Water Use

WAT-TEMP-68

Water Resource Monitoring Plan Template

Authorisation Number :	**CAR/L/**
Site Address :	
Prepared By:	**Name:** **Job Title:** **Contact Telephone Number:** **E-mail address:**
Date Submitted :	

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1. Introduction

This template is to be used by operators who are required to produce a monitoring plan covering an abstraction and/or impoundment licensed under the Controlled Activities Regulations. It should be read in conjunction with *WAT-SG-51: Monitoring Plan Guidance*.

For guidance on how to measure abstraction or discharge flows please refer to *Technical Guidance on Flow Measurement* on SEPA's website (*www.sepa.org.uk*).

Additional guidance is provided in *Annex 1: Example Monitoring Plan*.

NOTE: Linked references to other documents have been disabled in this web version of the document.

See the *Water >Guidance* pages of the SEPA website for Guidance and other documentation (*www.sepa.org.uk/water/regulations/guidance.aspx)*.

2. Summary of Site Controlled Activities

This section should introduce the number and location of abstraction, impoundment and, where appropriate, discharge activities on the site., Each activity given in the Summary table should be referenced to an attached site plan and should be consistent when referred to within the document. Any grouping of abstraction activities for the purposes of flow monitoring and recording should be made clear in the summary table. Each activity will be described in more detail in *section 4*.

Table 1 Abstraction Activities

Abstraction Licence Description	Location NGR XY 1234 5678	Source Type[1]	Abstraction Method[4]	Site Plan Reference

Table 2 Impoundment Activities

Impoundment Licence Description	Location NGR XY 1234 5678	Source Type[2]	Compensation Measurement Method[4]	Site Plan Reference

Table 3 Discharge Activities (Please refer to *section 6*)

Discharge Description	CAR Licence No. (if appl.)	Location NGR XY 1234 5678	Receiving Water[3]	Discharge Measurement Method	Site Plan Reference

1. W – Watercourse, GW – Borehole, S – Spring, L – Loch, R – Reservoir, T – Transitional Waters, C – Coastal Waters
2. W – Watercourse, L – Loch, R – Reservoir
3. W – Watercourse, L – Loch, T – Transitional Waters, C – Coastal Waters, S – Public Sewer
4. Method Key in Glossary Section 7.2

3. Site Water Usage

This section should give a non-technical process description of the attached site plan by explaining why the abstraction or impoundment is required and the nature of the process.

For abstractions give an overview of where the abstracted water is used in the operation and an approximate water balance, indicating proportions of abstracted water used in each process stage and volume that is returned to the water environment/to sewer/in the product or lost through evaporation.

The referenced site plan should be a schematic (A4 size) which shows the location of the abstractions and impoundments, relative to features of the water environment (wetlands, rivers, lochs, estuaries and coastal waters). The plan should also show where the water is returned to the water environment (where appropriate) and proposed existing and new monitoring locations.

4. Description of Activity

This section is to contain more details on each abstraction, impoundment and, where appropriate, discharge activity specified in the summary table in *section 2*. This shall include, where relevant, but not be limited to the following areas:

Description of abstraction and compensation flows

- Description of the abstraction or compensation release structure. Provide the dimensions of the structure and a simple diagram, in particular size of pipes, rating of pumps, etc. How is the flow abstracted and what controls the abstraction rate?
- Photographs of the activity showing the abstraction structure/impoundment
- The actual volume of abstraction/compensation release/discharge (m3/day), frequency and duration, is this process or source controlled? How does it vary during the day, week, month and year
- Is it a grouped activity or inter-dependent of other abstractions? Any water source issues?
- How has the flow been determined? If it has been measured, please explain the methodology used. If it has been estimated, please explain the basis of the estimate. Please include accuracy data where provided.

Description of existing flow measurement structure / monitoring / recording

- Describe existing flow measurement method/structure if available. Provide a simple diagram with dimensions of existing structures. If the flow measurement structures are not at the point of abstraction or release then justification must be provided that the site represents the flow actually abstracted or released. If a new flow measurement structure is proposed please provide details in *section 5*.

The method used to monitor and record flows, automatic or manual, should be described and current frequency of recording. Where continuous monitoring and recording is currently used, the specification for the equipment and its calibration should be provided as an annex.

5. Flow Measurement Proposals

Summary of flow measurement selection and installation timescales for any abstractions/impoundments/discharges identified in *section 4* that do not currently have a suitable means of measuring licence volumes in accordance with SEPA Guidance.

This section should address:

- Which activities require new flow measurements for licence compliance and the means identified for each location.
- Timescale of achieving flow measurements with justification and any interim data recording measures for annual volume returns (incl. estimated data and background calculations)
- Explanation of any activities that cannot be provided with a representative flow measurement structure or monitoring facilities, stating which options were considered and why they cannot be provided
- Any site-specific issues.

6. Notes

6.1 Discharge Details

You are only required to provide details of your discharge if:

- Your process is non-consumptive (and therefore is representative of your abstraction) and measuring the discharge is the most economical option, or
- Your process is consumptive and measuring the discharge and what is 'lost' to the process is representative of your abstraction and is the most economical option, or
- Your process is consumptive and measuring the abstraction and discharge is the most economical option for assessing what is 'lost' to the process

For further information please refer to *WAT-SG-51: Monitoring Plan Guidance*.

7. Units and Glossary

7.1 Units

The following units should be used:

Cubic metres per second	=	Cumecs or m3/s
Litres per second	=	l/s
Mega litres per day	=	Ml/d
Distance and depth	=	metres
Area	=	square metres or m2
Velocity	=	metres per second or m/s

7.2 Glossary

Abstraction/Compensation Method Key:

- Fixed Rate Pump
- Variable Rate Pump
- Gravity Pipe
- Turbine Flow
- Fixed Hydraulic Structure
- Variable Hydraulic Structure
- Natural Channel

Annex 1: Example Monitoring Plan

Monitoring Plan for Whisky Distillery	
Authorisation Number :	**CAR/L/1001234**
Site Address :	**Whisky Distillery** **Brewery Lane** **Isla** **AA1 2BB**
Prepared By:	**Name: Chris Smith** **Job Title: Production Manager** **Contact Telephone Number: 01620 453 567** **E-mail address: c.smith@isla.whisky.co.uk**
Date Submitted :	**01/01/08**

Summary of Site Controlled Activities

Table 1 Abstraction Activities

Abstraction Licence Description	Location NGR XY 1234 5678	Source Type[1]	Abstraction Method[4]	Site Plan Reference
Abstraction into lade	NN 1234 5678	W	Fixed hydraulic structure	1
Abstraction from lade (cooling water)	NN1235 5679	W	Variable rate pump	2
Borehole 1	NN 2345 1234	GW	Fixed rate pump	3
Borehole 2	NN 2345 1235	GW	Fixed rate pump	4
Spring 1	NN 2345 1236	S	Gravity pipe	5

Table 2 Impoundment Activities

Impoundment Licence Description	Location NGR XY 1234 5678	Source Type[2]	Compensation Measurement Method[4]	Site Plan Reference
Impoundment 1	NN 1234 5678	W	Fixed hydraulic structure	6

Table 3 Discharge Activities

Discharge Description	CAR Licence No. (if appl.)	Location NGR XY 1234 5678	Receiving Water[3]	Discharge Measurement Method	Site Plan Reference
Discharge into lade (Cooling Water)	CAR/L/1004567	NN 1235 5681	W	Meter	7

Site Water Usage

Attached is a site plan (Appendix 1) showing the locations of the abstractions, impoundment and cooling water discharge. Also attached are a series of photographs (Figures 1 to 4) in Appendix 2 showing the intakes and impoundments.

Water is diverted by a weir and intake channel (Figure 1) into a lade which runs parallel to the river for approximately half a mile before returning to the same river.

About 90% of the water used is for cooling. Cooling water is pumped using a variable rate pump from a widened section of the lade into the condenser pumps. Figure 2 shows the intake point. It is used for cooling distillate and also for pressure testing the stills. Approximately 97% of the abstracted water is returned back into the lade just downstream of the abstraction point. Around 3% is used for pressure testing.

The process water, accounting for about 10% of the total, is primarily derived from a spring that has a gravity pipe feeding a holding tank (Figure 3). The holding tank has an overflow that discharges into the lade. When the spring does not have the required flow to maintain the holding tank at the desired level, boreholes 1 and 2 (Figure 4) can be used to pump water via a fixed rate pump into the holding tank.

Once the water has been used within the process a small proportion is discharged to the foul sewer under consent from Scottish Water.

Description of Activity

Impoundment 1

The impoundment associated with the abstraction into the lade crosses the river and has a height of 1.2m. Following discussion with the local fishery association is not thought to represent a barrier to fish movement. Sediment is removed periodically, about every 5 years, from behind the structure.

Abstraction into lade

There is an intake at the impoundment directing water into the lade which runs as an open channel throughout its length. The flow figure provided for the transfer application was very rough, largely based on a visual inspection.

Abstraction from lade (cooling water)

The cooling water intake is operational whenever the stills are in use, with no abstraction on Saturdays or Sundays. The water is abstracted using variable rate pumps and returned to the lade via an existing magnetic flow meter which has an accuracy of at least +/- 2%. The meter is calibrated regularly as recommended by the manufacturer. This indicates the volumes of water used in the cooling process. Water abstracted from this source is also used to for pressure testing. During the transfer an estimate was made of the number of pressure tests and this was multiplied by the volume of each still.

Boreholes 1 and 2

These are only operational when the flow from the spring is not sufficient. The abstraction uses fixed rate pumps (18l/sec). The values applied for

during the transfer was based on 4 hours of operation per weekday for 4 weeks.

Spring 1

This spring feeds a 6" pipe which is source controlled, the abstraction taking place when there is sufficient flow at the spring. The maximum capacity of the pipe was calculated for the transfer application with no estimation of the volume of water discharged through the overflow.

Flow Measurement Proposals

Abstraction into lade

It is proposed that the flow into the lade will be measured by determining the profile of a straight section of the channel approximately 10m downstream of the intake. The length immediately below the intake is too variable in depth and width. The velocity will then be measured under different flow conditions (measurements being made in February, June, September and November) using an orange and stop clock. Each measurement will be the average from 8 readings taken on the same day.

Abstraction from lade (cooling water)

A record will be kept of the volume of water used in each still for pressure testing and added to the volume recorded by the discharge meter. This will give a total volume of water abstracted which will be recorded daily.

Boreholes 1 and 2

When operational, a record will be kept of the hours run per and a daily total calculated by multiplying the hours by the pump capacity (18l/sec).

Spring 1

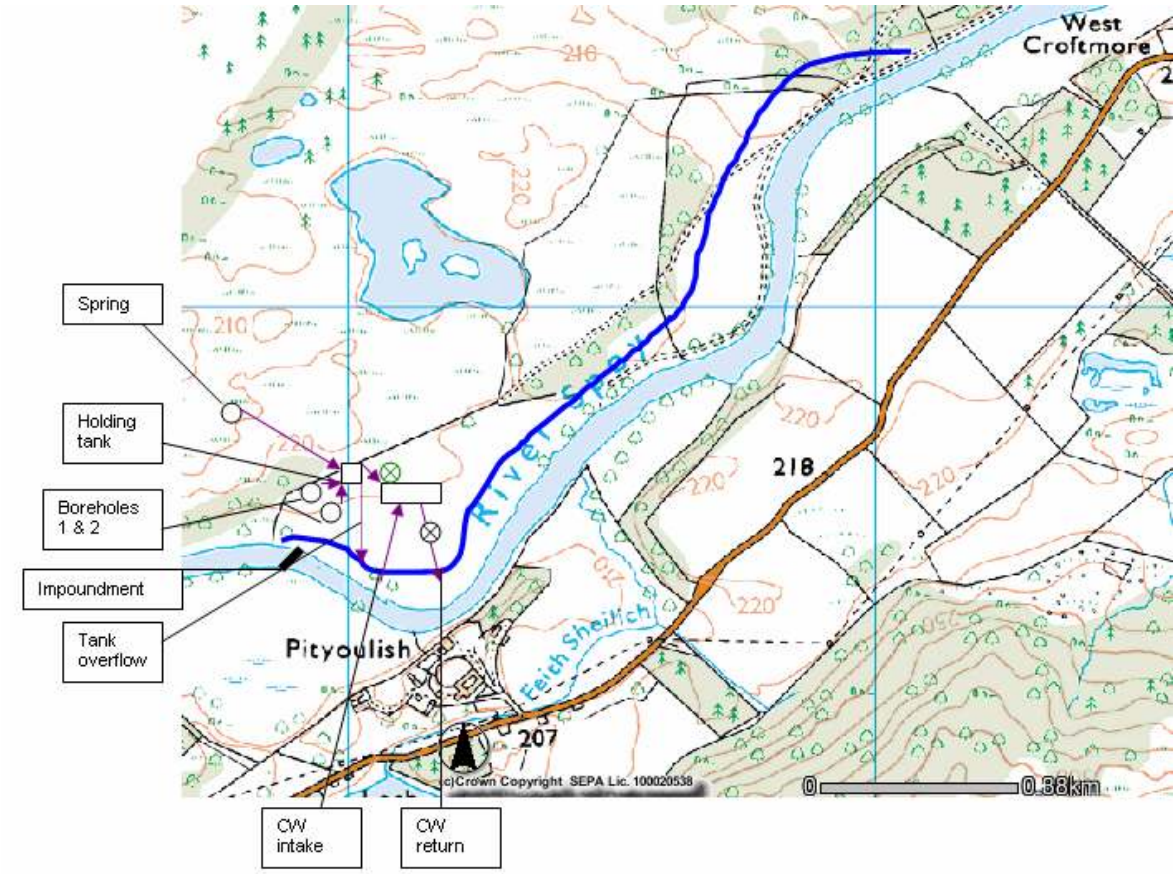
A magnetic flow meter will be installed on the pipe leading from the holding tank to the distillery. The volume abstracted from the spring will be the value recorded on the meter and minus any volume recorded from Boreholes 1 and 2. This does not take account of the overflow water from the holding tank.

- The overflow discharges into the lade which is in the same catchment as the spring would naturally feed into, with the return point being about 0.75km from the site of the spring. An estimate of the overflow can be obtained by subtracting the meter reading from the maximum capacity of the gravity fed pipe leading from the spring to the holding tank. There will be no overflow when Boreholes 1 and 2 are operational.

Appendix 1

⊗ Existing meter ⊗ Proposed meter

Figure 1



Appendix 2

Photos or diagrams – this is not essential information but helps with understanding the site.