



N2 Monaghan to Emyvale Phase 2, 3 and 4

Ecology Report

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FAO: Oliver Mulligan, Monaghan County Council

By: Billy Flynn, Flynn, Furney Environmental Consultants



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1. Introduction

1.1 Project Background

The following report details the findings of surveys carried out by Flynn, Furney Environmental Consultants on behalf of Monaghan County Council along the route of the proposed N2 Monaghan to Emyvale realignment. These works will include widening of the existing road, involving some additional landtake and the crossing of a number of small watercourses. Surveys were carried out in April 2011 in order to describe baseline ecological conditions within the lands made available for this project and in surrounding areas. The report also advises on predicted impacts and mitigation measures. The objectives of these surveys are given below.

1.2 Objectives of Survey

The objectives of the survey may be described as follows:

- To identify and describe type, location and extent of habitats
- To provide details of species found in these habitats
- To describe potential impacts upon these habitats and species by the proposed project
- To provide detailed mitigation measures
- To provide appropriate mapping and photographic records of findings

1.3 Outline Description of Site under Survey

The study site is located in north Co. Monaghan, north of Monaghan town. It extends from the townland of Coolkill some 3km north of Monaghan town to the village of Emyvale. The route is shown in the drawings in Appendix A. The vast majority of the landuse in the area is grazing and the adjoining lands are predominantly improved agricultural grassland. The topography of the site is typical of a drumlin landscape. An important feature of the area under survey is the frequency of well-maintained hedgerow boundaries. The vast majority of the field boundaries surveyed were hawthorn-dominated hedgerows which have been subject to management in recent years. As such, the majority of hedgerows were of the type described by Foulkes (2011) as the most commonly occurring in Monaghan. Ash was the most common tree appearing in hedgerows and in treelines as well as single trees. Beech trees in treelines were also found to be common, particularly at the existing N2 roadside. Woodland is rare within the study area. Some small conifer plantations are found as well as a wooded garden. There is a single area of wet woodland at the southernmost point of the route, close to Griggy Lough. A small area of wet grassland is also found here.

1.4 Outline Description of Proposed Works

The proposed N2 Monaghan to Emyvale Road Improvement scheme proposes to improve the existing N2 Dublin – Derry National Primary Road by widening the road cross-section, easing bends and undertaking localised minor realignments of the existing road in 4 phases. Phase 1 of the N2 Monaghan to Emyvale Road Improvement Works is currently under construction. The proposed road cross section will include an 8m road width, 2 no. 3m wide verges and associated embankments for cut and fill. Sight visibility splays will also have to be kept clear of obstructions at junctions and accesses. The current work surveys the lands made available (LMA) for Phase 2, 3 and 4 of the proposed N2 Monaghan to Emyvale Road Improvements works.

Phase 2 and 4 are contiguous sections of road, which together comprise a length of approximately 5.3km extending from the townland of Coolkill to the townland of Gortmoney at the settlement of Corracrin. Phase 3 extends from Gortmoney in the settlement of Corracrin to the village of Emyvale. The survey area extends from National Grid Co-Ordinate 267773,336475 to 267695, 343790. The overall length under survey is approximately 7.35km.

1.5 Methodologies

Surveys were carried out between 6 and 25 April 2011. Habitats were identified, mapped and classified and dominant plant species noted in accordance with the guidelines given by the JNCC (2007) and the Heritage Council (2010). Habitats were classified as per Fossitt (2000). Assessment of ecological impact followed the National Roads Authority (NRA, 2004) and the Institute of Ecology and Environmental Management (IEEM, 2006). The present survey was carried out in conjunction with surveys for terrestrial mammals, bats, birds and freshwater habitats. These are reported on separately in reports that accompany this present work. Consultation was carried out with the National Parks and Wildlife Service, Inland Fisheries Ireland and the local authority. A number of databases were consulted. These included the NPWS (www.npws.ie/en/protectedsites/) and given the proximity to the border with Northern Ireland, the GIS of the Northern Ireland Environment Agency (NIEA) was also used (<http://maps.ehsni.gov.uk/NIEAProtectedAreas/>).

A number of other databases were used such as the National Biological Data Centre (e.g. for Irish National Crayfish Database), the Red Data manual (2009), the Draft Local Area Biodiversity Plan (2008-13) for Co. Monaghan and the Monaghan Wetland Survey (2007).

2. Results

2.1 Area under Survey

The area under survey is shown graphically in the drawings in Appendix A (Drawing No. N2-1-001). The survey area included any lands or watercourses or other bodies within 150m of the proposed alignment. However, this was widened (up to 500m) in some areas (e.g.) in order to follow watercourses or mammal paths. All field boundaries such as hedgerows, treelines and ditches within 150m were surveyed. Additional survey effort was given to habitats within the landtake of the proposed scheme. These are described in Section 3.1 and shown graphically in Appendix A.

2.2 Designated Sites

There are no sites designated for conservation purposes within the landtake of the proposed scheme. There are 6 no. designated sites within 5km of the scheme. The nearest of these is Emy Lough, a mesotrophic lake- which is also designated as a Wildfowl Sanctuary- located 1.15km northwest of the most northerly extent of works. These sites are listed below:

Table 1. Sites Designated for Conservation within 5km of Scheme

Site	Site Code	Status
Emy Lough	000558	pNHA*
Gaslough Lake	000559	pNHA
Monmurry Grassland	000562	pNHA
Drumreaske Lough	001602	pNHA
Wright's Wood	001612	pNHA
Mullaghmore Lake (S)	001785	pNHA

*proposed Natural Heritage Area

There are an additional five designated sites in the Republic that are within 10km of the proposed scheme. All of these are pNHAs with the exception of Slieve Beagh which a Special Protection Area for birds (hen harrier). The pNHAs are the Ulster Canal (at Aghalisk), Killyhoman Marsh, Corcreeghy Lake and Woodland and Rosefield lake and Woodland.

A further five sites in Northern Ireland are within 10km of the proposed scheme. These are all Areas of Special Scientific Interest (ASSIs) with the exception of another SPA in the Slieve Beagh area across the border. The ASSIs are: Tullybrick Lough, Kiltubbrid Loughs, Lough Na Blaney Bane and Caledon and Tynan. None of the designated sites in either jurisdiction are directly connected to the watercourses or other habitats of the scheme.

2.3 Rare, Threatened and Protected Species

There are no records of any rare, threatened or protected species within the landtake of the proposed route. Correspondence from Inland Fisheries Ireland (IFI) confirmed that the white-clawed crayfish, a species listed in Annex II of the 'Habitats' Directive (1997) is found in the catchments of the rivers Blackwater and Mountain Water. This was a target species of the freshwater survey. However, few streams with suitable habitat conditions were found. Similarly, conditions were seen to be largely unsuitable for lamprey and salmonid species. Although there are no records for these species in this area, the above catchments could well contain brook lamprey. All four of the bat species recorded during surveys are protected under Irish and EU legislation. The kingfisher is a species listed under Annex I of the EU 'Birds' Directive (1979). The species is 'amber listed' as a bird of medium conservation concern by Lynas et. (2007) and was a target species for the bird and freshwater surveys carried out. No evidence of kingfisher nesting or other activity was found during this survey.

2.4 Areas of Ecological Constraint

Areas which were noted as containing more valuable habitat or particular species were recorded for the purposes of these works as *Areas of Ecological Constraint* (AECs). That is, works in these areas should be subject to particular requirements in order to minimise impact on habitat and species here and particular mitigation measures will be recommended. There are 5 no. of these areas and these are shown on the accompanying drawings as AEC with a guide number. The AECs are listed in the table below.

Table 2. Areas of Ecological Constraint

Number	Location	Outline Description
AEC 1	Phase 2: Chainage 1+400	Wet grassland and scrub
AEC 2	Phase 2: Chainage 3+000	Scrub and mature trees with rookery
AEC 3	Phase 4: Chainage 3+050-3+330	Mature trees with rookery
AEC 4	Phase 4: Chainage 5+800	Watercourse crossing at Gortmoney. Possible lamprey habitat
AEC 5		Watercourse crossing at Hoof Bridge. Possible crayfish habitat and riparian vegetation.

The areas of ecological constraint are detailed in Section 3.2 (below).

2.5 Freshwater Habitats

The proposed route will cross 7 no. watercourses and within close proximity (<100m) of one lake. There are a number of other lakes within c.1km of the route. These are detailed in an accompanying report.

2.6 Birds

A dedicated bird survey was carried out as part of the survey work contributing to an accompanying report. 31 no. species of birds were recorded. The majority of these would be part of the typical suite of birds expected from hedgerow and agricultural grassland habitat. By far the majority of the birds recorded were of least conservation concern, being 'green-listed' species (Lynas et al., 2007). 6 'amber list' and a single 'red-list' species were recorded.

2.7 Bats

Four bat species were recorded during the survey work. These were common pipistrelle, soprano pipistrelle, Leisler's bat and Natterer's bats. All of these are listed as being of 'Favourable Status' in the Republic of Ireland. Trees with substantial growth of ivy are found within the landtake of the proposed route. These may be used by several bat species as occasional roosts. Mature trees with holes and crevices may be used as roosting sites all year-round. Some large mature trees are found within the route (e.g. at Enagh and Legacurry). Some foraging area may be lost to bats as part of the works. There are also numerous private dwellings outside the landtake which may offer roost habitat.

2.8 Terrestrial Mammals

A total of 6 no. mammal species were recorded as being active within the area under study. All of these are listed as being of 'least concern' in the Red Data manual for mammals. Of these, only two are subject to wildlife legislation. These being the badger and the Irish hare. The proposed route will not impact upon any badger setts or indeed have any significant impacts upon badger populations within the study area. The route will not have any significant impact upon the habitat or populations of the Irish hare. Other mammal species not encountered are likely to occur within the study.

2.9 Soils

There is a possibility of impact upon soils within and outside the landtake as a result of contamination during works. This may be caused by spillage or leakage of fuels, lubricants or other liquids during the construction phase. Contamination may also arise from concrete or other materials.

Impacted soils may themselves cause pollution if giving rise to elevated suspended solids concentrations to watercourses adjacent to route. This may impact negatively upon species such as white-clawed crayfish and fish species.

3. Discussion

3.1 Habitat Areas to be Impacted upon by Scheme

The following section details the habitat areas likely to be directly impacted upon by the proposed works. Refer to accompanying drawings.

a) Phase 2 - 4

Chainage 1+400 - 2+400

The alignment will cross Stream 1 (the Tirnaneil River). This will result in loss of some riparian habitat.

The alignment will result in the loss of a small area of wet grassland. Some semi-mature alders may also be lost. A small area of blackthorn and hawthorn scrub may also be lost. This is AEC1, see Section 3.2 (below). A wet ditch here will also be affected.

Stream 2 will be crossed by the alignment twice within this section, resulting in the loss of some riparian habitat.

An area of agricultural grassland (marked as 'Area A') will be lost.

2 no. good quality hedgerows of hawthorn and blackthorn (cut low) will be lost.

3 no. mature beech trees have been recently cut down in this section.

A double treeline of semi-mature lime trees (on an avenue) will be lost. A more mature ash tree with ivy will be retained.

Chainage 2+400 - 3+400

A very small area of mixed woodland including elder, cherry laurel, Lawson's cypress, ash and a single semi-mature beech will be partially affected.

4 no. mature beech are to be lost on the west side of the existing N2.
A low-cut hedgerow and treeline are to be lost on this side also.

An area of scrub with some mature trees and a rookery will be affected by the works. This is AEC2, see Section 3.2 (below).

A number of mature beech trees in two treelines containing rookeries will be affected by works. This is AEC3, see Section 3.2 (below).

Chainage 3+400 - 4+400

A length of low-cut (<1m) hawthorn and blackthorn hedgerow will be lost. A short treeline/hedgerow of semi-mature ash and hawthorn/blackthorn will be lost.

Stream 3 will be crossed here resulting in the loss of some riparian habitat.

Stream 4 will be culverted or realigned for some distance. Some riparian habitat will be lost.

Some mature conifer trees will be lost from a small plantation.

Well-maintained hawthorn-dominated hedgerow as well as some semi-mature sycamore trees will be lost from the west side of the existing alignment.

Chainage 4+400 - 5+400

A diverse mature mixed hedgerow at the front of a garden on the east of the existing N2 may be affected by works. This includes hawthorn, field maple and several non-native species. This continues along Stream 4.

A small area of scrub may be affected on this side of the alignment.

A mature ash tree with ivy will be lost here.

A willow treeline will be partially affected by works.

A small area of hawthorn and blackthorn hedgerow with semi-mature willow which is developing into scrub will be lost.

Some of a small conifer plantation with young horse chestnut will be lost.

Chainage 5+400 - 5+850

6 no. mature beech trees with ivy are to be lost (east side)

A mature Spanish chestnut tree is to be lost (west side)

Stream 6 is crossed which result in the loss of some bankside trees and riparian habitat. This is AEC 4. Refer to Section 3.2 below.

b) Phase 3Chainage 0+000 - 1+000

A very small conifer plantation will be affected by works, trees lost may also include some young ash and beech.

An ash beech treeline may be lost on the west side of the alignment.

A number of ornamental or garden trees on the western side of the N2 may be lost at Anketell Grove. These include birch, semi-mature horse chestnut, poplar, sycamore and conifers.

6 no. ash trees on the east of alignment and 3 no. beech trees on the west of alignment are to be lost

A dwelling on the east of alignment is to be demolished. This is of no potential as bat habitat.

At the front of a garden on the west of alignment a mixture of trees including horse chestnut, cherry and beech will be partially affected by the development.

A spaced treeline of ash, cherry, beech, sycamore over a tightly-cut hawthorn hedgerow will be lost.

3 no. semi-mature ash trees with ivy will be lost. A further mature ash with ivy may be retained.

A mature, though damaged cherry tree on the west of alignment may be retained.

Mature treeline over a low hawthorn hedgerow and earth bank, including beech, ash and sycamore will be lost.

Chainage 1+000 - 2+400 (end of works)

4 no. mature beech of potential bat habitat and containing a rookery will be lost.

Stream 7 will be crossed. Some riparian habitat including bankside trees will be lost. This is AEC 5 - refer to Section 3.2 (below).

A small area of scrub with rowan on the east of alignment will be lost.

A small area of scrub with some gorse and bracken on the west of alignment will be lost. There is a mixed treeline of semi-mature trees here of birch, willow and ash. There is a wet ditch here (non-flowing), which contains some reedmace.

A ruined cottage and waste ground on the east of alignment will be lost. This structure is not of value as bat habitat.

A mixed treeline of semi-mature trees (mostly ash) is to be lost. Another semi-mature treeline of ash, birch, sycamore and elder over a hawthorn and blackthorn hedgerow on the east of alignment is likely to be lost.

A mature hawthorn hedgerow (cut to 1.5m in height) is to be lost from the west of alignment .



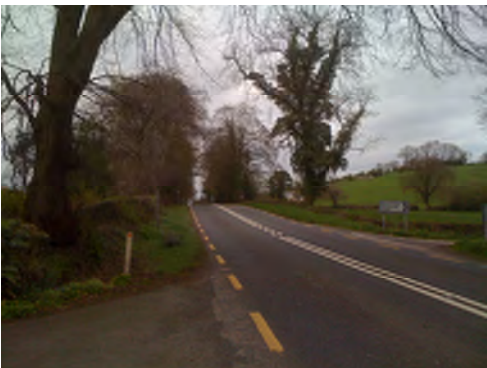
A mature ash tree with ivy is likely to be lost from this side. This is potential bat habitat.



Some ornamental (street) trees may be lost on the west of alignment on the approach to Emyvale village.

3.2 Ecological Interests and Impacts

Five areas which are to be impacted upon by the proposed works have been described as Areas of Ecological Constraint. These are described below.

Table 3. Description of AECs

<p>AEC 1</p> <p>This is a small area of wet grassland with a wet ditch. There is marsh marigold, meadow-sweet, meadow buttercup, bugle and some angelica. There is also a row of semi-mature alders. Some scrub is developing to the north of this. Wet grassland is a rare habitat in this area. Some of this will be lost. There is some wet woodland to the east of this but will not be affected by works</p>	
<p>AEC 2</p> <p>This is a small mixed plantation of pine, larch and ash. Below this, some scrub is developing which is mostly comprised of blackthorn. An adjacent hedgerow is of good diversity, having dog-rose, beech, ash, blackthorn and hawthorn. There is also a rookery in this plantation.</p>	
<p>AEC 3</p> <p>This is a double treeline of mature beech which are some of the oldest trees within the landtake for the route. There are two rookeries within this. These treelines are listed as containing trees of special amenity value in Appendix 3 of the Co. Monaghan Development Plan (2007-2013). Mature trees with potential bat habitat to be lost are to be felled and left for 24 hours to minimise potential impact on bat species.</p>	

<p>AEC 4</p> <p>This is the crossing of Stream 6. Some riparian habitat and bankside trees will be affected by works in this area. This stream may be of salmonid potential and may therefore represent habitat for brook lamprey.</p>	
<p>AEC 5</p> <p>This is the crossing of Stream 7. Some riparian habitat and bankside trees, including mature alder will be affected by works in this area. This stream has potential as white-clawed crayfish habitat.</p>	

The route crosses 7 watercourses in total. Potential impacts upon these have been described in the accompanying report: *N2 Monaghan to Emyvale Phase 2, 3 and 4: Freshwater Ecology and Bird Surveys*.

3.3 Impact Assessments

Impact assessment used for these surveys followed that of the National Roads Authority (2009) and the IEEM (2006). These provide guidance on assessing impact significance upon aspects of sites proposed for works. Assessment of ecological value of sites is given below:

Table 4. Assessment of Ecological Valuation Summary

Site Rating	Valuation
A	International Importance
B	National Importance
C	County Importance
D	Local Importance (Higher value)
E	Local Importance (Lower value)

The site evaluation scheme of these guidelines would categorise the AECs and the other freshwater sites crossed by the scheme as Rating D: *Locally Important-Higher Value*. Qualifying criteria for this categorisation are given in the table below:

Table 5. Qualifying criteria for sites of Local Importance (Higher value)

Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
Resident or regularly occurring populations (assessed to be important at the Local level)12 of the following:

- *Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive*
- *Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list.*

Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

(After NRA, 2009)

While sites of higher ecological value such as the River Blackwater and Emy Lough may be described as Rating B: *Nationally Important*, these sites are not directly connected to any of the freshwater sites crossed or affected by the proposed works. Conversely, the remaining areas to be impacted upon by the scheme may be categorised as *Rating E: Local Importance - Lower Value*.

Assessment of significance and duration of impact for these areas was derived from the NRA (2009). Criteria for assessment of used (EPA 2002), the following terms are defined when quantifying duration:

- Temporary: up to 1 year
- Short-term: from 1-7 years
- Medium-term: 7-15 years
- Long-term: 15-60 years
- Permanent: over 60 years

Assessment of likelihood of impact followed IEEM (2006) guidelines. Which assesses likelihood as follows:

- Almost Certain: probability estimated at greater than 95%
- Probable / Likely: probability estimated between 50% and 95%
- Unlikely: probability estimated between 5% and 50%
- Extremely Unlikely: probability estimated at less than 5%

Assessment of significance and duration of impacts on any D Rated sites are given in the table below.

Table 6. Assessment of Impacts

Site	Rating	Likelihood of Impact	Significance of Impact	Duration of Impact
AEC 1	D	Almost certain	Minor	Short-term
AEC 2	D	Almost certain	Moderate	Long-term
AEC 3	D	Almost certain	Moderate	Long-term
AEC 4	D	Almost certain	Minor	Short-term
AEC 5	D	Almost certain	Minor	Short-term
Tirnaneil River	D	Almost certain	Minor	Temporary
Griggy Lough	D	Unlikely	Minor	Temporary

Specific measures to mitigate against the significance of these impacts are given in the following section (4.2 - 4.3). Mitigation measures outside these areas are given in sections 4.3 -4.7.

4. Mitigation Measures

4.1 Rare, Threatened and Protected Species

No rare or threatened species of plant or mammal were found during surveys. All bird species recorded are subject to legislation. Mitigation measures for bird species are given in Section 4.4, for bat species in 4.5 and for protected mammal species in 4.6 (below)

4.2 Areas of Ecological Constraint

Mitigation measures specific to the areas of ecological constraint are given below.

Table 7. Mitigation measures for AECs

AEC No.	Conservation Interest	Mitigation Measures
1	Wet grassland and scrub	<ol style="list-style-type: none"> 1. Clearance area to be minimised 2. No works to take place in adjacent woodland 3. Soil to be salvaged for reinstatement 4. Clearance to take place outside of bird nesting season
2	Mature trees and scrub and rookery	<ol style="list-style-type: none"> 1. Tree-felling to take place outside of bird nesting season 2. Clearance of scrub to be minimised 3. Native species to be used for reinstatement
3	Mature treelines and rookeries	<ol style="list-style-type: none"> 1. Tree-felling to take place outside of bird nesting season 2. Number of trees to be felled to be minimised 3. Specific surveys for roots of mature trees to be carried out before works to minimise residual impact on trees to be retained 4. Native species to be used for reinstatement of trees
4	Stream: riparian habitat and salmonid potential	<ol style="list-style-type: none"> 1. Site to be surveyed for lamprey prior to works 2. Clearance area to be minimised
5	Stream: riparian habitat and potential crayfish habitat	<ol style="list-style-type: none"> 1. Site to be surveyed for white-clawed crayfish prior to works 2. Number of riparian trees felled to be minimised

4.3 Freshwater Habitats

Detailed mitigation measures for freshwater habitats are given in an accompanying report. These are summarised below.

- Works must follow best practice guidelines by the National Roads Authority (2006) for national road schemes crossing watercourses should be followed. These give specific directions with regard to works and design. In particular, culvert design specifications should be followed.
- The guidelines by the Eastern Regional Fisheries Board (2005) should also be used for planning of works and culvert and fish passage design.
- Consultation with Inland Fisheries Ireland (IFI) should be held on the design of any watercourse crossings.
- Culvert planning and design must be agreed with IFI prior to site works.
- Natural materials should be used in reinstatement of stream sections.
- An environmental operating plan should be drawn up for the site in accordance with guidelines given by the NRA (2009).
- Good site practice methodologies should be essential when working in proximity to watercourses. The guidelines given by CIRIA (Murnane et al., 2006) should be followed.
- A water quality monitoring programme should be set up prior to commencement of works.
- Surveys for protected species must be undertaken at Streams 6 and 7 as described above.

4.4 Birds

Detailed mitigation measures for bird habitats are given in an accompanying report. These are summarised below.

- Tree-felling and scrub clearance works should take place outside of the bird nesting season. Any works taking place within this should be appropriately supervised.

- Tree-felling and clearance should be minimised in extent and selective pruning / cutting carried out in preference to clearance.
- Machinery noise is to be limited.
- Native species are to be used for habitat reinstatement and landscape planting

4.5 Bats

Detailed mitigation measures for bats are given in an accompanying report. These are summarised below.

- The removal of trees, hedgerows, and treelines is to be limited where possible. The delineation of a buffer zone in areas of woody vegetation should be carried out.
- Where treelines or hedgerows must be removed, plants should be salvaged where possible for use in landscape planting. Any mature trees should be removed between September and November.
- Large mature trees showing potential for bat habitat should be removed under specialist supervision. These should be felled as per expert advice.
- Buildings identified as being of potential bat habitat should be protected during works.
- All works activity, including lighting systems should take account of bat activity.
- Compensatory bat habitat may be provided by means of bat boxes or tubes.
- Monitoring of the construction phase to ensure the success of these mitigation measures is recommended.

4.6 Terrestrial Mammals

Detailed mitigation measures for terrestrial mammals are given in an accompanying report. These are summarised below.

- The landtake of the scheme, in particular in areas of scrub or hedgerow, is to be limited.
- Alignment fencing is to be placed between the new alignment and any watercourses in order to allow access to these.
- Habitat reinstatement and landscape planting should use native species and be used to direct mammals toward culverts.

4.7 Soils

The potential impacts upon soils arising from construction of the proposed route may be mitigated against in a number of ways. The instigation of good site management and works practices will ensure that most of these are carried out on a routine basis. The implementation of an environmental operating plan will also assist in protecting soils. Specific recommendations to protect soils are given below:

- No works are to be carried out during times of heavy rainfall or flooding or at any other time when the stability or integrity of soil may be threatened.
- A buffer zone is to be maintained between stockpiled materials and any watercourses.
- Bunds are to be used to protect watercourses from sedimentation and possible ingress of solids
- Designated areas for concrete mixing, pouring and refuelling are to be maintained. These are to be positioned so that no extensive areas of ground or any watercourses may be impacted upon during works.
- Extent of works is to be limited within areas where soils are vulnerable such as wetland, wet grassland or on watercourse banks.

4.8 Other Mitigation Measures

Specific mitigation measures recommended for areas outside the AECs and watercourses are as follows (refer to drawings in Appendix A):

a) Phase 2 - 4

Chainage 1+400 - 2+400

Tree and other riparian habitat clearance at Stream 1 (the Tirnaneil River) is to be limited. Vegetation is to be replaced with native species.

Vegetation on the realigned Stream 2 is to be replaced with native species.

A mature ash tree with ivy at end of section will be retained.

Chainage 2+400 - 3+400

Mature trees with ivy to be lost are to be felled and left for 24 hours to minimise potential harm to bat species.

Trees at church to be retained where possible.

Hedgerows to be replaced with native species (hawthorn and blackthorn).

Chainage 3+400 - 4+400

Hedgerows and treelines are to be replaced with native species (hawthorn and blackthorn).

Riparian habitat at Streams 3 and 4 is to be retained where possible.

Number of mature conifer trees lost from plantation is to be minimised.

Chainage 4+400 - 5+400

Mature hedgerow loss is to be minimised

Number of trees to be lost from willow treeline is to be minimised.

Chainage 5+400 - 5+850

Hedgerows and treelines are to be replaced with native species (hawthorn and blackthorn).

b) Phase 3

Chainage 0+000 - 1+000

Trees at Anketell Grove are to be retained where possible. Care should be taken to avoid damage to roots of trees retained.

Mature trees with ivy to be lost are to be felled and left for 24 hours to minimise potential harm to bat species.

A mature cherry tree on the west of alignment should be retained if possible.

Hedgerows and treelines are to be replaced with native species such as ash, hawthorn and blackthorn.

Chainage 1+000 - 2+400 (end of works)

Mature trees with ivy to be lost are to be felled and left for 24 hours to minimise potential harm to bat species.

Area of scrub to be cleared is to be minimised.

Hedgerows and treelines are to be replaced with native species such as ash, hawthorn and blackthorn.

Ornamental trees are to be retained where possible

5. Conclusion and Recommendations

The main conclusions of this report may be summarised as follows:

- No designated areas for conservation lie within or will be affected by the proposed route.
- Areas to be affected by the route have been assessed as being of *Local Importance*. Of these, 5 no. areas as well as 5 no. watercourses were assessed as being of *Local Importance: higher value* (Rating D). The remaining habitats to be affected by the route may be described as being *Local Importance: lower level* (Rating E).
- No rare, threatened or protected plant or terrestrial mammal species will be significantly impacted upon by the proposed works.
- *Minor negative* impacts of permanent duration to bird populations arising from loss of habitat (mature trees and hedgerow) is predicted.
- *Moderate negative* impacts on commuting bats is predicted arising from loss of habitat such as treelines and hedgerows and feeding areas. However, these may be reduced to minor negative if remaining linear features are reconnected within the landscape.
- *Minor negative* impacts to freshwater habitats of temporary duration arising from habitat loss is predicted.

The main recommendations of this report may be summarised as follows:

- Loss of habitat, particularly riparian and mature woody vegetation is to be minimised. Habitat is to be replaced 'like-for-like' and soil salvage is to be incorporated into compensation habitat where possible.
- Impacts on bird population may be mitigated by correct timing of works, supervision of clearance in sensitive areas and replacement of lost habitat with native species.
- Impacts on bat populations may be mitigated by correct timing of works, limiting clearance areas, compensatory and replacement habitat provision, observance of good practice in any lighting schemes and during works.
- Pre-construction surveys as described above
- Consultation with relevant bodies, in particular Inland Fisheries Ireland and the National Parks and Wildlife Service, should be held prior to works.

- Best practice works operations and good site practice adhering to recognised standards are to be carried out in agreement with relevant personnel.

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Web Resources

National Biodiversity Data Centre www.nbdc.ie

National Parks and Wildlife Service www.npws.ie/en/protectedsites/

Northern Ireland Environment Agency (NIEA) <http://maps.ehsni.gov.uk/NIEAProtectedAreas/>

Appendix A: Ecology Drawings

Ecology Drawing Nos. N2-1-01
 N2-1-02
 N2-1-03
 N2-1-04



Morrighan County Council
Comhairle Contae Mhúineacháin

Client:

General Notes / Legend

- BC1 Arable Crops
- FL4 Mesotrophic Lakes
- FL5 Eutrophic Lakes
- FW1 Endorhithmic Rivers
- FW2 Depositing Lowland Rivers
- GA1 Grassland
- GS4 Wet Grassland
- WD1 Mixed Broadleaved Woodland
- WD4 Corridor Plantation
- WL1 Hedgerows
- WL2 Treelines
- WNB Wet Woodland
- WS1 Scrub
- AEC Area of Ecological Constraint
- 50m Offset

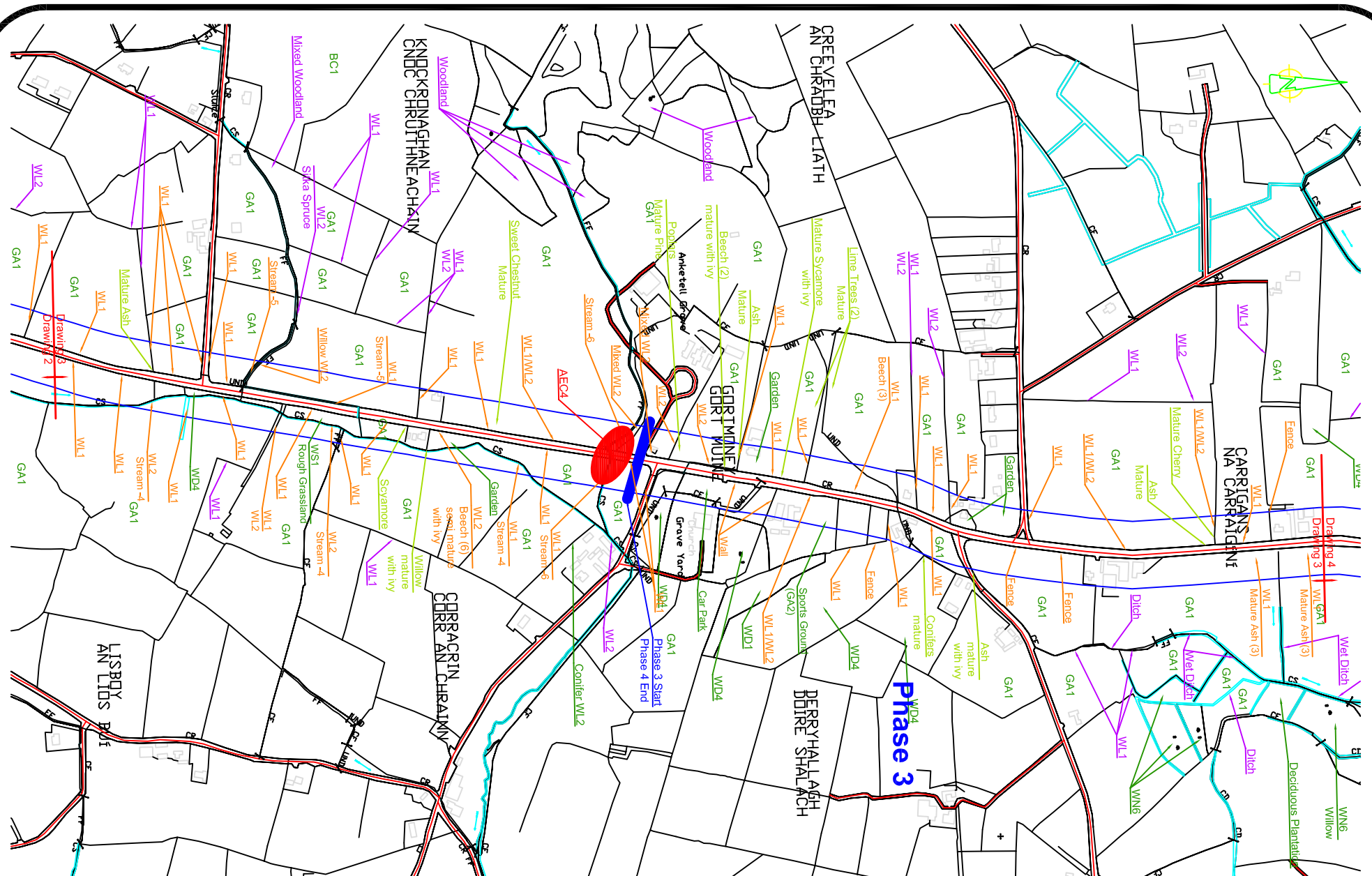
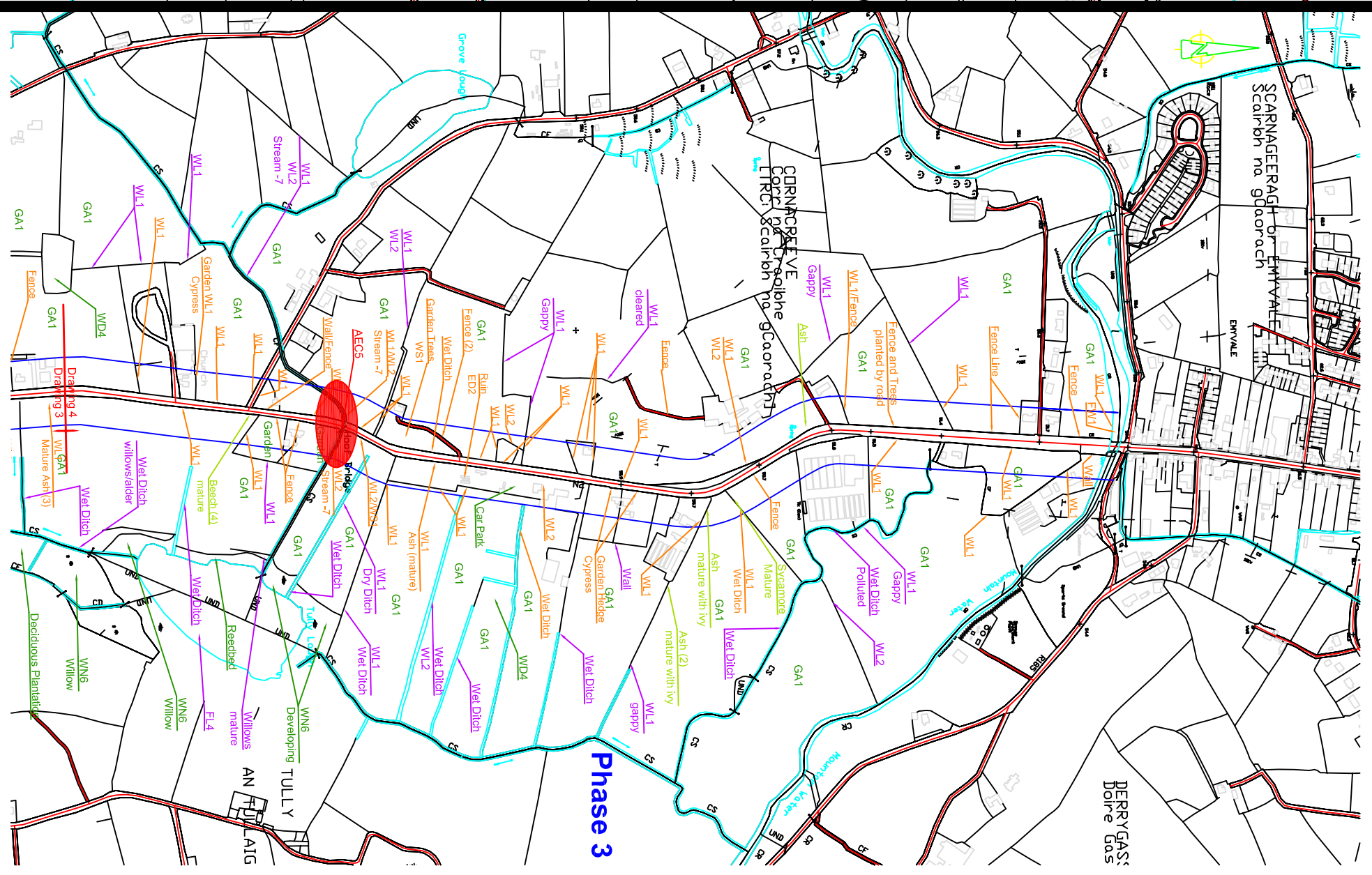
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Consultants Ltd
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Project Name and Address
N2 Redignment
Phase 2, 4 and 3
ECOLOGY DRAWINGS

ECOLOGY

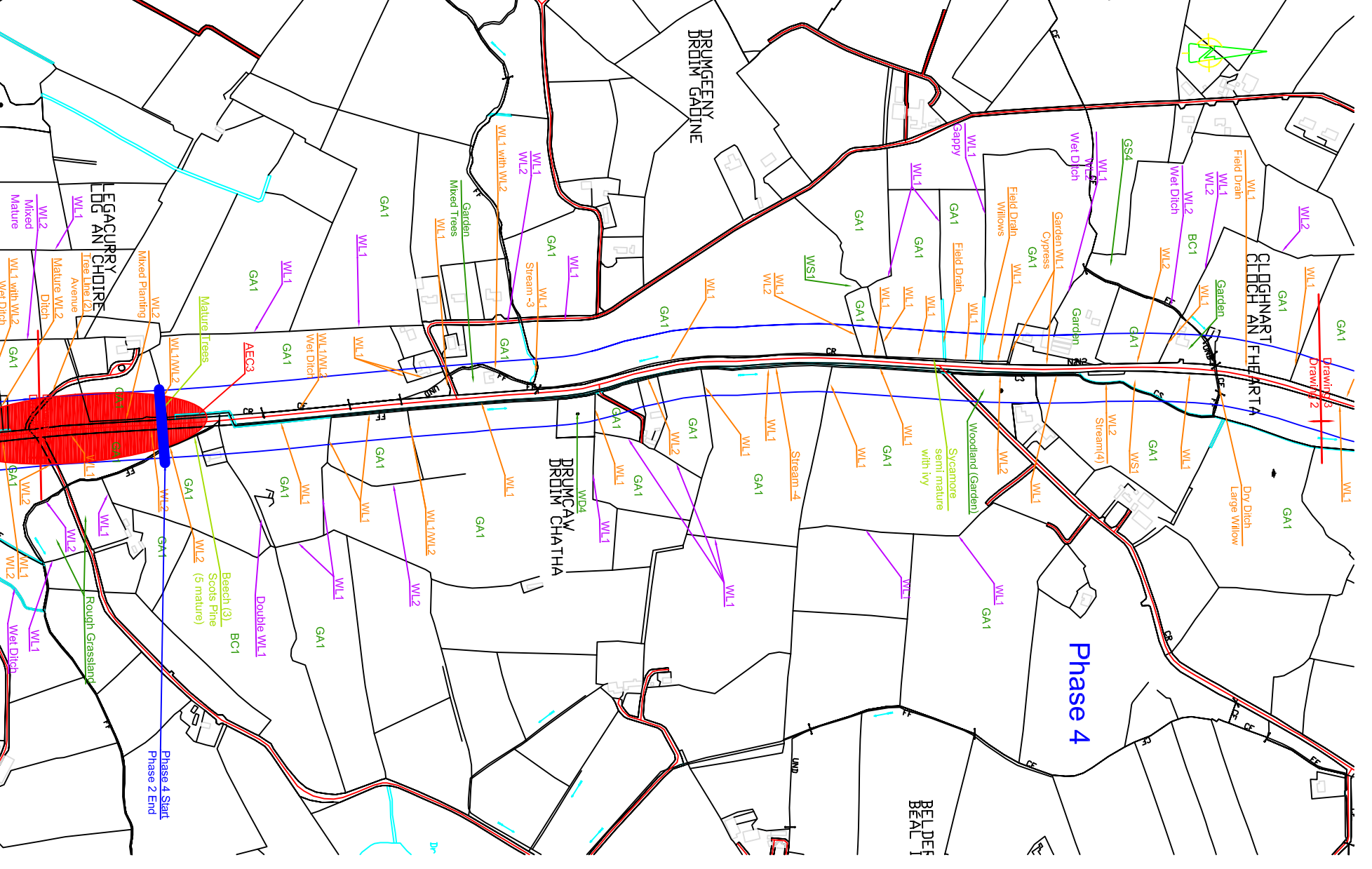
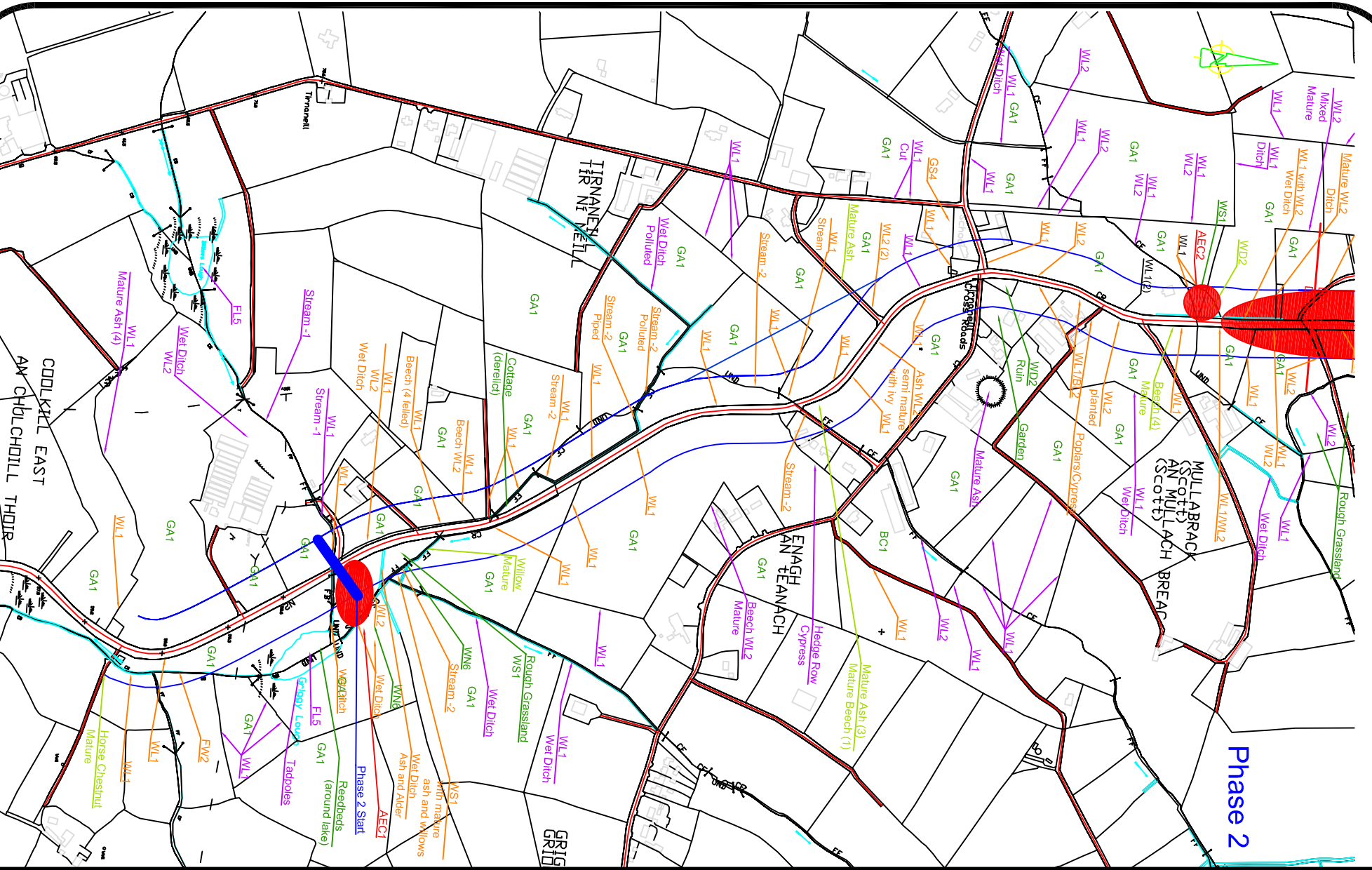
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No.	Rev. A	29.4.11
Revision/Issue		Date

Project	N2	Sheet No.	
Date	29.04.2011		02/02
Approx. Scale	1:4000		in A1



Drawing - C

Drawing - D



Drawing - A

Drawing - B

Client:

Monaghan County Council
Cornmáire Corrae Mhuirneacháin

General Notes / Legend

- BC1 Arable Crops
- FL4 Mesotrophic Lakes
- FL5 Eutrophic Lakes
- FW1 Eroding/Upland Rivers
- FW2 Depositing/Lowland Rivers
- GA1 Grassland
- GSA Wet Grassland
- WD1 Mixed Broadleaved Woodland
- WD4 Conifer Plantation
- WL1 Hedgerows
- WL2 Treelines
- WNV Wet Woodland
- WS1 Scrub
- AEC Area of Ecological Constraint
- 50m Offset

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Project Name and Address
N2 Reclamation Phase 2,4 and 3 Ecology Drawings

Ecology

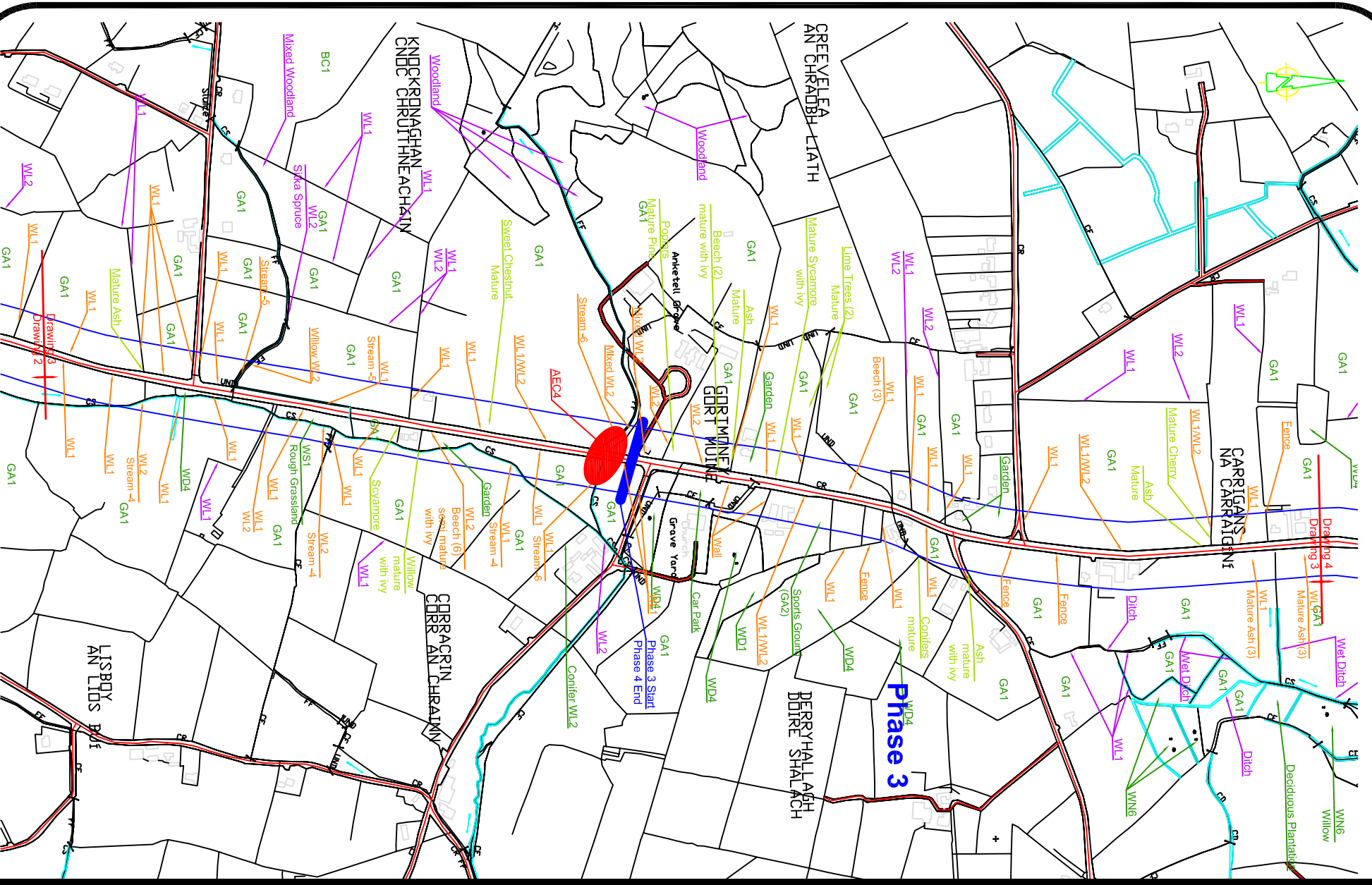
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No.	Revision/Issue	Date
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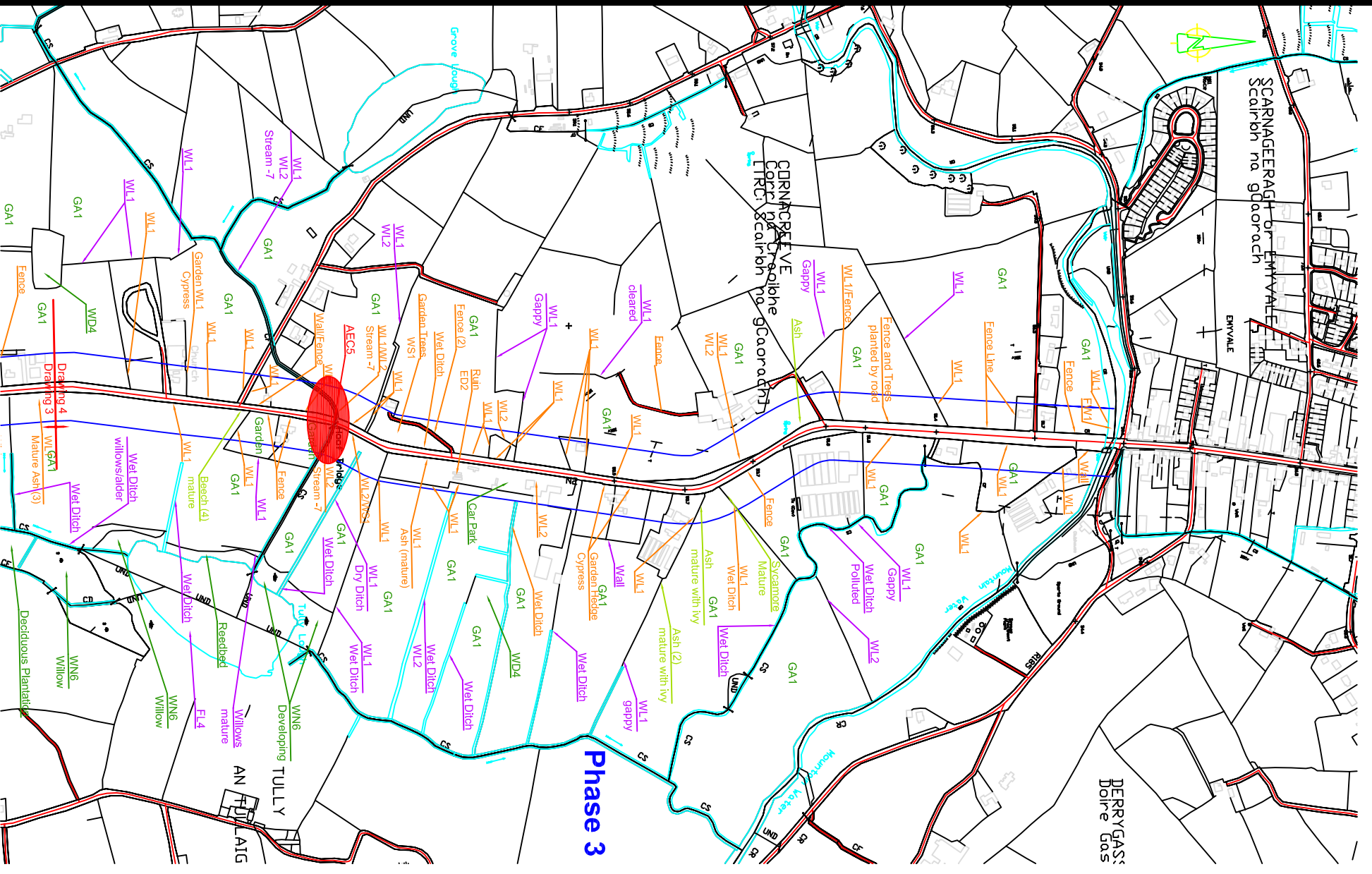
Project N2 **Sheet No.** 03/04

Date 29.04.2011

Approx Scale 1:4000 in A1



Drawing - C



Drawing - D



Client:
 Monaghan County Council
 Comhairle Contae Mhúnaigh

General Notes / Legend

BC1	Arable Crops
FL4	Mesotrophic Lakes
FL5	Eutrophic Lakes
FW1	Endorhizic Rivers
FW2	Depositing Lowland Rivers
GA1	Grassland
GS4	Wet Grassland
WD1	Mixed Broadleaved Woodland
WD4	Corker Plantation
WL1	Hedgerows
WL2	Treelines
WNB	Wet Woodland
WS1	Scrub
AEC	Area of Ecological Constraint
—	Som Offset

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Project Name and Address
 N2 Redignment
 Phase 2, 4 and 3
 Ecology Drawings

Ecology

Drawing No.	N2-1-04
No.	1
Revision/Issue	Final Issue
Date	29.4.11

Project	N2	Sheet No.	04/04
Date	29.04.2011	Scale	1:4000 in A1

Appendix B: Species Names

1. Plant Species

Name	Common Name
<i>Acer pseudoplatanus</i>	Sycamore
<i>Aesculus hippocastanum</i>	Horse chestnut
<i>Alnus glutinosa</i>	Alder
<i>Angelica sylvestris</i>	Angelica
<i>Betula pendula</i>	Silver birch
<i>Caltha palustris</i>	Marsh marigold
<i>Castanea sativa</i>	Spanish Chestnut
<i>Chamaecyparis lawsoniana</i>	Lawson's cypress
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved golden saxifrage
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Fagus sylvatica</i>	Beech
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Fraxinus excelsior</i>	Ash
<i>Hedera helix</i>	Ivy
<i>Ilex aquifolium</i>	Holly
<i>Ligustrum vulgare</i>	Privet
<i>Populus tremula</i>	Aspen
<i>Prunus sp.</i>	Cherry
<i>Prunus spinosa</i>	Blackthorn
<i>Ranunculus acris</i>	Meadow buttercup
<i>Ribes sanguineum</i>	Flowering currant
<i>Rosa canina</i>	Dog rose
<i>Rubus fruticosus</i>	Bramble
<i>Salix spp.</i>	Willow
<i>Sambuccus nigra</i>	Elder
<i>Sorbus aucuparia</i>	Rowan
<i>Sorbus aucuparia</i>	Rowan
<i>Symphoricarpos alba</i>	Snowberry
<i>Taraxacum sp</i>	Dandelion
<i>Tilia sp.</i>	Lime
<i>Urtica dioica</i>	Nettle

2. Avifauna

Scientific name	Common name
<i>Alcedo atthis</i>	Kingfisher
<i>Corvus frugilegus</i>	Rook
<i>Vanellus vanellus</i>	Lapwing (green plover)

3. Mammal Species

Scientific name	Common name
<i>Lutra lutra</i>	Otter
<i>Meles meles</i>	Badger
<i>Lepus timidus hibernicus</i>	Irish hare

4. Other Species

Scientific name	Common name
<i>Austropotamobius pallipes</i>	White-clawed crayfish
<i>Lampetra fluviatilis</i>	River lamprey
<i>Lampetra planeri</i>	Brook lamprey
<i>Limnephilidae</i>	A caddis fly family
<i>Petromyzon marinus</i>	Sea lamprey
<i>Rana temporaria</i>	Common frog