

SECTION 4 : FLORA AND FAUNA

4.1 INTRODUCTION

The proposed remediation of unauthorised landfills involves four sites within the large sand and gravel quarry (Doran's Pit) which lies just north-west of Blessington town. Three of these are deposits of buried waste incorporated in partly reclaimed areas, the fourth an un-worked deposit adjacent to a former quarry, where it is intended to establish a landfill to dispose of this material permanently.

The purpose of this section of the report is to describe and evaluate the likely effects of the development that are significant in terms of the local ecology.

The area was visited in August and September 2003 when the habitats and flora were examined by means of a Phase I Habitat Survey (JNCC 1990) but using the habitat classification of the Heritage Council publication (Fossitt 2000). A follow-up visit was undertaken on 13 February 2004. Consultations were held with Mike Wyse-Jackson of the Research Section, National Parks and Wildlife Service at the Department of the Environment.

4.2 EXISTING ENVIRONMENT

Sand and gravel extraction has been going on for many years in the immediate vicinity of the application site so that the habitats are largely secondary, having developed on modified ground. The three unauthorised landfill sites (Areas 1, 4 and 6) have been partly re-excavated for investigation purposes and thus constitute recolonising bare ground (habitat designation ED3 in Fossitt, 2000). The proposed site for the engineered landfill is partly disturbed ground also but there is also some exposed sand and gravel (ED1), dry grassland (GS1) and a scrub (WS1) of open coniferous trees.

4.2.1 Flora

Area 1

This is the largest area of fill and the surface consists of both relatively intact vegetation and disturbed ground which has been excavated recently. The former contains open grassland of false oat *Arrhenatherum elatius*, creeping bent *Agrostis stolonifera* and cocksfoot *Dactylis glomerata* with a few rushes *Juncus effusus*, *J. inflexus* and broad-leaved plants, for example coltsfoot *Tussilago farfara*, thistles *Cirsium vulgare*, *C. arvense*, yarrow *Achillea millefolium*, cinquefoil *Potentilla reptans* and docks *Rumex obtusifolius*, *R. crispus*.

Where the surface has been disturbed by trackways or digging a wider range of species occurs, including some weeds of tillage. There are for example:

| | |
|----------------------------------|--------------------|
| <i>Ranunculus repens</i> | creeping buttercup |
| <i>Senecio jacobaea</i> | ragwort |
| <i>S. vulgaris</i> | groundsel |
| <i>Urtica dioica</i> | nettle |
| <i>Brassica rapa</i> | wild turnip |
| <i>Tripleurospermum inodorum</i> | scentless mayweed |
| <i>Prunella vulgaris</i> | self-heal |
| <i>Veronica persica</i> | field speedwell |
| <i>Leontodon saxatilis</i> | lesser hawkbit |
| <i>Persicaria maculosa</i> | redshank |
| <i>Polygonum aviculare</i> | knotgrass |
| <i>Leucathemum vulgare</i> | dog daisy |
| <i>Arenaria serpyllifolia</i> | sandwort |
| <i>Trifolium dubium</i> | yellow trefoil |

The ground falls to the north where there is an adjacent pond of quite recent origin. A few large colonies of sweet grass *Glyceria notata* grow around this (Plate 4.1) with scattered plants of pondweed *Potamogeton natans* and *P. berchtoldii* in deeper water. The base and margins includes a large proportion of bare sand but there are some other plants around the edges, e.g.

| | |
|------------------------------|-------------------------|
| <i>Juncus inflexus</i> | hard rush |
| <i>Elytrigia repens</i> | scutch |
| <i>Equisetum arvense</i> | field horsetail |
| <i>E.fluviatile</i> | water horsetail |
| <i>Eleocharis palustris</i> | spike rush |
| <i>Typha latifolia</i> | bulrush |
| <i>Gnaphalium uliginosum</i> | cudweed |
| <i>Ranunculus sceleratus</i> | celery-leaved buttercup |
| <i>Roripa palustris</i> | yellowcress |

Area 4

This site is in the interior of the pit and is of newly planted grassland grazed by sheep. It is bordered by an access road into the active quarry and adjoins further pastures. Where undisturbed the ground is covered by ryegrass *Lolium perenne* with some moss *Brachythecium rutabulum* as well as:

| | |
|----------------------------|--------------------|
| <i>Trifolium repens</i> | white clover |
| <i>Poa annua</i> | annual meadowgrass |
| <i>Medicago lupulina</i> | black medick |
| <i>Tussilago farfara</i> | coltsfoot |
| <i>Cynosurus cristatus</i> | crested dogstail |
| <i>Agrostis capillaris</i> | common bent |
| <i>Linum catharticum</i> | fairy flax |
| <i>Festuca rubra</i> | red fescue |

A small seepage area occurs on the NW side with some soft rush *Juncus effusus* and creeping bent *Agrostis stolonifera*.

The excavations have introduced typical ruderal (weed) species such as occur in the other areas though in this case they are closely grazed.

A large pond occurs immediately north of this area carries the typical species of pondweed *Potamogeton berchtoldii* and *P.natans* though in small quantity (Plate 4.2). The edges are damp and support an open cover of willowherbs *Epilobium brunnescens*, *E.parviflorum*, field horsetail *Equisetum arvense*, jointed rush *Juncus articulatus* and the moss *Bryum bicolor*.

Area 6

Area 6 is again a grassed site sown with a seed mix of ryegrass *Lolium perenne* and white clover *Trifolium repens*. The surface layers contain silt from the settling ponds and this has the effect of holding water and allowing species of damp surroundings to grow such as autumn hawkbit *Leontodon autumnalis*, creeping bent *Agrostis stolonifera* and, along the south-west side, hairy sedge *Carex hirta*.

The disturbed part has similar vegetation to that described above though with more white goosefoot *Chenopodium album* and hedge mustard *Sisymbrium officinale* noticeable.

A small pond occurs near the northern end of the site though a ramp of stones (hardstanding) has recently been placed to allow water tankers to fill (Plate 4.3). In contrast to the other waterbodies it is a mature system with a fringe of bulrush *Typha latifolia*, spike rush *Eleocharis palustris*, bottle sedge *Carex rostrata*, amphibious bistort *Persicaria amphibia* and floating sweet grass *Glyceria fluitans*. Broad-leaved pondweed *Potamogeton natans* is the major floating plant while the edges are marked with a willow *Salix cinerea* and some hawthorn bushes *Crataegus monogyna*.

Engineered Landfill

The proposed engineered landfill is situated immediately south of Area 1 and extends over a former sand and gravel pit that was abandoned many years ago. A high ridge remains close to the western side (Plate 4.4) but the land beyond drops away in a cliff to lower, undulating ground on which coniferous trees are planted (Plate 4.5).

The vegetation on the higher ground is closed and there is little bare soil visible. Grassland with some gorse *Ulex europaeus* prevails and there are some planted pines and spruce. The dominant grasses are red fescue *Festuca rubra*, sweet vernal grass *Anthoxanthum odoratum* and false oat *Arrhenatherum elatius* and there are a number of leguminous species in this, i.e. birdsfoot trefoil *Lotus corniculatus*, red clover *Trifolium pratense*, meadow vetchling *Lathyrus pratensis* and bush vetch *Vicia sepium*. The species content is not so high as it is on the lower ground though the abundance of lady's mantle *Alchemilla filicaulis* at one point is notable.

The lower ground is stony and the soil development needed for permanent vegetation patchy. The resulting grassland is thin but species-rich with many plants characteristic of heathland or eskers. It tends naturally to become a scrub of gorse *Ulex europaeus*, *U.gallii* and butterfly bush *Buddleja davidii* but it has also been planted widely with conifers (spruce, pine and larch). These grow with little vigour and not all have survived. As well as the poor soil conditions they are subject to intense grazing by rabbits and goats.

The grasses in this cover consist of the same species as above with Yorkshire fog *Holcus lanatus* in damper places. The sedges *Carex panicea* and *C.flacca* also occur. Broad-leaved species are augmented by the following

| | |
|----------------------------------|------------------------|
| <i>Linum catharticum</i> | fairy flax |
| <i>Trifolium repens</i> | white clover |
| <i>Vicia angustifolia</i> | narrow-leaved vetch |
| <i>Potentilla reptans</i> | cinquefoil |
| <i>Chamerion angustifolium</i> | rose-bay |
| <i>Leontodon saxatilis</i> | lesser hawkbit |
| <i>Euphrasia arctica</i> | eyebright |
| <i>Achillea millefolium</i> | yarrow |
| <i>Veronica chamaedrys</i> | germander speedwell |
| <i>V.officinalis</i> | heath speedwell |
| <i>Teucrium scorodonia</i> | wood sage |
| <i>Pilosella officinalis</i> | mouse-eared hawkweed |
| <i>Fragaria vesca</i> | wild strawberry |
| <i>Trifolium dubium</i> | yellow trefoil |
| <i>Hypericum pulchrum</i> | shining St John's wort |
| <i>Pimpinella saxifraga</i> | burnet saxifrage |
| <i>Dactylorhiza fuchsii</i> | spotted orchid |
| <i>Anacamptis pyramidalis</i> | pyramidal orchid |
| <i>Rhytiadelphus squarrosus</i> | a moss |
| <i>Peltigera cf lactucifolia</i> | dog lichen |

A few depressions occur but they do not contain standing water for any length of time and are characterised by damp grassland with species such as silverweed *Potentilla anserina*, field horsetail *Equisetum arvense* and the moss *Calliergon cuspidatum*. A little autumn gentian *Gentianella amarella* occurs in one such depression near the SW corner (Plate 4.6).

The crest of the former sand and gravel pit is marked by a few brambles and *Buddleja* but also by lady's bedstraw *Galium verum* and glaucous sedge *Carex flacca*. The sandy face supports colonies of the liverwort *Reboulia hemisphaerica* and the loose material below, many plants of hogweed *Heracleum sphondylium*.

A feature of the open, slightly stony areas beyond the western section of the proposed landfill (Plate 4.7) is blue fleabane *Erigeron acer* (Plate 4.8) which grows with wood sage *Teucrium scorodonia*, carline thistle *Carlina vulgaris*, dwarf bracken *Pteridium aquilinum*, catsear *Hypochoeris radicata* and centaury *Centaurium erythraea* (white form). As a species it survives extended periods of drought and was flowering well in late summer 2003. Its status is discussed in the evaluation section below.

4.2.2 Fauna

The unauthorised landfill sites (Areas 1,4 and 6) are open and offer no cover for mammals and support few, if any, species. They are probably all visited by feral goats at times and some are also grazed by sheep. In contrast the proposed new site supports a high population of rabbits with the likelihood also of pygmy shrew. Stoats would be expected to feed in it regularly and there was also evidence of foxes.

The only bird species regularly found on the open areas was meadow pipit but it is unlikely to breed there because of a lack of cover. Pied wagtail and linnet were noted in flight and could also feed there at times. The old quarry area supports additional species characteristic of scrub and trees. Stonechat and linnet were noticeable as well as coal tit and there are likely to be willow warbler during the breeding season.

The National Parks and Wildlife Service of the Department of the Environment record peregrines nested in Doran's Pit close to Area 4 in 2002.

The pond near Area 6 provides feeding and a possible nesting site for moorhen. One bird was seen. Butterflies were frequent due to good weather during the visits but the old quarry was the only site with potential breeding species - common blue, small copper and six-spot burnet. Small tortoiseshell and the migratory painted lady and clouded yellow were also seen more widely.

Only the pond beside Area 6 appears to hold dragonflies and the common darter *Sympetrum striolatum* was seen here. The other ponds may have been too immature to have sufficient food though the blue-tailed damselfly *Ischnura elegans* would be expected to occur. Its main flight period is spring and summer.

A small stream flows south of Area 6 and its macrofauna has been investigated separately (see Section 6 of this report).

4.2.3 Evaluation

The only habitat of significant value is the former sand and gravel pit adjacent to the new engineered landfill. The other sites are typical of newly restored and/or disturbed ground and have no species of interest. Although ponds occur relatively near to each of them these do not have special features as far as is known. The smallest (at Area 6) is the best developed (though modern in origin) but it resembles many others in such situations and has very local interest.

The abandoned sand and gravel pit is of more significant value because of its lack of disturbance and available substrates. Abandoned quarries of all sorts develop interesting vegetation where they have not been restored with topsoil as the nutrient-poor conditions promote diverse vegetation with its share of associated invertebrates. In this case two scarce species have become established - *Gentianella amarella* and *Erigeron acer*.

The former occurs in few sites in eastern Ireland (Preston *et al.*, 2002) and has disappeared from many lowland areas. It was recorded as near Red Lane, Blessington by Brunker (1950). *Erigeron* is nationally scarcer and is included in the Red Data Book (Curtis and McGough, 1988) where it is described as rare and local but probably under-recorded. As an illustration of this it was noted as extant in seventeen 10km squares by the atlas of 1982 (Perring & Walters 1982) but in 38 by the more recent one of 2000 (Preston *et al.* 2002) Its distribution is concentrated in the SE quarter of the country and it was previously noted at Poulaphuca Gorge (Brunker 1950).

In the present site it is common and there are of the order of 500 plants. It grows mainly in the open area west of and beyond the proposed landfill but also extends through the conifers where there are spaces. Other apparently suitable ground, from which it is absent, occurs to the south-east. This illustrates that rare plants have a narrow tolerance and require particular conditions for growth - which may be unknown.

The original plan footprint of the engineered landfill encroached significantly on the *Erigeron* habitat. In order to minimise conflict with, and potential damage to, the plant and its existing habitat, the landfill site was re-positioned approximately 60m east of the original location. The extent of the existing *Erigeron* population is indicated in Figure 4.1.

The liverwort *Reboulia* is characteristic of slightly calcareous clay and sand and has been noted in other quarries nearby (Eadestown).

4.2.4 Designations

The sites affected by the proposed remediations works are not included within any ecological designation (NHA, SAC or SPA). The nearest such site is the Poulaphuca Reservoir - an SPA (Code No. 63) and a proposed Natural Heritage Area (Code No. 731). The stream south of Area 6 flows into the reservoir and this is the only ecological connection between the two areas.

None of the plants recorded are listed in the Flora Protection Order 1999 and there are no species with special mention under the EU Habitats Directive. The drier grassland fits into the Annex I habitat *semi-natural dry grassland on calcareous substrates* (34.31-34.34) but does not have the orchid numbers to be further qualified as 'orchid-rich'.

The peregrine is an Annex I species under the EU Birds Directive, i.e. a species which shall be the subject of special conservation measures.

4.3 IMPACT OF REMEDIATION WORKS

4.3.1 Do-nothing impact

If the proposed site remediation works do not proceed, the existing unauthorised landfill sites (Areas 1, 4 & 6) would gradually be re-covered by vegetation and develop a functioning ecology. Depending on grazing levels natural succession would introduce grasses, scrub and finally bushes and trees. Existing levels of grazing would probably limit this development to the grassland stage.

Further development of the old sand and gravel pit on the western side of the proposed landfill will also involve greater amounts of scrub but the process will be very slow because of rabbit grazing and the poor soils. *Erigeron acer* and *Gentianella amarella* would be expected to persist for many years. Indeed the site can be seen as a reservoir of these and other species from which future colonisation of Doran's Pit could take place during its rehabilitation.

4.3.2 Short-term impacts

The process of excavation and cell construction will require large scale earthmoving which will destroy the existing habitat and remove all vegetation. Additional ground nearby will probably be modified by vehicle tracks. Once complete a natural process of recolonisation will occur though this will be hastened by re-seeding and other measures. The rehabilitation process is likely to enrich the capping soils, which will create suitable conditions for the commoner weed species to establish.

Loss of tree cover at the former sand and gravel pit will remove some of the stonechat habitat currently used for nesting. Disturbance will also occur here though the effects of this will be limited outside the April-July period.

The process of digging up the existing landfills may release some nutrients to the surroundings. Some may find their way to the adjacent waterbodies where vegetation growth could be promoted. These effects are most unlikely to be significant and could be of benefit to the pond near Area 4 by diversifying its community structure.

The use of heavy equipment at Area 4 is unlikely to disturb peregrines should they return to nest in the vicinity. The species breeds in many active quarries and in this case the nest site is close to a haul road used regularly by large trucks.

Landfilling activity is likely to attract gulls and/or corvids (rooks, crows) from the area. Even if there is little to eat, these birds could spread litter to nearby areas. This is unsightly and a nuisance, rather than an ecological impact and can be addressed by active landfill management.

The excavation and placement of putrescible (food / kitchen) waste may also attract vermin (rats) and flies during the site remediation works.

4.3.3 Long-term impacts

Construction activity at the former sand and gravel pit will reduce the area of stabilised grassland and scattered conifers but will largely avoid the more open stands of vegetation where the blue fleabane *Erigeron acer*, autumn gentian *Gentianella amarella* and pyramidal orchid *Anacamptis pyramidalis* occur, along with the breeding butterflies. The existing cliffs with the liverwort *Reboulia* will be removed.

The few breeding birds will be reduced until scrub or new trees have become established in the vicinity. The local impacts of the work will obviously be considerable but will not be significant to the rarer items of flora and fauna. While a few species may be lost they are of species found widely in the vicinity.

4.4 MITIGATION MEASURES

Tree clearance at the old quarry should be done outside the March-August period to prevent disturbance to nesting birds.

Existing populations of *Erigeron* and *Gentianella* beyond the footprint of the remediation landfill should be fenced off to protect them from associated vehicle damage during construction. The extent of the fenced off-area should be as indicated in Figure 4.1

The restoration plan for the proposed landfill should make provision for restoration of disturbed ground with gravel of the same size as that already found in the *Erigeron* areas to create suitable conditions for natural colonisation.

Excavation in the unauthorised landfill areas should be carried out with suitable cut-off drains to limit water flow into the existing waterbodies.

The local population of *Erigeron* should be examined one and five years after completion of the works and the results of the mitigation measures assessed.

In order to minimise the number of birds attracted to the exposed waste, the area of exposed waste (active area) should be minimised during excavation and placement in the engineered landfill and netting should be provided around the active excavation and landfilling areas to restrict access to the waste.

In order to control the population of vermin (and flies) in the vicinity of the site remediation works, rodenticides (and insecticides) should be applied and bait should be laid at regular intervals around the remediation sites. Dead or dying rats should be collected and removed by a vermin control company in order to avoid attracting interest from scavenging animals / birds and minimise the spread of disease.

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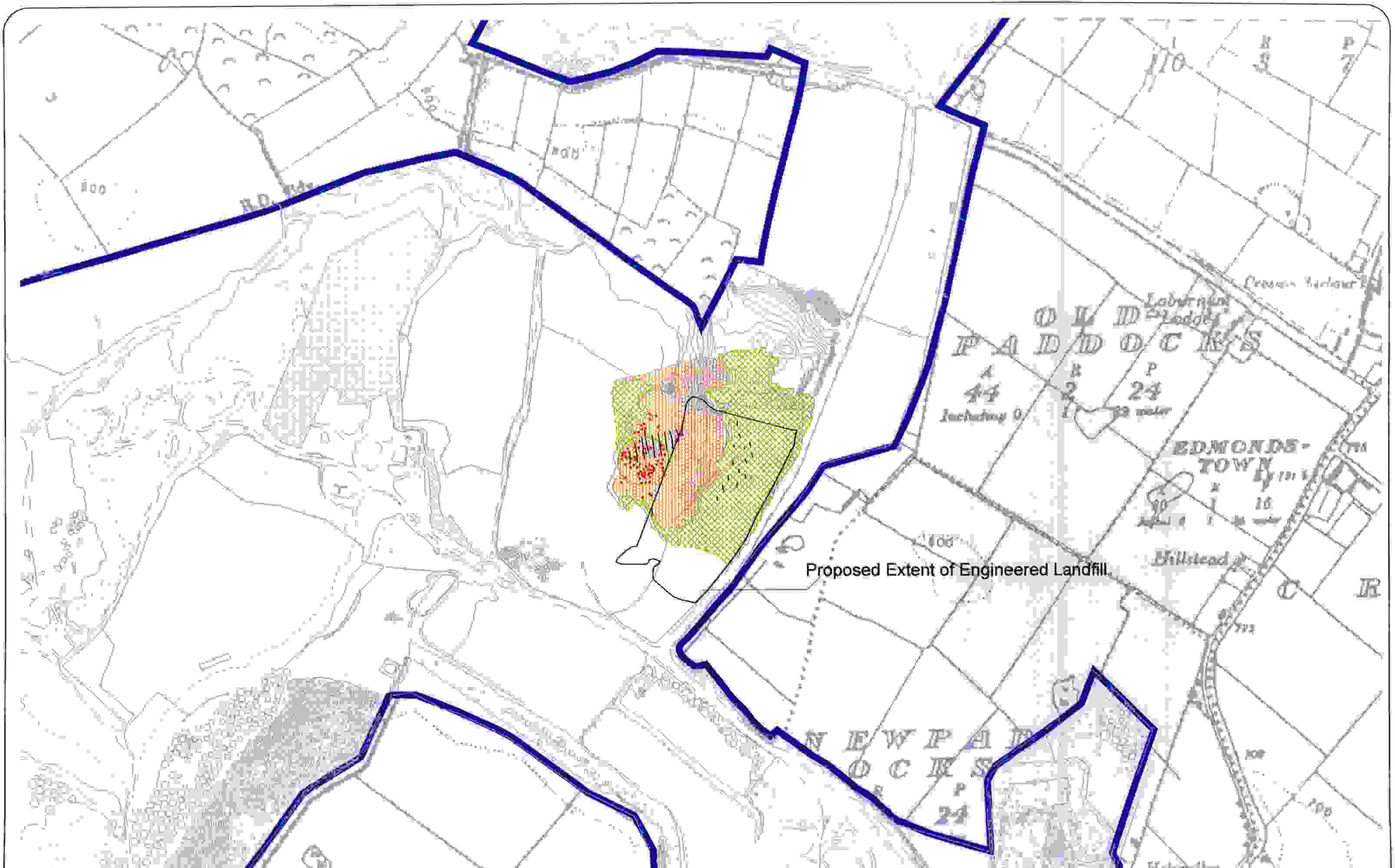
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FIGURES

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Proposed Extent of Engineered Landfill

roadstone
 ROADSTONE DUBLIN LTD.
 FORTUNESTOWN
 TALLAGHT
 DUBLIN 24

JBA
 JOHN BARNETT & ASSOCIATES
 7 DUNDRUM BUSINESS PARK
 WINDY ARBOUR
 DUBLIN 14

- Closed Grassland
- Open Grassland
- Successful Conifers
- Erigeron (fleabane)
- Area to be protected during remediation works

| Rev. | Date | By | Description |
|------|------|----|-------------|
| | | | |
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| | |
|--|----------------|
| Site: Lands at Blessington, Co. Wicklow | |
| Project: Remedation of Unauthorised Landfill Sites | |
| Title: Habitat Locations | |
| Drawn: PM | Scale: 1:5,000 |
| Job No: 2901/10 | Date: Dec 2004 |

FIGURE 4.1

PLATES

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PLATE 4.1 : Temporary pool north-east of Area 1 with clumps of grass *Glyceria notata*



PLATE 4.2 : Large pond 200m north-east of Area 4 with limited submerged vegetation



PLATE 4.3 : Small pond north of Area 6 with pondweed *Potamogeton natans* and clumps of stones

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PLATE 4.4 : Grassy ridge at proposed engineered landfill, looking north-east



PLATE 4.5 : Lower ground in former pit showing grazed gorse bushes and conifers



PLATE 4.6 : Autumn gentian *Gentianella amarella* in south-west corner of former pit. Plant 8cm high



PLATE 4.7 : Stony habitat of blue fleabane *Erigeron acer* in south-west corner of former pit



PLATE 4.8 : Blue fleabane *Erigeron acer* in former pit. Plant 20cm high

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