coach Park	Vehicle screening area and coach park in CZ8a	N/A	All areas	• Removal of concrete slabs • Excavation for utilities trenches • Construction of kerbing and asphalt surfacing	To be completed by others: • *Not applicable*

Project	Task	Description	Permanent	Temporary	Scope of Key Earthworks	Works to be Completed (unless otherwise indicated "others" refers to subsequent FoPs)
Infrastructure (Nuttall SBH)	Operational Area 8c: Southern Pedestrian Screening Area	Utilities and hard surfacing of Operation Area 8c	N/A	All areas	• Excavation of trenches for the installation of underground utilities • Installation of utilities and backfill of trenches • Installation of street lighting columns and security fence posts • Break-out of existing entrance road to the site • Completion of final surfacing works	To be completed by others: • N/A
Logistics (Volker Highways)	OPEPO and PML	OPEPO and PML office car parking and access route in CZ8a	Car park and access route	OPEPO and PML offices – removed pre-Games	• Site levelling and pavement construction • Installation of concrete slab, surface water drainage and ducts for power and communications • Installation of soft landscaped mulch area	To be completed by others: • Placement of HHSL to FFL (completed by SISK)
Logistics (Volker Highways)	Southern VSA	Hard surfacing of the Southern VSA	N/A	All areas	• Excavation and installation of surface water drainage and ducts for power and communications • Site levelling and pavement construction	To be completed by others: • N/A

Project	Task	Description	Permanent	Temporary	Scope of Key Earthworks	Works to be Completed (unless otherwise indicated "others" refers to subsequent FoPs)
LPR (Nuttall LPR)	Murphys Yard	Hard surfacing and drainage	N/A	All areas	• Cut to subgrade and collection of Validation samples • Fill void with mass concrete • Placement of Marker Layer • Backfill with imported materials • Completion of final surfacing works	To be completed by others: • Not applicable
LPR (Skanska LPR)	Southern Accreditation Area Landscaping	Hard and soft landscaping, drainage and Outfall S08-01	Outfall S08-01	Soft and Hard landscape areas	• Drainage trench excavation • Excavation and installation of Outfall S08-01 • Installation of utilities • Trench backfill • Placement of topsoil in areas of soft landscaping	To be completed by others: • Placement of hardstanding (completed by Nuttall SBH)
Utilities (McNicholas)	Communication Utilities	Utilities located across CZ8c	All areas	N/A	• Trench excavation • Installation of utilities • Trench backfill	To be completed by others: • Placement of HHSL to FFL (completed by Skanska LPR and Nuttall SBH)

Project	Task	Description	Permanent	Temporary	Scope of Key Earthworks	Works to be Completed (unless otherwise indicated "others" refers to subsequent FoPs)
Utilities (Barhale)	Under Track Crossing (UTX) 5	Launch pit to UTX 5 location in the northwest of CZ8c	UTX 5	UTX 5 launch pit	• Construction and excavation of launch pit in CZ8c • Excavation and installation of three 600 mm diameter tunnels guided by auger boring under Great East London (GEL) and Docklands Light Railway (DLR) lines • Backfill of launch pit and reinstatement of Marker Layer	To be completed by others: • Placement of HHSL to FFL (completed by Skanska LPR and Nuttall SBH)
Utilities (Cofely)	District Heating and Cooling Network (DHC)	Pipe work located within CZ8c, from UTX5 in the northwest to the northeast portion of the site	All areas	N/A	• Trench excavation • Installation of heating and cooling pipes • Trench backfill	To be completed by others: • Partial Marker Layer and HHSL (completed by Skanska LPR and Nuttall SBH)

2.2.1 Addenda to the Enabling Works Remediation Method Statements

A number of addenda to the established Enabling Works South Park RMSs were completed and approved for works undertaken by the FoPs in PDZ8 (Refs. 16, 17, 18, 19 and 20). These RMS addenda established the FoPs methodologies for undertaking their earthworks so as to complete the remedial strategy, whilst protecting / maintaining the existing Enabling Works remediation and detailing validation of their works. These documents were submitted to PDT to discharge the Planning Condition covering provision of RMS (SP.0.34) in addition to seeking discharge of related Slot-In Planning Conditions. The relevant FoP RMS addenda and Applications for PDZ8 are summarised in Table 2.2 below.

Table 2.2: RMS Addenda relevant to PDZ8

Project / Contractor	Document Title and Reference	Planning Application and Status	Rationale
Infrastructure: (Nuttall SBH)	Olympic Park Lot 2 (PDZ1, PDZ2, PDZ3, PDZ4, PDZ8) and Lot 5 (PDZ5 & PDZ6) Remediation Method Statement Addendum – Structures, Bridges and Highways (7040-SBH-SPK-W-REP-0027 & 7080-SBH-NPK-W-REP-0017) (Ref. 16)	08/90151/FULODA (Condition 25): Approved (10/90514/AODODA) 08/90194/FULODA (LOD.21): Approved (10/90579/AODODA) 10/90298/FULODA (Condition 20): Approved (10/90343/AODODA)	SBH Lot 2 works covered underpass U06, Outfall S08-02 and security fence. In their RMS a variation was included reducing the thickness of the HHSL / placing the Marker Layer at a shallower depth beneath permanent hard standing (see Section 2.2.2 below).
Infrastructure: (Nuttall SBH)	Planning Delivery Zone 8 Operational Area 8c: Southern Pedestrian Screening Area Remediation Method Statement and Import of Fill Submission (7085-SBH-A8C-W-MST-0006-C04) (Ref. 17)	07/90011/FUMODA (SP.0.34) 10/90558/FUMODA (No specific RMS condition) – approved.	SBH Lot 11 works covered the Southern Pedestrian Screening Area. In their RMS a variation was included reducing the thickness of the HHSL / placing the Marker Layer at a shallower depth beneath permanent hard standing (see Section 2.2.2 below).

Project / Contractor	Document Title and Reference	Planning Application and Status	Rationale
Logistics (CLM / Volker Highways)	RMS Addendum CLM Logistics & Security Work Packages (0009-TPI-EWK-CM-PRO-0001, Rev P06) (Ref. 18)	07/90011/FUMODA (SP.0.34): Approved (10/90492/AODODA)	To address CLM Logistics and Security works within PDZ8, encompassing car parks, access routes, utilities and pedestrian screening areas. Variations included reducing the thickness of the HHSL / placing the Marker Layer at a shallower depth beneath permanent hard standing (see Section 2.2.2 below) and the validation of more material against below ML criteria, as the hard cover is accepted to substitute for the separation layer.
LPR (Skanska)	Olympic Park Planning Delivery Zones 1, 2, 4 & 8: Remediation Method Statement Addendum – Landscape & Public Realm South (7170-LPR-SPK-L-RMS-0001) (Ref. 19)	08/90311/FULODA (PPR.38): Approved (09/90031/AODODA, 10/90363/AODODA, 11/90022/AODODA, 11/90079/AODODA, 11/90084/AODODA, 10/90357/FULODA (WTOD.15): Approved	To address LPR South works on hard and soft landscaping variations were proposed to the standard remediation design. These included reducing the thickness of the HHSL / placing the Marker Layer at a shallower depth beneath the permanent concourse (see Section 2.2.2 below) and omission of sub-grade validation testing on linear drainage trenches. This RMS document also discharged a number of pre-validation Slot-In Planning Conditions (refer to Section 2.2.6).
Utilities: Multi Utilities and DHC (McNicholas)	Design Note for McNicholas Works in the Olympic Park, Planning Delivery Zones 1, 2, 3, 4, 5, 6, 7 and 8 (8526-UNN-ECW-U-MST-0070, 8514-UNN-UCW-U-MST-0001) (Ref. 20)	08/90377/FULODA (Condition 15): Approved (10/90523/AODODA) 09/90212/FULODA (Condition 19): Approved (11/90331/AODODA)	To address the multi-utilities scope of works. Variations included placement of Marker Layer and reduced HHSL via FoPs subsequently installing permanent hard standing. No sub-grade validation testing for the utility linear corridors was proposed.

Note: Refer to Appendix B for a summary of the key elements of the various RMS addenda.

2.2.2 Hard standing as a Substitute to the Separation Layer

Under a site wide RMS addendum completed by the Enabling Works remedial designers a framework was established for reducing the thickness of the HHSL under suitably robust hard standing (Ref. 21). The basic premise behind this design change was that hard standing would act as a suitable barrier to certain pollution pathways (namely ingestion, dermal contact and dust inhalation) and reduce the requirement for a full-thickness HHSL.

The framework document required individual projects to provide information of where this approach was being adopted and provide details with regards to the extent of the area and the transition from reduced to full-thickness separation.

In accordance with Project Managers Instruction PMI-ATK-PM-08Z-ZZZ-ZZZ-E-0008 (Ref. 22) and the PDT approved CZ8a RMS addendum (Ref. 23), the hardcover placed by FoPs for Olympic land use at the site is considered to form a suitable substitute to the separation layer and Marker Layer. It was therefore agreed that the Marker Layer placed across CZ8a and CZ8b by Enabling Works was 'redundant' and that material above the redundant Marker Layer was not verified to human health separation layer criteria. The PMI stated that should FoPs necessitate any change in the extent of hardcover, they shall seek approval from the PDT before such works through the submittal of an RMS or otherwise agree with the PDT. In accordance with the PMI, the FoPs shall be responsible for the placement of a separate new Marker Layer, which shall be overlain by chemically acceptable materials in line with the approved Site Wide RMS Addendum (Use of Hard Cover as a Substitute to the Separation Layer) (Ref. 21), underpass U06 carriageway (Ref .16) and Soft Landscape areas in CZ8c (Ref. 32) and prevailing SSRS. The FoP HHSL and ML are discussed in more detail in Sections 3.3 and **Error! Reference source not found.**, respectively.

2.2.3 Quality of Imported Fill Submissions

Under the 2007 Planning Permissions (Conditions OD.0.39 and SP.0.37) and a number of the subsequent Slot-In Permissions, a requirement existed for projects, which intended to import unbound fill materials from off-Park, to confirm suitability of the material in advance of importation. This was required to demonstrate the material did not constitute a waste or unacceptable risk to human health, planting and the environment. A framework document, setting out the information required to satisfy the discharge of these 'Quality of Imported Fill' Planning Conditions was established by the Enabling Works Team and subsequently adopted by the FoPs (Ref. 24). Planning applications, in accordance with the framework, were submitted by a number of the FoPs and those applications submitted in relation to Slot-In conditions are summarised in Table 2.3, below.

A large proportion of the materials imported was supplied through the ODA's aggregate supplies concessionaire, Aggregate Industries, who worked alongside CLM Logistics to develop a further framework to encourage use of Waste and Resources Action Programme (WRAP) compliant recycled aggregates (Refs. 25 and 26).

2.2.4 Gabion Material

A site wide framework (Ref. 27) was approved by the PDT (Decision Notice: 10/90330/AODODA), which addressed the use of site derived gabion material in the FFL and established that no chemical testing of the material for human health or controlled

waters verification purposes was required to be undertaken. This framework was based on the principle that the nature and placement of gabion material mitigates the pathways to human health receptors. Regarding potential risks to controlled water receptors, the Environment Agency agreed that visual inspection of the material during hand placement was sufficient to ensure no fines or visual signs of contamination or deleterious material were apparent.

Gabion material was not used during the FoP works within PDZ8.

2.2.5 SSAC Amendments

Following derivation of the original SSAC for HHSL and general backfill materials for the individual zones / sub-zones across the Park, as provided in the remedial designer's SSRS documents, a number of amendments were subsequently discussed and agreed in consultation with PDT. These Olympic Park wide SSAC amendments included the following key documents:

- Site Wide RMS Addendum (Asbestos in the Sub-grade & General Fill). MST-ENL-CE-ZZZ-OLP-SP1-E-0159 Rev 05 (Decision Notice Refs. 08/90083/AODODA, 08/90181/AODODA, 08/90216/AODODA, 08/90217/AODODA, 08/90218/AODODA, 08/90219/AODODA, 08/90220/AODODA, 08/90221/AODODA, 08/90222/AODODA 08/90223/AODODA, 08/90281/AODODA and 08/90326/AODODA). This document details the sampling strategy to be utilised when an asbestos value of >0.1% w/w is encountered within the HHSL or General Fill.
- Site Wide SSRS Addendum (Justification of deviation from the GRS in the derivation of SSAC). MEM-ATK-CM-ZZZ-OLP-ZZZ-0004 Rev 2 (Decision Notice Ref. 09/90233/AODODA). This memorandum documents the changes Atkins applied in the derivation of SSAC from the methodology or data sources presented in the GRS along with justification for the changes.
- Proposed changes to the Human Health SSAC values for Lead, General Metals, and Polycyclic Aromatic Hydrocarbons (PAHs) in the Separation Layer, and to the SSAC values for General Fill. REP-ATK-CM-ZZZ-OLP-ZZZ-E-0004 (Decision Notice Ref. 08/90265/AODODA). Revised SSAC were calculated for lead using the Provisional Tolerable Weekly Intake method for the Soft Landscaping Legacy end use, for general metals using a single Soil Ingestion Rate, and for PAHs assessing the potential contribution from each of the vapour inhalation pathways based on the Henry's Law Constant.
- Errata to Document entitled 'Proposed changes to the Human Health SSAC values for Lead, General Metals, and polycyclic aromatic hydrocarbons (PAHs) in the Separation Layer, and to the SSAC values for General Fill'. REP-ATK-CM-ZZZ-OLP-ZZZ-E-0004 (Decision Notice Ref. 08/90265/AODODA). Atkins recalculated the inhalation Tolerable Daily Intake for lead; but the inhalation pathway was still not considered to be significant. The dermal pathway for lead was also calculated, resulting in a new SSAC for areas of soft landscaping not associated with commercial buildings. In addition, Atkins further justified the use of a fraction of organic carbon (FOC) of 0.01.

2.2.6 Pre-validation Remediation Slot-In Conditions

A number of the FoP works were subject to Slot-In Planning Permissions, which generally related to structural design changes rather than changes to remediation, and retained the key remediation Conditions from the 2007 Permissions as follows:

- Landscape and Planting Details (OD.0.28) – FoPs required to submit details of the means by which installed remediation measures would be safeguarded during landscaping works.
- Foundation Details (OD.0.26) – FoPs required to demonstrate the means by which existing remediation measures would be safeguarded during foundation construction works, along with any measures to prevent ingress of gaseous contaminants into that building or the contamination of controlled waters.
- IIMS, SSRS, RMS (SP.0.32, SP.0.33 and SP.0.34) – FoPs required to consider the suitability of the prevailing IIMS, SSRSs and RMSs for the area of their works and to provide details of any changes to these strategies or demonstrate how these strategies still applied.
- Quality of Imported Fill (OD.0.39) – FoPs are required to confirm suitability of imported material for use on the project (see Section 2.2.3 above).

Table 2.2 above provides details of the RMS Slot-In Conditions discharged by the FoPs in PDZ8 and a summary of the discharge of the remaining remediation Slot-In Conditions is provided in Table 2.3 below.

Table 2.3: ODA Remediation Slot-In Conditions relevant to PDZ8

Slot-In Application and Responsible Party	Pre-validation Slot-In Conditions							Validation
	Landscape Details	Foundation Details	IIMS	SSRS	RMS	Grouped IIMS, SSRS, RMS	Quality of Imported Fill	
Infrastructure: Temporary Outer Perimeter Fence 08/90151/FULODA (Nuttall SBH)	N/A	N/A	Condition 23 Approved: 10/90514/AODODA	Condition 24 Approved: 10/90514/AODODA	Condition 25 Approved: 10/90343/AODODA (approved under SP.0.34) 10/90514/AODODA	N/A	Condition 28 Approved: 10/90343/AODODA (approved under OD.0.39)	Condition 26 Approved: 10/90514/AODODA
Infrastructure: Outer Perimeter Fence 09/90109/FULODA (Nuttall SBH)	N/A	N/A	Condition 15 (discharged under Condition 18)	Condition 16 (discharged under Condition 18)	Condition 17 (discharged under Condition 18)	Condition 18 Approved: 10/90514/AODODA	Condition 21 Approved: 10/90343/AODODA (approved for OD.0.39)	Condition 19 Approved: 10/90514/AODODA
Infrastructure: U03/U07 09/90387/FUMODA (Nuttall SBH)	N/A	N/A	None	None	None	None	UOD.24 Approved: 10/90579/AODODA	UOD.21 Approved: 12/90043/AODODA
Infrastructure: Southern Sponsors Coach Park PDZ8 10/90211/FUMODA (SISK SBH)	N/A	N/A	None	None	None	Condition31 Approved: 12/90264/AODODA	Condition 35 Approved: 12/90264/AODODA	Condition 30 & 32 Approved: 12/90264/AODODA
Infrastructure: Underpass U06 09/90022/FULODA (Nuttall SBH)	UOD.8 Approved: 09/90376/AODODA	N/A	UOD.24 Approved: 11/90032/AODODA	UOD.25 Approved: 11/90032/AODODA	UOD.26 Approved: 11/90032/AODODA	N/A	UOD.31 *Not yet submitted*	UOD.28 Approved: 11/90032/AODODA
Infrastructure: Secondary Access road 09/90298/FUMODA (Nuttall SBH)	N/A	N/A	None	None	None	Condition 20 Approved: 10/90514/AODODA	Condition 25 *(Letter*0007-OPS-CLM-LET-00005 has been issued *to PPDT to close out this issue awaiting approval)*	Conditions 21 & 22 *(Letter*0007-OPS-CLM-LET-00005 has been issued *to PPDT to close out this issue awaiting approval)*
Landscape Public Realm, Parkland Public Realm 10/90566/FULODA (Skanska LPR South)	N/A	N/A	Condition 19 (discharged under Condition 22)	Condition 20 (discharged under Condition 22)	Condition 21 (discharged under Condition 22)	Condition 22 Approved: 10/90082/AODODA	Condition 27 Approved: 11/90355/AODODA	Condition 23 & Condition 24 Approved: 11/90764/AODODA

Slot-In Application and Responsible Party	Pre-validation Slot-In Conditions							Validation
	Landscape Details	Foundation Details	IIMS	SSRS	RMS	Grouped IIMS, SSRS, RMS	Quality of Imported Fill	
Infrastructure: Southern Access Security Plaza Vehicle Screening Area 10/90558/FUMODA (Nuttall SBH)	N/A	SOD.18 (N/A)	None	None	None	None	SOD.32 N/A	None
Infrastructure: Southern Plaza Pedestrain Screening Area / Vehicle Screening Area 10/90626/FULODA (CLM Logistics: Volker)	N/A	POD.10	None	None	None	POD.26 Approved: 12/90244/AODODA	POD.24 Approved: 12/90244/AODODA	POD27 & POD 28 Approved: 12/90244/AODODA
Utilities: Utilities Corridor 08/90377/FULODA (McNicholas)	N/A	Condition 19 (N/A)	Condition 12 (discharged under Condition 15)	Condition 13 (discharged under Condition 15)	Condition 14 (discharged under Condition 15)	Condition 15 Approved: 10/90523/AODODA	Condition 18 Approved: 11/90004/AODODA 11/90015/AODODA	Condition 16 Approved: 11/90147/AODODA 12/90075/AODODA

Note:

N/A = Condition Not Applicable to work undertaken

None = no specific planning condition

3. Implementation of Design – Follow-on Projects

3.1 Summary of Works Completed

The following sections summarise the key construction earthworks completed by the FoPs within PDZ8 and further details from each FoP validation report are provided within Appendix B, including which Enabling Works residual actions were addressed (see also Section 3.2 below). Details of the FoP works, including sub-grade excavations, extent and thickness of Marker Layer and HHSL and the final topography are included in Figures 5 to 8, respectively.

3.1.1 Infrastructure

3.1.1.1 Underpass U06

Underpass U06 spans between CZ3b and CZ8b and consists of a U-trough concrete structure comprising a reinforced concrete slab and retaining walls (Ref. 28). No ground investigation or remediation works were undertaken by Enabling Works within the area of the underpass, therefore Marker Layer and HHSL were absent prior to commencement of works. Eight sub-grade validation samples were collected and assessed against the respective SSACs with no exceedances identified.

Marker Layer was placed at the base of the excavation for the installation of drainage and construction of the U-trough structure and HHSL placed above this. However, HHSL was not placed within the carriageway as the hardstanding was deemed to act as a substitute as defined in the Site Wide RMS Addendum (Ref. 21). Material placed above the Marker Layer included imported Type 1 material (virgin crushed limestone) and Class 6N fill. Completion to FFL for the road verges and landscape was outside the scope of these works and was carried out by the follow-on contractor (LPR South). Typical sections of the U06 works can be seen in Figure 11.

3.1.1.2 Underpasses U03 and U07

At U03 the works involved removal of existing underpass decking, renovation of the existing concrete piles and installation of a new concrete deck (Ref. 29). No fill material was removed or placed. At U07 the works involved excavation of pre-placed fill, replacement and expansion of the existing underpass, and dredging of river sediment and replacement with geotechnically compliant material. Imported Class 6A limestone gravel was used for this purpose. Since the works involved the construction of bridge decks suspended over rivers, there was no requirement to install Marker Layer or HHSL.

3.1.1.3 Drainage and Outfall S08-02

Nuttall SBH constructed surface water drainage in the west of CZ8c. The drainage connects to Outfall S08-02 which drains into the City Mills River in the south western corner of CZ8c, just to the west of Underpass U07 (Ref. 30). The outfall was constructed within a sheet-piled cofferdam. Soils within the cofferdam were excavated to the top of the River Terrace Deposits. The Nuttall SBH report (Ref. 30) demonstrated these works did not

represent a new contamination pathway into groundwater because the cofferdam remains *in-situ* around the outfall and mass concrete has been placed within the structure to provide an impermeable replacement to the removed Alluvium (refer to Section 3.9). Two manholes were constructed to access the drainage pipe behind the outfall. Marker Layer was installed throughout the surface water drainage trench associated with Outfall S08-02, however no Marker Layer was placed during construction of the outfall and none of the site was completed to FFL (see Sections 3.3 and **Error! Reference source not found.** and Figures 6 and 7) as a part of this work package. The approach to underpass U07 was installed over the top of Outfall S08-02. During Legacy transformation the suspended wooden walkway to U07 will be dismantled and as a result the FoP will need to place Marker Layer and the full thickness of HHSL across this area.

3.1.1.4 Olympic Park Perimeter Fence Line

Nuttall SBH constructed a fence around the perimeter of the Southern Olympic Park as part of the SBH Lot 2 contract (Ref. 31). Within PDZ8 Nuttall SBH installed the OPF around CZ8a and CZ8b.The OPF is approximately 4.8 m high, with fence posts installed at 25.7 m intervals. Localised augering was required and the fence posts were secured with concrete. Placement of fill material was limited to a 300 mm thick layer of imported granite gravel between and around the fence posts. Marker Layer and HHSL were not required to be placed along the OPF due to the limited extent of excavations and the established easements and boundary agreements. The OPF will be removed during Legacy transformation, and any necessary remediation (including placement of Marker Layer and HHSL) and validation will be completed at this point by subsequent Transformation contractors (refer to the outstanding works in Table 4.1).

3.1.2 Landscape and Public Realm

3.1.2.1 Drainage and Outfall S08-01

Skanska IS constructed surface water drainage in the northern section of CZ8c as part of their Landscape and Public Realm (LPR) contract. The drainage connects to Outfall S08-01 which drains into the Waterworks River in the north eastern corner of CZ8c, just to the east of Underpass U03 (Ref. 32). The outfall was constructed within a sheet-piled cofferdam. Soils within the cofferdam were excavated to the top of the River Terrace Deposits; however, this has been demonstrated not to present a new contamination pathway into groundwater because the cofferdam remains *in-situ* around the outfall and mass concrete placed within the structure provides an impermeable replacement to the removed Alluvium (refer to Section 3.9). Typical sections of the landscaping drainage works can be seen in Figure 11.

3.1.2.2 Soft landscaping

LPR soft landscaping works completed by Skanska comprised areas along the eastern and north-western boundaries of CZ8c (Ref. 32) surrounding the hard landscaping. A total of 300 mm of topsoil was placed on top of the existing ground, following coppicing of shrubs. Due to the presence of existing vegetation, Marker Layer was not placed and no excavations were carried out in the soft landscaping areas completed by Skanska within CZ8c. These areas fall within the retained areas discussed in the Retained Areas Risk Assessment Report (RARAR) (Ref. 33).

3.1.2.3 Hard landscaping

LPR hard landscaping works completed comprised construction of pavements (temporary screening area and permanent), and installation of services including carrier, filter and foul drainage. Earthworks involved placement of fill, construction of tarmac surfaces, trench excavation, installation of services and trench backfill. Three different hard standing pavement designs were constructed across the site, with Type 1 thicknesses above the Marker Layer ranging from 150 to 500 mm. Not all areas of hard landscaping were finished to FFL by Skanska, within CZ8c, these works were completed by Nuttall SBH (Ref. 34). One exceedance of the applicable SSAC for benzo(a)pyrene was recorded in the south of the site, in the HHSL material used within the hard landscaping area. This has been demonstrated not to represent an unacceptable risk during Games mode. The affected area is currently scheduled to be allotments in Legacy, and as such there will be an opportunity to remove this exceedance during Legacy transformation. Exceedances are shown on Figure 10, while sections of the hard landscaping works can be seen in Figure 11.

3.1.2.4 Murphys Yard

No Enabling Works had been undertaken at the Murphys Yard site in CZ8b. LPR's scope of works included re-profiling the area, removing 600 mm of Made Ground, placement of Marker Layer and 300mm of imported Type 1 material as HHSL, with tramacing being completed by Volkers. The finish level after LPR works within the site ranged from 4.5 to 4.6 m AOD...

During excavation works, an underground structure was discovered in the south western portion of the site which was approximately 1.5 to 1.8 m bgl. This consisted of brick arches and steel girders that formed a former cellar. LPR's scope of works was then increased to include the removal of this structure and infill with concrete to ensure stability and reduce settlement of the final surface. A total of 380 tonnes of crushed concrete, 140 tonnes of Tarmac and 420 tonnes of Made Ground was removed from the site and disposed off site to licensed recycling / disposal facilities under appropriate Duty of Care (Ref. 35).

3.1.3 Logistics

3.1.3.1 OPEPO and PML office car park and access route

Volker Highways constructed two offices the Olympic Park Enrolment and Pass Office (OPEPO) and Pudding Mill Lane (PML) office and associated utilities and car parking on behalf of CLM Logistics and Security (Ref. 36). Both buildings were temporary, with removal undertaken prior to Games. Earthworks for OPEPO included installation of services and construction of the concrete foundation slab. The concrete slab for PML was constructed by Enabling Works. A temporary soft landscaped mulch area was also installed. The two office buildings (OPEPO and PML) have since been removed and hard standing installed in place of the temporary soft landscaping (see 3.1.3.3).

3.1.3.2 South Plaza

Construction of the South Plaza PSA was carried out by Volker Highways (Ref. 37). The South Plaza PSA encompasses CZ8b almost in its entirety. Works to prepare the PSA included the construction of a security fence, the installation of shallow utilities and pavement construction. A total of 150 to 350 mm Type 1 capping layer was placed above the Marker Layer, which was then overlaid with 160 mm asphalt surface to FFL.

3.1.3.3 Southern Sponsors Coach Park

Construction of the SSCP was carried out by SISK (Ref. 38). The SSCP encompasses CZ8a almost in its entirety. Works to prepare the SSCP included the construction of a security fence and the installation of shallow utilities. In addition, a small section of existing road near the site entrance that was left in place by Enabling Works was broken out (and the underlying sub-grade validated), after which Marker Layer and minimum 600 mm thick separation layer was placed. The majority of the site was then surfaced with tarmac to FFL, the remainder of the site comprises a Soft Landscape finish of topsoil and grass seeding.

3.1.3.4 Southern Pedestrian Screening Area

Construction of the Southern Pedestrian Screening Area (SPSA) was carried out by Nuttall SBH (Ref. 34). The SPSA encompasses CZ8c almost in its entirety. Works to prepare the SPSA included the demolition of two existing concrete slabs, excavation and installation of shallow utilities, including drainage and street light ducting. Marker Layer and HHSL was used to backfill the trenches. The site was then surfaced with tarmac to FFL.

3.1.4 Utilities

3.1.4.1 District Heating and Cooling Network

The DHC network runs along the east of PDZ8 in an approximately northwest-southeast alignment, from UTX5 in the north to midway along the eastern boundary. Cofely are the Principal Contractor for the DHC; but McNicholas were instructed to complete the civil earthworks components (excavation and backfilling only) on behalf of Cofely. As a result the corridor in which the DHC pipe work was installed was validated by McNicholas within their PDZ8 Multi-utilities Validation Report (Ref. 39). During Legacy transformation works and as a part of their 40 year concession, Cofely will complete excavation of approximately 40 m of trench to install the remainder of the DHC system leading up to the location of the new pipe bridge, south of the existing bridge (Ref. 40).

The earthworks associated with the DHC were completed below FFL and completed to FFL by Nuttall SBH (Ref. 34).

3.1.4.2 Multi-utilities

McNicholas installed the telecommunication ducts, jointing chambers and terminations points throughout CZ8C (Ref. 39). The utilities were installed from UTX5 in the north, along the eastern and southern boundaries. The works comprised trench excavation, utility installation and backfill. McNicholas placed Marker Layer and HHSL where necessary. However, none of the utility works were completed to FFL, these works were completed by Nuttall SBH (Ref. 34).

3.1.4.3 UTX5

UTX5 constructed by Barhale, spans between CZ2b and CZ8c and consisted of excavation of a launch pit in CZ8c and a reception pit in CZ2b and the excavation and installation of three 600 mm diameter tunnels by guided auger boring under the Great East London and Docklands Light Rail lines. All excavated material was exported to the Soil Hospital for disposal. Barhale replaced the Marker Layer to the pre-existing level at the completion of

their works, along with 300 mm of HHSL (Ref. 41). Works in CZ8c were completed to FFL by Nuttall SBH (Ref. 34).

3.2 Residual Actions from Enabling Works

Table 3.1 below presents the residual actions identified at the end of the Enabling Works stage of the project, as summarised within the Enabling Works (Stage 1) CVR for PDZ8 (Ref. 1) and summarises the works undertaken by the FoPs to address these actions, where relevant.

Table 3.1: Residual Remedial Actions from Enabling Works for PDZ8

No	Title	Description	Responsibility	Action completed by ODA FoP
PDZ8 GENERAL				
1	Completion of groundwater monitoring for the Southern Plume	'Southern Plume' groundwater monitoring across the southern part of the Olympic Park shall continue for a period of approximately 12 months (scheduled commencement date of December 2012 with an end date of December 2013). The groundwater monitoring results and any associated remedial works will be subject to Regulator / PPDT approval.	Enabling Works (novated to LLDC for completion in the Legacy Transformation phase)	N/A
2	No excavation of soils at the Site	The Permit to Proceed (PtP) Protocol (Ref. 42 and Appendix D) must be implemented for all below ground works. A review of available data relating to the condition of the soils at the Site should be undertaken prior to any excavation and appropriate precautions must be undertaken. The Validation Reports prepared by Enabling Works base their assessments on long-term risks to the end-user assuming the Legacy end use stated in the SSRS and does not consider risks to construction or maintenance workers when validating the site. Any risks to construction workers can safely mitigated through Personal Protective Equipment (PPE) and suitable engineering precautions. Reference should also be made to the H&S File.	FoP / Future land owners	FoP compliance with the PtP Protocol is detailed within Section 3.6 below and within the individual validation reports summarised in Appendix B. As detailed within Section 3.16, FoP works incorporated appropriate H&S measures for workers involved in the excavation of soils.
3	Restrictions to remediation	Restrictions to remediation exist in defined areas of PDZ8 as shown on Figure 9. If these areas are developed in the future, an assessment will be required to determine if remediation is required. In the meantime, any construction adjacent to the areas should consider available evidence from samples taken at the limits of the remediation works.	FoP / Future land owners	Please refer to details in Section 3.10 and Figure 9.

No	Title	Description	Responsibility	Action completed by ODA FoP
4	Suitable infrastructure design	Structures should be designed recognising the chemical and other characteristics of the stratum in which they are founded. Sections in contact with potentially contaminated materials may need to be resistant to chemical attack, particularly by sulphates.	FoPs	FoP structures have been designed and constructed to take account of known ground conditions. This includes infrastructure, landscaping and utilities. Example specification extracts, for a selection of projects, have been reproduced within Appendix E to demonstrate that this issue has been considered at design and construction stages.
5	Suitable methods to protect pathways	Consideration of design and construction methods (for example, choice of suitable pile design and construction methods) to avoid creation of pathways to lower aquifers.	FoPs	Section 3.9 describes measures taken to ensure pathways were not created where FoP works involved penetration and / or removal of the Alluvium. For assessment of risks associated with penetration and / or removal of the Alluvium within PDZ8 please refer to the Atkins Alluvium Technical Note (Ref. 43)
6	Ground gas and vapour assessments	Assessment of soil gas and soil vapour hazard and appropriate design and construction. Gas membranes or positive venting may be needed in the construction of any inhabited or enclosed spaces.	FoPs	No enclosed structures requiring ground gas / vapour assessment have been constructed by the ODA FoPs within PDZ8.
7	Protection of monitoring and groundwater remediation installations and facilities	Undertake any required measures to protect monitoring and groundwater remediation installations and facilities at the Site. Any damage to such installations or facilities is to be reported to the PtP team as soon as practicable so that remedial works / decommissioning (as appropriate) can be undertaken.	FoPs	FoPs followed these guidelines during their works and ensured that access to monitoring locations and facilities was maintained. Further information is provided within the FoP validation reports, summarised within Appendix B.

No	Title	Description	Responsibility	Action completed by ODA FoP
8	Future land use	Should any variations to this land use be proposed for either the Olympic or Legacy phase, then the risk assessment in the SSRS must be revisited and the requirement for any additional remediation be assessed. The areas designated for different land uses shall not be amended without reassessment of the soil conditions. The Site shall not be used for residential use, growing edible crops or for private gardens.	FoP / Future land owners	N/A
9	Changes in final level	Changes to final levels will need a reassessment of the underlying soil and potentially additional investigation or remediation. This is particularly pertinent where levels are reduced. End use FFL envisaged by the SSRS design are a minimum of 600 mm and a nominal 800 mm above the 'redundant' Marker Layer installed during the Enabling Works.	FoP / Future land owners	Instances where FoPs have used permanent hard standing as a substitute to the HHSL are detailed within Sections 2.2.2 and 3.3. Further detail on the HHSL and FFL is provided within Section 3.1, Section 3.3 and Appendix B. Typical sections of the final remedial cover system in PDZ8 are shown in Figure 11.
10	Final validation report	Produce and gain approval of final validation report on completion of overall construction or of construction required to complete the necessary remediation requirements.	FoPs	All FoP validation reports for PDZ8 submitted to PDT to date are summarised within this Stage 2 CVR (in Section 3 and Appendix B).

CONSTRUCTION ZONE 8A SPECIFIC				
8a-1	Placement of Marker Layer and separation layer if hardstanding is excavated and / or partially removed	In accordance with the RMS addendum No.2 the hardcover to be placed by FoPs for Olympic land use at the site is considered to form a suitable substitute to the separation layer and Marker Layer. It was therefore agreed that the Marker Layer placed across CZ8a by Enabling Works is 'redundant' and that material above the redundant Marker Layer has not been verified to human health separation layer criteria. Should FoPs necessitate any change in the extent of hardcover, they shall seek approval from the PPDT before such works through the submittal of a RMS or otherwise agreed with the PPDT. The FoPs shall be responsible for the placement of a separate new Marker Layer, which shall be overlain by chemically acceptable materials in line with the approved Site Wide RMS Addendum (Use of Hard Cover as a Substitute to the Separation Layer) and prevailing SSRS. In addition, the FoP shall seek approval from the PPDT before such works through the submittal of a RMS or otherwise agreed with the PPDT. In the case of the Former Retained Vegetation area covered by this report, a Marker Layer and 300 mm thickness of HHSL has been placed across the entire area by Enabling Works.	FoP	Details of the extent of Marker Layer, HHSL and hardstanding are presented in Sections 2.2.1 and 2.2.2, plus Figures 6 and 7.
8a-2	Inclusion of suitable vapour mitigation measures to future buildings	The potential risk to human health receptors within an indoor office environment in the areas adjacent to the EDF cable easement and Bow Back River boundary (is to be mitigated by the inclusion of suitable vapour membranes to future Legacy buildings). Appropriate vapour mitigation measures will also be required for any buildings present during the Olympic and Legacy land use.	FoP / Future land owners	No enclosed structures requiring ground gas / vapour assessment have been constructed by ODA FoPs within PDZ8. For details of LOCOG temporary structures, please refer to the Stage 3 CVR.

CONSTRUCTION ZONE 8B SPECIFIC				
8b-1	Placement of Marker Layer and separation layer if hardstanding is excavated and / or partially removed	A review of available data relating to the condition of the soils at the Site should be undertaken prior to any excavation and appropriate precautions must be undertaken. In particular, it must be noted that the Marker Layer placed across the majority of CZ8b by Enabling Works is 'redundant' and that material above the redundant Marker Layer has not been verified to human health separation layer criteria. The Marker Layer placed in the Murphy's area covered by this report is not redundant and the overlying material has been verified for human health and controlled waters. The human health assessment presented was based on long-term risks to the end-user assuming the Legacy end use stated in the SSRS and does not consider risks to construction or maintenance workers when validating the site. It is considered that following an appropriate risk assessment, any risks to construction workers will probably be safely mitigated through PPE and suitable engineering precautions.	FoP / Future land owners	Details of the extent of Marker Layer and HHSL are presented in Figures 6 and 7.
8b-2	Placement of additional separation layer in CZ8b	Placement of remaining separation layer, minimum of 300 to 500 mm depending on location within CZ8b (i.e. completion of the separation layer to FFL) such that the final HHSL is minimum 600 mm in thickness.	FoP	South Plaza and Murphys yard works have been completed to FFL. .
8b-3	River wall integrity	Future development must maintain integrity of river wall to prevent potential direct pathways to the river.	FoP / Future land owners	River wall maintained / not compromised by FoP.
CONSTRUCTION ZONE 8C SPECIFIC				
8c-1	Placement of additional or full separation layer over remainder of CZ8c	Placement of the remainder of the separation layer over the Site (i.e. completion of the separation layer to FFL) where the initial 300 mm thickness has been placed by Enabling Works or full 600 mm minimum and Marker Layer where none has been placed, such that the final HHSL is minimum 600 mm in thickness.	FoP	Details of the extent of Marker Layer and HHSL are presented in Figures 6 and 7.
8c-2	River wall integrity	Future development must maintain integrity of river wall to prevent potential direct pathways to the river.	FoP / Future land owners	River wall maintained / not compromised by FoP.

Note: Where residual actions require further consideration and / or need to be addressed as part of the next stages of the project (including Transformation / Legacy works) these have been taken forward and included in Table 4.1.

3.3 Human Health Separation Layer

The HHSL forms the upper section of the cover system across PDZ8 and is compliant with above Marker Layer SSAC, based on the known Legacy use and SSRS assumptions. Whilst the minimum design thickness of the HHSL is 600 mm, this varies in accordance with the ground build up and agreed variations (see Sections 2.2.1 and 2.2.2 above).

Within PDZ8 the thickness of HHSL placed by the ODA Enabling and FoP contractors varies from 200 mm (in areas where hardstanding has been used as a substitute to HHSL) to 600 mm (though is greater than 3 m in some areas of the Underpass U06 site) and includes the areas where, in accordance with approved RMS addenda (see Table 2.2), permanent hard standing acts as a substitute to the HHSL. In areas of soft landscaping, completed by LPR South in CZ8c, 300 mm thickness of topsoil on top of the existing ground, was completed. Marker Layer was not placed due to the presence of retained vegetation and no excavations were carried out in the soft landscaping areas completed by Skanska within CZ8c. The areas of soft Landscaping in CZ8c have been assessed separately as part of the update to the Retained Areas Risk Assessment report (see Section 3.10). Should the land-use within this area change in future the full remedial scope may need to be implemented (refer to items 2.4 and 2.15 of Table 4.1).

Figures 6 and 7 show the location and thickness of Marker Layer and separation layer placed by the FoPs, while Figure 7 also shows the locations within PDZ8 where hardstanding has been used as a substitute to HHSL. Figure 9 shows the 'retained' or unremediated areas within PDZ8 and those subject to FoP works.

As the Marker Layer placed by Enabling Works in CZ8a and CZ8b is considered 'redundant' based on Enabling Works' Project Manager's Instruction reference: PMI-ATK-PM-08Z-ZZZ-ZZZ-E-0008 (Ref. 22) and the CZ8a RMS addendum (Ref. 23), the hardcover placed by FoPs for Olympic land use within CZ8a and CZ8b is considered to form a suitable substitute to the separation layer and Marker Layer.

A total of approximately 17,300 m^3 HHSL material has been placed as part of the FoP works in PDZ8, with approximately 6,700 m^3 supplied by the Soil Hospital and approximately 10,600 m^3 imported from outside the Olympic Park. The principal material types imported from off-Park comprised sub- and topsoil placed within the soft landscape areas, virgin Type 1 / 2, Class 6A, 6C and 6N material used for pavement construction and virgin and recycled gravels and sands for pipe bedding / utility surrounds. Re-used, site derived materials principally comprised fill from the Westfield development and the Power Line Underground (PLUG) works across the site, which was used as sub-base beneath hard standing and as sub-soil.

The placed HHSL material in PDZ8 has been validated *in-situ*, where required, by the FoPs on an average testing frequency of at least one sample per 200 m^3 of placed material or an agreed variation to this frequency. Variations to this baseline frequency were recorded by the LPR South project, where Soil Hospital sourced material placed above marker layer by LPR South was sampled *in-situ* at a frequency of 1 per 500 m^3 as detailed in the PDT approved Validation Report (11/90764/AODODA) Ref. **Error! Bookmark not defined.**.

During LPR's works for the construction of hard and soft landscaping and drainage in CZ8c (Ref. **Error! Bookmark not defined.**), one exceedance of the applicable SSAC for benzo(a)pyrene was recorded in the southern section of the site, in the HHSL material used under the hard landscaping. No unacceptable risk during Games mode has been identified.

The affected area is scheduled to be allotments in Legacy, and as such there will be an opportunity to remove this exceedance during Legacy transformation. This exceedance is highlighted as outstanding work in Table 4.1 and as an exceedance on Figure 10.

No further exceedances of the applicable SSAC have been identified which require additional works to address and, as such, pending removal of the above exceedance, no unacceptable risk is presented to the Legacy users as defined in the SSRS.

Figure 7 shows the thickness and extent of the HHSL across PDZ8 and areas where a full thickness of separation layer has not been placed.

3.4 Marker Layer

The Marker Layer, a brightly coloured (orange) terram or netlon geogrid, forms an integral part of the Park's cover system and provides a visual demarcation between the HHSL (see Section 3.3) and underlying general fill or *in-situ* soils. For planning and remediation design purposes, no special health and safety precautionary measures or controls are required for those undertaking works within material above the Marker Layer. Material below the Marker Layer should be considered potentially contaminated and requires further health and safety consideration.

The default position across the Olympic Park is that the Marker Layer is located a minimum 600 mm below the FFL. However, variations in the placement of the Marker Layer have been agreed for a number of projects within PDZ8, as detailed in Section 2.2.2. As detailed in Section 3.3, hardcover placed by FoPs for Olympic land use within CZ8a and CZ8b is considered to form a suitable substitute to the separation layer and Marker Layer. The extent of the Marker Layer across PDZ8 is shown on Figure 6. Marker Layer was not placed in the small areas of soft landscaping in CZ8c due to the presence of retained vegetation as detailed in Section 3.3. The areas of soft Landscaping in CZ8c have been assessed separately as part of the update to the Retained Areas Risk Assessment report (see Section 3.10). Should the land-use within this area change in future the full remedial scope may need to be implemented (refer to items 2.4 and 2.15 of Table 4.1).

Reference should be made to the Table in Figure 6 which accurately defines the outstanding areas where marker layer has not been placed due to the presence of on- site restrictions.

3.5 General Fill

The Marker Layer placed by Enabling Works in CZ8a and CZ8b is considered 'redundant' in areas of permanent hardstanding (see Figure 6). The hardstanding placed by the FoP will therefore also act as a substitute for the separation layer. As such, the materials placed by Enabling Works above the Marker Layer have been referred to as 'upper' general fill rather than HHSL. It must be noted that material above the redundant Marker Layer has not been verified to HHSL criteria, and as such suitable measures should be undertaken by future contractors following a review of the chemical data, when excavating at the site.

General backfill was placed beneath the HHSL and Marker Layer during FoP excavations in PDZ8 including as part of drainage installation, foundation works for structures and to raise

site elevations in accordance with the Legacy design e.g. beneath permanent hard standing.

A total of approximately 3,300 m^3 of general fill was placed during the FoP works, all of which was imported from outside the Olympic Park. Imported general fill principally comprised recycled (Waste Recycling Action Programme, WRAP compliant) demolition rubble, rail ballast and glass and recycled sand for pipe bedding / utility surrounds. Chemical testing of this placed material was, where required, generally undertaken on a frequency of one sample per 1,000 m^3.

In certain instances agreed in retrospect; however, *in-situ* testing of Soil Hospital supplied general fill was not undertaken and works were validated through assessment of *ex-situ* stockpile test data provided by Soil Hospital. Within PDZ8, this approach was adopted by the DHC contractor Cofely (Ref. 4032) where Soil Hospital data, based on an *ex-situ* sampling frequency of 1 per 500 m^3, was utilised to demonstrate compliance. Assessment of these data has established that the FoP placed general fill material does not present an unacceptable risk to identified SSRS receptors.

In addition, Skanska LPR South (Ref. 32) re-used a total of approximately 310 m^3 in PDZ8 of as-dug, existing, unremediated ground excavated from beneath the sub-grade and did not undertake validation of the replaced material. Skanska LPR South carried out a visual-olfactory assessment of this reused as-dug material. This approach was subsequently approved by PDT.

Assessment of this data has established that the general fill placed by FoPs does not present an unacceptable risk to identified SSRS receptors.

3.6 Safeguarding Remediation

On completion of the Enabling Works remediation, processes were put in place by the ODA to ensure the integrity of these works were protected. These processes are collectively known as the PtP system.

This system ensures the protection of remediation works and the maintenance of environmental protection measures during FoP excavation works. The PtP system has been implemented across the Olympic Park and is fully adhered to by FoPs throughout the duration of their works. The procedure is described in full in the PtP Protocol (Appendix D).

Prior to the commencement of any ground excavation works, all the information required by the PtP team is provided on an ATK-084 'Protection of Remediation Works' *pro forma* completed by the FoPs and submitted to the PtP team for approval. The PtP team inform the FoPs of any remedial aspects they should be aware of during their works. On completion of the ground excavation works FoPs provided as-built details to the PtP team to demonstrate adequate protection of existing remediation works. This process is supported by regular PtP Audits of the projects by the PtP team, which monitor materials management and protection of remediation works. Any non-compliances identified were informed to the CLM project management team and steps put in place to address the issues.

Slot-In Conditions relating to the safeguarding of remediation during foundation and landscape works are detailed within Table 2.3 above.

3.7 Soil Hospital Process

As part of the Olympic Park development, a facility known as the Soil Hospital was established and made available for use throughout the project. The procedure is detailed within the Soil Hospital protocol (Ref. 44). The Soil Hospital was introduced with a view to maximising the re-use of site derived earthworks materials within the Park, in accordance with the ethos of the Construction Code of Practice (Ref. 45). Soil Hospital provided a hub for processing / handling materials generated by ground works within the Park (both Enabling Works and FoPs) and included treatment facilities and related testing of produced materials to maximise re-use across the project.

Prior to any material movements to or from the Soil Hospital, information required by Soil Hospital was provided by the FoPs on an ATK-088 'Request from Follow-on Contractor' *pro forma* and submitted to the Soil Hospital team. The Soil Hospital maintained stockpiles of a range of recycled earthworks materials and collected chemical and geotechnical test data on these materials which was supplied to the FoPs for them to confirm acceptability based on the proposed area of placement. When FoPs needed to dispose of material, the Soil Hospital team provided a response detailing the arrangements for disposal of the material within the Park or agreement that the material could be disposed off-site (to landfill).

3.8 Gas / Vapour Protection Measures

Gas and vapour protection measures are driven by the design of certain structures / venues across the Olympic Park in the context of the known and established gas regime. Based on item 8a-2 in Table 3.1 a potential risk to human health receptors exists within an indoor office environment, in the areas adjacent to the EDF cable easement and Bow Back River boundary in CZ8a. Appropriate vapour mitigation measures will also be required for any buildings present during the Olympic and Legacy land use. However, there are no ODA structures which require a ground gas / vapour assessment within PDZ8.

3.9 Mitigation Measures for Contamination Migration

Residual Action 5 in Table 3.1 above states that FoPs must adopt suitable design and construction methods to avoid creation of preferential contaminant migration pathways to the lower aquifers. Environmental risk assessments were not produced by the FoPs carrying out piling works within PDZ8, as none of the piling works exceeded 10 m in depth.

One of the key SSRS assumptions for PDZ8 was that the cohesive Alluvium underlying the Made Ground across the site provides a barrier to the migration of overlying contamination to the River Terrace Deposits aquifer. Where works compromised or breached the Alluvium the remedial strategy called for consideration of replacement of cohesive fill or a suitable substitute to the Alluvium, for example, an impermeable membrane or other appropriate seal.

At the request of PDT a site wide assessment of penetrations of the Alluvium is being produced by the remediation designers which will consider the risks to the underlying River Terrace Deposits and how these have been mitigated. Penetration of the Alluvium was noted for works relating to surface water drainage outfalls S08-01 and S08-02 (LPR South

and Nuttall SBH, respectively) and underpasses U06 and U07 (Nuttall SBH). The report concluded that '*available FOP Validation Reports indicated that where earthworks have penetrated the Alluvium mitigation measures have been put in place to prevent the creation of preferential pathways. Therefore, these works are not considered to present a significant risk to controlled waters*.' This document (Ref. 43) forms a separate submission to this CVR.

Where relevant, information has been submitted to the PPDT and the Environment Agency with regards to safeguarding remediation and minimising potential contamination pathways in the context of the applicable foundation design condition(s). As indicated within Table 2.3 above, only planning permission 09/90410/FUMODA has an applicable condition regarding foundation details (PGT.18). Since this permission relates to Legacy transformation, details of these works are not covered within this Stage 2 CVR.

3.10 Non Remediated Areas

Figure 9 shows the location of areas defined as 'unremediated' i.e. those not subject to remediation during the Enabling Works phase of the project and subsequent works in these areas completed by the FoPs within PDZ8. In addition to these areas, the existing ground beneath the Enabling Works or FoP sub-grade is also termed as unremediated.

A separate, revised and updated assessment of retained areas will be produced at the end of the programme to capture the works completed by the FoPs (Ref. 33) in these unremediated areas, forming an addendum to the existing RARAR (Ref. 46). Where works in these areas have a potential to impact future works these are recorded in Table 4.1.

3.11 Sampling and Analytical Testing

In-situ sampling and validation chemical testing, where undertaken by the FoPs, was in accordance with recognised UK industry guidance and Park-wide protocols. Analysis of samples was undertaken by UKAS accredited laboratories and soils were analysed using MCERTS accredited methods.

Test suites were designated by the individual FoPs to capture the relevant compounds listed within the zonal SSAC for HHSL and general backfill, as outlined within the SSRS for PDZ8.

3.12 Invasive Species

Invasive Species were not encountered during FoP works within PDZ8, however the LPR project has undertaken ongoing treatment of invasive species, especially along the river banks and these works will likely need to be continued in the future. Reference should be made to the Park Wide Invasive Species Treatment Report (Ref. 47), residual action 2.13 in Table 4.1, below and the invasive species drawing in Appendix E.

3.13 Unexploded Ordnance

A Park wide risk assessment of German air-dropped unexploded ordnance (UXO) was conducted by BAE Systems in advance of the project (Ref. 48). The objective of this

document was to assess the potential to encounter UXO during the project, to evaluate implications of such an occurrence and to determine whether risk mitigation measures would be necessary. The assessment recommended that there was a moderate probability of German air-dropped UXO being encountered during the Project.

No UXO were recorded during the Enabling Works phase of the project. Based on this and the limited extent of the FoP works undertaken beneath the Enabling Works sub-grade, the risk associated with the FoPs encountering UXO was deemed to be low. No UXO were encountered during the FoP works in PDZ8.

3.14 Radiological Material / Unexpected Contamination

The SSRSs (Refs. 7 to 13) did not present any evidence to suggest the presence of radiological material in the PDZ8 *in-situ* soils. There were no reported incidents in CZ8a and CZ8b where areas, isolated or otherwise, exceeded the background level of radiation. The results of the surveys in CZ8a and CZ8b have been summarised by Nuvia in the respective Unsaturated Zone Validation Reports and addendums (Refs. 49, 50, 51, 52, 53, 54 and 55).

During the removal of hardcover at CZ8c carried out during Enabling Works, elevated readings above background were recorded in a localised area from concrete spoil. The elevated readings were identified to be associated with concrete adjacent to the Network Rail boundary. This concrete amounted to 187 m^3 and was moved to a temporary holding facility in PDZ2 before appropriate removal off-site. Following its removal Nuvia conducted a clearance survey of the sub-grade and recorded activity levels below background (Ref. 56

The temporary holding facility in PDZ2 was constructed in May / June 2009 consisting of two individual cells. These cells were constructed to receive radioactive materials classified as Exempt (in accordance with the Radioactive Substances [Phosphatic Substances, Rare Earths etc] Exemption Order 1962 made pursuant to the Radioactive Substances Act 1993) materials encountered in PDZ2 and elsewhere on the Olympic Park. These temporary cells held a total volume of 193 m^3 of 'exempt' materials and were removed from site in August 2009 to an appropriately licensed off-site facility. Following off-site disposal a clearance survey of the temporary holding area was conducted by the specialist sub-contractor. All survey results were comparable with background levels and no further action was considered necessary (Ref. 57).

Where as-dug materials were re-used as general fill within PDZ8 these materials are located beneath a full thickness HHSL or hard standing substitute. The full thickness (minimum 600 mm) of HHSL or hard standing substitute has been shown to provide an effective barrier to underlying materials thus breaking potential pathways to future human health receptors. Within PDZ8 the only area identified as not having full thickness HHSL or an agreed hard standing substitute is the small soft landscape retained area in CZ8c. However, in this area no material was excavated or re-used and a 300 mm thickness of HHSL compliant topsoil was placed, providing a degree of cover. This area has been assessed as part of the update to the RARAR (see Section 3.10) and is identified within Table 4.1 below.

No instances of unexpected contamination, in accordance with the applicable Planning Condition definition, were recorded for FoP works in PDZ8.

3.15 Materials Management and the Waste Recovery Licence

Temporary stockpiling of materials was managed by all FoPs in accordance with the established Park wide guidance and included segregation of different types of material and, where required, sheeting and appropriate bunding of potentially contaminated material to reduce rainwater infiltration / run-off and the release of odours / dust. Stockpiles were located to be clear of waterways and public places where practical and were constructed so as to shed water.

On-site material tracking has been undertaken by the FoPs across the project. All material movements were subject to a ticketing process with a record of the source and destination of the load, its description, the time, date and vehicle identifier and signatures for representatives controlling the loading and unloading. The tickets were collated to provide daily and weekly summaries of materials moved. The information was then entered onto the ODA Smartwaste / M^3N system to allow material movements and re-use to be reconciled.

A Waste Recovery Licence (Environmental Permit) held by the ODA for its scope of works, has been managed by the CLM Waste Recovery Manager and sets out requirements with regards to managing the recovery of materials from within the Park and limits importation of waste materials. Any variations to the original consent have been discussed and subsequently agreed with the Environment Agency. No breaches of the Waste Recovery permit have been recorded for the FoP works in PDZ8. The Waste Recovery Licence was surrendered in the Autumn of 2012 as the ODA had completed its obligations under the licence.

3.16 Health, Safety and Environment

FoP works were completed in accordance with Construction (Design and Management) (CDM) Regulations. Permit to work and permit to dig systems were in operation for the duration of FoP works. Staff wore suitable PPE, with gloves, helmets, boots, eye protection and hi-visibility clothing required at all times as a minimum. All details regarding Health and Safety, environmental controls and monitoring are provided within the various FoP construction risk assessments and method statements.

Baseline environmental monitoring across the Olympic Park was undertaken and reported by Enabling Works. General environmental control measures that were in place during FoP works included the following, in accordance with the requirements of the Code of Construction Practice (Ref. 45):

- wheel washes at site entrances / exits;
- wetting of roadways to prevent dust generation;
- sheeting of loads;
- use of hard surfaces for heavily-used haul roads;
- control of vehicle speeds on site;
- readily available spill kits to deal promptly with any spillages;
- monitoring to confirm the absence of protected and invasive species; and
- toolbox talks to brief workers on potential environmental issues.

3.17 Legacy Transformation Works

A number of structures completed for the Olympic mode within PDZ8 will be subject to works in transformation to facilitate the Legacy development. Final details of these works are not currently known. However certain structures will be subject to decommissioning and removal.

It is noted that residual remedial works / protection of existing remediation, will be a requirement of transformation for these structures in addition to the wider transformation works (refer to Table 4.1 below).

4. Conclusions

The PDZ8 FoP Validation Reports conclude that the placed and validated soils do not pose an unacceptable risk to the SSRS defined critical controlled waters and human health receptors. The exception to this includes a benzo(a)pyrene exceedance identified in the south of CZ8c, as detailed in Section 3.1.2.2 and added to the outstanding works list in Table 4.1. On this basis this PDZ8 FoP (Stage 2) CVR seeks to discharge the ODA's obligations under Condition OD.0.36 of the Facilities and Their Legacy Transformation Planning Application and the Slot-In Validation Planning Conditions referenced in Section 1.3. Aside from the residual actions identified in Table 4.1 below, the ODA has completed the SSRS remedial scope within PDZ8 and is not reliant upon works by LOCOG to demonstrate the design has been fully implemented. The final pre-Games site conditions, are subject to LOCOG completing their temporary structures and details of these can be found in the LOCOG Stage 3 CVR.

Residual remedial actions for completion during future Transformation / Legacy works and / or restrictions to future development within PDZ8 are summarised in Table 4.1 below. The incoming Project Teams should be cognisant of these residual actions together with the underlying assumptions of the SSRS design.

4.1 Further Works - Residual List and Issues Affecting Future Development

Table 4.1 below records the works that have been transferred from the ODA Enabling Works and FoPs to LOCOG, the LLDC Transformation team and future Legacy developers. This table collates the residual items identified in the preceding individual FoP reports and those passed on from the Enabling Works team (refer to the report summaries in Appendix B). No areas of PDZ8 are being passed back to their original landowners..

In addition, Table 4.1 records some key aspects for future developers to consider as part of their works. It is further noted that this table does not in any way alleviate the incumbent Project Teams from complying with the full requirements of the remediation documentation, their legal, regulatory and contractual obligations.

4.2 Stage 3 Consolidated Validation Reporting

This report summarises the FoP validation works completed by the ODA to create the venues and infrastructure suitable for staging the London 2012 Olympic and Paralympic Games. It is recognised that other, non-ODA, parties have earthworks on the site which follow on from these ODA completed works, most notably LOCOG. These works are not summarised herein and are to be included in a third stage of the CVR programme.

In the context of the works in PDZ8, known third party works, which are not summarised herein include the LOCOG overlay construction (refer to Drawing 1) Removal of temporary infrastructure, the 'bump-out' phase of the project, may also need to be captured through validation reporting and this will be established with the appropriate parties.

Further works, as a result of post Games transformation will need to be captured under separate documentation and submitted against the relevant Legacy Transformation Development Planning Conditions (refer to item 2.18 in Table 4.1).

Table 4.1: Outstanding Works transferred to Future Developers / Land Owners and Restrictions on Future Works in PDZ8

Item No.	Title	Site Specific Actions Required	Action By
2.1 (Table 3.1-Item 1)*	Completion of groundwater monitoring for the Southern Plume	Southern Plume groundwater monitoring across the southern part of the Olympic Park shall continue for a period of 12 months (commencing as soon as reasonably practicable Post Games). Although it should be noted that no specific groundwater monitoring shall be undertaken in PDZ8 the Southern Plume boreholes shall be retained in case the lateral extent of the monitoring needs to be expanded.	Future land owners and developers / LLDC
2.2	FoP SSAC exceedance assessment / removal	There was an exceedance of benzo(a)pyrene identified within imported fill used as HHSL in the south of CZ8c (Ref. 34). It was deemed suitable for the Games use of hardstanding, but further assessment / consideration will be required post Games if the end use changes. Additional information is contained within the Skanska IS Validation Report for the Construction of Hard Landscaping, Soft Landscaping and drainage network in CZ8c (Ref. 32). Further information regarding these exceedances are provided in Sections 3.1.2.3 and 3.3, shown on Figure 10 and details of such are provided in Appendix E.	Future land owners and developers / LLDC
Item No.	**Title**	**General Actions Required**	**Action By**
2.3 (Table 3.1 – Item 2)	Excavation of soils at the Site	Future land owners and developers shall take appropriate health and safety measures to protect workers involved in excavation of soils. It is likely that a permitting system similar to PtP shall be implemented within the Olympic Park in post-Games mode in order to protect the existing remediation works that have been undertaken across the site.	Future land owners and developers / LLDC
2.4 (Table 3.1 – Item 3)	Restrictions to remediation	Due to site constraints across certain portions of PDZ8 the remediation works could not be fully completed. The Retained Areas Risk Assessment Report, which assessed these areas will be updated via an addendum to detail any areas not remediated as part of the ODA works (Ref. 33). Future developers need to consider what additional information or work may need to be carried out in these areas.	Future land owners and developers / LLDC

Item No.	Title	Site Specific Actions Required	Action By
2.5 (Table 3.1 – Item 4)	Suitable infrastructure design	Future land owners and developers need to consider ground conditions when designing appropriate infrastructure, such as services, utilities and foundations. Infrastructure installed beneath the Marker Layer should assume ground conditions are impacted by chemical contamination and appropriate mitigation measures should be taken (e.g. use of barrier pipes for potable water, sulphate resistant concrete etc)	Future land owners and developers / LLDC
2.6 (Table 3.1 – Item 5)	Suitable methods to protect contamination pathways	In agreement with PPDT the remedial designers have completed a Park-wide assessment of risks to controlled waters from removal of Alluvium (Ref. 43). Future land owners and developers need to consider protection of contamination pathways as part of their earthworks design.	Future land owners and developers / LLDC
2.7 (Table 3.1-Item 6 and item 8a-2)	Ground gas / vapour assessment	Future land owners and developers need to review requirements for ground gas / vapour assessment and potentially protection measures as part of the design process. It is noted that an area in CZ8a (Ref. 49) in particular is likely to required vapour membrane installation or further vapour monitoring.	Future land owners and developers / LLDC
2.8 (Table 3.1-Item 7)	Decommissioning / Protection of monitoring installations and facilities	Future land owners and developers will be responsible for either decommissioning of any monitoring installations and facilities no longer required for monitoring purposes, or the protection of any retained monitoring installations and facilities, required for ongoing monitoring.	Future land owners and developers / LLDC
2.9 (Table 3.1-Item 8)	Future land use	Future land owners and developers shall ensure that areas designated for different land uses are not amended without reassessment of the soil conditions and that the Site is not used for growing edible crops or for private gardens without further assessment / remediation being undertaken.	Future land owners and developers / LLDC
2.10 (Table 3.1-Item 9)	Changes in final level	Any works by future land owners and developers involving a reduction of FFL will require a reassessment of the underlying soil and potentially additional investigation or remediation. The design levels used for the Enabling Works remediation assume that a minimum 600 mm thickness HHSL will be provided.	Future land owners and developers / LLDC
2.11	OPF removal	An easement associated with the OPF has meant that remediation and placement of Marker Layer and full HHSL has not been completed by ODA. The area of the OPF shall be assessed and corrective actions undertaken to complete the remedial design as part of the Legacy / Transformation phase. The location of the OPF is shown in Figure 4.	Future land owners and developers / LLDC

Item No.	Title	Site Specific Actions Required	Action By
2.12	Piling Risk Assessments	Piling risk assessments will be required for any future structures that required piled foundations on the site.	Future land owners and developers / LLDC
2.13	Invasive Species Monitoring	Ongoing monitoring for invasive species adjacent to river bank will be required as discussed in Section 3.12. The location of invasive species requiring ongoing monitoring is shown in Appendix E.	Future land owners and developers / LLDC
2.14 (Table 3.1 – Items 8b-3 and 8c-2)	River Wall Integrity	Future development must maintain integrity of river wall to prevent potential direct pathways to the river.	Future land owners and developers / LLDC
2.15 (Tables 3.1 – Items 8a-1, 8b-1 and 8c-1)	Placement of Marker Layer and separation layer	FoPs were required to provide survey plans within two months of completion of the entire HHSL to demonstrate to the PPDT an acceptable thickness of HHSL (600 mm thickness) was placed. If any residual areas of Marker Layer and separation layer require placement these shall be completed.	Future land owners and developers / LLDC
2.16	Radiological Materials	Radiological materials were previously encountered in the north of CZ8C, as discussed in Section 3.14. Whilst they were not encountered elsewhere on the site there still remains a potential risk of radiological materials being present.	Future land owners and developers / LLDC
2.17	Risk Assessments	Future land owners and developers shall complete appropriate risk assessments with respect to UXO, pathogens, asbestos, radiation, and ground gas / vapours when undertaking excavations and / or construction activities during their work.	Future land owners and developers / LLDC
2.18	Placement of marker layer and separation layer around outfall S08-02 and U07	Placement of Marker Layer and HHSL in area of S08-02 outfall chamber and surrounding cofferdam, where his been omitted, will be completed during Legacy Transformation. Walkway tie-in with surrounding Marker Layer and HHSL will also be completed in the Transformation phase	To be completed by LLDC
2.19 (Table 3.1 – Item 10)	Validation reporting	Future works will need to be captured and recorded through the established validation process including further stages of Consolidated Validation Report production on a zonal basis. This includes the already established LOCOG Stage 3 CVRs, infrastructure 'bump-out', where necessary and subsequent Transformation and Legacy stages of the project.	LOCOG, LLDC and future land owners and developers

Note: This table incorporates residual actions following completion of the ODA Enabling and Follow-on Project works and represents the status at the end of the Stage 2 consolidated reporting (hence

the Residual Action Item Nos. **2.1** etc). For the status of these residual actions following the LOCOG works please refer to the applicable Stage 3 CVR.

5. References

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3 Planning Application Approval (Olympic, Paralympic and Legacy Transformation Planning Applications: Site Preparation Planning Application, Application No – 07/90011/FUMODA, Date of Application - 7th February 2007): Condition 35.

4 Capita Symonds, January 2007. Global Remediation Strategy (Version 2.0, Rev B). ODA Ref: REP-CSP-VZ-ZZZ-OLP-XXX-E-0076. (Decision Notice Ref: 07/90011/FUMODA).

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6 Atkins, March 2008. PDZ8a Review of Approach to Remediation. ODA Ref: REP-ATK-CM-08a-OLP-XXX-E-0001. (Decision Notice Ref: 08/90083/AODODA).

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12 Atkins, February 2009. PDZ8c (North) Site Specific Remediation Strategy. ODA Ref: REP-ATK-CM-08c-OLP-XXX-E-0002. (Decision Notice Ref: 08/90326/AODODA).

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30 BAM Nuttall. March 2012. Validation Report for Surface Water Drainage Outfall S08-02 and U07 Underpass Eastern Approach Ramp. ODA Ref: 7040-SBH-SCW-W-REP-0039 Rev00. (Decision Notice Ref. 12/90043/AODODA).

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