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Quality Assurance**Survey/ Assessment Work Schedule**

Survey/Assessment Type	Surveyors/ Author	Date
Otter Survey	Tom Knight & Max Ellson	08/01/19

Review Schedule

Issue	Date	Author	Reviewed by	Approved by
1.0	10/01/19	Tom Knight	Max Ellson	Max Ellson

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The evaluation and assessment provided in this report is specific to the iteration of the proposal detailed in *Section 1*. It would no longer be valid should the layout be changed in anyway, should the report be used for a different proposal at the same site or should it be used a maximum of 12 months after the date of issue.

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Figure 1 – Otter Target Notes

1 INTRODUCTION

1.1 Project Background

1.1.1 Marches Ecology was commissioned by Wrexham County Borough Council (WCBC) to undertake an Otter (*Lutra lutra*) Survey of a stretch of the River Gwenfro adjacent to Nant Silyn, Pont Wen, Wrexham (approximate OS Grid Ref. SJ 343 499). This report is provided as supporting information to a planning application for a proposed residential housing scheme and associated infrastructure.

1.1.2 A separate confidential Badger Annex (Marches Ecology 2019) has been produced which includes information on Badgers (*Meles meles*). This report should be read in conjunction with the Badger Annex.

1.1.3 This survey report has three key aims:

- to provide an initial appraisal of the value of the survey site for Otters and thereby identify ecological constraints relevant to the proposal;
- to identify further surveys that may be required; and
- to identify potential mitigation/ compensation measures relating to Otters where possible along with opportunities to deliver ecological enhancement.

The structure of this report is based on the guidance provided in the Chartered Institute of Ecology and Environmental Management (CIEEM) documents CIEEM (2017a) and CIEEM (2017b).

1.2 Report Author

1.2.1 This report was produced by Tom Knight of Marches Ecology. Tom Knight is an ecologist with over twenty years of consultancy experience and has undertaken Otter Surveys on a wide range of sites. His relevant academic qualifications and professional memberships are as follows:

- Chartered Environmentalist (Society for the Environment).
- Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- PgDip Conservation Management.
- BSc (Hons) Environmental Studies.
- C&G Biological Surveying.

1.3 Site Description and Context

1.3.1 The proposed development site extends to approximately 0.46 hectares of land and is located to the southeast/ east of the centre of Wrexham, between Hightown and Caia Park. The proposed development site has recently been the subject of demolition works and as such is largely characterised by levelled, crushed hardcore/ rubble or tarmac. There are small patches of species-poor unmanaged grassland towards the northeast and southwest ends. There is a small number of *Betula pendula* (Silver Birch) trees associated with this grassland as well as a small number of, largely ornamental, shrubs elsewhere within the proposed development site.



**The proposed development site from close to the eastern corner looking towards the west.
The River Gwenfro is on the right of this view.**

- 1.3.2 The north/ northwest side of the proposed development site includes the southern bank of the adjacent River Gwenfro. This bank is characterised by some species-poor unmanaged grassland/ tall ruderals with scattered trees and small patches of dense scrub. The boundaries of the proposed development site are largely formed by various types of fence other than where it is adjacent to the River Gwenfro. The River Gwenfro flows from approximately west-south-west to east-north-east adjacent to the proposed development site.
- 1.3.3 The proposed development site is in an urban area typically characterised by residential housing estates with some large areas of public open space. 'The Dunks' is located to the north of the river: a large area of open space dominated by amenity grassland. To the south and east of the proposed development site there is residential housing with some smaller areas of amenity grassland. To the southwest there is another larger area of public open space again dominated by amenity grassland. The river corridor extends further to the west of the proposed development site (where it is increasingly urban in character) and to the east where it flows through further areas of public open space within Caia Park. Upstream of the proposed development site the river flows approximately north-west to southeast. The River Gwenfro flows into the River Clywedog at King's Mills. The confluence is approximately 1.68 km downstream of the proposed development site.

1.4 The Proposal

- 1.4.1 The proposed development is presented on a JDA Architects plan entitled '*Proposed Site Plan – Nant Silyn*', dwg. no. 1044 A 100 Rev. A, dated 16th August 2018. The proposal concerns a small residential housing development with associated infrastructure. A small block of flats, three semi-detached houses and one bungalow would be constructed. The location of a second 'potential additional' bungalow unit is also illustrated.

1.4.2 Vehicle access to the site would be off Pont Wen connecting to a short stretch of new internal road. Car parking spaces are provided for each property. All units have associated garden areas. A small area of open space with existing trees is retained towards the southwest end of the site with further landscaping (including limited tree planting) along the southeast frontage.

1.4.3 It is currently anticipated that construction will commence in June/ July 2019 and will be completed by April/ May 2020.

1.5 Legislation

1.5.1 This sub-section provides a brief summary of the relevant legislation. It should not be considered a comprehensive review and is not meant to be so. It is provided here for information only and is not intended to replace specialised legal advice. It does not replace the text of the legislation but summarises the salient points.

1.5.2 The Otter is listed on *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and receive full protection under *Section 9*. The 1981 Act was amended by the *Countryside and Rights of Way Act 2000* (the CRoW Act) which further extends the protection. It is also listed on *Annexe IV* of the European Union Directive on Natural Habitats and Wild Fauna and Flora (*Council Directive 92/43/EEC*), which is implemented in the UK by *The Conservation of Habitats and Species Regulations 2017*. It is included on *Schedule 2* of these regulations which gives it full protection under *Regulation 42(1)*. The Otter is therefore a so-called European Protected Species.

1.5.3 Under the above legislation it is an offence to intentionally or recklessly:

- kill, injure or take an individual of such a species;
- possess any part of such species either alive or dead;
- damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
- disturb such a species whilst using any place of shelter or protection; or
- sell or attempt to sell any such species.

1.5.4 The Otter is included on *Section 7* of the *Environment Act 2016*.

2 METHODOLOGY

2.1 Otter Survey

- 2.1.1 A detailed Otter Survey was carried out on 8th January 2019. The aim of this survey was to identify potential resting places/ holt sites as well as prove presence/ absence where possible. The survey was led by Tom Knight assisted by Max Ellson both of Marches Ecology. Tom Knight holds a current Natural Resources Wales (NRW) 'disturbance' licence (No. S085335/1). The Target Notes recorded during this survey are shown on *Figure 1*. The survey site was defined as extending to approximately 100 m upstream and 100 m downstream of the proposed development site. The 'proposed development site' and the 'survey site' (with regards the Otter Survey) are shown on *Figure 1*. Immediately adjacent habitat was considered where deemed appropriate and viewed from the survey site boundary where possible. The weather during the survey was 10% cloud, bright and sunny with a light breeze.
- 2.1.2 Both banks of the River Gwenfro within the survey site were searched. The positions and numbers of spraints, feeding remains, footprints, holts, resting places, and other field signs were recorded as Target Notes. The Target Notes are provided in *Section 5*. The approximate location of the field signs was recorded with a hand-held GPS (Garmin etrex 10). Chanin (2003) defines spraint condition as 'not dry', 'dry intact' and 'dry fragmented'; likely to indicate their relative age with the former the most recent. These terms have been used throughout this report. The methodology broadly follows that outlined in NRA (1993), Chanin (2003) and JNCC (2004).
- 2.1.3 There is some difficulty in identifying Otter resting places, refuges and holts and similarly there is a range of terms applied to these features but no standard. For transparency the terms holt and resting place will be utilised in this report as follows:
- A holt is usually a secure underground resting place usually associated with breeding locations. This may be applicable to the natal den (as defined in Liles, 2003) and is taken to be the small space occupied by the female when she gives birth and where the cubs stay for up to three months. Liles (2003) also makes a distinction between the natal site and breeding site. The term breeding site describes an area of land, or open water and land large enough to provide a breeding Otter with all the required resources. These resources include one or more potential natal den sites.
 - A resting place is a temporary 'bivouac' often used at the end of a foraging period or to rest overnight. An Otter will have many resting opportunities within its usable range often under exposed tree roots or undercut riverbanks, in pollard trees, drains, thick vegetation like Bramble, scrub, reed-beds and stands of tall herbs. Resting places can be located above or below ground. They are often referred to as couches, hovers or lie-ups and are the most frequently used and encountered Otter resting site (Woodroffe, 2001).

2.2 Survey Limitations

2.3.1 The following may be considered survey limitations:

- In some places along the River Gwenfro corridor there are patches of dense scrub where it was not possible to gain access throughout such features to search for evidence of Otter use.
- Discarded drug paraphernalia is frequent along the river corridor. Where the risk of injury was assessed as being too great this reduced the thoroughness of inspection of some features.
- Access permission was not provided to private land beyond the survey site boundary (largely the river channel).

3 BASELINE ECOLOGICAL CONDITIONS

3.1 Introduction

- 3.1.1 The Otter Survey map is provided as *Figure 1*. The Target Notes (numbered 1 to 19) are provided in *Section 5* and shown on *Figure 1*.
- 3.1.2 The Otter Survey was originally scheduled to be undertaken on 6th December and then 12th December 2018. Both survey visits were aborted as the river level was too high and due to recent heavy rain. Based on the river level observed at this time most of the Otter signs recorded on 8th January 2019 had been deposited in the intervening period, approximately 27 days or a month.

3.2 Habitat Description

- 3.2.1 At the upstream end of the survey site the river is approximately 3.5 m wide and generally 0.2-0.4 m deep with a moderate flow over gravel/ cobbles. No aquatic or marginal vegetation was visible. The right bank has been reinforced with gabions otherwise the banks are of earth to approximately 1.2 m above the water level. On the left bank there is a narrow strip of heavily disturbed woodland with frequent *Acer pseudoplatanus* (Sycamore) and *Alnus glutinosa* (Alder). The right bank supports a 3-4 m wide strip of tall ruderals with some *Rubus fruticosus* agg. (Bramble). Beyond this there are residential houses.



View downstream, upstream end of survey site.

- 3.2.2 Adjacent to the proposed development site the river is approximately 4 m wide and 0.1-0.3 m deep with a moderate flow over gravel/ cobbles/ boulders. The banks are largely of earth extending to approximately 2 m above the water level. Locally the banks have been reinforced. Both banks support various trees, shrubs and tall ruderals with a few patches of dense Bramble. The trees include *Fraxinus excelsior* (Ash), *Salix fragilis* (Crack Willow) and *Salix caprea* (Goat Willow). Litter and tipped items are frequent along the whole surveyed stretch.



View downstream of the river corridor adjacent to the proposed development site.

- 3.2.3 Downstream of the proposed development site the river enters an extensive area of public open space. The open space is characterised by amenity grassland with scattered trees.



View upstream of the river corridor just downstream of the proposed development site.

3.3 Otter Activity Within the Survey Site

- 3.3.1 Recorded evidence of Otter activity along the survey site was frequent with a particular cluster (*Target Notes 2 to 10*) associated with a bridge and the adjacent downstream stretch of river by the western corner of the proposed development site. A large number of spraint locations were recorded and were found throughout the surveyed stretch (*Target Notes, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17 and 18*). The spraints recorded at *Target Note 19* are

located just outside the survey site. As mentioned above most of these spraints are likely to have been deposited within the last month; a number of 'not dry' spraints likely to have been deposited in the last few days were also recorded. A single footprint was recorded at *Target Note 4*.

Resting Places/ Holts

- 3.3.2 No actual resting places or holt sites were recorded within the survey site. There are a small number of features that could provide potential resting places. As the surveyed stretch of river is bordered by residential housing and/ or public open space all of these potential resting places are subject to varying levels of disturbance. Most of these potential resting places are associated with patches of dense scrub/ tall ruderal vegetation (e.g. *Target Notes 10a, 12 and 15*). The patch of scrub described at *Target Note 12* is located within the proposed development site; that described at *Target Note 10a* is on the opposite bank.



Scrub at *Target Note 12*.



Scrub at *Target Note 10a*.

- 3.3.3 There is a concrete drainage pipe at *Target Note 1* that provides a potential resting place when dry. The culvert within the proposed development site described in Marches Ecology (2019) provides a similar feature.



Drainage pipe at *Target Note 1*.

4 EVALUATION, RECOMMENDATIONS AND CONCLUSIONS

4.1 Introduction

4.1.1 Brief details regarding the proposal are provided in *Section 1.4*. An assessment of issues relating to Otters based on the information provided is detailed below and considers:

- potential ecological constraints relevant to the proposal;
- further survey requirements; and
- potential mitigation/ compensation measures along with opportunities for ecological enhancement.

Potential impacts have been considered with reference to the plan/ information provided only. This assessment considers the proposed development site and immediately surrounding area.

4.2 Evaluation

4.2.1 The stretch of the River Gwenfro within the survey site provides a small number of opportunities for resting places but apparently no potential holt sites. However, it should be noted that identification of holt sites is notoriously difficult. It is known that the River Gwenfro does provide a potential prey source including fish such as Brown Trout (*Salmo trutta*) and Bullhead (*Cottus gobio*) along with other potential prey items such as mammals and birds.

4.2.2 Otters require a large territory that supports an abundant and varied food resource. Depending on the productivity of the river and other factors the range of a male Otter may be up to 70 km (of linear watercourse) while for a female it could be 25-40 km; a male Otter may overlap with two or three female territories (e.g. Woodroffe 2001). Within an occupied territory, Otters may have up to around 30 resting places some used regularly while many more are used only once or a few times.

4.2.3 The number of spraints recorded indicates a relatively high level of recent Otter activity along this stretch of the River Gwenfro. This is likely to be due to more than one animal, possibly a female with cubs along with one or more males though it is not possible to confirm this. Female Otters spend most of their time in a core part of their range while males regularly patrol the full extent of their range (travelling up to 16 km in a night in freshwater systems; Grogan *et al.* 2001).

4.2.4 Marches Ecology completed Otter surveys along this stretch of the River Gwenfro in 2008/ 2009 for an unrelated project also on behalf of WCBC. At this time the level of Otter activity along the stretch within Caia Park down to King's Mill and further upstream through the town centre was also generally high (though it was subject to variation through the year). This level of activity is not unexpected as the survey site is not far from the confluence with the River Clywedog. The national survey undertaken in 2009-2010 recorded signs of Otters from 93% of sites in the River Dee catchment including the River Clywedog (Strachan 2015).

4.3 Assessment and Recommendations

Introduction

4.3.1 Potential impacts of the proposed development on Otters are likely to be limited to the following:

- Increased risk of inadvertent killing/ injury or disturbance of animals during the construction phase should they access the proposed development site.
- Temporary indirect disturbance of any Otters using potential resting places near the proposed development site during the construction phase, including noise, vibration and lighting.
- Permanent indirect disturbance of any Otters using the river corridor during the operation phase, including noise and lighting.
- Indirect effects on habitat/ food resource, *e.g.* pollution of River Gwenfro.

Risk of Killing/ Injury or Disturbance

4.3.2 While no evidence has been recorded that suggests Otters currently access the proposed development site away from the immediate bank of the River Gwenfro, Otters are known to travel considerable distances from their aquatic habitat. Otters are also inquisitive animals and may be attracted onto the construction site to investigate new machinery or spoil heaps¹. Whilst this risk is considered to be low there remains the possibility that Otters could access the proposed development site and could therefore be inadvertently killed/ injured/ disturbed during the construction phase. It is unlikely that the loss of a single animal would greatly affect the Favourable Conservation Status (*e.g.* the carrying capacity of the habitat) of the local population but the loss of more than one animal could in the short to medium-term.

4.3.3 To prevent Otters accessing the proposed development site during the construction phase as far as is reasonably possible a temporary exclusion fence should be installed along the entire length of the boundary adjacent to the River Gwenfro (along the alignment of the existing fence at this location) as well as the whole of the northeast and southwest site boundaries. This temporary exclusion fence must be installed prior to the start of construction or any other related work on site. The fence will be retained in-situ, and in an effective state of repair, for the duration of all the works. There should be no construction activities/ access by personnel/ use of machinery/ vehicles or storage of equipment/ materials/ tools on the opposite side of the fence to the construction site. Other materials and spoil/ rock piles, *etc* should not be stored against the fence.

4.3.4 The temporary exclusion fence must ensure that it does not hinder the movement of Badgers particularly where they enter/ exit the proposed development site near the northern corner. Marches Ecology (2019) should be referred to for further information. The ecologist may need to be consulted to confirm an appropriate alignment for this fence.

4.3.5 The temporary exclusion fence will be of chestnut paling with uprights at a maximum 25 mm interval and at least 1.5 m high. The fence and stakes will be pushed in to the ground to ensure that no gaps are present between the base of the fence and the ground level. There should be no gaps between different stretches of fence. Appropriate signage (*e.g.* standard construction site prohibition notices) will inform site personnel of the importance of this fencing and that they should not access outside the fenced area. Such information would

¹ DMRB Volume 10, Section 4 (Part 4) HA81/99: Nature Conservation Advice in Relation to Otters.

also be covered in all site inductions. Should any work be deemed necessary outside of the fence then the ecologist should be contacted for advice and the work may need to be supervised.

- 4.3.6 An alternative to the installation of the temporary exclusion fence would be to install featherboard/ closeboard fencing along these boundaries prior to the commencement of construction. This fence would need to be at least 1.5 m high and contain no gaps greater than 25 mm. The horizontal timbers must be on the site-side of the fence. The alignment and installation of this fence should be discussed with the ecologist. The difficulty with this type of fence is making the base fully otter-proof, unless it is on a solid base (Jay *et al.* 2008).
- 4.3.7 Once the fence has been installed a watching brief will be maintained by all site personnel throughout the construction phase. The requirement for this watching brief will be detailed in all site inductions or as part of a specific ecology toolbox talk which would include information on the legal protection of Otters, the identification of Otters and of signs of Otter activity. The site induction/ toolbox talk will also explain the actions to take should an Otter or signs of Otter activity be found on the site.
- 4.3.8 To further reduce the possibility of disturbing Otters or coming into contact with them it is recommended that all construction work should be completed within 'daylight hours' (approximately 8 am until 5 pm depending on time of year). No work will be carried out in the early morning or late evening. As there will be no 'night-working' there should be no requirement for uncontrolled external lighting during the construction phase. If any such lighting is required it should not be located within a minimum of 15 m from the bank top of the river and should point away from the river.

Disturbance of Otters at Resting Places During the Construction Phase

- 4.3.9 There are a small number of potential resting places both within the proposed development site (*Target Note 12*) and close to it (*Target Note 10a*). It is likely that part of the potential resting place at *Target Note 12* will be directly impacted by the proposed works. It is assumed that at least some of this scrub will need to be cleared to install new boundary fencing. Any Otters present at this time may be subject to disturbance. Similarly, due to the proximity of the scrub/ tall ruderals at *Target Note 10a* it is possible that should an Otter use this as a resting place at any stage during the construction phase then it may be subject to indirect disturbance.
- 4.3.10 As potential resting places are frequent along other parts of the River Gwenfro/ River Clywedog, the small number of resting places involved and due to the relatively short construction duration, the risk of Otters being disturbed at these locations is considered to be low. It should also be noted that until recently there was a care home on the site and as such the proposal will not radically change the site usage. Whilst Otters usually select '*low disturbance habitats*' where possible '*at least some Otters are willing to tolerate high levels of human disturbance*' (Strachan 2015) and they are now found in many town/ city centres throughout Wales.
- 4.3.11 It is recommended that should any of the scrub at *Target Note 12* need to be removed then this will be undertaken prior to the commencement of the construction phase and this work will be the subject of Reasonable Avoidance Measures (RAMs). Before vegetation clearance this feature will be checked by an ecologist who retains an NRW 'survey/ disturbance' licence. Machinery/ personnel will only commence work when the licensed ecologist has confirmed that it is appropriate to proceed. All clearance works should be

completed in a methodical manner from a single edge of the area to be cleared always ensuring that there is a potential escape route for any animal that may be present. Clearance would be undertaken generally in the direction of the river (rather than potentially flushing animals away from it).

- 4.3.12 Where there is dense Bramble/ other vegetation (as at *Target Note 12*) to be removed it may be necessary to clear this with a manual scrub-cutter or similar where it is not possible for the ecologist to clearly view all parts of the ground beneath this vegetation. Should this be the case then the patch of vegetation will be walked along one edge (furthest from the river) in an attempt to make Otters aware of the presence of the site personnel. Clearance with the scrub-cutter will then proceed in the direction of the river with small sections being removed at any one time. This work will be supervised by the licensed ecologist who will re-check the feature for the presence of Otters after each clearance stage. The height of the vegetation will be reduced in stages with the scrub-cutter to an approximate height of 0.5 m. The woody cut material can subsequently be removed by hand (raked off). Once removed this woody material should be chipped and the remaining 0.5 m high stalks further reduced (once it can be established that no Otter is present).
- 4.3.13 Containing all construction work within the temporary exclusion fence will minimise the potential for indirect disturbance of Otters at other potential resting places.
- 4.3.14 Should an Otter be confirmed as being present at a resting place at any time then all work would immediately cease, advice would be sought from the licensed ecologist and it may be necessary to obtain an NRW 'development' licence before work can re-commence.

Indirect Disturbance During Operation Phase

- 4.3.15 Temporary or permanent lighting may affect Otters that utilise the river and alter behaviour patterns. Whilst no data is available on current light levels at the river the potential significance of this impact should be considered in relation to its urban setting and existing/ street/ external lighting.
- 4.3.16 No information is currently available on the proposed lighting layout and specifications. Lighting at the proposed development site will follow guidance provided by The Bat Conservation Trust and Institution of Lighting Professionals (2018). There should be no additional light spillage onto the river corridor or adjacent habitat that Otters might utilise.

Measures to avoid/ minimise light spillage will include:

- No external lights will be fitted to the northwest side of the buildings (the side facing the river);
 - 'Warm white' LED lamps should be used where external lighting is proposed;
 - All luminaires used will be fully directional (e.g. LED) and will point straight down to where the light is required. They will be mounted on the horizontal, i.e. no upward tilt. Lighting that reduces vertical and horizontal light spillage will be used;
 - The number of poles/ bollards/ lamps installed will be kept to a minimum and will be as low (in height) as possible;
 - Low wattage lamps (<70W) will be used; and
 - Cowls/ hoods/ baffles or similar will be used where the light spillage may cause an unacceptable light level increase along the river.
- 4.3.17 Further disturbance may occur during the operation phase, for example due to increased human access to the watercourse. This potential impact will be minimised through the installation of secure fencing along the northwest boundaries of the gardens.

Indirect Impacts on Habitat

- 4.3.18 Due to the proximity of the proposed development site the river will be sensitive to sediment-laden or otherwise polluted run-off, dust and other forms of pollution, such as accidental spillage, during construction works and run-off/ water quality issues during site operation. Such pollution could indirectly impact the habitat used by Otters including prey availability.
- 3.3.4 The River Gwenfro would be protected (from indirect impacts) during the site clearance/ construction phase through implementation of best practice measures to prevent sediment release, sediment run-off, pollution by fuel and oil and other accidental spillages. The general advice contained in the Guidance for Pollution Prevention (GPP) leaflets² produced by SEPA, EA and the Environment and Heritage Service (Northern Ireland) will be adhered to where applicable, particularly the following:
- PPG1: Understanding Your Environmental Responsibilities - Good Environmental Practices.
 - GPP5: Works and Maintenance in or Near Water.
 - PPG6: Working at Construction and Demolition Sites.
- 4.3.19 The site compound and storage facilities will be located as far away from the river as possible. All fuelling of tools and equipment will be undertaken in accordance with the GPP leaflets and at least one fluid spill-kit will be located on site at all times.
- 4.3.20 Information on the proposed drainage system (including surface water and foul water) is not currently available although it is assumed that foul water would be connected to the existing sewerage system. Drainage for the site (particularly concerning surface water) should be designed to ensure that there will be no reduction in water quality of the adjacent river. This will help to safeguard Otters as well as other riverine species.

4.4 Conclusions

- 4.4.1 The following avoidance/ mitigation measures are recommended to address perceived possible impacts on Otters and their habitat:
- The installation of a temporary exclusion fence prior to the commencement of works.
 - A watching brief will be maintained by site personnel.
 - Individual responsibilities with regards Otters will be identified in all site inductions/ a specific ecology toolbox talk.
 - Construction work will be restricted to 'daylight hours'.
 - The implementation of RAMs where scrub is to be cleared near the river.
 - Proposed external lighting will avoid increased light spillage along the river corridor.
 - Implementation of best practice/ pollution prevention measures during the construction phase.
 - Appropriate design of the operation phase drainage system.
- 4.4.2 Subject to the implementation of the recommended avoidance/ mitigation measures no significant impact is anticipated either on individual Otters, the local population or their habitat.

² <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

5 TARGET NOTES

All locations are approximate. References to right-/ left-hand side of river when looking downstream.

Target Note 1. A concrete drainage pipe with an approximate diameter of 0.6m. This feature provides a potential resting place when dry. GPS Grid Ref. of pipe entrance SJ34250 49843 (+/- 3 m).

Target Note 2. Three or four spraints (one not dry, two or three dry fragmented) located on the side wall of a weir. GPS Grid Ref. SJ34254 49848 (+/- 4 m).

Target Note 3. Four spraints (two not dry, two dry intact) on a stone slab beneath a bridge. No GPS reading as beneath bridge.

Target Note 4. One footprint on sand/ gravel bar and one dry intact spraint on a large boulder. GPS Grid Ref. SJ34288 49866 (+/- 3 m).

Target Note 5. One dry intact spraint on a rock on the right-hand bank. Fish eggs visible in spraint. GPS Grid Ref. SJ34288 49867 (+/- 3 m).

Target Note 6. One not dry and one dry fragmented spraint on a mid-channel rock slab beneath a pipe. GPS Grid Ref. SJ34287 49867 (+/- 3 m).

Target Note 7. One dry intact spraint on a mid-channel rock slab. GPS Grid Ref. SJ34291 49866 (+/- 3 m).

Target Note 8. One dry intact and one dry fragmented spraint on a rock slab. GPS Grid Ref. SJ34295 49868 (+/- 3 m).

Target Note 9. One old dry fragmented spraint on a bank wall. GPS Grid Ref. SJ34302 49876 (+/- 3 m).

Target Note 10. One dry intact and two dry fragmented spraints on a large rock with a further dry fragmented spraint on a mid-channel block approximately 2 m away. GPS Grid Ref. SJ34309 49883 (+/- 3 m).

Target Note 10a. The left-hand bank at this location supports large patches of dense *Rubus fruticosus* agg. (Bramble) with various tall ruderals including *Epilobium hirsutum* (Great Willowherb) and *Oenanthe crocata* (Hemlock Water-dropwort). This area of vegetation provides potential resting places.

Target Note 11. One dry intact and one dry fragmented spraint on the left-hand bank. GPS Grid Ref. SJ34353 49910 (+/- 3 m).

Target Note 12. A patch of dense *Rubus fruticosus* agg. (Bramble), *Lonicera* sp. (Honeysuckle) and *Hedera helix* agg. (Ivy) scrub on the right-hand bank by the proposed development site. The patch measures approximately 10 m by 5 m. Vegetation like this provides potential resting places. GPS Grid Ref. SJ34364 49914 (+/- 3 m).

Target Note 13. One not dry and one dry fragmented spraint on a stone block by the headwall of a small outflow pipe. Grid Ref. SJ34395 49936 (+/- 3 m).

Target Note 14. Four not dry and one dry fragmented spraint on a rock used for bank reinforcement. Fish eggs were visible in one of the spraints. Grid Ref. SJ34412 49951 (+/- 3 m).

Target Note 15. A pile of logs and tree trunk within a patch of *Symphoricarpos albus* (Snowberry) and *Rubus fruticosus* agg. (Bramble). A potential resting place though likely to be subject to some level of disturbance. Grid Ref. SJ34422 49956 (+/- 3 m).

Target Note 16. One dry intact spraint on a side gravel bar. On the same gravel bar, approximately 2 m away on a rock, there were a further two dry intact and three or four dry fragmented spraints. Grid Ref. SJ34431 49964 (+/- 3 m).

Target Note 17. Two dry fragmented spraints on a rock used for bank reinforcement. Grid Ref. SJ34436 49968 (+/- 3 m).

Target Note 18. One dry fragmented spraint on a rock by the bank. Grid Ref. SJ34490 49974 (+/- 3 m).

Target Note 19 [Outside survey site]. Two dry intact and one dry fragmented spraint on a stone block beneath a pipe. Grid Ref. SJ34518 49980 (+/- 3 m).

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