# 1 Executive Summary

1.1.1 Monitoring was undertaken across C1 throughout May 2022. Graphs showing the monitoring data for the month are attached in Appendix A.

1.1.2 During the first weekend of May, both TBM's completed the crossing of the Misbourne River. However, a fire broke out on a vehicle within the downtrack tunnel on the 10th May, and thereafter, both TBM's were stationary for much of the month.

1.1.3 The launching girder for the CVV deck installation, named Dominique, was launched on the 23rd May. Piling continues along the CVV, with the jetty nearing completion and sheet piling completed for the time being.

1.1.4 The monitoring at Chalfont St Peter (CSP) reduced to monthly monitoring in response to construction work changes. Daily monitoring continued at Little Missenden (LMI). Monitoring at the CSG and Amersham (AMS) shaft site continued monthly in line with the SSMP. Chesham Road (CHR) and North Portal (NPTL) both continue to be monitored weekly.

1.1.5 Daily monitoring continued at Colne Valley Viaduct (CVV) module 3 with piling works on-going. Monitoring at Modules 4, 2 and 1 of the CVV remained at monthly monitoring frequency in response to the works in the area.

1.1.6 Monitoring across the South Portal and Western Valley Slopes areas continued as before, including continued surface water monitoring of the drainage systems.

1.1.7 The priority monitoring round was completed, with all locations visited.

1.1.8 There was one trigger level exceedance during May; this excludes the on-going contamination identified in ML032-RC009, discussed in doc no.: 1MC05-ALJ-EV-NOT-C001-000006. There was additional concern over a sudden drop in water level within the Misbourne river on the 3rd May, following which a possible subsidence location was identified within the river bed. This was infilled by the 9th May, with ongoing monitoring not indicating any additional concern regarding water levels related to ALIGN's works.

1.1.9 Turbidity at priority location ML035-CR003 exceeded trigger levels on 09/05/2022 and remains elevated to date compared with background values, but below trigger levels. ALIGN attribute this to the passage of the downtrack TBM (Cecilia), as at its closest, the borehole is within 15m of the alignment. Due to the fire with the tunnel on the 10th May, both TBM's were stationary for a number of weeks, with Cecilia

being stopped in close proximity to this borehole location. Elevated turbidity is anticipated to occur following the passage of the TBMs through the aquifer and is anticipated to return to more normal values as the TBM moves away.

1.1.10 The elevated Electrical Conductivity (EC) observed in CVV Module 1 within the New Years Green Bourne (NYGB) surface water (SW) monitoring locations, ML026-SW005 and ML026-SW006, , continues and will no longer be discussed on a monthly basis following the issuing of the May 2022 report. Both locations mirror one another with upstream monitoring point ML026-SW005 showing higher values than downstream, indicating a non-ALIGN source.

## 2.9 Colne Valley Viaduct (CVV)

2.9.1 Rotary piling activities continued with the following locations worked on during the month:

- P29
- P30
- P34
- P35

2.9.2 Roughly 9 m3 of support fluid was lost at pier 34 on 9 May.

2.9.3 At South Embankment, the first continuous flight auger (CFA) pile was started on 22 April. To date, 271 CFA piles have been completed. Currently a total of 1188 CFA piles are planned.

2.9.4 Jetty works across CVV during the month included the below:

Jetty A:

- Side platform installation – 80%
- Vehicle barrier and pedestrian barrier – 80%

Jetty B:

- P20 berm installation – 100%
- P20 cofferdam backfilling – 100%

Jetty C:

- Jetty fully complete

Jetty D:

- Jetty fully complete

## 2.10 CVV Module 4 groundwater

2.10.1 There were no trigger limit breaches during the month in Module 4.

2.10.2 Table 7 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

Table 7 CVV Module 4 borehole in-field parameter data

| | pH | SPC (µS/cm) | Turb (NTU) | REDOX (mV) | DO (mg/L) |
|---|---|---|---|---|---|
| **Typical Range** | 6.5 – 8 | 700 - 875 | 1 – 25 | 50 - 300 | 7 – 11 |
| **Trigger limit** | 5 – 9 | 1000 | 100[3]/250[4]/500[5] | - | - |
| **Trigger Level Exceedances** | - | | - | - | - |
| **Exceeding borehole** | - | | - | - | - |

2.10.3 Groundwater levels declined gently in line with seasonal change between 0.5-0.15m.

[3] ML029-CR010, ML029-RO431
[4] ML028-CR018, ML028-CR009
[5] ML028-CR006

## 2.11 CVV Module 3 groundwater

2.11.1 Table 8 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

2.11.2 No trigger limit breaches were observed during the month in Module 3.

Table 8 CVV Module 3 borehole in-field parameter data

| | pH | SPC (µS/cm) | Turb (NTU) | REDOX (mV) | DO (mg/L) |
|---|---|---|---|---|---|
| **Typical Range** | 6.5 – 8 | 700 - 875 | 1 – 25 | 50 - 300 | 7 – 11 |
| **Trigger limit** | 5 – 9 | 1000 | 250 | - | - |
| **Trigger Level Exceedances** | - | | - | - | - |
| **Exceeding borehole** | - | | - | - | - |

2.11.3 Groundwater levels displayed a gentle decrease in line with seasonal trends. Decreases were between 0.5 – 0.1m.

## 2.12 CVV Module 2 groundwater

2.12.1 Table 9 compares typical priority borehole ranges for the area with trigger levels and any trigger level exceedances.

2.12.2 There were no trigger limit breaches in Module 2 during the month.

Table 9 CVV Module 2 borehole in-field parameter data

| | pH | SPC (µS/cm) | Turb (NTU) | REDOX (mV) | DO (mg/L) |
|---|---|---|---|---|---|
| **Typical Range** | 6.5 – 8 | 700 - 875 | 1 – 25 | 50 - 300 | 7 – 11 |
| **Trigger limit** | 5 – 9 | 1000 | 250 | - | - |
| **Trigger Level Exceedances** | - | | - | - | - |
| **Exceeding borehole** | - | | - | - | - |

2.12.3 Groundwater levels have displayed gentle declines in line with seasonal trends or have otherwise remained generally stable throughout the month.

## 2.13 CVV Module 1 groundwater

2.13.1 Table 10 compares typical borehole ranges for the area with trigger levels and any trigger level exceedances.

2.13.2 There were no trigger limit breaches in Module 1 during the month.

Table 10 CVV Module 1 borehole in-field parameter data

| | pH | SPC (µS/cm) | Turb (NTU) | REDOX (mV) | DO (mg/L) |
|---|---|---|---|---|---|
| **Typical Range** | 6.5 – 8 | 550 - 1400 | 1 – 25 | -100 - 300 | 1 – 12 |
| **Trigger limit** | 5 – 9 | 1500[6] | 500 | - | - |
| **Trigger Level Exceedances** | - | - | - | - | - |
| **Exceeding borehole** | - | - | - | - | - |

2.13.3 Groundwater levels have displayed a decrease across the month between 01.0 – 0.60m. Dewatering tests have begun at Pier 11 and it is likely this is affecting GWL in nearby boreholes.

[6] Due to pre-existing contamination in the module 1 area, EC values are generally higher than anywhere else in Section C1.

## 2.14 Colne Valley surface water

2.14.1 Surface water monitoring at various locations was completed during the month with chemical sampling and gauge board readings collected where possible. Monitoring continued both weekly and monthly.

2.14.2 Table 11 compares typical surface water ranges for the area with trigger levels and any trigger level exceedances.

Table 11 Colne Valley surface water in-field parameter data

| | pH | SPC (µS/cm) | Turb (NTU) | REDOX (mV) | DO (mg/L) |
|---|---|---|---|---|---|
| **Typical Range** | 7 – 9 | 500 - 1000 | 1 – 25 | 0 - 300 | 4 – 14 |
| **Exceedances** | - | 5500, 3400 | - | - | - |
| **Exceeding location** | - | ML026-SW005, ML026-SW006 | - | - | - |

2.14.3 EC at ML026-SW005 and ML026-SW006, on the New Years Green Bourne (NYGB), has been consistently displaying variability since December 2021 and higher EC in comparison to other CVV surface water locations.

2.14.4 Discussions with HS2 S1/S2 operator SCS have identified that the NYGB upstream of ALIGN's work ranges between 500 and 5000 µS/cm with an average of 1500 µS/cm.

2.14.5 The continued symmetry between the two locations data within ALIGN operated areas, and the highest peaks being within the upstream location identify that the EC is a not attributable to ALIGN works.

2.14.6 These EC fluctuations will no longer be discussed monthly following the issuing of this report unless something out of the ordinary occurs.