

Minutes of Microsoft Teams meeting
Maple Cross technical update
12 January 2021, 10:00 – 11:40

Attendees

Chair: Hannah Fraser (HF) from H Fraser Consulting Ltd (HFCL)

Ilias Karapanos (IK) from Affinity Water (AW)

Roberts Sage (RS), Consultant to AW

Alister Leggatt (AL) from AW

Richard Asford (RA) from Ashford Developments

William Chambers (WC) from Barwood Capital

Philip Barlow (PB) from Tier Consult

Adrian Reed (AR) from Tier Consult

Minutes by Emilie Roberts from HFCL

Agenda

1. Preliminary DQRA review
2. Piling risk assessment review
3. Telemetry – data update
4. Telemetry – [REDACTED] signal test
5. Alkalinity data requested (awaited).
6. Groundwater flow in the piling zone
7. Turbidity transport
8. Planning timetable
9. Any other business

Minutes

1. Preliminary detailed quantitative risk assessment (DQRA) review

IK made the following comments:

- [REDACTED] it is key to monitor this
- [REDACTED] The proportion of contribution from gravels and surface water is significant but is not quantified due to the complex system. Rainfall related turbidity events are more pronounced than at other boreholes. However, it is not correct to assume a direct vertical link between Springwell lake and the PWS because
 - Although the AMP 5 signal test (c.4 MI/d) found no impact on groundwater or lake levels, the maximum deployable output of 16 MI/d is much greater than this so AMP5 conclusions may not hold.
 - Springwell Lake has a direct inflow and outflow with the River Colne, which could mask any change in lake level due to pumping
 - A previous research paper concluded that the presence of shrimps does not necessarily infer direct surface water connection

- [REDACTED] The proportion of contribution from gravels and surface water is significant but is not quantified due to the complex system. Rainfall related turbidity events are more pronounced than at other boreholes. However, it is not correct to assume a direct vertical link between Springwell lake and the PWS because 1) Although the AMP 5 signal test (c.4 MI/d) found no impact on groundwater or lake levels, the maximum deployable output of 16 MI/d is much greater than this so AMP5 conclusions may not hold. 2) Springwell Lake has a direct inflow and outflow with the River Colne, which could mask any change in lake level due to pumping 3) A previous research paper concluded that the presence of shrimps does not necessarily infer direct surface water connection
- The water balance was discussed

2. Piling method statement risk assessment (PMSRA) review

Comments raised are included in spreadsheet "DRAFT 2020.01.05 AW comments tracker – piling MSRA and DQRA.xlsx"; tab: AW comments PMSRA; column: H (Comments from meeting 12-1-2021)

3. Telemetry – data update

HF reported that:

- Chalk groundwater levels on site indicate no response to either cessation of pumping at [REDACTED] or change in pumping rate at [REDACTED]. A signal test is required at [REDACTED] to assess impact on site Chalk groundwater level.
- Occasional turbidity spikes have measured in both shallow and deep boreholes. Furthermore, shallow boreholes 102S and 105S have large fluctuations in turbidity as well as temperate suggesting a surface connection. Further investigation is required.
- A fuller report will be submitted around 22 January.

IK reported that [REDACTED] is now back online.

ACTION: HFCL will:

- assess AW abstraction data (5 minute frequency) to assess whether PWS outages impact site groundwater level.
- clean up turbidity data (spikes due logger maintenance etc) then perform statistics on turbidity spike data
- investigate fluctuations in temperature and turbidity at 102S and 105S

ACTION: IK to send HFCL data from loggers at Denham Way observation borehole, Clubhouse and Marsh lakes (due to be downloaded 19 January)

4. Telemetry – [REDACTED] signal test

It was agreed that a signal test at [REDACTED] would be very informative as during AMP5 signal tests various lakes responded to [REDACTED]. IK will request a signal test for as long a duration as possible (preferably c.24 hr duration), for as soon as possible, hopefully before the end of January. However, the occurrence, duration and timing of the test is beyond his control.

The signal test would preferably not be undertaken during heavy rainfall, which will mask impact on groundwater level.

WC requested that if possible the signal test take place prior to 22 Jan, the date upon which the loggers are due to be removed. Leaving them in longer will incur substantial cost.

ACTION: WC to request authorisation for funds for the loggers to potentially stay in place until the end of January

ACTION: IK to request a signal test

5. Alkalinity data requested (awaited)

ACTION: AL to send alkalinity data within the next few days.

6. Groundwater flow in the piling zone

HF explained how displacement piling compresses soil, making it denser, less porous and less permeable. Piling within the unstructured Chalk will cause a c.1 % reduction in flow to [REDACTED] (average daily amount).

IK requested that the change in flow within the gravel due to piling be estimated, as per HFCL's method for Chalk. If this is significant, the proportion of [REDACTED]'s flow from overlying gravel should be calculated. This is important because if the piling causes a significant disruption in flow to the PWS, the PWS will draw water from other sources which may compromise water quality (i.e. high manganese from the lakes). The proportion of flow in the gravel should be calculated as per the method in AMP 5 for Blackford Lake, which was shown to contribute 30% via downward leakage. IK expects the proportion to be less than 30%. [REDACTED] and [REDACTED] should be less significant because no lake response was observed during their signal tests.

ACTION: HFCL calculate the change in flow within the gravel due to piling. If this is significant, the proportion of [REDACTED]'s flow from overlying gravel will be calculated

7. Turbidity transport

HF "summarised HFCL technical note 30422TN8.0 Turbidity transport". She explained that analysis of site drilling logs shows the top of the structured Chalk at 14.8 m bgl on average. There is no structured Chalk within the upper 10 m. Flow velocity calculations indicate that turbidity transport cannot be sustained in the piling zone. Densification due to piling will further mitigate against this.

Where the top of the structured Chalk is shallower, more numerous, shallower piles are recommended. Furthermore, piling should be undertaken such that a downstream barrier is created (by the piles) and then work backwards.

ACTION: HFCL to produce:

- Contour plots of the surface of the structured Chalk
- isopach map of sediment thickness above top of structured Chalk

ACTION: Turbidity transport to be further discussed at meeting on 20 January

8. Planning timetable

RA is planning to submit the application by the end of January, subject to the revised PMSRA, revised DQRA and thresholds and mitigation measures. RA hopes to work with AW to address issues rather than incurring objections later in the planning process.

Planning conditions would refer to monitoring and mitigation measures in the PMSRA and DQRA.

ACTION: RA to arrange a meeting with AW (AL and Kim Harding) to discuss the planning process and timescales.

Regarding management of AW's confidential data within the planning application, it was decided that extended executive summaries of the PMSRA and DQRA will be available publicly. AW and RA will then consult on whether to issue redacted reports.

ACTION: AL to summarise what is / is not allowed in terms of publicly available information

9. Any other business

Tier Consult have been unable to access Springwell, Clubhouse and Marsh Lakes for water quality sampline due to COVID access restrictions. Access to Springwell Lake may be achievable via [REDACTED] PWS.

ACTION: AR to co-ordinate access to Springwell lake with IK