1. **Introduction and Purpose**

The University has two borehole systems used for heating/cooling and private water supply. These activities are authorized by the Environment Agency through abstraction licenses and environmental permits:

* **Business School** - Abstraction License: NW/069/0006/003; Permit: EPR/DP3526GN; issued in October 2010.
* **Birley Campus** - Abstraction License: NW/069/0004/003; Permit: EPR/UB3936AX; issued in August/September 2013.

The licenses and permits place conditions and legal responsibilities on the University. This document outlines the University’s procedure to ensure legal compliance.

1. **Requirements of Abstraction Licence and Environmental Permit**

 ***2.1 Abstraction Licence***

**Abstraction licenses** are issued under the Environment Act 1995, the Water Act 2003 and the Water Resources (Abstraction and Impounding) Regulations 2006 (SI/2006/641). Under the license conditions, the University must ensure that the maximum abstraction thresholds in Table 1 are not exceeded.

***Table 1****: Maximum quantities of water to be abstracted*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Site** | **Purpose of abstraction** | **Instantaneous limit (l/s)** | **Hourly limit (m3)** | **Daily limit (m3)** | **Annual limit (m3)** |
| Business School | General non-potable use | NA | 6 | 20 | 7,300 |
| Ground source heat pump | NA | 63 | 1,512 | 275,940 |
| Birley | Ground source cooling | 7 | 25.5 | 604.8 | 220,752 |
| General domestic | 1.84 | 6.7 | 146.2 | 53,363 |

MMU must also ensure that meter readings are taken monthly and records must sent to the Environment Agency in April each year. Records should be kept for at least 7 years.

***2.2 Environmental Permit***

**Environmental Permits** are issued under the Environmental Permitting (England and Wales) Regulations 2016. In order to comply with the permit conditions, the University must ensure the operation of each borehole is kept within the limits specified in the table below.

***Table 2****: Environmental permit – point source emissions limits and monitoring requirements*

| **Site** | **Effluent and discharge point** | **Parameter** | **Limit/unit** | **Reference period** | **Monitoring frequency** | **Compliance statistic** |
| --- | --- | --- | --- | --- | --- | --- |
| Business School | Abstracted groundwater used in heat exchanger discharged to ground | Flow | 1,512 m3/day1 | Instantaneous (spot sample) | Daily | Maximum |
| Temp. | 5°C above/ below source water temperature, provided that temp does not exceed 20°C | Continuous  | Daily | Maximum  |
| Birley | Abstracted groundwater used in heat exchanger to ground via borehole 1 | Flow | 259.2 m3/day | Total daily volume | NA | Maximum |
| Flow | 3 l/s | Spot sample | NA | Maximum |
| Abstracted groundwater used in heat exchanger to ground via borehole 2 | Flow | 345.6 m3/day | Total daily volume | NA | Maximum |
| Flow | 4 l/s | Spot sample | NA | Maximum |
| Abstracted groundwater used in heat exchanger to ground via boreholes 1 and 2 | Temp. | 25 C | Continuous | Daily | Maximum |
| Temp. | 10 C | Continuous | Daily | Maximum change compared to abstracted water |

Any malfunction of the system likely to lead to pollution must be communicated to the Environment Agency within 24h of detection using the forms included in the license document.

1. **Actions to ensure compliance**

Water abstraction is monitored using a number of water meters and temperature sensors connected to the University’s Building Management System. This enables the monitoring of consumption and flow temp on an hourly, daily and annual basis.

Consumption data is recorded automatically on the BMS and sent to the ESB Active Energy Management System. The system is configured such that the abstraction thresholds of the license + permits are not exceeded. If abstraction exceeds the specified limits an alarm is triggered alerting the BMS manager and Environment and Energy Officer.

A record of consumption is sent annually to the Environment Agency in April in line with requirements of the Abstraction License. This is compiled by the Energy Manager in consultation with the Principle Engineer (BMS).

***3.1 Identification of non-conformance + corrective action***

Instances of non-conformance are identified by alarms on the BMS. If an alarm is detected by the BMS Manager the reasons for breaching thresholds are investigated immediately and corrective actions put in place.

If a technical fault is detected, the operation of the borehole is halted until the fault is corrected.

 Records of technical faults and corrective actions are saved in the Borehole Issues log.

1. **Roles and Responsibilities**
* Maintenance of the physical systems – Principle Engineer (Mechanical)
* Monitoring of the BMS to ensure we are within compliance thresholds – Principle Engineer (BMS) and Energy Manager
* Sending records to Environment Agency – Energy Manager
* Ensuring this procedure is kept up to date- Energy Manger
1. **Location of Records**

Records for all parameters are kept on the BMS and can be extracted as .csv files when required for reporting. Records of abstraction are also held on Active Energy will be extracted for analysis and reporting.

|  |  |
| --- | --- |
| Annual Abstraction Returns | [..\..\..\..\5. Emissions and Discharges\Borehole\Annual Abstraction Returns](file:///%5C%5Cstaff2staff.ad.mmu.ac.uk%5CShared%5CServices%5CEstates%5CEnvironment%5CA%20NEW%20FILE%20STRUCTURE%5C5.%20Emissions%20and%20Discharges%5CBorehole%5CAnnual%20Abstraction%20Returns) |
| Environmental Permits + Licence | [..\..\..\..\5. Emissions and Discharges\Borehole](file:///%5C%5Cstaff2staff.ad.mmu.ac.uk%5CShared%5CServices%5CEstates%5CEnvironment%5CA%20NEW%20FILE%20STRUCTURE%5C5.%20Emissions%20and%20Discharges%5CBorehole) |
| Borehole Issues log | [..\..\..\..\5. Emissions and Discharges\Borehole\Borehole Issues Log.xlsx](file:///%5C%5Cstaff2staff.ad.mmu.ac.uk%5CShared%5CServices%5CEstates%5CEnvironment%5CA%20NEW%20FILE%20STRUCTURE%5C5.%20Emissions%20and%20Discharges%5CBorehole%5CBorehole%20Issues%20Log.xlsx) |

**CHANGES TO THE PROCEDURE**

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| --- |
| **REASON FOR THE CHANGE** |
| **11/01/2020- update of roles and responsibilities**  |
| **08/02/2018 – removal of cost section. Not relevant to procedure**  |
| **08/03/2017- Simplified wording of procedure and updated location of records section** |
| **11/01/2019- Updated legislation following amendments. Updated Hyperlinks** |