

As mentioned above disturbance as a result of increased human activity and noise from onsite machinery during the construction phase will also impact on bird species within the survey area. Birds such as the Mallards, which occur in large numbers along the Tanyard stream and those which nest in the scrub areas and trees along both the stream and the River Finnow will experience the greatest impact during the construction phase.

Overall, it is expected that the greatest impact on birds will arise from onsite disturbance arising from increased human activity and machinery during the construction phase. This is considered a *short-term slight negative impact* on the birds within the survey area.

3.2.1.2 Impacts on Mammals

The greatest impact on mammal populations arising from the proposed development will also occur during the construction phase, both from loss of habitat and disturbance. Increased noise levels arising from the movement and operation of machinery coupled with increased human activity will result in the temporary dispersal of mammals from the survey area to neighbouring lands. Mammals, which nest and forage within the vegetation throughout the grassland, scrub and wooded areas, such as the Pygmy shrew will experience the greatest disturbance. However, this is considered a temporary impact as mammals are very adaptable and once accustomed to the noise levels will continue to forage in nearby locations.

In the event that tree felling is required along the Tanyard Stream and the River Finnow, possible loss of roosting sites/areas for bats may occur. However, the proposed development should not result in the removal of significant numbers of trees along the stream and the river Finnow. The trees along the bank of the River Finnow from Finnow bridge to the confluence with the Tanyard stream will not experience any disturbance as this area is not under consideration as a likely outfall route. Mitigation measures are outlined in section 4 of this report with respect to the felling of trees, which may support bat populations.

Otters also exist along the River Finnow and evidence of their occurrence was noted within the survey upstream of the confluence of the River Finnow and Tanyard stream. Both poor water quality and the loss of riparian and scrub habitat are associated with the decline in otter populations (Hamilton & Rochford, 2000; NPWS 2008). Therefore the removal of riparian and scrub habitat utilised by otters is considered a significant impact. These habitats are important for otter breeding and resting sites. However, this stretch of river is not under consideration as a route for the outfall pipe, thus ensuring that habitats along this stretch of the river remain intact. The impact arising from the discharging treated effluent to the River Finnow on the otter populations is discussed within section 3.2.2 – Impacts during the Operation Phase.

3.2.1.3 Impacts on Amphibians

Similar to those impacts outlined above the greatest impact on the common frog (amphibian most likely to occur at the site) will arise during the construction phase. Temporary dispersal may also arise during

this time. However, it is thought the frog, which is common to the area, is widespread and abundant. The resulting loss in suitable habitat is not considered significant. Overall, it is expected that the proposed development will have an *imperceptible negative impact* on amphibian populations in the area.

3.2.2 Impacts during the Operational Phase

The operational phase of the development will not result in any further disturbance to habitats, thus ensuring that foraging and nesting areas for mammals and birds remain undisturbed.

However, the proposed development will result in discharge of treated effluent to either the River Finnow or Tanyard stream. The impact on aquatic ecology arising from this discharge is outlined below in section 3.3. As mentioned above, deterioration of water quality can result in a population decline of mammals such as otters. Poor water quality has been linked to sites that proved negative for otter activity. Pollution arising from sewage discharges and acidification by coniferous forestry will decrease the availability of prey and subsequently otter populations (Mason and Mac Donald, 1989). Existing background concentrations of Ortho-phosphate in the River Finnow are elevated above the limit concentration of <0.03mg/L P. Cumulative concentration calculations show that the addition of the treated waste water from the WWTP will not result in a significant increase in the concentrations of BOD and Orthophosphates. Therefore, assuming that the proposed level of treatment is achieved on a continuous basis, it is not expected that the discharging of treated effluent to the River Finnow will have a significant impact on the existing otter populations.

There was no evidence of otter activity downstream of the confluence with the Tanyard stream. Therefore, if the outfall route runs parallel to the Tanyard stream with the discharge point at the confluence with the River Finnow or downstream of Wallis's bridge at the confluence with the River Blackwater, the proposed development will not have a significant negative impact on the existing otter population within the survey area. However, any deterioration in water quality in the stretch of river between Finnow Bridge and the confluence with the Tanyard stream and River Finnow could have a potential significant negative impact on the otter population.

3.3 Impacts on Aquatic Ecology

For the purpose of this impact assessment the likely impacts on the aquatic ecology of the Tanyard stream and the River Finnow are discussed separately. As discussed previously there are 5 no. options under consideration as a likely point of discharge and 2 no. options under consideration as a likely outfall route from the WWTP to the point of discharge. This impact assessment will serve to identify an outfall route and point of discharge, which will result in the least negative impact on the existing aquatic ecology.

3.3.1 Impacts arising from placing of outfall pipe along the third class road from the WWTP to Finnow Bridge and discharging of treated wastewater at Finnow Bridge

The greatest impact on aquatic ecology from this option arises from the likely deterioration of water quality of the River Finnow.

Table 14: Effect of Proposed Discharge on the River Finnow at Finnow Bridge – Expected Concentration Increases

PARAMETER	EXPECTED CONCENTRATIONS INCREASES IN RIVER FINNOW ARISING FROM DISCHARGING AT FINNOW BRIDGE ^{NOTE 1 & 2}	RESULTANT RECEIVING WATER CONC. (MG/L)	MAXIMUM PERMISSIBLE CONC.
BOD	0.74mg/l	3.74	<3.0mg/l
Suspended Solids	0.74mg/l	6.74	<25mg/l
NH ₄ tot	0.38mg/l	0.96	<1.00mg/l
Ortho-phosphate	0.01mg/l	0.16	<0.03mg/l

Note 1: Values outlined in table 1 obtained from client

Note 2: Values are based on the provision of a tertiary treatment with nutrient reduction

Overall, the discharge from the treatment plant will result in an orthophosphate level downstream of 0.16mg/l P. Having regard to the existing background orthophosphate concentration in the river at this location, this increase is not significant. Increased levels of nitrogen and phosphorus within a river can result in increased vegetation growth, particularly algae, which, if takes place is considered a significant negative impact. The existing concentrations and expected resultant ortho-phosphate concentrations are elevated and exceed the limit value for this parameter.

As discussed previously, the South Regional Fisheries Board have stated that significant salmonid spawning habitats are located upstream of the confluence of the River Finnow and Tanyard Stream. Any further deterioration in water quality could pose a significant negative impact on the continued use of these spawning habitats.

Discharging of wastewater at Finnow Bridge will result in disturbance to riverbed dwelling macroinvertebrates. However, this disturbance is not considered significant and, similar to other points of discharge, will be isolated to the mixing zone.

There may be some disturbance to the river bank vegetation to facilitate the construction of the discharge point. This could result in sediment/suspended solids entering the River. However, owing to the short duration required to install the point of discharge, this impact is not considered significant.

3.3.2 Impacts arising from placing of outfall pipe parallel to Tanyard Stream with discharge point located at options 1, 2, 4 or 5 (Refer to Figure 4).

Based on the assumption that the outfall pipe will be set back at least 10m from the Tanyard stream, it is not expected that excavation work required for the laying of the outfall pipe will pose a risk to the water quality of the Tanyard stream. A setback distance will ensure that no suspended solids/sediment enter the stream. This setback should also ensure that there is no accidental spillage of hydrocarbons from machinery into the stream.

Similar to above, the greatest impact of the development on the Tanyard stream will arise from the discharge of treated wastewater to the stream and the subsequent impact on water quality.

Tables 15,16 & 17 below outline the effect of the proposed discharge on the water quality of the Tanyard Stream and also downstream of the confluence with the River Finnow. Presently, this stream is classed as moderately polluted based on the results of a biological assessment. The chemical analysis results presented by the client concur with this Q rating, whereby elevated ortho phosphate concentrations are observed.

Table 15: Effect of Proposed Discharge on the Tanyard Stream (existing outfall adjacent to the WWTP) – Expected Concentration Increases

PARAMETER	EXPECTED CONCENTRATIONS INCREASES IN RIVER FINNOW ARISING FROM DISCHARGING AT FINNOW BRIDGE ^{NOTE 1 & 2}	RESULTANT RECEIVING WATER CONC. (MG/L)	MAXIMUM PERMISSIBLE CONC.
BOD	3.178mg/l	6.18	<3.0mg/l
Suspended Solids	3.178mg/l	5.58	<25mg/l
NH ₄ tot	1.635mg/l	2.66	<1.00mg/l
Ortho-phosphate	0.318mg/l	0.43	<0.03mg/l

Note 1: Values outlined in table 1 obtained from client

Note 2: Values are based on the provision of a tertiary treatment with nutrient reduction

Table 16: Effect of Proposed Discharge on the Tanyard stream (downstream of confluence with sister stream)

PARAMETER	EXPECTED CONCENTRATIONS INCREASES IN RIVER FINNOW ARISING FROM DISCHARGING AT FINNOW BRIDGE ^{NOTE 1 & 2}	RESULTANT RECEIVING WATER CONC. (MG/L)	MAXIMUM PERMISSIBLE CONC.
BOD	2.33mg/l	5.83	<4.0mg/l
Suspended Solids	2.33mg/l	7.33	<25mg/l
NH ₄ tot	0.23mg/l	0.66	<1.00mg/l
Ortho-phosphate	0.04mg/l	0.14	<0.03mg/l

Note 1: Values outlined in table 1 obtained from client

Note 2: Values are based on the provision of a tertiary treatment with nutrient reduction

Table 17: Effect of Proposed Discharge on the River Finnow (downstream of confluence with Tanyard stream – location no. 4)

PARAMETER	EXPECTED CONCENTRATIONS INCREASES IN RIVER FINNOW ARISING FROM DISCHARGING AT FINNOW BRIDGE ^{NOTE 1 & 2}	RESULTANT RECEIVING WATER CONC. (MG/L)	MAXIMUM PERMISSIBLE CONC.
BOD	0.63mg/l	2.63	<3.0mg/l
Suspended Solids	0.63mg/l	2.63	<25mg/l
NH ₄ tot	0.33mg/l	0.39	<1.00mg/l
Ortho-phosphate	0.01mg/l	0.06	<0.03mg/l

Note 1: Values outlined in table 1 obtained from client

Note 2: Values are based on the provision of a tertiary treatment with nutrient reduction

Owing to elevated levels of nutrients within the Tanyard stream at present, in particular Phosphate and BOD concentration, any further increase is considered a significant impact. Further deterioration of water quality within this stream could impact on that of the River Finnow. There are 2 no. locations along this stream currently under consideration as a possible point of discharge. The confluence of the Tanyard and the Finnow is also a possible location for the discharge point. Having regard to the present water quality of this stream together with the fact that it is a tributary of the River Finnow, which contains important spawning habitat for salmonids, any discharge to this watercourse is considered a likely significant impact on the aquatic ecology of both the stream and the river Finnow.

3.4 Conclusion of Impact Assessment

The discharging of treated effluent at location no. 4 is considered the least detrimental to the existing aquatic environment for the following reasons:

- The discharging of treated effluent at the confluence of the Tanyard stream and the River Finnow is downstream of the salmonid spawning habitats
- Owing to the large volumetric flow within the River Finnow, any discharges are quickly diluted and will therefore have less of an impact on the macroinvertebrates. While there will be some disturbance to aquatic fauna at the immediate point of discharge, this is not considered significant.
- Owing to the presence of Fresh water Pearl Mussel and Lamprey within the River Blackwater, it is preferable that discharges are diluted prior to entering the river.
- It is not expected that the proposed development will have a significant negative impact on the Blackwater SAC, provided that the discharge of treated effluent occurs at a location other than no. 5.
- Therefore, option no. 4 is the preferred discharge point and that which is considered to pose the least impact on both aquatic and terrestrial ecology.

3.5 “Do Nothing” Impact

In the absence of the proposed upgrading of the treatment plant at Millstreet, there would be no disturbance to terrestrial habitats and the associated fauna. There would be no disturbance to stream /river banks at the proposed discharge point. However, in the long term, without the proposed upgrading and improvement to the quality of the treated wastewater, it is likely that the quality of the Tanyard stream would deteriorate further, thus have a likely significant impact on the quality of the River Finnow. It is likely that existing salmon and trout within the stream would disappear.

3.6 “Worst Case Scenario” Impact

Where mitigation measures outlined below fail and where the expected level of treatment proposed at the wastewater treatment plant is not achieved, it is likely that significant pollution/contamination of the Tanyard stream and/or River Finnow would occur. The section of the Blackwater cSAC included in this survey area and beyond would experience a profound negative impact with a definitive occurrence of algal growth arising from organic pollution. Sensitive species which may occur downstream of the proposed point of discharge could likely be eliminated from this section of the river due to the organic loading coupled with increased levels in suspended solids. However, having regard to the high specification of the proposed treatment plant coupled with the required maintenance necessary to operate such a plant, it is not considered likely that the above outlined “worst-case scenario” impact will ever arise.

4.0 Mitigation Measures

The proposed development will not have a significant impact on the existing flora/habitats and associated fauna within the survey area. There will be no significant loss in habitat area arising from the planned upgrading, thus ensuring that there will be no significant impact on the local fauna arising from the reduced foraging and breeding sites. Water quality at the discharge point will experience some impact, the significance of which is dependant on the chosen location.

The following measures are recommended to safeguard the flora and fauna during the construction phase and to reduce the impact on water quality of River Finnow and Tanyard stream on commencement of discharging of treated effluent:

4.1 Mitigation Measures – Flora & Habitats

- Where possible and practical it is recommended that the proposed outfall pipe be placed in the wet grassland habitat, thus avoiding disturbance and/or loss to areas of scrub habitat and the necessity for tree felling.
- Where this is not possible, no disturbance to these terrestrial habitats should occur during the bird nesting season, namely 1st March to the 31st August. In the event that disturbance is necessary to facilitate the construction phase, it should be conducted during the period between the 1st September and end of February.
- Where storage of soil/gravel materials during the excavation is required to facilitate the laying of the outfall pipe is required, this storage should be confined to predetermined locations. On completion of the construction any remaining unwanted materials should be removed from these locations and taken off site. This is necessary to avoid damage to vegetation and deterioration of habitat quality.

4.2 Mitigation Measures – Mammals

It is not expected that the construction phase will have a significant impact on the local mammals. As stated previously the greatest impact on mammals will arise during the construction phase. Therefore, to reduce the level of disturbance impacts, site activity should be confined in so far as possible to the survey area.

- In addition to the above, no disturbance of habitats in the area utilised by the otters should take place
- Where it is not possible to retain all mature trees along the route of the outfall pipe, mature trees should be assessed during a suitable time for their likelihood as bat roosts.
- Trees should not be felled during the bat breeding season (late May to end of August) or during hibernation (late October to late March)

4.3 Mitigation Measures – Aquatic Ecology

- Owing to the presence of important salmonid spawning habitat upstream of the confluence with the Tanyard stream, discharge of treated wastewater should be avoided at Finnow Bridge.
- A further survey to determine the importance of the River Finnow and Tanyard stream with respect to salmon, lamprey and freshwater pearl mussel species should be carried out
- Discharges to the Tanyard stream should also be avoided owing to present Q rating, which indicates a moderately polluted status.
- Temporary silt traps should be installed during excavation/construction works at the point of discharge to avoid unnecessary release of sediment/suspended solids to the water
- A setback of at least 10m from both the River Finnow and Tanyard stream must be adhered to during the construction phase
- All fuels or oils, which may be onsite during the construction phase, should be stored in bunded storage areas to avoid leakage to this drain.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

Appendix 1

- Figure 1: Map outlining overall survey area
 - Figure 2: Map outlining sections of survey area within the Blackwater River (Cork/Waterford) SAC
 - Figure 3A: Habitat Map
 - Figure 3B: Habitat Map
 - Figure 4: Map outlining the location of the 5 no. options under consideration as proposed point of discharge
-

*For inspection purposes only.
Consent of copyright owner required for any other use.*



Figure 1: Map outlining overall survey area

Survey Area ■



Figure 2: Map outlining sections of survey area within the Blackwater River (Cork/Waterford) SAC

For inspection purposes only.
Consent of copyright owner required for any other use.

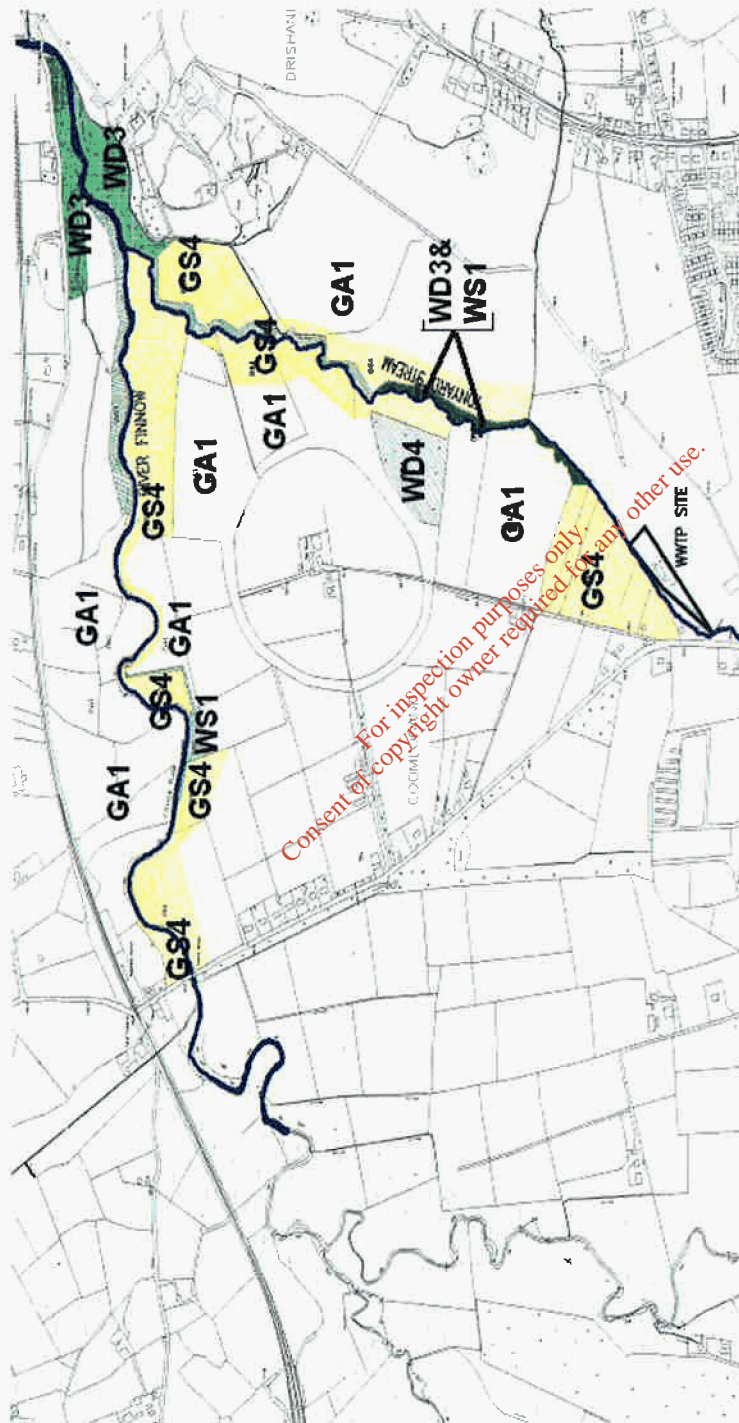


Figure 3A: Habitat Map

Scale: Not to scale – for illustration purposes only

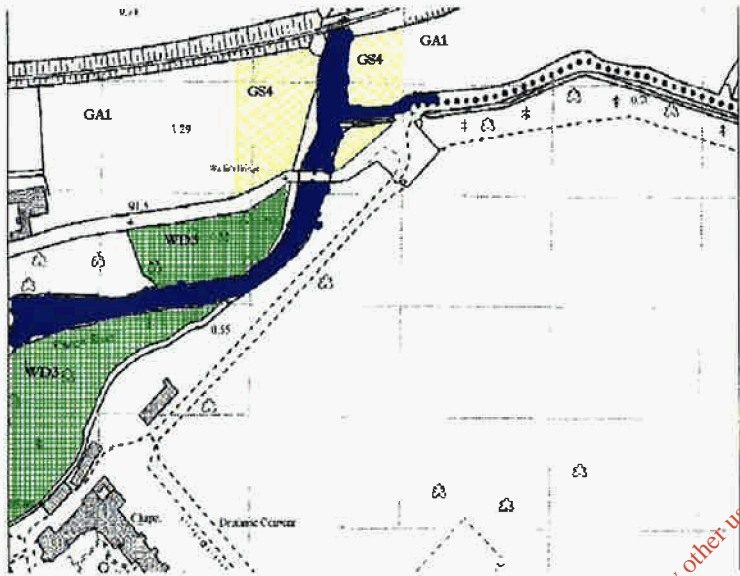


Figure 3B: Habitat Location Map

For inspection purposes only.
Consent of copyright owner required for any other use.

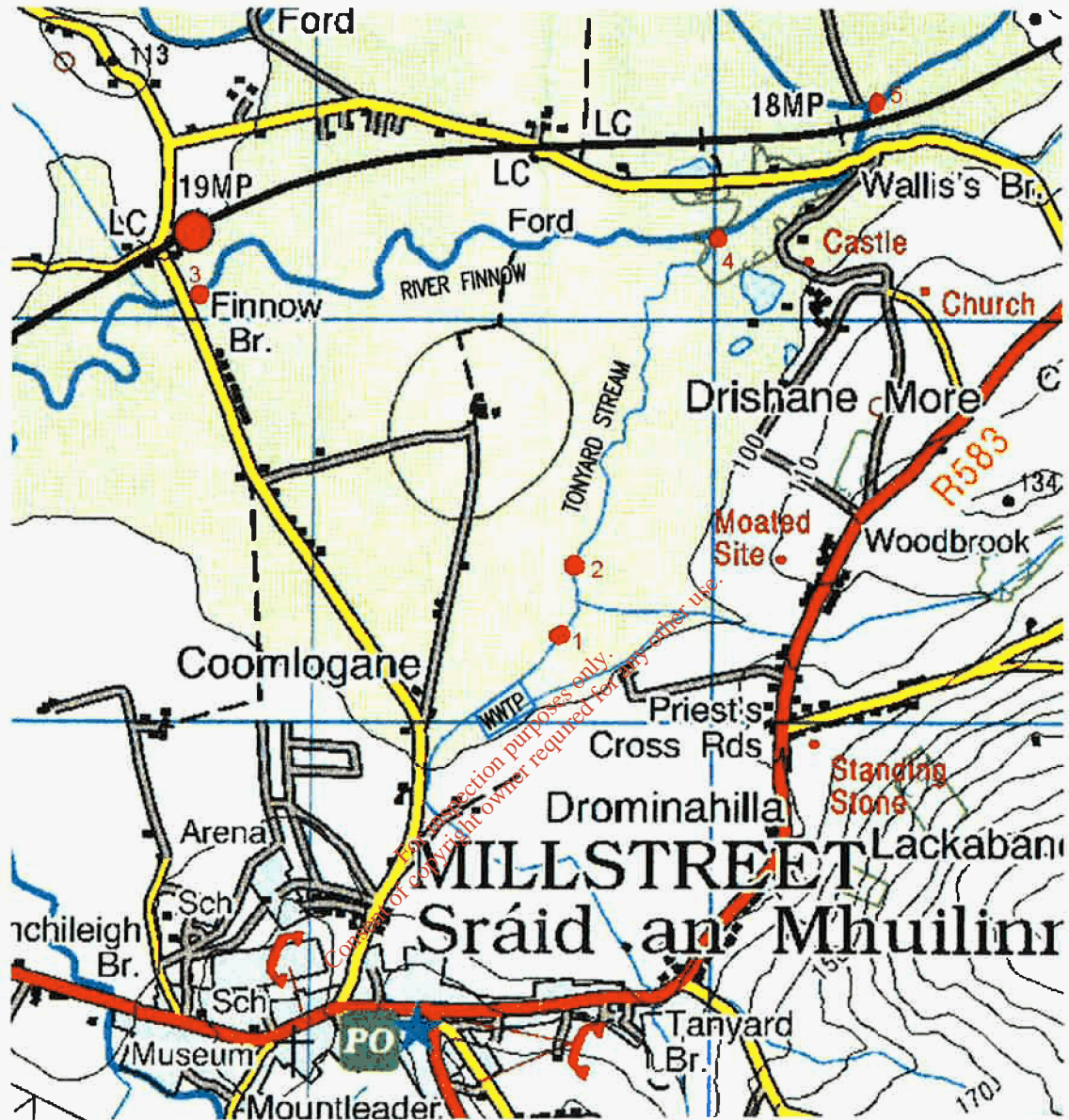


Figure 4: Map outlining the location of the 5 no. options under consideration as proposed point of discharge

Appendix II

- Plates 1 – 4: Survey area
-

*For inspection purposes only.
Consent of copyright owner required for any other use.*



Plate 1: Tanyard stream upstream from existing WWTP

For inspection purposes only
Consent of copyright owner required for any other use



Plate 2: Grassland area, which is the predominant habitat throughout the survey area

For inspection purposes only.
Consent of copyright owner required for any other use.



Plate 3: Confluence of Tanyard Stream and River Finnow

For inspection purposes only
Consent of copyright owner required for any other use



Plate 4: River Finnow – Downstream of Finnow Bridge