HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 5 | Technical appendices

Land Quality

(LQ-001-004, LQ-001-005)

October 2015

SES3 and AP4 ES 3.5.1.7

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Department for Transport

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Appendix name:	Land Quality assessment	001
Community forum area:	Kilburn (Brent) to Old Oak Common	004

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1 Introduction

1.1.1 The land quality appendix for the Kilburn (Brent) to Old Oak Common community forum area (CFA4) comprises:

- detailed risk assessment (Section 2); and
- references (Section 3).

2 Detailed risk assessment

2.1 Introduction

2.1.1 This appendix presents assessments for areas potentially posing a contaminative risk which are referenced in the Supplementary Environmental Statement 3 (SES3) and the Additional Provision Environmental Statement 4 (AP4 ES). For each site the following data is presented:

- baseline risk assessment;
- construction risk assessment;
- post-construction risk assessment; and
- assessment of temporary (construction) and permanent (post-construction) effects.

2.1.2 This risk assessment incorporates the following assumptions:

- construction workers are not included within this assessment;
- higher risk, potentially contaminated sites have been grouped and considered together where appropriate. It should be noted that some parcels of land may have had several land uses from different eras;
- during construction standard mitigation procedures will be in place in accordance with the provisions of the draft Code of Construction Practice (CoCP) (Volume 5: Appendix CT-003-000 of the main ES); and
- during the post-construction condition it is assumed that all required remediation has been undertaken.

2.1.3 The sites assessed in this study area (comprising sites AP4-4-001, AP4-4-002, AP4-4-10 and AP4-4-119) are set out in Table 1.

Table 1 : Detailed risk assessment for areas potentially posing a contaminative risk within the CFA4 study area

Site reference	Land use	Table reference
AP4-4-002	Onsite railway land at the Canterbury Works site	3, 7, 11, 15
AP4-4-001	Onsite substation at the Canterbury Works site	4, 8, 12, 16
AP4-4-119	Onsite garage at the Canterbury Works site	4, 8, 12, 16
AP4-4-10	Onsite motor works at the Canterbury Works site	4, 8, 12, 16

2.1.4 The contaminant groups included in this risk assessment are based on research into the site-specific processes, materials and wastes associated with particular industries and land uses and the information provided in the Department of Environment (now Defra) Industry Profiles. The series of Industry Profiles were first published by the previous Department of the Environment in 1995, but remain a valid technical resource for the evaluation of land quality. [1]

2.1.5 The remainder of this appendix presents the risk assessment for the sites set out in Table 1. The following abbreviations are used in Tables 2 to 9:

- CSM - conceptual site model;
- MTBE - methyl tert-butyl ether;
- PAH - polycyclic aromatic hydrocarbons;
- PCB - polychlorinated biphenyls; and
- VOC - volatile organic compounds.

[1] A full list of Department of Environment (now Defra) Industry Profiles are available at https://www.gov.uk/government/publications/department-of-environment-industry-profiles.

2.2 Baseline risk assessment

Table 2 : Summary CSM for former on-site railway land located at the Canterbury Works site (Area ref: AP4-4-002)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Residual contamination in made ground (e.g. ballast): PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane, carbon dioxide and VOC)	Site users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
		Exposure to asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Likely	Minor	Moderate/low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Severe	Moderate/low

Table 3 : Summary CSM for a former onsite warehouse, garage and motor works located at the Canterbury Works site (Area ref: AP4-4-119, AP4-4-10, AP4-4-001)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Residual contamination from former activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, PCBs, methyl lead and MTBE	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Low likelihood	Minor	Low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Severe	Moderate/low

2.3 Construction risk assessment

Table 4 : Summary CSM for former on-site railway land located at the Canterbury Works site during construction phase (Area ref: AP4-4-002)

Source	Receptor	Pathway	Probability	Consequence	Risk with construction phase mitigation
Residual contamination in made ground (e.g. ballast): PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane, carbon dioxide and VOC)	Site users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Not present during construction		
		Exposure to asphyxiative or explosive gases	Not present during construction		
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Likely	Minor	Moderate/low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Severe	Moderate/low

Table 5 : Summary CSM for a former onsite warehouse, garage and motor works located at the Canterbury Works site during construction phase (Area ref: AP4-4-119, AP4-4-10, AP4-4-001)

Source	Receptor	Pathway	Probability	Consequence	Risk with construction phase mitigation
Residual contamination from former activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, methyl lead and MTBE	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Not present during construction		
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Low likelihood	Minor	Low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Severe	Moderate/low

2.4 Post-construction risk assessment

Table 6 : Summary CSM for former on-site railway land located at the Canterbury Works site during post-construction phase (Area ref: AP4-4-002)

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual contamination in made ground (e.g. ballast): PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane, carbon dioxide and VOC)	Site end users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Unlikely	Minor	Very low
		Exposure to asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Unlikely	Minor	Very low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Medium	Low

Table 7 : Summary CSM for a former onsite warehouse, garage and motor works located at the Canterbury Works site during post-construction phase (Area ref: AP4-4-119, AP4-4-10, AP4-4-001)

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Residual contamination from former activities: contaminants primarily comprising petroleum and diesel range hydrocarbons, methyl lead and MTBE	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Unlikely	Medium	Low
	Adjacent site users, such as those within residential properties, adjacent primary school and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Unlikely	Minor	Very low
		Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Unlikely	Severe	Moderate/low

2.5 Assessment of temporary (construction) and permanent (post-construction) effects

Table 8 : Significance of effect assessment for former on-site railway land located at the Canterbury Works site (Area ref: AP4-4-002)

Contaminant linkage	Baseline	Construction	Post-construction	Construction effect	Post-construction effect
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil, soil-derived dust or contaminated water	Moderate/low	N/A	Very low	Negligible	Moderate beneficial
Exposure of on-site humans to contamination by inhalation of ground-gas and volatile vapours from contaminated soil/water	Moderate/low	N/A	Moderate/low	Negligible	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Very low	Negligible	Minor beneficial
Migration of contamination and direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Moderate/low	Moderate/low	Very low	Negligible	Moderate beneficial
Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Overall significance				Negligible effect	Negligible to moderate beneficial effect

Table 9 : Significance of effect assessment for a former onsite warehouse, garage and motor works located at the Canterbury Works site (Area ref: AP4-4-119, AP4-4-10, AP4-4-001)

Contaminant linkage	**Baseline**	**Construction**	**Post-construction**	**Construction effect**	**Post-construction effect**
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil, soil-derived dust or contaminated water	Moderate/low	N/A	Low	Negligible	Minor beneficial
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Low	Low	Very low	Negligible	Minor beneficial
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Migration of contamination and direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low	Low	Very low	Negligible	Minor beneficial
Migration of hazardous gas and vapours to confined spaces via permeable strata or conduits	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Overall significance				Negligible effect	Negligible to minor beneficial effect

3 References

Defra and Environment Agency, (2002), *Potential contaminants for the assessment of land- R&D Publication*, Bristol, Environment Agency.

Environmental Protection Act 1990, Part IIA, Introduced in England on 1 April 2000, London, Her Majesty's Stationary Office.

Environmental topic:	Land quality	LQ
Appendix name:	Detailed risk assessment	001
Community forum area:	Northolt Corridor	005

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1 Introduction

1.1.1 The land quality appendix for the Northolt Corridor study area, community forum area 5 (CFA5)comprises:

- detailed risk assessment (Section 2); and
- references (Section 3).

2 Detailed risk assessment

2.1 Introduction

2.1.1 This appendix presents assessments for areas potentially posing a contaminative risk which are referenced in the Supplementary Environmental Statement 3 (SES3) and the Additional Provision 4 Environmental Statement (AP4 ES). For each site the following data is presented:

- baseline risk assessment;
- construction risk assessment;
- post-construction risk assessment; and
- assessment of temporary (construction) and permanent (post-construction) effects.

2.1.2 This risk assessment incorporates the following assumptions:

- construction workers are not included within this assessment;
- higher risk, potentially contaminated sites have been grouped and considered together where appropriate. It should be noted that some parcels of land may have had several land uses from different epochs;
- during construction standard mitigation procedures will be in place in accordance with the Code of Construction Practice (CoCP) (Volume 5: AppendixCT-003-000); and
- during the post-construction condition it is assumed that all required remediation has been undertaken and carried out.

Table 1: Sites included in the detailed risk assessment within the Northolt Corridor study area

Site reference	Land-use	Table reference
AP4-5-001	Rail land (sidings)	2, 5, 8, 11

Site reference	Land-use	Table reference
AP4-5-001	Rail land (West Gate vent shaft site)	2, 5, 8, 11
AP4-5-079	Former confectionery/unspecified factory	3,6, 9, 12
AP4-5-111	Industrial estate	3,6, 9, 12
AP4-5-109	Industrial estate	3,6, 9, 12
AP4-5-104	Business park (West Gate vent shaft site)	4, 7, 10, 13

2.1.3 The contaminant groups included in this risk assessment are based on research into the site-specific processes, materials and wastes associated with particular industries and land uses and the information provided in the Department of the Environment (now the Department of Environment, Food and Rural Affairs (Defra)) industry profiles. The series of industry profiles were first published by the previous Department of the Environment in 1995, but remain a valid technical resource for the evaluation of land quality.[1]

2.1.4 The remainder of this appendix presents the risk assessment for the sites set out in Table 2. The following abbreviations are used in these tables:

- CSM - Conceptual site model.
- MTBE - Methyl tert butyl ether;
- PAH - Polycyclic aromatic hydrocarbons;
- PCB - Polychlorinated biphenyls;
- SVOC - Semi-volatile organic compounds; and
- VOC - Volatile organic compounds.

[1] A full list of Department of Environment (now Defra) Industry Profiles are available at https://www.gov.uk/government/publications/department-of-environment-industry-profiles.

2.2 Baseline risk assessment

Table 2: Summary CSM for on-site rail land at baseline (Ref ID AP4-5-001, 5-001)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Contamination in made ground (e.g. ballast) as well as: PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane and carbon dioxide)	Current site users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
		Exposure to asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Low likelihood	Minor	Low
	Grand Union canal	Lateral and vertical migration of mobile contamination.	Low likelihood	Minor	Low
	River Brent*	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	River Terrace Deposits*	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Likely	Minor	Moderate/low
		Migration of hazardous gas (potentially asphyxiative or explosive gases) to confined spaces via permeable strata or conduits	Low likelihood	Medium	Moderate/low

* Refers to Polygon 5-001 only.

Table 3: Summary CSM for off-site industrial estates and former confectionery/unspecified factory at baseline (Area ref: 5-079, 5-111, 5-109)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Grand Union Canal	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

Table 4: Summary CSM for on-site business park at baseline (Area ref: 5-104)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	River Brent	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	River Terrace Deposits*	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

* Refers to Polygon 5-001 only.

2.3 Construction risk assessment

Table 5: Summary CSM for on-site rail land during construction phase (Ref ID AP4-5-001, 5-001)

Source	Receptor	Pathway	Probability	Consequence	Risk during construction without mitigation
Contamination in made ground (e.g. ballast) as well as: PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane and carbon dioxide)	Current site users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Not present during construction		
		Exposure to asphyxiative or explosive gases	Not present during construction		
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Low likelihood	Minor	Low
	Grand Union canal	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	River Brent*	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	River Terrace Deposits*	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Likely	Minor	Moderate/low
		Migration of hazardous gas (potentially asphyxiative or explosive gases) to confined spaces via permeable strata or conduit	Unlikely	Medium	Low

*Refers to Polygon 5-001 only.

Table 6: Summary CSM for off-site industrial estates and former confectionery/unspecified factory during construction phase (Area ref: 5-079, 5-111, 5-109)

Source	**Receptor**	**Pathway**	**Probability**	**Consequence**	**Risk during construction without mitigation**
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Grand Union Canal	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

Table 7: Summary CSM for on-site business park at during construction (Area ref: 5-104)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Not present during construction		
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	River Brent	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	River Terrace Deposits	Lateral and vertical migration of mobile contamination	Low likelihood	Minor	Low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

2.4 Post-construction risk assessment

Table 8: Summary CSM for on-site rail land post-construction (Ref ID AP4-5-001, 5-001)

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction without mitigation
Contamination in made ground (e.g. ballast) as well as: PCB, metals, asbestos, PAH and chlorinated hydrocarbons); potentially low levels of ground gas (methane and carbon dioxide)	Current site users (rail staff)	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Minor	Low
		Exposure to asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Grand Union canal	Lateral and vertical migration of mobile contamination.	Unlikely	Minor	Very low
	River Brent*	Lateral and vertical migration of mobile contamination	Unlikely	Minor	Very low
	River Terrace Deposits*	Lateral and vertical migration of mobile contamination	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low	Minor	Low
		Migration of hazardous gas (potentially asphyxiative or explosive gases) to confined spaces via permeable strata or conduits	Unlikely	Medium	Low

* Refers to Polygon 5-001 only.

Table 9: Summary CSM for off-site industrial estates and a former confectionery/unspecified factory post-construction at baseline (Area ref: 5-079, 5-111, 5-109)

Source	**Receptor**	**Pathway**	**Probability**	**Consequence**	**Risk post-construction without mitigation**
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	Grand Union Canal	Lateral and vertical migration of mobile contamination	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

Table 10: Summary CSM for on-site business park at baseline (Area ref: 5-104)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Contamination from on-going activities residual contamination from former activities – hydrocarbons including waste oils, heavy metals and asbestos	Site users - workers in businesses	Human uptake through: dermal contact, ingestion or inhalation of soil/dust, volatilised compounds	Low likelihood	Medium	Moderate/low
	Adjacent site users, such as those within residential properties and workers in the surrounding light industrial/residential areas and rail areas	Off-site migration of soil vapours and volatile organic compounds (by diffusion or due to wind)	Unlikely	Minor	Very low
		Off-site migration of wind-blown dust	Unlikely	Minor	Very low
	River Brent	Lateral and vertical migration of mobile contamination	Unlikely	Minor	Very low
	River Terrace Deposits	Lateral and vertical migration of mobile contamination	Unlikely	Minor	Very low
	Buildings/underground structures and services	Direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low likelihood	Minor	Low

2.5 Assessment of temporary (construction) and permanent (post-construction) effects

Table 11: Significance of impact during construction/post construction for on-site rail land (Ref ID AP4-5-001, 5-001)

Contaminant linkage	Baseline	Construction	Post-construction	Construction effect	Post-construction effect
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil, soil-derived dust or contaminated water	Moderate/low	N/A	Low	N/A	Minor beneficial
Exposure to asphyxiative or explosive gases	Moderate/low	N/A	Moderate/low	N/A	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Low	Low	Very low	Negligible	Minor beneficial
Lateral and vertical migration of mobile contamination into the Grand Union canal	Low	Low	Very low	Negligible	Minor beneficial
Lateral and vertical migration of mobile contamination into the River Brent	Low	Low	Very low	Negligible	Minor beneficial
Lateral and vertical migration of mobile contamination into the River Terrace Deposits	Low	Low	Very low	Negligible	Minor beneficial
Migration of contamination and direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Moderate/low	Moderate/low	Low	Negligible	Minor beneficial
Migration of contamination and direct contact with buildings receptors including foundations and services.	Low	Low	Low	Negligible	Negligible

Overall significance				Negligible effect	Negligible to minor beneficial effect

Table 12: Significance of impact during construction/post construction for off-site industrial estates and a former confectionery/unspecified factory (Ref ID: 5-079, 5-111, 5-109)

Contaminant linkage	**Baseline**	**Construction**	**Post-construction**	**Construction effect**	**Post-construction effect**
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil, soil-derived dust or contaminated water	Moderate/low	N/A	Moderate/low	N/A	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Lateral and vertical migration of mobile contamination into the Grand Union canal	Low	Low	Very low	Negligible	Minor beneficial
Migration of contamination and direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low	Low	Low	Negligible	Negligible
Overall significance				Negligible effect	Negligible to minor beneficial effect

Table 13: Significance of impact during construction/post construction for an onsite business park (Ref ID: 5-104)

Contaminant linkage	**Baseline**	**Construction**	**Post-construction**	**Construction effect**	**Post-construction effect**
Exposure of on-site human receptors to contamination by direct contact, ingestion and inhalation of contaminants in soil, soil-derived dust or contaminated water	Moderate/low	N/A	Moderate/low	N/A	Negligible
Exposure of adjacent human receptors (residents) to contamination by inhalation of migrating ground-gas and volatile vapours from contaminated soil/water	Very low	Very low	Very low	Negligible	Negligible
Exposure of adjacent human receptors (in commercial properties) to contamination by direct contact, ingestion and inhalation of contaminants in windblown, soil-derived dust	Very low	Very low	Very low	Negligible	Negligible
Lateral and vertical migration of mobile contamination into the River Brent	Low	Low	Very low	Negligible	Minor beneficial
Lateral and vertical migration of mobile contamination into the River Terrace Deposits	Low	Low	Very low	Negligible	Minor beneficial
Migration of contamination and direct contact of fabric of buildings and services (e.g. foundations, and water supply pipes)	Low	Low	Low	Negligible	Negligible
Overall significance				Negligible effect	Negligible to minor beneficial effect

3 References

Environmental Protection Act 1990, Part IIA, Introduced in England on 1 April 2000, London, Her Majesty's Stationery Office.

Department of Environment, (1995), Industry Profiles (series) https://www.gov.uk/government/publications/department-of-environment-industry-profiles.

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