A358 Taunton to Southfields Dualling Scheme

Preliminary Environmental Information Report - Appendix 9.2
Contamination Preliminary Risk Assessment for Priority Sites

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1 Preliminary Conceptual Site Models (CSMs) for priority sites

Table 1-1 Summary of Preliminary CSM for priority sites based on Contamination Preliminary Risk Assessment (PRA) (Section 9.3.7)

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
Construction					
On-alignment					
• Thornfalcon refuse tip	Construction workers	Ingestion or dermal contact with landfilled materials and/or waste products/made ground.	Likely	Severe	**High**
		Inhalation of dusts derived from landfilled materials and/or asbestos fibres from landfilled materials and/or waste products.			
		Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials.			
		Ingestion or dermal contact with contaminated groundwater/leachate.			
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Adjacent site users: commercial. residential, agricultural	Inhalation of ground gas, dusts derived from Made Ground and/or asbestos fibres in Made Ground.	Likely	Medium	**Moderate**
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Colluvium (Secondary undifferentiated aquifer) Branscombe Mudstone (Secondary B aquifer)	Infiltration of rain/surface run off causing contaminants to leach from landfilled materials to groundwater in the Branscombe Mudstone. The Branscombe Mudstone will inhibit vertical migration as it is of low permeability and will facilitate lateral migration within the superficial deposits.	Low	Medium	**Moderate/Low**

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
• Ashill Bypass Site A Landfill	Construction workers	Ingestion or dermal contact with landfilled materials and/or waste products.	High	Medium	**High**
		Inhalation of dusts derived from landfilled materials and/or asbestos fibres from landfilled materials and/or waste products.			
		Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials.			
		Ingestion or dermal contact with contaminated groundwater/leachate.			
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Adjacent site users: commercial/ agricultural	Inhalation of ground gas, dusts derived from Made Ground and/or asbestos fibres in Made Ground.	Low	Mild	**Low**
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Colluvium, Alluvium, (Secondary undifferentiated) Charmouth Mudstone (Secondary B)	Infiltration of rain/surface run off causing contaminants to leach from landfilled materials to groundwater. The Charmouth Mudstone will inhibit vertical migration as it is of low permeability and will facilitate lateral migration within the superficial deposits.	Low	Mild	**Low**
• Great Western Railway (GWR) infilled cutting	Construction worker	Ingestion or dermal contact with Made Ground	High	Medium	**High**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			
		Inhalation of ground gas from the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater.			
	Adjacent site user: commercial agricultural	Inhalation of ground gas, dusts derived from Made Ground and/or asbestos fibres in Made Ground.	Low	Mild	**Low**

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
	Head deposits (Secondary A) Branscombe Mudstone (Secondary undifferentiated)	Infiltration of rain/surface run off causing contaminants to leach from the Made Ground to groundwater in Secoindary A aquifer. The Branscombe Mudstone will inhibit vertical migration as it is of low permeability and will facilitate lateral migration through superficial deposits.	Low	Medium	**Moderate/Low**
Off-alignment					
• Texaco Service Station (SS) • Butlers fuel depot • Shell SS	Construction worker	Ingestion or dermal contact with Made Ground and/or free phase product.	Likely	Medium	**Moderate**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			
		Inhalation of vapours from volatilisation of free phase product within the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater and/or free phase product.			
		Inhalation of vapours from volatilisation of free phase product within contaminated groundwater.			
	Adjacent site user: residential/ commercial/ agricultural	Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.	Low	Mild	**Low**
		Inhalation of vapours from volatilisation of free phase product on the groundwater table.			
	Head deposits (Secondary A) Branscombe Mudstone (Secondary B) or Charmouth Mudstone (Sec Undiff)	Infiltration of rain/surface run off causing contaminants to leach from the Made Ground to groundwater. NAPL may be present as free phase product on the water table. Both the Branscombe and Charmouth Mudstone will inhibit vertical migration as it is of low permeability and will facilitate lateral migration in the superficial deposits.	Low	Medium	**Moderate/Low**

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
• Ashill petrol filling station (PFS)	Construction workers	Ingestion or dermal contact with Made Ground and/or free phase product.	Low	Medium	**Moderate/Low**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			
		Inhalation of vapours from volatilisation of free phase product within the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater and/or free phase product.			
		Inhalation of vapours from volatilisation of free phase product within contaminated groundwater.			
	Adjacent site user: residential/ commercial/ agricultural	Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.	Low	Mild	**Low**
		Inhalation of vapours from volatilisation of free phase product on the groundwater table.			
	Charmouth Mudstone (Secondary undifferentiated)	Infiltration of rain/surface run off causing contaminants to leach from the Made Ground to groundwater. NAPL may be present as free phase product on the water table. The Charmouth Mudstone will inhibit vertical migration as it is of low permeability and will facilitate lateral migration in the superficial deposits.	Low	Mild	**Low**
		Lateral migration of leachate and NAPL across the interface of Made Ground and the Mudstone towards a surface drain 44m to the east.	Low	Medium	**Moderate/Low**
• Near Dairy Farm landfill • Land east of Bow Bridge and • Saw mills Landfills	Construction workers	Inhalation of ground gas from the landfills migrating through permeable strata.	Low	Mild	**Low**
Operational phase					
On-alignment					

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
• Thornfalcon Landfill	Future maintenance worker	Ingestion or dermal contact with landfilled materials and/or waste products/Made Ground.	Low	Medium	**Moderate/ Low**
		Inhalation of dusts derived from landfilled materials / made ground/ waste products and/or asbestos fibres from landfilled materials/waste products/made ground.			
		Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials/Made Ground.			
		Ingestion or dermal contact with contaminated groundwater/leachate.			
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Adjacent site users: commercial/ agriculture	Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials through preferential pathways created by the proposed scheme (service ducts).	Low	Medium	**Moderate/ Low**
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate through preferential pathways created by the proposed scheme (service ducts).			
	Foundations and services on-site+	Direct contact with landfilled materials and/or groundwater/landfill leachate.	Low	Medium	**Moderate/ Low**
		Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.			
	Buildings, foundations and services off-site+	Direct contact with landfilled materials/made ground and/or groundwater/landfill leachate.	Low	Mild	**Low**
		Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.	Likely	Medium	**Moderate**
• Ashill Bypass Site A	Future maintenance worker	Ingestion or dermal contact with landfilled materials and/or waste products/Made Ground.	Low	Medium	**Moderate/ Low**
		Inhalation of dusts derived from landfilled materials / made ground/ waste products and/or asbestos fibres from landfilled materials/waste products/made ground.			

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
		Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials/Made Ground.			
		Ingestion or dermal contact with contaminated groundwater/leachate.			
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Adjacent site users: commercial/ agriculture	Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials through preferential pathways created by the proposed scheme (service ducts).	Low	Mild	**Low**
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate through preferential pathways created by the proposed scheme (service ducts).			
	Foundations and services on-site+	Direct contact with landfilled materials and/or groundwater/landfill leachate.	Low	Medium	**Moderate/ Low**
		Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.			
	Buildings, foundations and services off-site+	Direct contact with landfilled materials/made ground and/or groundwater/landfill leachate.	Low	Mild	**Low**
		Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.	Likely	Medium	**Moderate**
• GWR infilled cutting	Future maintenance worker	Ingestion or dermal contact with Made Ground.	Low	Medium	**Moderate/Low**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			
		Inhalation of ground gas from the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater.			
	Foundations and services on-site+	Direct contact with Made Ground and/or groundwater.	Likely	Medium	**Moderate**
		Accumulation of ground gas in confined spaces.			
	Buildings, foundations and	Direct contact with Made Ground and/or groundwater.	Low	Mild	**Low**
		Accumulation of ground gas in confined spaces.	Low	Medium	**Moderate/Low**

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
	services off-site+				
Off-alignment					
• Texaco SS • Shell SS • Ashill PFS	Future maintenance worker	Ingestion or dermal contact with Made Ground and/or free phase product.	Low	Medium	**Moderate/Low**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			
		Inhalation of vapours from volatilisation of free phase product within the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater and/or free phase product.			
		Inhalation of vapours from volatilisation of free phase product on the groundwater table.			
	Adjacent users: commercial/ agricultural/ residential	Inhalation of vapours from volatilisation of free phase product within Made Ground through preferential pathways created by the proposed scheme (service ducts).	Low	Mild	**Low**
		Inhalation of vapours from volatilisation of free phase product on the groundwater table through preferential pathways created by the proposed scheme (service ducts).			
	Foundations and services on-site+	Direct contact with Made Ground and/or groundwater affected by the continued use as a PFS.	Likely	Medium	**Moderate**
		Accumulation of vapour from free phase product in confined spaces.			
	Buildings, foundations and services off-site+	Direct contact with Made Ground and/or groundwater affected by the continued use as a PFS.	Low	Mild	**Low**
		Accumulation of ground gas and/or vapour in confined spaces.	Low	Medium	**Moderate/Low**
• Butlers fuel depot	Future maintenance worker	Ingestion or dermal contact with Made Ground and/or free phase product.	Low	Medium	**Moderate/Low**
		Inhalation of dusts derived from Made Ground and/or asbestos fibres in Made Ground.			

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
		Inhalation of vapours from volatilisation of free phase product within the Made Ground.			
		Ingestion or dermal contact with contaminated groundwater and/or free phase product.			
		Inhalation of vapours from volatilisation of free phase product on the groundwater table.			
	Adjacent users: commercial/ agricultural/ residential	Inhalation of vapours from volatilisation of free phase product within Made Ground through preferential pathways created by the proposed scheme (service ducts).	Low	Mild	**Low**
		Inhalation of vapours from volatilisation of free phase product on the groundwater table through preferential pathways created by the proposed scheme (service ducts).			
	Foundations and services on-site+	Direct contact with Made Ground and/or groundwater affected by the continued use as a PFS.	Low	Medium	**Moderate/Low**
		Accumulation of vapour from free phase product in confined spaces.			
	Buildings, foundations and services off-site+	Direct contact with Made Ground and/or groundwater affected by the continued use as a PFS.	Low	Mild	**Low**
		Accumulation of ground gas and/or vapour in confined spaces	Low	Medium	**Moderate/Low**
• Nr Dairy Farm • Land East of Bow Bridge Landfill • Sawmills Landfill	Future maintenance workers	Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials.	Low	Mild	**Low**
		Inhalation of vapours from volatile compounds within contaminated groundwater/leachate.			
	Adjacent site workers	Inhalation of ground gas and/or vapours from volatile compounds within the landfilled materials through preferential pathways created by the proposed scheme (service ducts).	Low	Mild	**Low**
	Foundations and services on-site+	Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.	Low	Mild	**Low**
	Buildings, foundations and services off-site+	Accumulation of ground gas and/or vapours from volatile compounds from the landfilled materials.	Low	Mild	**Low**

Source	Receptor	Linkage	Likelihood	Severity	Qualitative Assessment of Risk
Note: **+** These receptors are not identified in *Design Manual for Roads and Bridges* (DMRB) LA 109 *Geology and soils* and therefore have not been included in the assessment of significant effects.					