# Appendix L
# Water environment desk study

# 1. Introduction

1.1.1.1 This Appendix should be read in conjunction with **Section 2** of the **Preliminary Environmental Information Report Supplementary Information Report (PEIR SIR)**. This Appendix presents results of the desk studies carried out to establish the existing water environment conditions associated with the Longer Alternative Cable Routes (LACRs) LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. The information within this Appendix informs the summary of baseline information and the preliminary assessment of potential effects. The approach to screening in this appendix follows the same approach which was carried out in the **PEIR**. Background information on data gathering methodologies is presented in the **Chapter 27: Water environment, Volume 2** of the **PEIR** (Rampion Extension Development Limited (RED), 2021) for reference.

# 2. Baseline conditions

## 2.1 Conservation sites

2.1.1.1 One statutory designated site has been identified as potentially water dependent but has been screened out from further assessment in the PEIR SIR due to a lack of hydrogeological connectivity to LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. **Table L-1** provides details of its potential water dependency and its location in relation to the LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 to help determine its potential hydrological or hydrogeological connection to the Proposed Development. The table also identifies and presents equivalent information for other non-designated features such as Chalk streams and dew ponds. The features which are screened in are those which are considered further and assessed in **Section 3** of this Appendix and the **PEIR SIR**.

**Table L-1 Conservation sites with potential water dependency or other features or interest associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| Conservation site | Description and water dependency | Potential connection to the LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to LACR-02 |
|---|---|---|---|
| **Statutory designated sites with potential for water dependency** | | | |
| **Amberly Mount to Sullington Hill Site of Special Scientific Interest (SSSI)** | Groundwater-dependent Chalk grassland on scarp slopes including juniper scrub habitat and rare invertebrates. | The nearest part of the SSSI lies on the northern slopes of Sullington Hill approximately 310m and upgradient of the closest boundary of LACR-01 (LACR-01b). Therefore, this habitat is unlikely to be linked to LACR-01. Screened out from further assessment in the PEIR SIR (and already considered in the PEIR (RED, 2021) as part of the original PEIR Assessment Boundary). | The nearest part of the SSSI lies approximately 4km northeast and upgradient of the LACR-02 boundary. The habitat is therefore unlikely to be linked to LACR-02. |
| **Non-statutory designated sites with potential for water dependency** | | | |
| **There are no non-statutory designated sites with potential for water dependency associated with LACR-01 and LACR-02.** | N/A. | N/A. | N/A. |
| **Other features of interest** | | | |
| **Chalk stream near Poling Corner** | Chalk stream identified in South Downs National Park Authority (SDNPA) 2010 survey. | The stream is crossed by a section of the temporary onshore construction corridor (505034 105362) associated with the nearest LACR-01 boundary (LACR-01a) | The stream is not crossed by LACR-02 and has therefore been screened out. |

| Conservation site | Description and water dependency | Potential connection to the LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to LACR-02 |
|---|---|---|---|
| | | where an open cut crossing is proposed. Screened in for further assessment. | |
| **Chalk stream and ponds to the south of A27 near Decoy Lane** | Chalk stream identified in SDNPA 2010 survey. | The stream is crossed by a section of the temporary onshore construction corridor (505695, 105582 and 506044, 105557) associated with the nearest LACR-01 boundary (LACR-01a) where trenchless methodologies are proposed. Screened in for further assessment. | The stream is not crossed by LACR-02 and is approximately 1.5km southeast of the LACR-02 route corridor and has therefore been screened out. |
| **Spring and Chalk stream near Hammerpot** | Chalk stream identified in SDNPA 2010 survey. | The temporary onshore construction corridor associated with the nearest LACR-01 boundary (LACR-01a) and is situated approximately 90m to the north of the mapped spring and associated section of Chalk stream. Screened in for further assessment. | LACR-02 is over 1.8km from the mapped spring and associated section of chalk stream. Screened out of further assessment. |
| **Chalk Stream near Crossbush** | Chalk stream identified in SDNPA 2010 survey. | The temporary construction corridor associated with the nearest part of LACR-01 (LACR-01a) is situated approximately 1km east of the chalk stream. Screened out of further assessment. | The LACR-02 route corridor crosses the chalk stream. Screened in for further assessment. |
| **A dew pond at Angmering Park Stud Farm** | Identified by SDNPA as another pond in good condition (SDNPA, 2010). | The pond is approximately 300m and downgradient of the nearest LACR-01 boundary (LACR-01a). Screened in for further assessment. | The pond is approximately 1km south and downgradient of |

| Conservation site | Description and water dependency | Potential connection to the LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to LACR-02 |
|---|---|---|---|
| | | | LACR-02. Screened in for further assessment. |
| **A dew pond at Lower Barpham** | Identified by SDNPA as another pond in good condition (SDNPA, 2010). | The pond is approximately 250m and downgradient of the nearest LACR-01 boundary (LACR-01b). Screened in for further assessment. | The pond is approximately 600m downstream of the LACR-02 boundary and screened in for further assessment. |
| **A dew pond near Michelgrove Park** | Identified by SDNPA as another pond in good condition (SDNPA, 2010). | The pond is approximately 450m and downgradient of the nearest LACR-01 boundary (LACR-01a). Screened in for further assessment. | The pond is approximately 450m and downgradient of LACR-02. Screened in for further assessment. |
| **A dew pond to the south of Long Furlong Farm** | Identified by SDNPA as another pond in unknown condition (SDNPA, 2010). | Approximately 810m to the south of the nearest LACR-01 boundary (LACR-01c) and therefore screened out from further assessment due to distance and lack of hydrological connectivity. | The pond is approximately 1.7km from the LACR-02 boundary. Screened out of further assessment. |
| **Dew ponds between Blackpatch Hill and Harrow Hill** | Identified by SDNPA as another pond in unknown condition (SDNPA, 2010). | Approximately 250 – 350 m and up gradient from the nearest LACR-01 (LACR-01b and LACR-01c) boundaries. Screened out from further assessment due to distance and lack of hydrological connectivity | The ponds are over 1.5km upgradient of the LACR-02 boundary and screened out of further assessment. |

| Conservation site | Description and water dependency | Potential connection to the LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to LACR-02 |
|---|---|---|---|
| **Dew ponds near Cobden Farm near Findon** | Identified by SDNPA as another pond in unknown condition (SDNPA, 2010). | Approximately 200m the east and within a different part of the catchment to the nearest LACR-01 boundary (LACR-01c). Screened out from further assessment due to a lack of hydrological connectivity. | The ponds are approximately 3.5km of the LACR-02 boundary in a different part of the catchment. Screened out of further assessment. |
| **A dew pond near Lee Farm** | Identified by SDNPA as a pond in poor condition (v). | Approximately 1.6km - 2.5km upgradient to the north of the nearest LACR-01 (LACR-01b and LACR-01c) boundaries. Screened out from further assessment due to a lack of hydrological connectivity. | Approximately 1.7km from the LACR-02 boundary and in a different part of the catchment. Screened of further assessment. |
| **A dew pond at Upper Barpham** | Identified by SDNPA as a pond in poor condition (v). | Approximately 800m upgradient of the nearest LACR-01 (LACR-01a) corridor. Screened out from further assessment due to a lack of hydrological connectivity. | Approximately 130m downstream of LACR-02 boundary. Screened in for further assessment. |
| **Dew pond at Hill Barn, Warningcamp.** | Identified by SDNPA as another pond in unknown condition (SDNPA, 2010). | Over 2km west (and not downgradient) of the nearest LACR-01 (LACR-01b) boundary. Screened out from further assessment due to a lack of hydrological connectivity. | Approximately 60m downstream of LACR-02 boundary |

### Water Framework Directive Classifications

2.1.1.2 The current (2019) status of all Water Framework Directive (WFD) water bodies associated with the LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 are presented in **Table L-2** (Environment Agency, 2022a). Those which are identified as having a potential connection to the Proposed Development are considered further and assessed in **Section 3** of this appendix and the **PEIR SIR**. At the ES stage those interim findings will be considered together with offshore aspects within the standalone WFD Assessment alongside the Environmental Statement (ES).

**Table L-2 WFD water bodies associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| Water body ID/ management catchment | Water body type | Status | Supporting elements, less than Good Status/Potential | Issues preventing the attainment of Good Status | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection the boundary of LACR-02 |
|---|---|---|---|---|---|---|
| **Black Ditch (West Sussex) GB107041012890 Arun and Western Streams** | River | Poor Status (2019): Poor Ecological Potential, Chemical Status: Fail | Macrophytes and Phytobenthos Combined - Fish | Natural conditions – sediment and morphology<br><br>Land drainage – operational management<br><br>Physical modification – Reservoir/ impoundment<br><br>Flow – low flow | | The Ditch is over 2km from the boundary of LACR-02 and has been screened out of further assessment. |
| **Littlehampton Anticline East GB40701G503400** | Groundwater | Poor status (2019): Poor Quantitative Status, Poor Chemical Status | No data available | No data available | Water body is intersected by the boundary of LACR-01 (LACR-01a) between Lyminster | The water body is not intersected by the boundary of LACR-02 and has been |

| Water body ID/ management catchment | Water body type | Status | Supporting elements, less than Good Status/Potential | Issues preventing the attainment of Good Status | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection the boundary of LACR-02 |
|---|---|---|---|---|---|---|
| | | | | | and Poling. Screened in. | screened out of further assessment. |
| **Sussex Lambeth Group GB40701G505100** | Groundwater | Good status (2019): Good Quantitative Status, Good Chemical Status | N/A | N/A | Water body is intersected by the nearest boundary of LACR-01 (LACR-01a) between Poling and Hammerpot. Screened in for further assessment. | The water body is intersected by LACR-02 between Crossbush and Warningcamp. Screened in for further assessment. |
| **Worthing Chalk GB40701G505300** | Groundwater | Poor Status (2019): Poor Quantitative Status, Poor Chemical Status | Quantitative Water Balance, Quantitative Dependent Surface Water Body Status Chemical Drinking Water Protected Area – fail, General Chemical Test – fail, and Trend | Pollution from rural areas, poor nutrient management, and groundwater abstraction. | Water body is intersected by the LACR-01 (LACR-01a, LACR-01b and LACR-01c) boundaries between Hammerpot and Sullington Hill. Screened in for further assessment. | LACR-02 is within the water body between Warningcamp and Myrtle Grove Farm. Screened in for further assessment. |

| Water body ID/ management catchment | Water body type | Status | Supporting elements, less than Good Status/Potential | Issues preventing the attainment of Good Status | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection the boundary of LACR-02 |
|---|---|---|---|---|---|---|
| | | | Assessment – Upward Trend | | | |

## 2.2 Water resources

2.2.1.1 Five private water supplies (PWSs) have been identified associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. Each of the five PWSs are situated within the Arun District Council (ADC) area, and details are provided in **Table L-3** below.

2.2.1.2 The information available regarding these PWSs varies in terms of its level of detail. Where its purpose is unknown, a PWS has been assumed as potable as part of the precautionary approach adopted within the subsequent assessment of effects.

**Table L-3 PWSs associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| ID | Supply name | NGR | Local Planning Authority | Source | Use and property type | Estimated volume ($m^3$/day) and population served | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|---|
| **P3** | Pauls House | 502392, 104768 | ADC | Groundwater (borehole) | Domestic | 2.8$m^3$/day | Screened in for further assessment: groundwater abstraction, within close proximity of the nearest boundary of LACR-01 (LACR-01a) (170m) near Lyminster, and with the same geology (Chalk). The abstraction lies slightly upgradient and to the north of LACR-01. The groundwater flow is likely to flow to the south towards the Black Ditch and therefore any connectivity is likely | Screened out of further assessment. The boundary of LACR-02 is over 1.7km from the PWS and has limited geological connectivity. |

| ID | Supply name | NGR | Local Planning Authority | Source | Use and property type | Estimated volume ($m^3$/day) and population served | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | to be minimal at this location. | |
| **P4** | The Decoy | 505857, 105344 | ADC | Groundwater (borehole) | Single domestic | Unknown | Screened in for further assessment: groundwater abstraction in close proximity (150m) to the nearest boundary of LACR-01 (LACR-01a) and within the same geology (Lambeth Group). The abstraction lies downgradient to the south of LACR-01 and there is likely to be potential for hydrogeological connectivity. | Screened in for further assessment. Groundwater abstraction is over 2km from the LACR-02 but has likely geological connectivity via the Lambeth Group. |
| **P5** | Angmering Park Stud Farm | 506195, 105863 | ADC | Groundwater (borehole) | Small supplies, including | Unknown | Screened in for further assessment: groundwater | Screened in for further assessment. Groundwater |

| ID | Supply name | NGR | Local Planning Authority | Source | Use and property type | Estimated volume ($m^3$/day) and population served | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|---|
| | | | | | small shared supplies and those to single dwellings only | | abstraction in very close proximity (57m) to the west of the nearest boundary of LACR-01 (LACR-01a) and within a band of the same geology (Lambeth Group). It is along a similar gradient to LACR-01. | abstraction is over 2km from the LACR-02 boundary but has likely geological connectivity via the Lambeth Group. |
| **P7** | Upper Barpham | 506729, 108945 | ADC | Groundwater (borehole) | Small supplies, including small shared supplies and those to single dwellings only | Unknown | Screened in for further assessment: groundwater abstraction, 640m to the west of the nearest LACR-01 boundary (LACR-01a) and with same geology (Chalk). | Screened in for further assessment: groundwater abstraction, 440m to the south of the nearest LACR-02 boundary and has the same geology (Chalk). |

| ID | Supply name | NGR | Local Planning Authority | Source | Use and property type | Estimated volume ($m^3$/day) and population served | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|---|
| **P9** | Long Furlong Barn | 509571, 107528 | ADC | Groundwater (borehole) | Large supplies and those used as part of a commercial or public activity (including some supplies to tenanted single dwellings) | Unknown | Screened in for further assessment: groundwater abstraction between Patching and Clapham with same geology as the original PEIR Assessment Boundary (Chalk), circa 330m to the south of the nearest boundary of LACR-01 (LACR-01c). | Screened in for further assessment. Groundwater abstraction has the same geology (chalk) as the nearest LACR-02 boundary. |

## Licensed abstractions

2.2.1.3 The Environment Agency (EA) has provided information for licensed abstractions. Ten licensed abstractions have been identified associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02, and details are provided in **Table L-4** below. Six are assessed as having a potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) and/or LACR-02 and have been considered for further assessment in **Section 3** of this Appendix.

**Table L-4 Licensed abstractions associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| **A7** | 24/065 Torri House | Molica Esq | 502320, 104020 | Groundwater | Agriculture - horticultural watering | Screened out of further assessment: groundwater abstraction in Littlehampton, situated 430m to the south of the nearest boundary of LACR-01 (LACR-01a). Although the abstraction is in the same Chalk geology, the agricultural supply is situated upgradient of the boundary and on the opposite bank of the Black ditch watercourse and therefore unlikely to be connected. | Screened out of further assessment: groundwater abstraction in Littlehampton situated over 2.5km southwest of the LACR-02 boundary and unlikely to be connected. |
| **A8** | 24/064 Marina House | Molica Esq | 502320, 104060 | Groundwater | Agriculture - horticultural watering | Screened out of further assessment: groundwater abstraction in Littlehampton, situated 420m to the south of the nearest boundary of LACR-01 (LACR-01a). Although the abstraction is in the same Chalk geology, the agricultural supply is situated upgradient of the boundary | Screened out of further assessment: groundwater abstraction in Littlehampton situated over 2.5km southwest of the LACR-02 boundary and unlikely to be connected. |

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| | | | | | | and on the opposite bank of the Black ditch watercourse and therefore unlikely to be connected. | |
| **A20** | 10/41/310210 Angmering PS Point 2 | Southern Water Services Ltd | 506701, 106700 | Groundwater | Water supply - public water supply, potable | Screened in for further assessment: groundwater abstraction 200m to the west of the nearest boundary of LACR-01 (LACR-01a) and in the same geology (Chalk). The boundary of LACR-01 crosses the Source Protection Zone 2 (SPZ2) of this supply. | Screened in for further assessment: groundwater abstraction 1.5km southeast of the LACR-02 boundary and in the same geology (chalk). The boundary also crosses the SPZ3 of this supply. |
| **A21** | 10/41/310210 Angmering PS Point 1 | Southern Water Services Ltd | 505820, 106940 | Groundwater | Water supply - public water supply, potable | Screened in for further assessment: groundwater abstraction circa 1km to the west of the nearest boundary of LACR-01 (LACR-01a), and in the same geology (Chalk). The boundary of LACR-01 (LACR-01a) crosses the SPZ2 of this supply. | Screened in for further assessment: groundwater abstraction 670m southeast of the LACR-02 boundary and in the same geology (Chalk). The LACR-02 boundary crosses the SPZ3 of this supply. The existing access road (AA-30) passes through SPZ1 for |

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| | | | | | | | Angmering public water supply (PS) along Angmering Park Road. It is anticipated that no dig solution would be utilised along this access. |
| **A22** | 10/41/414009 Black Ditch at Ham Manor Golf Club | Ham Manor Golf Club Ltd | 505870, 103890 | Groundwater | Industrial, commercial and public services - spray irrigation - direct | Screened out of further assessment: groundwater abstraction circa 1.5km to the south of the nearest boundary of LACR-01 (LACR-01a) and overlying different geology (sand and gravel). Given that the abstraction is upgradient from LACR-01 (LACR-01a), within the upper reaches of the Black Ditch catchment, there is no potential for connection. | Screened out of further assessment: groundwater abstraction circa 3km south of the LACR-02 boundary and overlying different geology (sand and gravel). Given the abstraction is upgradient from LACR-02 and within the upper reaches of the Black Ditch catchment there is no potential for connection. |
| **A24** | 24/066 Old Place Farm | F W Longhurst & Son Ltd | 505370, 104580 | Groundwater | Agriculture - general | Screened in for further assessment: groundwater abstraction circa 1km to the | Screened out of further assessment: groundwater abstraction |

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| | | | | | farming and domestic | south of the nearest boundary of LACR-01 (LACR-01a) and within same geology (silt, Littlehampton Anticline East). Given that the abstraction is downgradient from LACR-01 (LACR-01a), within the same part of the Black Ditch catchment, there is potential for connection. | circa 2km of the LACR-02 boundary and not within the same geology. |
| **A25** | 10/41/414021 Black Ditch at Ham Manor Farm, Rustington | Rustington Golf Centre Ltd | 505620, 104190 | Surface water | Industrial, commercial and public services - spray irrigation - storage | Screened out of further assessment: surface water abstraction circa 1.4km to the south of the nearest boundary of LACR-01 (LACR-01a) and upgradient of the Black Ditch crossing, hence there is no potential connection. | Screened out of further assessment: surface water abstraction circa 2.5km south of the LACR-02 boundary and upgradient of the Black Ditch crossing and no potential for connection. |
| **A27** | 24/068/R01 Side Channel of the Black Ditch at Manor Farm, Poling | Langmead | 505164, 104596 | Surface water | Agriculture - spray irrigation - storage | Screened in for further assessment: surface water abstraction circa 1.1km downstream of the Black Ditch crossing of the boundary of LACR-01 (LACR-01a), hence there is a potential connection. | Screened out for further assessment; surface water abstraction circa 2km southeast of the LACR-02 boundary. |

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| **A28** | 10/41/310210 Patching PS | Southern Water Services Ltd | 509160, 107450 | Groundwater | Water supply - public water supply, potable | Screened in for further assessment: groundwater abstraction circa 1.4km to the south of the nearest boundary of LACR-01 (LACR-01c) near Blackpatch Hill. It is in the same geology (Chalk) and lies downgradient of the onshore temporary construction corridor associated with LACR-01 (LACR-01c) which overlaps with parts of the abstraction's SPZ2. | Screened in for further assessment: groundwater abstraction circa 1.8km southeast of the LACR-02 boundary and within the same geology (Chalk). The boundary also intersects the SPZ2 of the abstraction. |
| **A31** | 10/41/310210 Stanhope Lodge PS | Southern Water Services Ltd | 511000, 105000 | Groundwater | Water supply - public water supply, potable | Screened in for further assessment: groundwater abstraction circa 3.5km to the south-east of the nearest boundary of LACR-01 (LACR-01c). It is in the same geology (Chalk) and lies downgradient of the onshore temporary construction corridor associated with LACR-01 which overlaps with parts of the abstraction's SPZ2. | Approximately 2.8km from the LACR-02 boundary but within the same geology. Screened in for further assessment. |

| ID | Licence no. and name | Operator | NGR | Source | Use | Potential connection to the boundary of LACR-01 (LACR-01a, LACR-01b and LACR-01c) | Potential connection to the boundary of LACR-02 |
|---|---|---|---|---|---|---|---|
| **A15** | 24/063 Warningcamp borehole | Southern Water Services Ltd | 504590, 107250 | Groundwater | Water Supply - Public Water Supply, Potable | Screened in for further assessment for LACR-01a as the proposed access (AA-29) passes through SPZ1 for Warningcamp public water supply (PS) along a farm track to Hill Barn. A no dig solution would be utilised and normal farm entrances and tracks can be used along this access. | The proposed access (AA-29) passes through SPZ1 for Warningcamp public water supply (PS) along a farm track to Hill Barn. A no dig solution would be utilised and normal farm entrances and tracks can be used along this access. |

## 2.3 Flood Risk

2.3.1.1 LACR-01b and LACR-01c are situated entirely within Flood Zone 1. The first 500m section of LACR-01a runs parallel to the Black Ditch. This section of LACR-01a runs east from the branch point to the pre-existing PEIR Assessment Boundary which is situated within Flood Zones 2 and 3 of the lower course of the River Arun. The entirety of LACR-02 is situated within Flood Zone 1.

2.3.1.2 Depth to groundwater is anticipated to be shallow along LACR-01a adjacent to Lyminster. Similarly, the depth to groundwater would be anticipated to shallow for LACR-02 at the branch point from the original PEIR Assessment Boundary at Blakehurst. However, in each case, this is in accordance and comparable with the pre-existing PEIR Assessment Boundary situated within the low-lying floodplain of the River Arun (with regards to LACR-01a), and also crossing a narrow band of shallow groundwater at Blakehurst. In each case, the risk of groundwater intrusion is comparable to the pre-existing assessment provided in **Chapter 27** of the **PEIR** and anticipated to be managed via the embedded environmental measures (**Appendix F** of the **PEIR SIR**).

2.3.1.3 Across the remainder of LACR-01 (LACR-01a, LACR-01b and LACR-01c), and LACR-02 routes, the risk of surface water flooding is anticipated to be low. The Environmental Agency Risk of Flooding from Surface Water (RoFSW) dataset indicates that surface water flood risk is predominantly very low across LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 (Environment Agency, 2022b). LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 are anticipated to cross several surface water flowpaths, although the risk associated with each is predominantly low owing to the high permeability of the underlying Chalk.

2.3.1.4 Two residential properties have been identified as potential receptors at Lower Burpham (LACR-01b) and Michelgrove (LACR01a, LACR-01c, and LACR-02). These properties are within the 0.1% Annual Exceedance Probability (AEP) (low risk) RoFSW extent and are situated approximately 600m and 1,000m downstream of proposed crossing points respectively. However, owing to the distance downstream of the crossing points and existing low risk these have been screened out from further assessment.

# 3. Summary assessment of potential effects

## 3.1 Introduction

3.1.1.1 In the **Chapter 27: Water environment, Volume 2** of the **PEIR** there was a comprehensive assessment of potential effects for water environment receptors during the construction, operation and maintenance and decommissioning phases of the Proposed Development.

3.1.1.2 Within the following section this exercise has been carried out again for any new receptors which have been identified and screened in for LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02, relating to the onshore temporary construction corridor infrastructure type. For further details on the assessment evaluation methodologies please refer to **Section 27.8** in **Chapter 27** of the **PEIR**.

3.1.1.3 As was noted in **Chapter 27** of the **PEIR**, effects on the water environment will principally be associated with the construction phase as this will involve the greatest change from baseline conditions. Once constructed, the Proposed Development is expected to result in relatively limited effects. Decommissioning effects will be similar to construction phase effects, albeit in reverse and of a lower magnitude as sub-surface onshore cable infrastructure will be left in-situ.

## 3.2 Preliminary assessment: construction phase

3.2.1.1 **Table L-5** lists the potential negative effects associated with the onshore cable laydown in relation to the water environment for LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. An indication is provided of the range of the value, magnitude, and significance classifications for each potential effect (based on **Table 27-16, 27-18** and **27-19** in **Section 27.8** of **Chapter 27** of the **PEIR**). The magnitude, and hence the significance, of potential effects have been assessed considering the implementation of embedded environmental measures listed in **Appendix F** of the **PEIR SIR**. This includes Code of Construction Practice (COCP) measures implemented as part of the Proposed Development. On the basis of the implementation of embedded environmental measures (outlined in **Appendix F** of the **PEIR SIR**), at this preliminary stage, there may be a potentially significant effect associated with both LACR-01 and LACR-02 onshore cable corridor options.

3.2.1.2 Karst is a topography formed from the dissolution of soluble rocks, and is characterized by underground drainage systems. Whilst the PEIR acknowledged some potential for fissuring along the PEIR route (within **Section 27.6** of **Chapter 27** of the **PEIR**) the potential presence of karst features is higher along the LACR routes associated with a large area of chalk with flints and Paleogene (Lambeth Group) contact. Southern Water have since shared information which confirms that the prevalence of karst is lower to the north, along the original PEIR route where older and harder formations of Chalk exist. The potential presence of karst fissuring and proposals for trenchless crossings (e.g. TC-24, TC-25, TC-26, and TC-27) along sections of both LACR-01 (LACR-01a, LACR-01b and LACR-01c)

and LACR-02 means that there is a risk of drilling contamination from fluid breakout which could introduce a Low or Medium magnitude of effect towards Water Resources (such as public and non public water supplies) and this could be potentially significant (as indicated in **Table L-5**). At this preliminary stage, there is uncertainty over the level of risk associated with all options (LACR-01a, LACR-01b, LACR-, 01c, and LACR-02), and significant adverse effects on the underlying aquifer, public water supplies (e.g., Angmering and Patching public water supply) and other features including the Decoy, Angmering Park Stud Farm and Long Furlong Barn PWSs cannot be ruled out at this preliminary stage of assessment.

3.2.1.3 However, a detailed Hydrogeological Risk Assessment will be prepared to support the Water environment chapter in the Environmental Statement (ES). This will be undertaken to further understand the potential relationship between each of the LACRs and the public water supply and other potential receptors. This will be supported by a site visit and conceptual cross sections to establish relative elevations and pathway linkages. This will assist in establishing whether there is a source - pathway - receptor link between LACRs, the public water supply and/or other water features in the area and will consider additional embedded environmental measures where necessary to minimise potential adverse water quality effects.

**Table L-5 Potential residual effects during the onshore cable laydown associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **Groundwater WFD Water Bodies** | A decline in groundwater levels arising from dewatering of the trenched excavations for cabling or the development of less permeable access track/temporary construction compound establishment reducing infiltration. | C-7, C-19, C-20, C-27, C-29, C-73, C-74, C-77, C-120, C-121, C-129, C-133, C-140, C-141, C-144 and C-147. | Medium – High | Negligible – Low | Negligible – Minor adverse (**Not Significant**) |
| **Groundwater and Surface Water WFD Water Bodies** | Potential for accidental contamination entering groundwater or watercourses, associated with spillage or leakage of fuels, lubricants or other chemicals. This includes the potential for leakage of bentonite during trenchless crossing. | C-8, C-76, C-135, C-142, C-148, C-149, C-150, C-151, C-167, C-182 and delivery of a detailed Hydrogeological Risk Assessment at ES. | Medium – High | Negligible | Negligible – Minor adverse (**Not Significant**) |
| **Surface Water WFD Water Bodies** | Ground disturbance and mobilisation of sediments / contaminants leading to silt-laden or otherwise contaminated runoff entering watercourses. | C-3, C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140, | Medium | Negligible – Low | Negligible – Minor adverse (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | | C-141, C-142, C-143, C-144, C-145, C-148 and C-182. | | | |
| | Changes to watercourse morphology as a result of works in or near watercourses (e.g. installation of watercourse crossings and associated earthworks). | C-3, C-7, C-8, C-10, C-11, C-13, C-19, C-25, C-27, C-28, C-30, C-33, C-73, C-75, C-76, C-77, C-120, C-122, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-133, C-135, C-137, C-138, C-139, C-140, C-141, C-142, C-143, C-144, C-145, C-148 and C-182. | Medium | Negligible | Negligible (**Not Significant**) |
| **Conservation Sites, Ponds, Chalk Streams and Springs** | Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features. This could arise from dewatering of the trenched excavations for cabling, ground disturbance for the development of temporary access track establishment, or the leakage/spillage of fuels and chemicals onsite. This includes the potential for | C-3, C-6, C-7, C-8, C-10, C-11, C-13, C-17, C-18, C-19, C-20, C-21, C-23, C-27, C-28, C-29, C-30, C-33, C-64, C-73, C-74, C-76, C-77, C-120, C-121, C-122, C-124, C-125, C-126, C-127, C-128, | Very Low – Medium | Negligible – Low | Negligible (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | leakage of bentonite during trenchless crossing. | C-129, C-130, C-131, C-133, C-134, C-135, C-137, C-138, C-139, C-140, C-141 C-142, C-143, C-144, C-145, C-146, C-147, C-148, C-149, C-150, C-151, C-167, C-176, C-179, C-181, C-182, C-183 and delivery of a detailed Hydrogeological Risk Assessment at ES stage. | | | |
| **Water Resources**<br><br>**Licensed Abstractions – Southern Water Public Water Supplies (A31 Stanhope Lodge PS. A15 Warningcamp)** | Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quantity and/or quality effects. This could arise from dewatering of the trenched excavations for cabling, ground disturbance for the development of temporary access track/temporary construction compound establishment, or the leakage/spillage of fuels and chemicals | C-3, C-7, C-8, C-10, C-11, C-13, C-18, C-19, C-20, C-21, C-25, C-27, C-28, C-29, C-30, C-33, C-73, C-74, C-75, C-76, C-77, C-78, C-120, C-121, C-122, C-125, C-126, C-127, C-128, C-129, C-130, | High | Negligible | Minor adverse (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **Licensed abstractions – Southern Water Public Water Supplies (A20 Angmering PS Point 1, A21 Angmering Point 2, A28 Patching PS)** | onsite. This includes the potential for leakage of bentonite during trenchless crossing. | C-131, C-133, C-134, C-135, C-137, C-138, C-140, C-141, C-142, C-143, C-144, C-145, C-146, C-147, C-149, C-150, C-151, C-167, C-179, C-181, C-182 and delivery of a detailed Hydrogeological Risk Assessment at ES stage. | High | Negligible, Low or Medium | Minor adverse (**Not Significant**) – Major adverse (**Potentially Significant**). N.B. the degree of uncertainty due to the potential for sub-surface karst fissuring which could, in theory, provide rapid pathways for pollutants and cause resultant impacts on the water quality of supplies. |
| **Other (Non-Public) Licensed Abstractions (A24 Old Place Farm, A27 Manor Farm Poling)** | | | Low – Medium | Negligible | Negligible – Minor (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **PWSs and Unregistered Mapped Wells (P4 The Decoy, P5 Angmering Park Stud Farm, P9 Long Furlong Barn)** | | | Low | Negligible, Low or Medium | Minor adverse (**Not Significant**) – Major adverse (**Potentially Significant**). N.B. the degree of uncertainty due to the potential for sub-surface karst fissuring which could, in theory, provide rapid pathways for pollutants and cause resultant adverse impacts on the water quality of supplies. |
| **PWSs and Unregistered Mapped Wells (P3 Pauls House, P7 Upper Barpham)** | | | Low | Negligible, | Minor adverse (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **Flood Risk Receptors** | Changes in watercourse conveyance associated with temporary watercourse crossings. | C-3, C-5, C-17, C-18, C-20, C-118, C-126, C-127, C-128, C-130, C-131, C-132, C-133, C-134, C-139, C-145, C-148, C-176, C-177, C-178 and C-182. | Low – High | Negligible | Negligible – Minor adverse (**Not Significant**) |
| | Volumetric displacement of flood water associated with the construction of temporary stockpiles and raised access tracks within floodplain areas. | C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-123, C-124, C-127, C-128, C-130, C-131, C-132, C-133, C-134, C-175, C-179, C-180 and C-181. | Low – High | Negligible | Negligible – Minor adverse (**Not Significant**) |
| | Changes in runoff rates and new flow pathways associated with ground disturbance and the development of temporary access tracks and temporary construction compound areas. | C-3, C-11, C-13, C-17, C-18, C-19, C-20, C-21, C-27, C-28, C-33, C-73, C-74, C-75, C-77, C-117, C-119, C-120, C-121, C-122, C-123, C-124, C-125, C-126, C-127, C-128, C-129, C-130, C-131, C-132, C-133, C-134, C-138, C-139, | Low – High | Negligible | Negligible - Minor adverse (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | | C-140, C-144, C-148, C-175, C-176, C-177, C-178, C-179, C-190, C-181 and C-182. | | | |
| | Increases in flow in watercourses due to dewatering of excavations. | C-29, C-77, C-118, C-134 and C-141. | Low – High | Negligible | Negligible – Minor adverse (**Not Significant**) |

## 3.3 Preliminary assessment: Operation and maintenance phase

3.3.1.1 **Table L-6** lists the potential effects associated with the operation and maintenance of the proposed landfall and the onshore cable circuits in relation to the water environment for LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. An indication is provided of the range of the value, magnitude, and significance classifications for each potential effect (based on **Table 27-16, 27.18** and **Table 27-19** in **Section 27.8** of **Chapter 27** of the **PEIR**). The magnitude, and hence the significance, of potential effects have been assessed considering the implementation embedded environmental measures listed in **Appendix F** of the **PEIR SIR**. This includes COCP measures implemented as part of the Proposed Development. On the basis of the implementation of embedded environmental measures (outlined in **Appendix F** of the **PEIR SIR**), there would be no material change in the predicted magnitude of change and significance of effect assessed between the LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 onshore cable corridor options.

**Table L-6 Potential residual effects during the operation and maintenance of the landfall and cable circuits associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **Groundwater and Surface Water WFD Water Bodies** | Potential for accidental contamination entering groundwater or watercourses. This could arise from isolated cable repairs or the leakage/spillage of fuels and chemicals from vehicles onsite. | C-8, C-149, C-150, C-151, C-153 and C-182. | Medium – High | Negligible | Negligible – Minor adverse (**Not Significant**) |
| **Surface Water WFD Water Bodies** | Changes to watercourse morphology due to the permanent presence of erosion protection around cable crossings. Cable crossings may exacerbate downstream or upstream bank and bed erosion and sediment deposition. | C-7, C-9, C-25, C-122, C-151 and C-153. | Medium | Negligible | Negligible (**Not Significant**) |
| **Conservation Sites, Ponds and Springs** | Reduction of water availability to support existing groundwater or surface water designated or undesignated sites, ecosystems and features as a consequence of quantity / quality effects from isolated repairs and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground | C-6, C-8, C-9, C-21, C-23, C-25, C-29, C-33, C-74, C-147, C-149, C-150, C-151, C-153, C-167 and C-182. | Very Low – Medium | Negligible | Negligible (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | concrete-lined joint bays and backfilled material around cable circuits. | | | | |
| **Water Resources**<br><br>**Licensed Abstractions – Southern Water Public Water Supplies** | Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quality and/or quantity effects. This could arise from isolated repairs, and the leakage/ spillage of fuels and chemicals from vehicles onsite; or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete lined joint bays and backfilled material around cable circuits. | C-8, C-21, C-29, C-33, C-74, C-137, C-147, C-149, C-150, C-151, C-153, C-167 and C-182. | High | Negligible | Minor adverse (**Not Significant**) |
| **Other (Non-Public) Licensed Abstractions** | | | Low – Medium | Negligible | Negligible (**Not Significant**) |
| **PWSs and Unregistered Mapped Wells** | | | Low | Negligible | Negligible (**Not Significant**) |
| **Flood Risk Receptors** | Volumetric displacement of flood water associated with maintenance works in floodplains during isolated repairs of the cable circuits. | C-11, C-19, C-20, C-21, C-75, C-119, C-120, C-121, C-122, C-130, C-132, C-133, C-153, C-154 and C-175. | Low – High | Negligible | Negligible - Minor (**Not Significant**) |
| | Changes in runoff rates and new flow pathways associated with ground | C-3, C-11, C-13, C-19, C-20, C-21, C-27, C-28, C-30, C-73, | Low – High | Negligible | Negligible – Minor |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | disturbance during isolated repairs of cable circuits. | C-74, C-75, C-119, C-120, C-121, C-130, C-131, C-133, C-153, C-175 and C-182. | | | adverse (**Not Significant**) |

## 3.4 Preliminary assessment: Decommissioning phase

3.4.1.1 At the decommissioning stage, it is anticipated that the cable circuits will be left buried in-situ with circuit ends being cut and sealed to minimise effects associated with removal. For the purposes of a maximum design scenario, negligible impacts for the decommissioning phase are anticipated. On this basis, **Table L-7** lists the negligible potential effects associated with the decommissioning of the onshore cable circuits in relation to the water environment for LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02. An indication is provided of the range of the value, magnitude, and significance classifications for each potential effect (based on **Table 27-16, Table 27-18** and **Table 27-19** in **Section 27.8** of **Chapter 27** of the **PEIR**). On the basis of the implementation of embedded environmental measures (listed in **Appendix F** of the **PEIR SIR**), there would be no material change in the predicted magnitude of change and significance of effect assessed between the LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02 onshore cable corridor options.

**Table L-7 Potential residual effects during decommissioning of the landfall and onshore cable circuits associated with LACR-01 (LACR-01a, LACR-01b and LACR-01c) and LACR-02**

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| **Groundwater and Surface Water WFD Water Bodies** | Potential for accidental contamination entering groundwater or watercourses. This could arise from isolated decommissioning works and the leakage/spillage of fuels and chemicals from vehicles onsite. | C-8, C-149, C-150, C-151, C-167 and C-182. | Medium – High | Negligible | Negligible – Minor adverse (**Not Significant**) |
| **Surface Water WFD Water Bodies** | Changes to watercourse morphology due to the permanent presence of erosion protection around cable crossings. Cable crossings may exacerbate downstream or upstream bank and bed erosion and sediment deposition. | C-7, C-9, C-25, C-122 and C-151. | Medium | Negligible | Negligible (**Not Significant**) |
| **Conservation Sites, Ponds and Springs** | Reduction of water availability to support existing groundwater or surface water designated or undesignated sites or ecosystems as a consequence of quantity / quality effects from isolated decommissioning works, and the leakage / spillage of fuels and chemicals from vehicles onsite or from diversion of sub-surface land drainage flow pathways due to | C-6, C-8, C-9, C-21, C-23, C-25, C-29, C-33, C-74, C-147, C-149, C-150, C-151, C-167 and C-182. | Very Low – Medium | Negligible | Negligible (**Not Significant**) |

| Receptor groups | Activity and potential effect | Embedded environmental measures | Value | Magnitude of effect | Significance of effect |
|---|---|---|---|---|---|
| | the permanent presence of limited below ground concrete-lined joint bays and backfilled material around cable circuits. | | | | |
| **Water Resources**<br><br>**Licensed Abstractions – Southern Water Public Water Supplies** | Reduction of water availability to support existing surface water and groundwater abstractions as a consequence of water quality and/or quantity effects. This could arise from isolated decommissioning works, and the leakage/spillage of fuels and chemicals from vehicles onsite; or from diversion of sub-surface land drainage flow pathways due to the permanent presence of limited below ground concrete-lined joint bays and backfilled material around cable circuits. | C-8, C-21, C-29, C-33, C-74, C-137, C-147, C-149, C-150, C-151, C-167 and C-182. | High | Negligible | Minor adverse (**Not Significant**) |
| **Other (Non-Public) Licensed Abstractions** | | | Low – Medium | Negligible | Negligible (**Not Significant**) |
| **PWSs and Unregistered Mapped Wells** | | | Low | Negligible | Negligible (**Not Significant**) |
| | Changes in runoff rates and new flow pathways associated with ground disturbance during decommissioning of the cable circuits. | C-3, C-11, C-13, C-19, C-20, C-21, C-27, C-28, C-30, C-73, C-74, C-75, C-119, C-120, C-121, C-130, C-131, C-133, C-175 and C-182. | Low – High | Negligible | Negligible – Minor adverse (**Not Significant**) |

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