

## Project Number: 144490

### Weldale Street, Reading – Phase 2

## Technical Note – Potential Impact of installation of open loop heating pump wells on controlled waters

### Introduction

This technical note considers the potential risks associated with the installation of open loop heat pumps and the abstraction and discharge wells associated with them, at the Weldale Street site and particularly whether installation and operation could introduce additional contamination risk to the controlled water around the Weldale Street site. Below is the installation diagram of a typical open loop abstraction well taken from CIBSE industry guidance.

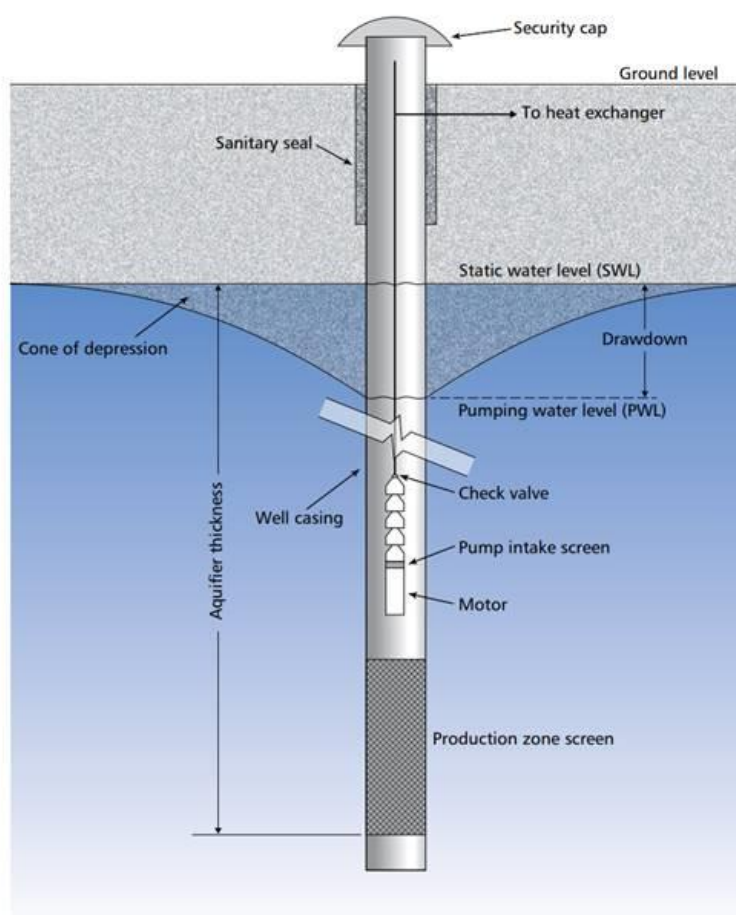


Figure 15 Example of an abstraction well (adapted from Kavanaugh and Rafferty (2014); courtesy of ASHRAE)

### Geo-environmental Assessment of the site

An investigation of the site completed in 2019 revealed a number of Geo-environmental risks to be present, all of which have been dealt with through the planning process by appropriate testing, monitoring, reporting and where necessary remediation. The risk most particular to the open loop heat pump proposal relates to the impact that the installation of the wells associated

with these systems may have on controlled waters, where the following risk was identified by investigations.

## Risk to Controlled Waters

Site testing revealed petroleum hydrocarbons in groundwater within the Chalk Principal aquifer are locally present at high concentrations. On the basis of the above and taking into account the nature of the proposed development following works were recommended (and subsequently carried out) to protect controlled waters:

### Foundation works risk assessment:

A foundations works risk assessment specifying piling methods is recommended to be completed and to be agreed with the regulator, The Environmental Agency (EA). The foundations works risk assessment will also have to include a groundwater monitoring programme with monitoring to be carried out at different (pre-, during and post) stages of the piling operation.

EA guidance's states, the main potential risks associated with constructing foundations in ground with known areas of contamination is that pathways will be created between the contaminants and sensitive receptors i.e. the groundwater and/or surface water receptors on, and / or adjacent to the site or new pathways in relation to ground gas or risks to site personnel during the piling activities associated with contaminated arising's.

As a result of investigations and the reported recommendation the development is subject to Reading Borough Council Planning Permission ref: 170326, dated 15<sup>th</sup> March 2018 and is subject to a number of planning conditions pertaining to contaminated land and groundworks piling.

*Condition 36 - Piling or any other foundation designs using penetrative methods shall not be permitted other than with the express written consent of the LPA, which may be given for the part of the site that there is no resultant unacceptable risk to groundwater. The development shall be carried out in accordance with the approved details*

A Foundation Works Risk Assessment was prepared and submitted to the Local Planning Authority to support discharge of Condition 36. This report was accepted and the condition discharged (copy attached) on the basis that non-displacement piling was used and that ground water monitoring was implemented and reviewed prior to, throughout, and after construction of the foundations.

## Conclusion:

The installation of the wells (as indicated in the detail above) would utilise a penetrative method of installation and is a 'displacement' method of penetration that may carry contaminated material into the aquifer below. The installation of these wells will penetrate contaminated ground and create potential pathways for contamination to enter the chalk aquifer below the site, as such if installed they would run the risk of the development contravening the Contaminated Land Regime under Part 2A of the Environmental Protection Act 1990. Open loop systems are regulated by the Environment Agency. They require a Groundwater Investigation Consent followed by an abstraction licence and an environmental permit to discharge water. In view of the contamination risk to potable water posed at this site it is unlikely that the EA would grant these consents.