

## 1.1 Description of the Proposals

November 2022

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# 1. BACKGROUND

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## 1.1 Executive Summary

South West Water is applying for a drought permit under section 79A of the Water Resources Act 1991 ("**WRA 1991**") for a temporary permit to abstract water from Hawk's Tor Pit for the purposes of replenishing the storage levels at Colliford Reservoir.

The actions set out in this permit will offer support across the entire Colliford Water Resource Zone ("**WRZ**") in response to the Exceptional Shortage of Rainfall ("**ESOR**") from November 2021 to the end of October 2022, which presents an anticipated risk to the security of supply from December 2022 through to the end of September 2023.

This permit is applying to:

1. Abstract a volume of 8Ml/d starting from the licence being granted until 30 April 2023 to offer greater flexibility to either
  - a. pump the water abstracted from Hawk's Tor Pit directly to Colliford Lake via existing raw water mains: and/or
  - b. pump the water abstracted from Hawk's Tor Pit to the De Lank Water Treatment Works via existing raw water mains.

In accordance with paragraph 1.3.5 of the Drought Permit Guidance, South West Water is applying for this drought permit to reduce the risk of drought permits or orders being required in Spring/Summer 2023, to assist the recovery of water supply resources which have been excessively depleted because of exceptional shortage of rainfall.

South West Water is applying for a drought permit to abstract at Hawk's Tor Pit. This permit application is part of a suite of interventions currently in progress to reduce the risk of future drought actions by supporting the winter refill of Colliford Reservoir from winter 2022 into 2023.

Table 1 – Colliford WRZ Interventions

Colliford WRZ – Drought Permit Interventions		
Location	Intervention Required	Drought Permit Status
Restormel	Increase in Annual abstraction licence	Submitted 13 October 22 and approved 31 October 22
Stannon Lake	Increase of existing daily abstraction	Submitted 27 October 22
Porth/Rialton	Recommissioning a disused source	To be submitted November 2022
Park Lake	Increase of existing daily abstraction	Submitted 02 November 2022
Hawks Tor	New abstraction	To be submitted November 2022

In addition to the suite of Colliford WRZ interventions outlined above, we are reviewing opportunity for further mitigation options outlined within our Drought Plan.

## 1.2 Background

South West Water's Drought Management Plan ("**the Drought Plan**"), which has been approved by Defra, sets out the actions and interventions which will be used to reduce the demand for water and options to increase access to water during times of drought.

The Drought Plan details the actions expected to be taken at various "Drought Levels" based upon benefit, confidence, and the need to support the environment (e.g., watercourses, waterbodies, and ecology). Our approach has meant that up until 2022, we have avoided the need to impose demand restrictions for 25 years.

This permit application is required due to exceptionally below average rainfall between November 2021 and the end of October 2022. The amount of rain that has fallen in the Colliford WRZ within this period is the 5th lowest since 1891.

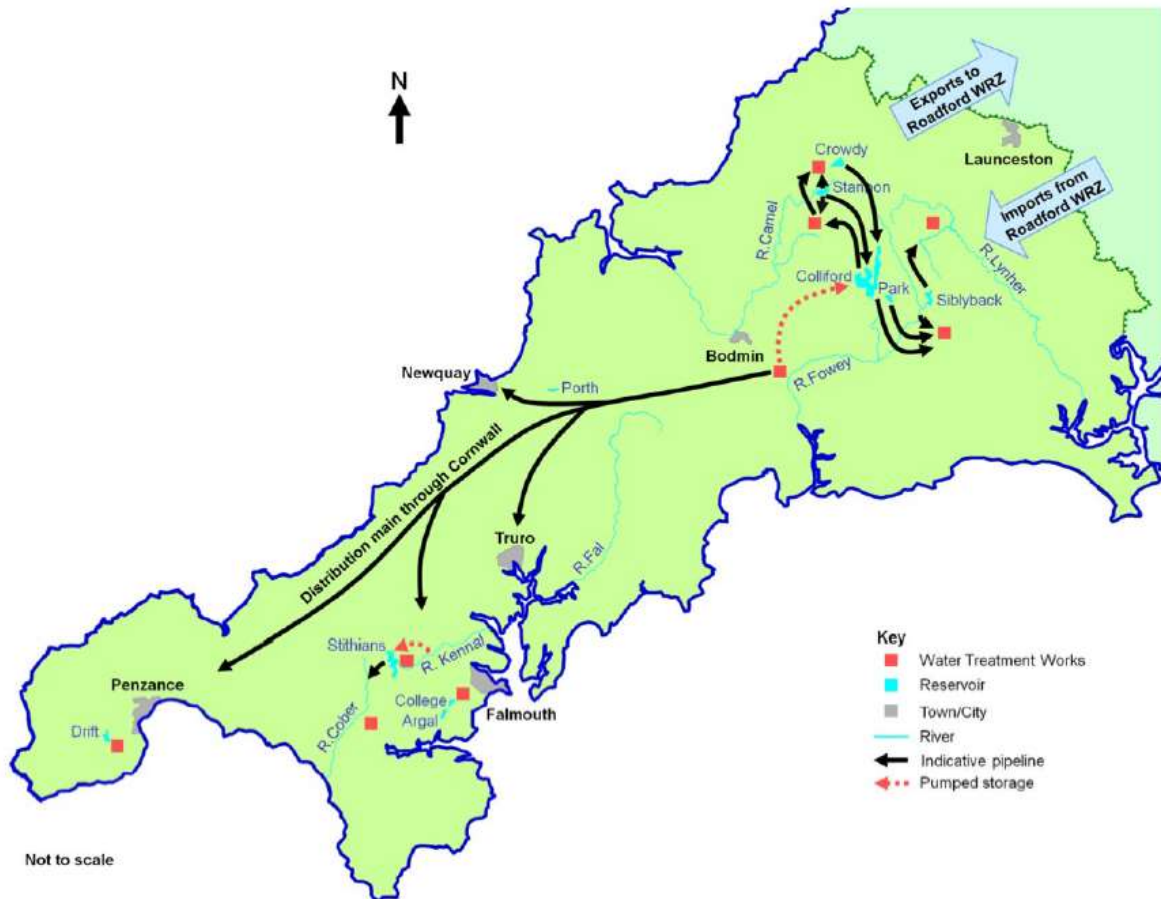
The consequence of this period of ESOR has been a significant reduction in the natural recharge rate and higher than normal environmental releases from Colliford Reservoir during 2022. This means we are currently projecting a risk to supply in December 2022 and through to the end of summer 2023, as recovery to acceptable storage levels by 1 April 2023 will not be possible without intervention.

By way of explanation and without intervention, even if we were to receive 100% long term average ("**LTA**") winter rainfall, the Colliford Reservoir water level would only recover to around 35% full by 1 April 2023. 80% LTA winter rainfall would provide recovery to around 25% and under a 60% LTA winter rainfall would provide recovery to only around 15%. Recent modelling has highlighted that under extreme autumnal conditions, deploying low rainfall forecasts for the next three weeks and then applying 59% rainfall (driest historic), Colliford reservoir could cross drought Level 4 in early 2023. This represents our worst-case scenario.

The Colliford WRZ serves a population of c.567,000 people or c.276,000 domestic and commercial properties.

The strategic Colliford Reservoir, in conjunction with abstraction at Restormel WTW, is responsible for supplying c.65% of the total population of Cornwall via transfer along the Cornwall Spine Main to large parts of Mid and West Cornwall. In periods of high demand, the supply area can be further increased to provide support to smaller WTWs. As such the Restormel WTW and Colliford Reservoirs act as the central regulators of the Colliford WRZ.

Figure 1 - Map showing the Colliford WRZ



Critical to the recharge of Colliford Reservoir is the Restormel abstraction point which is used as a pumped winter recharge option for Colliford Reservoir, with any volume for this activity included within the daily and annual limits proscribed by the licence at Restormel.

A separate drought permit application to increase abstraction from Restormel was submitted on 13 October 2022, a drought permit application to increase abstraction from Stannon Lake was submitted 27 October 2022 and a drought permit application to increase abstraction at Park Lake was submitted 2 November 2022. A drought permit for Porth/Rialton abstraction is planned for November 2022.

Routine operational levers to reduce demand on Restormel WTW are dependent on a combination of available raw water resource and production headroom at supporting reservoirs and WTW's (Stithians, Wendron, Drift and De Lank). During 2022, all impounded raw water reservoirs in the Colliford WRZ have experienced significantly reduced levels due to the exceptional shortage of rainfall across the region, a combination of reduced in-year refill

and higher than base year demand. As such it has been necessary to draw down Colliford Reservoir by abstracting more at Restormel WTW to support supply to the region.

Colliford Reservoir is a multi-season reservoir, it is designed to provide resources for more than one summer. Whilst the reservoir is resilient to a normal dry summer, the drier than average winter, spring, and summer from November 2021 throughout 2022 has resulted in significant draw down of resources. Whilst the reservoir is large (28,540 MI) and is in an area with normally high annual rainfall (Bodmin Moor), it has a small catchment area of only 12.4 km<sup>2</sup>.

The Colliford Reservoir is the largest and most significant store of raw water resources in Cornwall and is fundamental to the operation of the system of reservoirs and pipes which keep our customers supplied.

In July 2022 the Colliford Reservoir crossed Drought Level 1. Using rainfall, storage and demand forecast we notified our customers on the 15 August that a temporary use ban ("TUB") was required for Colliford WRZ, as we had forecasted that the Drought Level 2 stage noted in our Drought Plan would be reached. This notification was published ahead of reaching Drought Level 2 to ensure we were doing everything we could to protect the environment. Our notice came into effect on 00:01 on 23 August 2022.

This application, at Hawk's Tor Pit, provides further support for the recharge of Colliford Reservoir. This is a new source which has previously supported Colliford Reservoir under historical drought conditions. Whilst it has required the installation of new pumps at Hawk's Tor Pit, existing raw water infrastructure between Colliford Reservoir and DeLank WTW can be utilised. This application supports the direct winter recharge of Colliford reservoir.

Within the Drought Plan, Hawk's Tor Pit is classified as a 'more before 4' site (A200 Ref CS6/E) for extreme supply-side drought actions. However, post consultation of the Drought plan South West Water purchased Hawk's Tor Pit (March 2022). South West Water had previously used the water from Hawk's Tor Pit through two historic temporary abstraction licences (1995 and 1996), South West Water is reasonably seeking to utilise Hawk's Tor's Pit available water resource ahead of further 'more before 4' actions.

### **Environmental Monitoring Approach for Hawk's Tor Pit**

South West Water has commissioned an Environmental Assessment Report (EAR) for Hawk's Tor Pit. This EAR is due to be completed in late November 2022, however with escalating drought conditions, we have taken the approach to request a permit for Hawk's Tor Pit supported by a desktop Environmental Impact Review of existing literature; 1995 and 1996 drought orders, environmental information already held for Hawk's Tor Pit, and an extensive desktop survey which reviewed 2007 impacts in line with up-to-date regulations, to outline our preliminary monitoring and mitigation plan.

While this situation is unprecedented, South West Water fully acknowledges the requirement to have an updated EAR and to demonstrate our ongoing commitment to an appropriate environmental monitoring and mitigation plan. Therefore, we have suggested specific conditions for the timely update of our monitoring and mitigation plan for Hawk's Tor Pit, in line with the updated EAR no later than 31<sup>st</sup> December 2022.

The Hawk's Tor Pit documents we have utilised to outline our monitoring and mitigation plan are:

- 2007 Environmental Monitoring Plan (“**APEM**”)
- Records from previous draw down in 1995
- 2019 Report & Valuation (“**FennWright**”)
- Internal information from Hydrology and Fisheries & Biodiversity teams
- Open-Source Environment Agency Data

## The drought permit application documents

This document is part of a suite of documents which form the application for the drought permit as set out in Table 1.

The structure and contents of the documents follows the requirements set out in **Appendix E** of the EA guidance on drought permits and drought orders (“**The Drought Permit Guidance**”), which was issued in 2019 and revised in 2021, with some adjustments to the sequence of documents / sections.

**Table 1: Document structure for drought permit application**

Documents: Drought Permit Proposals		
<b>1</b>	1.1 1.2 1.3 1.4 Appendix 1	Description of Proposals Draft Permit Drinking Water Services Report 2022 – Operations Supporting Evidence Water Quality Information National Security Notice
<b>2</b>	2.1 2.2	Statement of Reasons Case for Exceptional Shortage of Rain (ESoR)
<b>3</b>	3	Hawk's Tor Drought Permit Environmental Impact Review
<b>4</b>	4 Appendix 1 Appendix 2	Evidence the Company has followed its Drought Plan Enhanced Media Campaign Leakage and pressure management
<b>5</b>	5	Actions taken to reduce demand and conserve supplies in line with Drought Plan
<b>6</b>	6 Appendix 1 Appendix 2	Consultation Process Formal Notice Email and letter to Stakeholders

### 1.3 Objectives of this document

This document provides a description of the proposed drought permit as required in the Drought Permit Guidance.

A draft drought permit is included at **Document 1.2 Draft Permit**.

### 1.4 Drought Permit Guidance

This set of drought permit application documents have been prepared with reference to the Drought Permit Guidance.

### 1.5 Application checklist for accompanying information

The Drought Permit application form includes a checklist of accompanying information. The items on the checklist are to be found in the set of documents as set out in Table 2.

**Table 2 Application Checklist**

	Checklist requirement	Application document reference	Section Number (where relevant)
1	A description of the proposals	Document 1.1	
2	A draft drought permit	Document 1.2	
3	A statement of reasons	Document 2.1	
4	A location map	Document 1.1	
5	Navigation authority permission	N/A	
6	Notices to local councils	Document 6	
7	Notices to protected persons	Document 6	
8	Notices to other water companies	N/A	
9	Notices to navigation authorities	N/A	
10	Notices on internal drainage boards	N/A	
11	Advertisement in local newspapers	Document 6	
12	Advertisement in London Gazette	Document 6	
13	Description of arrangements for public inspection	Document 6	
14	Statutory instrument or local Act of Parliament	N/A	



## Hawk's Tor Pit Drought Permit Application 2022

<b>15</b>	Water Shortage Strategy	Document 4	
<b>16</b>	Environmental Assessment Report	Document 3	
<b>17</b>	Consultation comments received	Document 6	
<b>18</b>	Objections received and details of agreements with objectors	Document 6	

## 2. DESCRIPTION OF THE PROPOSALS

### 2.1 Overview of catchments

Colliford Reservoir is a regionally important source of raw water supply in South West Water's Colliford WRZ in the South West of England.

South West Water currently abstracts water from the River Fowey at Restormel WTW. Abstraction at Restormel WTW is part of a winter pumped storage scheme, supporting natural refill and inflow, whereby water is stored in Colliford and Siblyback Reservoirs, which can then be released to the River Fowey to support abstraction at Restormel WTW. This release is made via the St Neot River in the case of Colliford Reservoir.

The amount of water available to abstract for pumped storage is controlled under permit -by both the river flow and the amount of water needed at Restormel WTW for public water supply. Therefore, operationally this is only undertaken when river flows are sufficiently high enough to support winter refill without the need for releases necessary to support abstraction into supply.

The Water Environment Regulations Directive ("**WER**") river water body of relevance to Hawk's Tor Pit is the Warleggan River (also known as the River Bedadler) (GB108048007630). Hawk's Tor Pit is not defined as WFD lake waterbody but is within the Warleggan River catchment

Colliford Reservoir is a (heavily modified) WFD lake water body (GB30846225) with the St Neot River catchment (GB108048007640), which discharges into the Fowey (Warleggan to St Neot) Water Body (GB108048001410) and ultimately the Lower River Fowey (GB108048001420).

#### Hawk's Tor Pit

Hawk's Tor Pit was a disused China clay pit located at National Grid Reference [NGR] SX 151 745 on Bodmin Moor in Cornwall, just northeast of Colliford Reservoir (SX 15032 74637) within the headwaters of the Warleggan River.

Hawk's Tor Pit is ideally geographically placed, either to enable pumped storage to Colliford Reservoir (most likely during the winter months) or to provide raw water directly to St Cleer, De Lank and/or Lowermoor Water Treatment Works (WTWs) (most likely during the summer months). It thus offers great flexibility as a raw water resource.

Hawk's Tor Pit is a large open area of water with a surface area of 12.3 hectares and a top water level of 220.5 metres Above Ordnance Datum (AOD). Estimated volume is c.1,526,587 cubic metres (Randall Surveys LLP, 2022 preliminary report) and maximum recorded depth at c. 32 metres (Fenn Wright, 2019: Appendix 3), being relatively shallow at the southern end with the deepest area at the northern end.

Figure 2 – Map of Hawk's Tor Pit within Colliford WRZ



**Flow and Water Quality**

Hawk's Tor Pit is now predominantly surface water fed since the naturalisation of the Warleggan River in c.2009 which enters the pit in the North and flows out at the South.

The defined reach downstream for monitoring programmes under the previous Drought Orders of 1995/6 was a distance of 8.6km, identified as either three-times the catchment area or four-times the natural Q95 flow (EMP, 2007: pg11). Environment Agency data 1969-1997 from the Trengoffe flow metering station, approximately 6km south of Hawk's Tor Pit outlet, indicated Q95 flow averages at 0.195 m<sup>3</sup>/s (see Table 3 below extracted from the EMP, 2007: pg18).

Table 3: Flow statistics (m<sup>3</sup>) for the Warleggan River (based on EA data from 1969 to 1997)

Station Name	NGR	Catchment Area (km <sup>2</sup> )	Q95	Q90	Gauged ADF	Q10	Q5
Trengoffe	SX 1593 6737	25.3	0.195	0.235	0.855	1.803	2.271

Source: EMP, 2007: pg18

Overall, the Warleggan River is c.12.92 km long (catchment area 29.014 km<sup>2</sup>) of which only c.1.3 km is upstream of the pit forming a small area of wetlands and downstream eventually becomes a tributary of the River Fowey. The most recent WFD classification data for the Warleggan River waterbody is the 2019 cycle 3 data. The waterbody is classed at Moderate ecological status, with fish the only failing chemical element (Moderate). All other ecological elements achieve good status or better (Source - Warleggan River | Catchment Data Explorer | Catchment Data Explorer). The fish classification of moderate is however linked to natural causes, natural barriers to fish migration in the catchment. As the failure is a result of a natural issue, a less stringent objective of moderate status has been set for the fish element and overall ecological status, the waterbody is therefore currently meeting its ecological objectives.

### ***Designations***

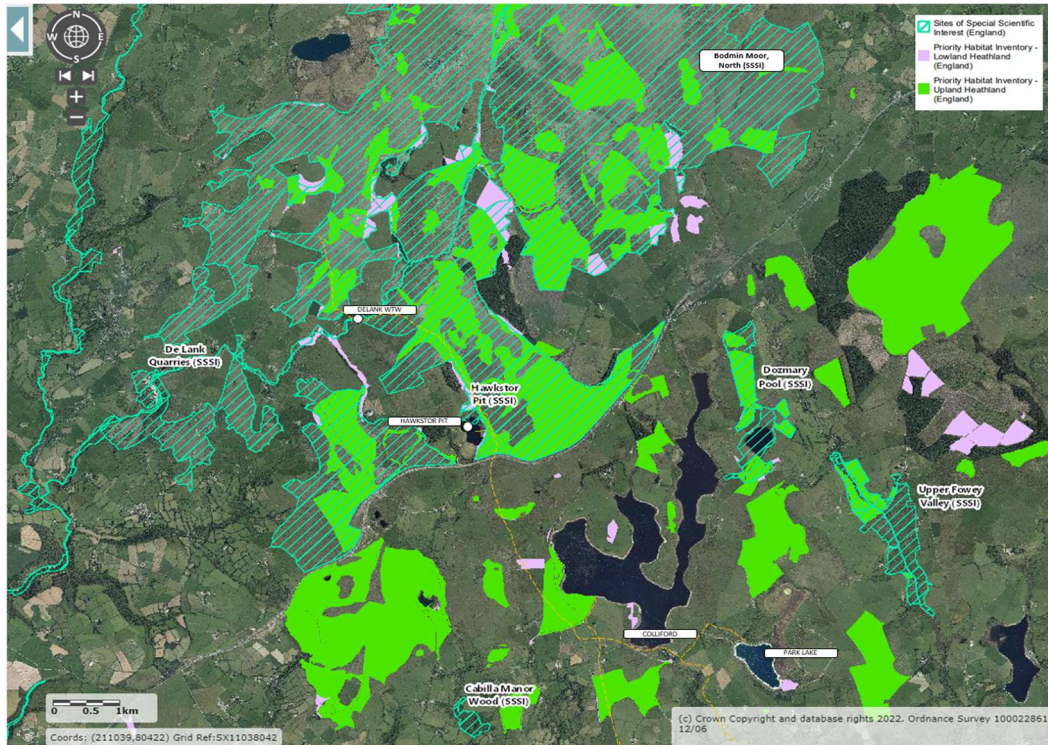
Hawk's Tor Pit is located within a designated Area of Outstanding Natural Beauty (AONB). Part of the Pit, the northern end including some of the area currently flooded, is designated a geological (palynological) Site of Special Scientific Interest (SSSI) (SW 150749, 5.94 ha) and is reported as being in a favourable condition with no condition threats (Natural England, 2022). Furthermore, during valuation of the site no adverse ground or soil conditions were reported (Fenn Wright Valuation Report, 2019; pg.16).

Away from the northern and eastern boundary of Hawk's Tor Pit is the western boundary of Bodmin Moor North SSSI (SX 157 755, 487.55 ha), a biological designation for upland heath dominated by acid grasslands, shrub, and bog wetlands to the north of the site. It was reported as being in an unfavourable recovering condition in 2015, due to historic overgrazing, which is now controlled, so the existing condition threat risk is considered low.

The SSSIs are not considered to be hydraulically linked to Hawk's Tor Pit or sensitive to any draw down of the water level in the pit (EMP, 2007: pg.6). The fluvial interface between the pit discharge (within the Warleggan River) and Hawk's Tor Pit SSSI extends for only c. 240m downstream, before being hydrologically isolated by the A30 truck road. Consequently, no adverse effects on hydrogeology are anticipated.

Within the wider catchment Cabilla Manor Wood SSSI is bisected by the Warleggan River. This SSSI is located c.5.2km downstream and is designated for its coppiced, ancient Sessile Oak (*Quercus petraea*) woodland habitat and fern assemblage. The river within the woodland is described as structurally diverse with boulders, riffles, pools, and overhanging banks, and is a breeding site for Large Red Damselfly (*Pyrrosoma nymphula*) and Broad-bodied Chaser (*Libellula depressa*). Neither odonata species are considered as threatened. Otter (*Lutra lutra*) spraint has also been reported on the riverbanks. Both units of the SSSI are reported to be in favourable condition (NE, 2015) and given the conservation features covered by the designation and distance downstream, this SSSI would not be adversely affected by the implementation of the proposed drought permit.

**Figure 3:** Map of SSSI designations and priority habitats surrounding Hawk's Tor Pit.



Source: Magic Map 28th October 2022

### Species

Fish species present in the River Fowey covered under the EC Habitats Directive (95/43/EEC) include:

- Atlantic salmon (*Salmo salar*).
- Bullhead (*Cottus gobio*).
- Brook lamprey (*Lampetra planeri*);
- Sea lamprey (*Petromyzon marinus*).

Of these fish species, only salmon and bullhead have been recorded in the Warleggan River. Salmon are recorded throughout the river, while the bullhead is only found in the lowermost reaches (EMP, 2007: pg.7) and past records indicate the most consistently performing reaches for salmon are located downstream of Carne Wood (pg.28).

The river habitat is conducive to support eels (*Anguilla anguilla*) which in the past have been recorded throughout the Warleggan, yet abundance levels were low (EMP, 2007: pg.28).

Within the wider catchment, wetland species are recorded including the otter (*Lutra lutra*), dipper (*Cinclus cinclus*), kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), merlin (*Falco columbarius*), hen harrier (*Circus cyaneus*), golden plover (*Pluvialis apricaria*) and grey heron (*Ardea cinerea*) (EMP, 2007: pg.5; pg.7). All are listed in the Habitats Directive, therefore would require protection and conservation assistance through EC legislation if found present in any further assessment of Hawk's Tor Pit.

Consultation with Natural England (NE) on 01/11/2022 outlined the proposal and NE was appropriately reassured that neither Hawk's Tor Pit SSSI or Bodmin Moor North SSSI are likely to adversely affected by the proposed drought permit abstraction (Document 6 consultation document)

**Historical Drought Orders**

The former South West Water Authority held a temporary Licence to Abstract Water relating to Hawk's Tor Pit from 16 June 1977 to 28 February 1986 (pre Colliford Reservoir construction). The license authorised an abstraction from the Pit of up to 10,000 cubic metres per day (2.2 Mg/d) or one million cubic metres per year (220 Mg/year). The water taken was used to support De Lank and/or Lowermoor Water Treatment Works (WTW) at times of low river flows and/or major depletion of storage in Crowdy Reservoir.

This former operation was brought back into use on 20 September 1995, using existing mains, when a Drought Order (DO) was made (Statutory Instrument 1995 Number 2477) authorising a temporary abstraction of up to 10,000 cubic metres per day (2.2 Mg/d) from the Pit. Thereby providing additional raw water to support De Lank and/or Lowermoor WTWs and helping to conserve raw water storage in Colliford Lake. In 1996, a second DO granted a new temporary abstraction link to Colliford Reservoir.

**Table 4:** Overall performance of the pit in response to the abstraction regime under DO I & II.

	DO I	DO II (phase 1)	DO II (phase 2)
Abstraction Period	03/10/95 - 19/12/95	23/02/96 - 10/06/96	23/07/96 - 16/08/96
No of Pumping Days	78	109	25
Licensed Abstraction Rate (MI/d)	10	20	20
Average Abstraction Rate (MI/d)	4.31	11.92	6.59
Maximum Abstraction Rate (MI/d)	7.98	16.83	14.96
Maximum Draw-down (m)	1.91m	11.55m (12m cut-off)	11.78m (12m cut-off)
Total Transferred Volume (MI)	335	1400	
Cessation & Recovery date	06/02/96	23/07/96	24/07/97
Cessation & Recovery depth (m)	+ 1.91m*	+ 1.31m	+ 11.78m*
* to Top Water Level (TWL)			

(EMP, 2007: pg.16)

The operational phases of both historical DO extended for 319 days in total (212 of which were pumped), resulting in a total abstraction of c.1,800 MI and a maximum drawdown of 11.78m, i.e., to the 12 m cut-off depth. Following the final cessation of operation, the pit took 465 days to recharge naturally to TWL (EMP, 2007: pg.16).

An important condition on both DOs for 1995 and 1996 was the need for SWW to collect and collate the agreed data and provide this in reports at the end of each drought order. A final

report in 1998 summarised events between 1995-1997 and notably concluded that operational procedures had *no significant impact* on:

- (i) water quality in the Warleggan River
- (ii) groundwater levels in the wetlands to the north of the pit
- (iii) river flows in the Warleggan River

Also, that the slow response of the pit during the recovery phase demonstrated that Hawk's Tor [Pit](#) was isolated and extensively reliant on rainfall to facilitate recharge and maintain water levels. It concluded the DOs were managed effectively to reduce risks and ensure no significant impact to the environment (EMP, 2007: pg.9).

Given the above, it has been identified post SWW purchasing the site, that the Warleggan River flows are now entering the pit at the northern end of the site in two channels (SX 15106 74864 and SX 15086 74889), along with a smaller flow on the south-east side (SX 15222 74485).

Consequently, the Warleggan River channel to the east of Hawk's Tor Pit is largely dry. Flow estimates of these inflows closely match the outlet flows (SX 15127 74363). Natural England (NE) has confirmed that the current alignment occurred due to natural processes (following a bank collapse after heavy snow and flooding) in 2009/10. Given the current alignment was the original route of the watercourse (pre-1898) NE and EA decided not to interfere with the natural process of the river, so the reinstatement of the 'man-made' channel was not permitted.

### ***Risks & Impacts (as currently known)***

In our last available environmental assessment (2007: pg.43) it was anticipated that the hydrological influence of a Hawk's Tor Pit DO proposal would be marginal flow decreases in the Warleggan River (to Pantersbridge approximately 6km downstream). However, this assessment did not take into consideration the current route of the Warleggan River and hence the potential significance of the current pit discharge on the Warleggan River flows immediately downstream.

The key potential impacts associated with reduced flows from Hawk's Tor Pit could include changes to:

- Fish populations: reduction of available habitat, drying of gravels and marginal spawning grounds, impact to the free migratory movement of fish within the catchment
- Aquatic ecology and habitats: changes to invertebrates, macrophytes and diatoms in terms of diversity, abundance, associated with changes in water level, flows, sediment transportation/settlement and wetted width.
- Water quality: critical thresholds for water temperature, dissolved oxygen and ammonia, reduced discharge dilution capacity.

Our best available information indicates there are no authorized abstraction licences greater than 20m<sup>3</sup>/d on the Warleggan River, within the defined reach of 8.6km and only one consented discharge of treated effluent for a small community (Mount village, resident

population equivalent 127) which discharges to a tributary of the Warleggan River near Pantersbridge (EMP, 2007: pg.38).

## 2.2 Abstraction from Hawk's Tor

There is no current abstraction licence for Hawk's Tor Pit. There is also currently no permitted compensation flow rate, to the Warleggan River, from Hawk's Tor Pit.

## 2.3 The intended drought permit

### 2.3.1 Context

The water levels in Colliford Reservoir are at the lowest recorded since impoundment in the mid-1980's: 14.9% as at 08:00 on 28 October 2022. The exceptionally dry weather from November 2021 to date resulted in reduced 2021/22 winter recharge and increased draw-down of the reservoir storage throughout spring/summer 2022 with minimal natural recharge.

The forecast for a dry autumn/winter in 2022 combined with the current reservoir low level, represent a risk to public water supply in Winter 2022 and into 2023. Given the ESOR seen throughout 2022, even if we were to experience the same conditions as seen in the wettest winter on record, we would only achieve a net gain in storage between November and April of 43%, Colliford Reservoir is presently (as of 28 October 2022) at 14.9%. Target operating level at Colliford Reservoir on 1 April 2023 is 80%.

This permit application would provide up to an additional c.4.7% of net capacity in Colliford Reservoir by 1 April 2023. Whilst this application does not allow us to achieve our target storage, it is part of a basket of measures to support winter recharge, and we are simultaneously progressing additional supply and demand side activities for 2023, as well as further Drought Actions outlined within the Drought Plan.

South West Water previously held a temporary licence to abstract 10 MI/d from Hawk's Tor Pit between 16 June 1977 and 28 February 1986. SWW has previously been granted two drought orders in 1995 and 1996 for Hawk's Tor Pit, which permitted South West Water to temporarily abstract up to 10 MI/d and 20 MI/d respectively.

The proposed application would not require any additional shoreside pipeline infrastructure to Colliford Reservoir or De Lank WTW.

We have installed two electrically driven submersible pumps, horizontally mounted on a floating pontoon at SX1499974589, have been installed to operate as duty/assist. These are connected to a temporary outstation with full Supervisory Control and Data Acquisition (SCADA) telemetry for ongoing monitoring of pump operation, abstraction rates and Pit water level.

### 2.3.2 Start and end dates



South West Water would like the permit to commence abstraction to commence as early in November 2022 as possible and understand the start date is the date of determination by the Environment Agency.

The proposed end date would be 30 April 2023, or a date mutually agreed with the EA. This is suggested to be when Colliford Reservoir has returned to 80% (maintained for at least 5 days) or 30 April 2023, whichever is the sooner.

### 2.3.3 Proposed drought permit

The proposed drought permit will involve the following provision of a new abstraction licence:

- Abstract a volume of 8Ml/d starting from the licence being granted until 30 April 2023 to give us flexibility to either:
  - a. pump the water abstracted from Hawk's Tor Pit directly to Colliford Lake via existing raw water mains and/or
  - b. pump the water abstracted from Hawk's Tor Pit to the De Lank Water Treatment Works, via existing raw water mains.

The following safeguards are also proposed:

- Provision of compensation flow to the Warleggan River at the outlet channel from Hawk's Tor Pit.
- Provision of a hand-off flow level at 12.5m from TWL to preserve bank stability.
- Provision to visually inspect Hawk's Tor Pit bankside stability during draw-down.
- Provision to publish an Environmental Assessment Report and revised Monitoring Plan by 31<sup>st</sup> December 2022.

## 2.4 Further conditions of the permit

South West Water's monitoring and mitigation plan for the proposed permit is included with the Environmental Impact Review (**Document 3 Hawk's Tor Pit Drought Permit Environmental Impact Review**). This has been undertaken from a desktop study of existing information and an Environmental Assessment Report has been commissioned and is ongoing. South West Water has committed to publishing the Environmental Assessment Report by 31<sup>st</sup> December 2022.

South West Water anticipates that further to this application, discussions with the Environment Agency will be held to review the need for further conditions attached to this permit.

### 2.5 Summary of impacts

The main impact associated with this drought permit application is to lower the level of Hawk's Tor Pit which would, without mitigation, impact the flow in the Warleggan River below the Pit.

This drought permit is likely to have a moderate impact to fish life in upper reaches of Warleggan River as far as Black Tor Downs tributary. Whilst this can be mitigated through the provision of compensation releases from Hawk's Tor Pit.

The effect of the drought permit is predicted to be negligible or minor on all other receptors in comparison with the baseline, including any designated conservation sites.

Whilst we have not highlighted an invasive species risk through our Environmental Impact Review we shall manage this potential through installation of screens as described below.

### 2.6 Monitoring and Mitigation

An Environmental Monitoring Plan (EMP) has been developed as part of the application process based upon our Environmental Impact Review and assessment:

We shall undertake the following **monitoring** steps:

- i. In-flow and out-flow volumes measured fortnightly at manual gauging stations.
- ii. Flow upstream of the Warleggan River north of the A30 (new temple bridge) by fortnightly manual gauging
- iii. Piezometers to be installed to the south and east perimeters of the Pit with a weekly review of data.
- iv. Continuous levels of Hawk's Tor Pit measured from pump pontoon and recorded via telemetry.
- v. Continuous compensation flow readings to Warleggan River; reported weekly for the daily average.
- vi. Daily abstraction volume via installed meter on the pump pontoon collated as daily a total and reported weekly.
- vii. In-situ spot water quality monitoring at two locations of Warleggan River; downstream of Hawk's Tor outflow (SX1514374312) and at Cabilla Wood/Warleggan River road bridge (SX1478968927)
- viii. Walkover survey of lake for fish in distress weekly, specifically to target times of downstream migration and should pooling occur in the lake.
- ix. Walkover survey of Warleggan River downstream for fish in distress weekly; downstream of Hawk's Tor outflow (SX1514374312), to the confluence with the Black

Tor tributary (SX1502673571) and to the accessible limit approaching Cabilla Woods from Cabilla Wood/Warleggan River road bridge (SX1478968927)

- x. Implement weekly assessment of bankside stability of Hawks Tor SSSI exposed faces during draw-down.

To **mitigate** the impacts of the drought permit we shall:

- i. Provide a compensation flow of 32 l/s (based on Nov-Mar Q95 Qube modelling) through temporary pumps from Hawk's Tor Pit into Warleggan River.
- ii. Provide three artificial spates for twelve hours duration during November to December 2022 at 64 l/s to aid migration of salmonid fish.
- iii. Provide a post drought permit compensation of 11 l/s (based on Apr-Sept Q95 Qube modelling) until 30 September 2023 or until recovery of Hawks Tor Pit to TWL, whichever is sooner.
- iv. Provide three artificial spates for twelve hours during April and May 2023 at 32 l/s to aid migration of salmonid smolts.
- v. Provision for fish rescue team to support migration of fish around the site as TWL is drawn down.
- vi. Provision of further compensation and artificial spates will be undertaken in autumn 2023 in the event until Hawk's Tor not returning to TWL.
- vii. Deliver habitat enhancement of Warleggan River to the A30 (current land boundary).
- viii. Include a hands-off flow condition of 12m from TWL, based on 1995 experience, to preserve bank stability.
- ix. In the unlikely event that we identify bankside instability we shall seek immediate review from an internal South West Water accredited Supervising Civil Engineer.
- x. In the event of water quality downstream pollution or water quality issues which are proven to be linked to the abstraction at Hawk's Tor Pit, we shall look to increase compensation volumes.
- xi. Publish an Environmental Assessment Report and revised Environmental Monitoring Plan by 31st December 2022
- xii. Implement 2mm screening on the pumps to protect against unknown invasive species transference risk.

An environmental statement setting out a summary of the environmental assessments which have been undertaken for this drought permit is included as **Document 3 Hawk's Tor Pit Drought Permit Environmental Impact Review**.

The key documents with the environmental assessments and monitoring plans are:

3. Drinking Water Services Report 2022 – Operations Supporting Evidence (**Document Ref: 1.3**)
4. Water Quality Information Hawk's Tor (**Document Ref: 1.4**)
5. Hawks Tor Drought Permit Environmental Impact Review (**Document Ref: 3.0**)

## 3 COPY OF ABSTRACTION LICENCE

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There is no existing abstraction licence for Hawk's Tor Pit.

## 4 REFERENCES

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Environment Agency, 2021, Drought permits and drought orders – Supplementary Guidance from the Environment Agency and Department of Environment, Food and Rural Affairs.

South West Water, 2022, Drought Plan, September 2022

## 5 FIGURES

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|----------|--|
| Figure 1 | Map showing the Colliford supply area                                |
| Figure 2 | Figure 2 – Map of Hawk's Tor Pit within Colliford WRZ                |
| Figure 3 | Map of SSSI designations and priority habitats surrounding Hawks Tor |

## 6 TABLES

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Table 1	Document structure for drought permit application
Table 2	Application Checklist
Table 3	Flow statistics (m3) for the Warleggan River (based on EA data from 1969 to 1997)
Table 4	Overall performance of the pit in response to the abstraction regime under DO I & II