



JBA2901-10/L10/dl

Office of Licensing
Environmental Protection Agency
Johnstown Castle Estate
County Wexford

7 December 2004

Dear Sirs

Please find enclosed a waste licence application on behalf of Roadstone Dublin Ltd. in respect of the proposed remediation of unauthorised landfill sites on its lands at Dillonsdown, Deerpark, Newpaddocks and Santryhill, Blessington, Co. Wicklow.

This waste licence is being submitted in accordance with directions issued by Wicklow County Council in a notice dated 7 July 2004 under Section 55 of the Waste Management Acts 1996-2001.

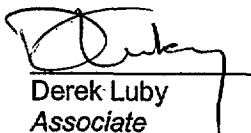
The Waste Licence Application comprises the following documentation

- 1 original copy of Waste Licence Application comprising completed and signed Waste Licence Application Form and 2 No. volumes of attachments;
- 3 No. copies of the Waste Licence Application Form and Attachments;
- 1 No. digital copy of Waste Licence Application on CD;
- 3 No. copies of the Environmental Impact Statement;
- 11 No. digital copies of the Environmental Impact Statement on CD.

A cheque for €45,000 is also attached in respect of the waste licence application fee.

Should you require any additional information of clarification in respect of this waste licence application, please contact the undersigned.

Yours sincerely,
For John Barnett & Associates Ltd.


Derek Luby
Associate

Enc Waste Licence Application



SECTION 1: INTRODUCTION

1.1 PROPOSED REMEDIATION SCHEME

This Environmental Impact statement (EIS) provides supporting information to accompany a Waste Licence Application (WLA) to the Environmental Protection Agency (EPA) by Roadstone Dublin Limited for

- (i) excavation, removal, processing and temporary storage of buried waste from three unauthorised landfill sites on its lands in Dillonsdown, Deerpark and Newpaddocks townlands, north of Blessington, Co. Wicklow and
- (ii) development of an engineered landfill in Dillonsdown townland, to receive a *maximum of* 175,000m³ of residual non-hazardous domestic, commercial and industrial (DCI) waste excavated at the three unauthorised landfill sites.

The location of the application site and the extent of lands owned by Roadstone Dublin Limited, are indicated on an extract from the 1:50,000 scale Ordnance Survey Discovery series map of the area, reproduced as Figure 1.1.

It is estimated on the basis of investigative works undertaken to date that approximately 52,300 tonnes of unauthorised DCI waste was imported and buried on Roadstone Dublin's lands at Blessington. This quantity has been derived on the basis of assumptions about the plan footprint of the buried waste at the unauthorised sites, its in-situ density and the degree of intermixing with inert soil.

Wicklow County Council and its technical advisors have separately determined that there are 115,500 tonnes of buried waste on Roadstone Dublin's lands at Blessington, although it is understood that this figure includes construction and demolition (C&D) waste, in addition to DCI waste.

Given the degree of uncertainty as to:-

- (i) the exact volume of buried DCI waste at the unauthorised landfill sites;
- (ii) the degree of contamination of in-situ soil (if any) intermixed with or underlying the waste;
- (iii) the proportion of non-inert and non-recoverable material within the C&D waste,

it is considered prudent to assume an upper bound volume for the unauthorised waste buried on Roadstone Dublin's land and to provide sufficient capacity within the engineered landfill to accommodate it.

For this reason, the engineered landfill has been designed to provide up to a landfill storage capacity of up to 175,000m³. Ultimately however, it is expected that the total volume of waste placed at the landfill will be less than that provided for in design. Any deficit in the volume of waste placed in the constructed cell will be made up by excess soil generated by the excavation at the site of the proposed engineered landfill.

No waste, other than that buried on Roadstone Dublin's lands in Dillonsdown, Deerpark and Newpaddocks townlands, Co Wicklow, will be imported to or accepted at the proposed engineered landfill.

1.2 BACKGROUND / NEED FOR THE PROPOSED REMEDIATION SCHEME

Between December 2002 and February 2003, Wicklow County Council undertook an environmental investigation of lands owned by Roadstone Dublin Limited in Dillonsdown, Deerpark and Newpaddocks townlands in response to allegations that unauthorised waste disposal had occurred there in the past. The investigation was undertaken with the agreement and co-operation of Roadstone Dublin Ltd. and comprised excavation of deep trial pits (up to and in excess of 15m deep) at eight separate areas, all of which were restored (i.e. backfilled) sand and gravel pits.

Wicklow County Council's investigation (designated Phase 1 Environmental Investigation) uncovered DCI waste at three separate areas on Roadstone Dublin's lands, specifically at Area 1 in Dillonsdown, at Area 4 in Deerpark and at Area 6 in Newpaddocks (refer to annotated aerial photograph in Figure 1.2).

Roadstone Dublin subsequently commissioned additional hydrogeological, geotechnical and environmental investigations (designated Phase 2 Environmental Investigation) at each unauthorised landfill area. The objective of these investigations was to obtain sufficient data to assess the potential risk to environmental receptors (principally surface water, groundwater and air) presented by the buried waste.

In March 2003, Roadstone Dublin appointed Parkman International (*now MouchelParkman*) to determine

- (i) if any contamination from the buried waste will travel via groundwater to existing drinking water wells or surface waters (streams, rivers, lakes or ponds) and arrive at concentrations greater than permitted in drinking water or that required to safeguard aquatic life and
- (ii) if migration of landfill gas (specifically methane and carbon dioxide) poses a risk to nearby properties.

Parkman International considered all available information on the geology and hydrogeology of the site and its surrounds and used computer generated models to identify potential water resources (or 'receptors') at risk from the buried waste.

The study undertaken by Parkman International concluded that on the basis of available information, there was no current risk to existing drinking water supplies and that future risks to drinking water and surface water resources were generally low. Should such a risk materialise, the study identified that inorganic ions were the most likely to exceed drinking water standards at a theoretical compliance point, in this instance a groundwater abstraction well 100m down-gradient of Area 6. The study concluded that the only conceivable way in which organic contamination could present a major risk was if there was a major leakage of organic liquid, most critically from Area 6. However, it is emphasised that no such liquid was identified by recent investigations in any of the investigated areas across Roadstone's landholding.

Parkman International's report also concluded that housing under construction immediately east of Area 6 (at that time) was at risk from landfill gas when assessed against Department of Environment, Heritage and Local Government (DOEHLG) Guidelines, and that there was no comparable risk from Areas 1 and 4. The report also indicated that there was no health risk to either workers extracting waste or residents from potentially volatile chemicals within the buried waste.

In light of its initial risk assessment, Parkman International considered two potential remediation options in detail. Option 1 required the removal of buried waste from Area 6 to Area 1, capping of Areas 1 and 4 and establishing a long-term groundwater monitoring regime to monitor groundwater quality. Option 2 required the removal of all buried waste in Areas 1, 4 and 6 to a designed, engineered repository elsewhere on Roadstone Dublin's landholding.

Although the risk assessment undertaken by Parkman indicated that leaving the buried waste in the ground and establishing a long-term groundwater monitoring regime to monitor groundwater quality was an acceptable risk management strategy, Roadstone Dublin expressed a preference to excavate and remove the buried DCI waste and transfer the waste to an engineered landfill facility. Further details of the risk assessment can be obtained from Parkman International's report entitled 'Investigation into Unauthorised Tipping on Lands at Blessington, Co. Wicklow – Environmental Risk Assessment and Management Strategy' (Ref. No. 4000043/OR/03, dated August 2003).

In addendum to the Risk Assessment Report (Ref. No. 4000043/OR/04A, dated December 2003), Parkman addressed a number of technical issues raised by Wicklow County Council and found that when a worst case combination of infiltration, hydraulic conductivity and hydraulic gradient were modelled, additional inorganic ions and organic contaminants could also potentially arrive at the theoretical compliance point.

Having identified its preferred remediation strategy and investigated the alternatives available to it, Roadstone Dublin concluded that the best option open to it was to transfer the buried waste from the three unauthorised waste disposal sites to an engineered landfill on its lands in Dillonsdown. In order to give effect to the company's decision, it is necessary to obtain a waste licence from the Environmental Protection Agency. This EIS is prepared in support of the Waste Licence Application for the proposed remediation of the unauthorised landfill sites and development of an engineered landfill in Dillonsdown townland.

1.3 THE APPLICANT

Roadstone was founded by the Roche Brothers in the 1930's and became part of Cement Roadstone Holdings (CRH) plc in 1970, following the merger of Roadstone and Cement Ltd.

The company is Ireland's leading supplier of aggregates, construction and road building materials and employs over 1280 people in 65 locations throughout the country. The company is divided into five separate businesses, each operating within a separate geographical area, of which Roadstone Dublin is one.

Roadstone has been extracting sand and gravel in the Blessington area since the early 1950's. In 1962, the company established a washing plant at 'Doran's Pit', on the eastern side of the Dublin to Baltinglass road (N81 National Secondary Road), approximately 1km north of Blessington. Sand and gravel reserves at the original Doran's Pit have long been depleted and over the years, the company acquired land in the adjoining townlands of Dillonsdown, Newpaddocks, Deerpark, Santryhill in County Wicklow and Redbog in Co. Kildare to augment its original reserves.

1.4 THE SITE

1.4.1 Site Location

The site to which this Waste Licence Application refers is located within Roadstone Dublin's landholding, north of Blessington, Co. Wicklow. The plan extent of the company's landholding is outlined in blue on a 1:10,560 scale map of the area, reproduced as Figure 1.3. The plan extent of the application site is also outlined in red on the same figure.

1.4.2 Site Description

Roadstone Dublin's total landholding at Blessington currently comprises 267 hectares (643 acres). At the present time, the company extracts sand and gravel from an area in excess of 200 acres to the west of the N81 National Secondary Road. The excavated materials are transferred by conveyor, under the N81, for processing at the washing and screening plant in Doran's Pit. The existing operations at Blessington currently employ 18 people directly and 27 indirectly.

Reserves of sand and gravel in some areas of the company's landholding have been completely worked out and the company has progressively restored these areas to agricultural and forestry use. To date, approximately 53 hectares (130 acres) have been restored to agricultural use, with a further 60 hectares (147 acres) restored to forestry.

For the purposes of the Waste Licence Application, the 'Application Area' comprises the three areas where the unauthorised waste was uncovered, the site of the proposed non-hazardous landfill and the interlinking road network.

1.4.3 Site Access

At the present time, public road access to Roadstone Dublin lands is principally via the N81 National Secondary Road, to the east of the application site. Access to the lands may also be gained via a minor county road to the north of the application site, known locally as 'Darkers Lane'. Traffic movement within the landholding itself is via a network of unpaved haul roads. The existing network of public roads and internal haul roads can be seen on the aerial photograph reproduced in Figure 1.2

A local property developer, Cookehill Ltd., has acquired planning permission to construct the northern section of the proposed Blessington Inner Relief Road, across part of the Roadstone Dublin lands which front onto the existing N81. Construction of this road will entail re-configuring the existing site access as shown on Figure 1.4. At the present time however, land purchase negotiations are ongoing between the property developer and Roadstone Dublin and no definite start date has been fixed for the start of road construction works.

1.4.4. Planning History

At the present time, Roadstone Dublin is extracting sand and gravel at a 6 hectare (15 acre) site at Glen Ding ridge, on the western side of the N81 National Secondary Road. This activity is proceeding on foot of a planning permission originally granted by Wicklow County Council in July

1970 (Planning Ref 3114/70) and a more recent planning permission granted by Wicklow County Council in December 1999 (Planning Ref. 99/410). Permission for retention of three settling ponds covering an area of approximately 10 hectares was granted by Wicklow county Council in February 1998 (Planning Ref. 97/6853).

Roadstone Dublin had previously submitted a planning application in August 1997 for sand and gravel extraction over a considerably larger area than that which is currently being worked. Although permission for this development was granted by Wicklow County Council (Planning Ref 97/6010), it was overturned on appeal by An Bord Pleanála on 18 September 1998 (Planning Ref PL27.105399)

Roadstone Dublin submitted a planning application to Wicklow County Council in June 2001 to re-locate the washing and screening plant from Doran's Pit on the eastern side of the N81 National Secondary Road, to a site on the opposite side of the road in Deerpark townland, in the middle of the company's landholding, closer to where existing sand and gravel extraction takes place. Following the discovery of buried waste at the application site in January 2003, Roadstone Dublin requested an extension of time so that site remediation measures could be agreed and implemented and this was acceded to by Wicklow County Council.

Planning permission was granted to Cookehill Limited by Wicklow County Council in August 2002 (Planning Ref. 00/3897) to construct part of the Blessington Inner Relief Road across part of the Roadstone Dublin lands fronting onto the existing N81. As can be seen from Figure 1.4, part of the road runs in cutting through the unauthorised landfill site in Newpaddocks townland (Area 6). It is currently envisaged that construction of this road will proceed subsequent to the proposed remediation works at Area 6.

1.4.5 Surrounding Land Use

At its closest point, Roadstone Dublin's landholding lies approximately 700m north-west of the village of Blessington, Co. Wicklow. The surrounding land use is varied, with new housing and industrial development encroaching on the southern and south-eastern corner of the landholding. The lands to the south-west of the landholding are forested and provide an important local amenity at Deerpark Wood.

A number of competitor sand and gravel companies operate from sites adjacent to Roadstone Dublin's landholding. These include Hudson Brothers to the north-west and east and J.W Carnegie and Co. to the north-west. The other lands surrounding the landholding are used for agricultural purposes, mainly pastoral grazing of sheep and cattle. Existing land use in the vicinity of Roadstone Dublin's landholding is shown on Figure 1.5

1.5 PLANNING CONTEXT

1.5.1 Wicklow County Development Plan (1999)

Although a Draft Local Area Plan for the Blessington Area was prepared by Wicklow County Council in late 2002, it has not been adopted by the elected members. It is understood that further consultations are ongoing in respect of the Plan.

In the absence of a local area plan, the planning and development controls pertaining to the application site are those outlined in the current Wicklow County Development Plan (1999). The plan identifies the town of Blessington as one of the Primary Growth Centres for the county of Wicklow and indicates that both the town and application site lie within a landscape zone described as a 'Corridor Area'.

The application site is indicated to overlie a vulnerable sand and gravel aquifer. Section 3.6.2 of the County Development Plan, under the heading 'Aquifer Protection' states that the Council will 'control developments that are likely to cause pollution of water catchment basins used as gathering grounds for public drinking water in order to prevent pollution'. The proposed remediation strategy for the unauthorised landfills on Roadstone Dublin's lands (excavating and removing the buried waste and transferring it to an on-site engineered landfill) is consistent with this objective, as it significantly reduces the potential risk to local groundwater supplies in and around Blessington, arising from the continued presence of DCI waste in the ground.

None of the trees or woodlands in the vicinity of the site are designated as amenity trees or woodlands, nor are any subject to tree preservation orders. The plan does not identify any views or prospects of Special Amenity Value or Interest either into or across the application area, nor does it identify any amenity access route for future preservation or protection.

There are no designated or proposed Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Natural Heritage Areas (NHAs) within 0.5km of the application site. The nearest such areas to the application site are

- (i) the lake and bog at Redbog which has formed in a closed depression between moranic ridges, approximately 1km to the north in Co. Kildare
- (ii) the dammed valley of the River Liffey at Pollaphuca Reservoir, approximately 1km to the south-east (at its nearest point).

The Blessington Delta, the gently sloping ground beyond the south-east flank of Glen Ding ridge, is identified by the County Development Plan as an area of Geological and Geomorphological Interest. Part of the application site extends over this area. Section 3.5.8 of the County Development Plan, under the heading '*Geological Areas of Scientific Interest*' states that the Council will protect listed sites from development that would adversely affect their existence and '*ensure where development is allowed its effect is minimised*'. It is considered that the proposed remediation strategy for the unauthorised landfills on Roadstone Dublin's lands is consistent with this objective, insofar as it significantly reduces the potential risk of further soil contamination from the DCI waste which is currently buried in the ground.

No demesne houses or vernacular structures are listed for preservation within 1km of the application site. Although the plan does not designate any area in the vicinity of the application site as being of archaeological potential or significance, it does identify that the RathTurtle Moat in Deerpark, approximately 1km to the south-west as a National Monument in State Care.

Section 2.6.4 of the County Development Plan under the heading '*Waste, Effluent and Emission Control*' states that it will have regard to Section 38(1) of the Waste Management Act and '*provide or operate, or arrange for the provision and operation of such facilities as may arise for the recovery and disposal of household waste arising within its functional area*'. It also states that the Council will '*protect existing groundwater aquifers, surface waters and coastal waters from pollution*'.

The available evidence from the recent environmental investigations indicates that ALL of the waste uncovered at the unauthorised landfill sites on Roadstone Dublin's lands was generated in and around the Blessington area, in north-west Wicklow and East Kildare. At the present time, the only facility for disposal of household and commercial waste in County Wicklow is at Rampere in Baltinglass. The waste licence for the Rampere facility issued by the Environmental Protection Agency (EPA) currently limits its waste intake to just 11,500 tonnes per annum.

Given that some, though not all of the buried waste on Roadstone Dublin's lands, arose within the Wicklow County Council's functional area, the proposed remediation strategy is considered to be consistent with the first stated development plan objective above. The transfer and placement of the buried waste in a lined, engineered landfill will significantly reduce the potential risk to local groundwater supplies in and around Blessington. As such, it is considered that the proposal also complies with the second stated development plan objective above.

Section 4.6.2 of the County Development Plan states that the Council will '*provide for waste disposal sites as necessary*', in accordance with the needs arising in County Wicklow'. It further states that '*in particular, the Council will develop a waste disposal facility*' and that it will ensure that '*any landfill element is in accordance with the ...GSI Groundwater Protection Code of Practice and the EU Draft Landfill Directive*'.

It is considered that, in the absence of suitable alternative waste disposal facilities within the eastern region (refer to Section 1.8.1 of this report), an engineered landfill is **necessary** at the application site in order to facilitate remediation of the unauthorised landfill sites on Roadstone Dublin's lands at Blessington. This need is particularly acute given the failure of Wicklow County Council to develop, or even begin to develop, a waste disposal facility within its functional area, in accordance with its stated intention in the County Development Plan adopted some 5 years ago, in March 1999.

Consultations were held with the Groundwater Section of the Geological Survey of Ireland (GSI) to establish if an engineered non-hazardous landfill at this site was compatible with the groundwater response matrix published in the GSI / EPA / DOELG publication 'Groundwater Protection Schemes'. In a letter dated 17 November 2003, the GSI confirmed that the relevant risk response category for the site of the proposed landfill facility is 'R3¹'.

This classification means that a landfill is not generally acceptable unless

- the groundwater in the aquifer is confined OR
- there will be no significant impact on the ground water AND
- it is not practicable to find a site in a lower risk area.

The GSI further notes that the GSI / DoELG / EPA publication and the groundwater protection response for non-hazardous landfills contained therein '*is primarily intended for use at the initial screening stage of a range of potential landfill sites, rather than for evaluating a sitewhere unauthorised disposal has already taken place*'. The GSI letter is reproduced in Appendix 1A.

The design and siting of the proposed non-hazardous landfill has also had regard to the requirements of the EU Landfill Directive (Council Directive 1999/31/EC).

In light of the above, the proposed remediation strategy for the unauthorised landfill sites on Roadstone Dublin's lands at Blessington is considered to be consistent with the objectives of the Wicklow County Development Plan.

1.5.2 Draft Wicklow County Development Plan (2004)

The draft Wicklow County Development Plan (2004) re-states many of the existing provisions of the current (1999) plan.

Section 5.4 of the draft plan, '*Waste Effluent and Emission Control*' states that the Council '*will facilitate the provision of waste disposal sites as necessary in accordance with the needs arising within the County, the Wicklow County Waste Management Plan 2000-2004 and the proper planning and development of the County*' (Policy WS3).

The new plan makes specific provision for the construction of the Blessington Inner Relief Road to the south of Roadstone Dublin's landholding and associated junction improvements on the R410 Regional Road between Blessington and Naas. The plan also defines the town limits for development purposes and this currently includes all of the Roadstone Dublin landholding within Co. Wicklow. The lands immediately north, east and west of the Roadstone Dublin landholding are not included within the defined town limits and they currently have no formal zoning designation. Given their existing land use and their location outside the new inner relief road, it is considered that these lands are unlikely to be zoned for development at any time in the foreseeable future.

1.5.3 County Wicklow Waste Management Plan (2000-2004)

Wicklow County Council has prepared a waste strategy independent of Dublin and surrounding regions and adapted its own Waste Management Plan on in April 2000. The Plan states that County Wicklow faces a crisis situation due to lack of landfill capacity, and identifies two main objectives:

- (i) to define a clear policy and implementation plan for future waste management in the County, to conform to Irish and EU waste policy and legislation;
- (ii) to find a solution to a short-term crisis in waste disposal in the county.

The overall waste management policy of the county is to move quickly to a maximum recycling scenario, and to stop and reverse current trends of waste growth through measures aimed at waste minimisation.

The short-term waste crisis in the County Wicklow is principally due to lack of landfill capacity following closure of one of its two former landfills (at Ballymurtagh, near Avoca). The other site, at Rampere (near Baltinglass) remains open in the short-term.

The '**short term**' waste disposal policy of the Council provides for :

- (i) an extension to existing Rampere landfill.
- (ii) private sector disposal by KTK (now Greenstar), who operate a licenced landfill facility at Kilcullen, County Kildare, to accept non-organic waste only.

Three possible scenarios over a 15 year-period are explored in the development of waste strategy for Wicklow. A combination of maximum realistic recycling and thermal treatment for any residual waste is considered the best option for County Wicklow. It is considered that this strategy would also help meet the requirements of EU directive by diverting organic waste away from landfill.

The waste management plan considers that given that recycling would cater for a maximum of 40% of the overall waste stream and the construction and operation of a thermal treatment plant (incinerator) to serve County Wicklow's needs alone would not be economically feasible. The scenario also assumes that a new landfill facility will be available in the County to cater for residual waste from 2003 onwards.

The policy of the Council in this regard is:

- (i) to pursue co-operation with neighbouring waste management regions and other Local Authorities to establish access to a thermal treatment facility when such facilities are established (no thermal treatment initiatives will be taken by the Council within the County without prior agreement of not less than two-thirds of the Councillors)
- (ii) to provide for a transfer station facility for bulk transfer of the non-recyclable residual waste arising in the County, utilising either rail or road transport

Presently approximately 70,000 tonnes of household, commercial and non-hazardous industrial waste produced in the county is landfilled in municipal and private landfills. Of this, household waste contributed approximately half of the total amount. Assuming maximum recycling and provision of thermal treatment facilities, the amount requiring landfill could drop significantly, to approximately 20-25,000 tonnes per annum, including residual ash from thermal treatment. This model however assumes that thermal treatment can be realised by 2006. The model also assumes that C&D waste is not accepted at municipal landfill and that a separate facility is provided for inert waste, mainly soil material.

Maximum recycling in the shortest possible timeframe and eventual introduction of thermal treatment would reduce significantly, but would not eliminate the need for landfill disposal. The stated policies include:

- (i) Ensuring provision of a new landfill for municipal and similar non-hazardous waste (household, commercial, industrial) in the county which will accept non-recyclable waste in the short term and non-combustible (residual) waste once thermal treatment can be achieved (target date 2006).
- (ii) Limiting and regulating what waste will be acceptable for disposal, with a view to increasing recycling. Certain waste streams (e.g. green waste, commercial packing waste, etc.) will not be accepted for landfill disposal once adequate segregation at source and/or thermal treatment facilities are available in the county.

1.5.4 Wicklow County Council's General Policy on Remediation of Unauthorised Landfill Sites

A detailed description of the proposed remediation of the unauthorised landfill sites on Roadstone Dublin's lands at Blessington is provided in Section 2 of this report. The proposed remediation of the unauthorised landfill sites takes into account Wicklow County Council's 'General Policy Regarding Remediation of Illegal Landfills' which states that remediation of such site could involve all or some of the following integrated activities:

- (i) Excavation of the waste bodies on the site including contaminated surrounding soils;
- (ii) Segregation of waste from the soils and surrounding material;
- (iii) Segregation of waste into specified fractions;
- (iv) Processing of waste fractions to alter characterisation and waste category;
- (v) Removal of waste fractions to authorised facilities for disposal, processing or reuse;
- (vi) Construction of a properly engineered, contained repository area on the site where residual waste and contaminated soils may be stored;
- (vii) Grading / capping of former illegal landfill areas to reduce water ingress into those soils;
- (viii) Installation of down-gradient groundwater monitoring boreholes to monitor changes over time;
- (ix) On-going monitoring of the site for an agreed period.

1.6 ENVIRONMENTAL GAIN

The proposed remediation scheme provides for the excavation and removal of unauthorised waste buried on Roadstone Dublin's lands at Blessington. The transfer of waste to engineered landfill facilities will significantly reduce the potential risk to local groundwater supplies in and around Blessington and the risk of landfill gas migration to new residential housing in Woodleigh, immediately east of Area 6.

1.7 ALTERNATIVES CONSIDERED

1.7.1 Alternative Remediation Strategies

Subsequent to the initial discovery of unauthorised landfilling on its lands, Roadstone Dublin undertook a detailed review of the various remediation options open to it. Outline details of the alternatives to the proposed remediation strategy are presented and discussed in brief below.

Option 1

The risk assessment undertaken by Parkman International (*now MouchelParkman*) indicated that one alternative to the proposed remediation strategy, which was acceptable from a risk management standpoint, was to

- (i) transfer the waste from Area 6 to Area 1;
- (ii) leave buried waste in the ground in Area 1 and Area 4 and place an impermeable clay capping layer over it;
- (iii) establish and implement a long-term monitoring regime to monitor groundwater quality;
- (iv) install a perimeter vent trench around Area 6 and install boreholes in soils remaining in-situ to facilitate passive venting of any residual landfill gas which may be present.

Although this alternative involved considerably less up-front capital expenditure than the proposed remediation strategy, it was nonetheless discounted by Roadstone Dublin for the following reasons:

- (i) The risk assessment undertaken by Parkman International is based on *available* soil and groundwater monitoring information in areas of buried waste. Although the amount of soil and groundwater testing in these areas has been extensive, there is a small residual risk that a pocket of organic liquid remains undetected within the waste and that such a liquid could leak into, and contaminate, the underlying groundwater aquifer. While the company recognises that there is no scientific evidence to indicate such a risk exists, it has had regard to the Precautionary Principle and decided on the proposed remediation strategy on the basis that such a risk could conceivably materialise.
- (ii) Irrespective of how much reassurance the company and/or its technical advisors offer the public that the unauthorised landfills present no quantifiable risk to the quality of local surface water and groundwater supplies in Blessington, local residents will continue to have these concerns as long as the waste remains undisturbed in-situ. The company recognises that this in turn could have a detrimental impact on its public image and reputation and on the goodwill and support it has heretofore enjoyed from its neighbours in Blessington. The company has therefore decided to excavate the buried waste and transfer it to an engineered landfill facility.

Option 2

Another alternative to the proposed development, which was also actively considered was to excavate the buried waste and transfer it via road haulage lorries (HGV's) and the existing public road network to a suitably licensed landfill facility.

In exploring this option, Roadstone Dublin has only looked at the feasibility of transferring the buried waste to appropriately licensed facilities within 80km of the application site. In setting a distance limit of 80km, Roadstone Dublin is having regard not only to the associated haulage costs and environmental impact, but also to the stated policy objectives of published Regional and County Waste Management Plans which generally stipulate that all non-hazardous commercial, domestic and industrial waste generated within a defined geographical or administrative area, should be recycled, treated or disposed of within that same defined area. These policy objectives are essentially a restatement of the Proximity Principle.

In this respect, it must be recognised that evidence from the recent environmental investigations indicates that ALL of the waste uncovered at the unauthorised landfill sites on Roadstone Dublin's lands was generated in and around the Blessington area, in north-west Wicklow and East Kildare. Unlike other unauthorised landfills discovered in recent times in West Wicklow, no waste was imported from Dublin City or County.

A list of all licensed waste disposal facilities within 80km of Roadstone Dublin's lands is appended in Appendix 1B. As can be seen, most of these facilities either:

- (i) have a permitted annual waste intake below the estimated tonnage of waste buried on Roadstone Dublin's lands (56,000 to 115,000 tonnes);
- (ii) accept only construction and demolition waste or
- (iii) have recently closed.

Of the facilities that are permitted to accept in excess of the estimated tonnage of waste on Roadstone Dublin's lands,

- (i) Ballealy in North County Dublin operates a quota system for established users only and is therefore unable to accept waste from this site;
- (ii) Arthurstown in Kill, Co. Kildare accepts only pre-baled waste;
- (iii) KTK in Kilcullen Co., Kildare is not licensed to accept putrescible wastes, such as the food / kitchen wastes or green wastes which are intermixed with the commercial and industrial waste found on Roadstone Dublin's lands at Blessington;
- (iv) Knockharley Landfill in Navan Co. Meath is not yet operational and is constrained by its planning permission to only accepting wastes generated within the North-Eastern Waste Management Region.

It is generally acknowledged that there is a severe shortage of landfill capacity within the state as a whole. It is understood that the annual intake of waste at most of the existing landfill facilities in the east of Ireland is currently at or close to permitted limits. If waste at the unauthorised landfill sites on Roadstone Dublin's lands was split and transferred to a number of smaller licensed facilities, the existing level of demand is such that there would have to be significant displacement of established users to other licensed facilities. If, as is likely, little or no additional landfill capacity exists at other licensed facilities nearby, this would give rise to

- (i) transfer of waste to other waste management regions (if such landfilling capacity even exists), in breach of the principles laid down in Regional Waste Management Plans and recent precedence established by An Bord Pleanála in deciding to grant planning permission for landfill facilities;
- (ii) environmentally unsustainable transfer of waste over long distances to other jurisdictions or
- (iii) increased risk of unauthorised waste disposal at unlicensed sites.

On 24 November 2003, An Bord Pleanála granted planning permission on appeal to Greenstar Recycling Holdings Limited for a landfill for DCI waste at Ballynagran, in east County Wicklow. In granting planning permission, An Bord Pleanála essentially ignored the longer-term waste management strategy outlined in the County Wicklow Waste Management Plan and decided in view of the clearly identifiable waste crisis in the county (identified in the plan) to permit a larger landfill development than envisaged therein, with an upper intake threshold of 150,000 tonnes of residual DCI waste per annum over a 15-year lifespan. The Board also allowed one-third of which could be imported from outside County Wicklow. The Environmental Protection Agency issued a waste licence to Greenstar Recycling Holdings to landfill 175,000 tonnes of residual waste per annum at the same site in September 2003.

While it may be feasible to transfer the buried waste on Roadstone Dublin's lands to the permitted facility at Ballynagran, this option is not considered to be practicable for the following reasons:

- (i) remediation of the Roadstone Dublin lands at Blessington will be contingent on the actions of a third party and it may be some time before the site becomes operational;
- (ii) it is likely that the bulk of the 150,000 tonne limit imposed by An Bord Pleanála would be used by the operator's existing long-term customers. There is no certainty that it would reserve the required capacity for Roadstone Dublin on a once-off basis;
- (iii) were the maximum potential volume of 175,000m³ of intermixed DCI waste to be transferred to the site, it would delay by in excess of one year, the availability of the site to

- accept waste from any other source. As such, this would frustrate the objectives cited An Bord Pleanála in its decision to grant planning permission for the landfill.
- (iv) The transfer of such a large volume of waste would have an unacceptable environmental impact on the Wicklow Mountains Special Area of Conservation or on residential suburbs of south county Dublin.

Option 3

Another alternative to the proposed development, which was also considered was to excavate the buried waste and transfer it via road haulage lorries (HGV's) and/or ferries to landfills and/or incinerators in foreign jurisdictions, specifically the United Kingdom and Germany. Aside from the environmental impact and traffic hazard associated with such large scale transfer of partially decomposed wastes, this option was considered to be inconsistent with the Proximity Principle and was therefore discounted.

Summary

Having had regard to both the precautionary principle, existing constraints on licensed landfill capacity, the environmental impact and traffic hazard associated with large scale transfer of partially decomposed waste over the existing public road network, Roadstone Dublin is satisfied that the proposed remediation strategy for the unauthorised landfill sites on its lands at Blessington represents the Best Environmental Option Not Entailing Excessive Cost.

1.7.2 Alternative Locations for Engineered Landfill on Roadstone Dublin's Lands

Only a small number of potential sites for the proposed engineered landfill were identified on Roadstone's lands at Blessington. The locations of these sites, designated Site A, Site B and Site C, are shown in Figure 1.6. They were identified by applying the following selection criteria:-

- (i) the site had to be located a minimum of 250m at its nearest point from any inhabited dwelling as required by the Department of Environment and Local Government Publication 'Protection of New Buildings and Occupants from Landfill Gas';
- (ii) the available depth of unsaturated soil (between the base of the engineered landfill and the groundwater table) should exceed 10m in order to ensure compliance with guidelines on landfill site location produced by the Geological Survey of Ireland (GSI). In the event of a leak in the landfill liner system, this unsaturated soil will facilitate breakdown of contaminants and afford some protection to underlying water-bearing granular strata.
- (iii) the site should not conflict with established sand and gravel extraction operations or future processing / value added activities, nor should it sterilise aggregate reserves;
- (iv) the amount of HGV traffic generated on the public road network in transferring the buried waste to the engineered facility should be minimised. In practice this means that waste should not be transferred across the N81 National Secondary Road or across Darkers Lane.

As each of the three potential sites identified on Roadstone Dublin's lands is located above a locally important aquifer, none offers a distinct environmental advantage over the others in this regard.

The proposed location of the engineered landfill, Site B, was selected for the following reasons:

- (i) the depth of the underlying zone of unsaturated soil is greater than at Site A or Site C;
- (ii) it is further up hydraulic gradient of known groundwater wells than Site C;
- (iii) it is further sideways along hydraulic gradient of known groundwater wells than Site A;
- (iv) it is largely hidden from the view of local residences and public roads / rights of way;
- (v) the existing site topography is such that the engineered landfill can be readily merged, in an unobtrusive fashion, into the landscape;

Initial field investigations undertaken for the purposes of this Waste Licence Application revealed that the south-western corner of the proposed engineered landfill supported a rare flower known as 'blue fleabane' (*Erigeron acer*). In order to prevent the destruction of a significant proportion of this habitat, it was agreed that the original footprint of the proposed landfill cell should be moved approximately 60m to the east (Site B1), thereby significantly reducing and mitigating the potential impact of the development on the population of blue fleabane.

1.7.3 The Do-Nothing Alternative

In the event that the proposed remediation scheme for the unauthorised landfills on Roadstone Dublin's lands did not proceed, the buried waste currently in the ground would continue to undergo anaerobic decomposition and produce both leachate and landfill gas.

The risk assessment undertaken by Parkman International (*now MouchelParkman*) indicated that this option is not acceptable from a risk management standpoint, as the buried waste at Area 6 is currently generating landfill gas in very close proximity to new residential housing in Woodleigh. The risk assessment indicated that at the very least, the buried waste should be removed from Area 6.

Even, if the alternative strategy of transferring the buried waste at Area 6 to Area 1, placing an impermeable clay capping layer over Area 1 and Area 4, establish a long-term monitoring regime to monitor groundwater quality were implemented, a small residual risk would remain that a hitherto undetected pocket of organic liquid within the waste could leak into, and contaminate, the underlying groundwater aquifer. This option is not acceptable to Roadstone Dublin Limited.

1.8 CONTRIBUTORS

Roadstone Dublin appointed John Barnett and Associates to prepare this Environmental Impact Statement in support of its Waste Licence Application for the remediation of unauthorised waste disposal sites and development of an engineered landfill on its lands at Doran's Pit, Blessington, Co. Wicklow.

Sections 1 and 2 of this EIS comprises an introduction and detailed description of the proposal and has been prepared by John Barnett and Associates in consultation with Roadstone Dublin Limited.

Sections 3 to 11 of this EIS provide details of existing environmental receptors, and for each receptor, provides an assessment of the potential environmental impacts of the proposed remediation scheme and details of mitigation measures, where these are considered practicable or feasible.

The contributors who have assisted in the preparation of this EIS are identified by topic below:

TOPIC	CONTRIBUTOR	COMPANY
Human Beings	Dearbhla Walshe BSc (Surv) DipEnvMgmt	Brady Shipman Martin
Flora and Fauna	Roger Goodwillie PhD	Roger Goodwillie and Associates
Soils and Geology	Peter Glanville PhD	John Barnett and Associates
Surface Water and Groundwater	Anna Jeffcoat PhD	Parkman International
Air Quality and Climate	Eugene McKeown BE LLB CEng	Biospheric Engineering
Noise and Vibration	Claire McNamara BSc	John Barnett and Associates
Landscape	Kevin Fitzpatrick BA(Hons) MLA	Brady Shipman Martin
Cultural Heritage	Stephen Johnston MA	Arch Tech
Material Assets	Dearbhla Walshe BSc (Surv) DipEnvMgmt	Brady Shipman Martin

Table 1.1 Contributors to Environmental Impact Statement

Each contributor has been fully briefed about the proposal and the background to it. They have also visited the site and are familiar with the local environment.

1.9 CONSULTATIONS

Following the initial discovery of buried waste on Roadstone Dublin's lands, formal consultations were held between Roadstone Dublin, its technical advisors and the following organisations :

- Wicklow County Council (ongoing involvement throughout Section 55 process)
- Environmental Protection Agency (pre-consultations on proposed remediation scheme and Waste Licence Application)
- Geological Survey of Ireland (to discuss aquifer classification)

In addition, a number of informal meetings were held between Roadstone Dublin and

- Blessington Forum (umbrella group for community groups in Blessington)
- Cookehill Limited (the adjacent land-owner and developer) and its technical advisors

In preparing the Environmental Impact Statement, a number of contributors consulted archives and documentation held by state agencies and organisations and also held informal discussions with relevant experts, details of which are included in the relevant sections of this report.

Prior to collating and finalising the Environmental Impact Statement and submitting the Waste Licence Application, a number of statutory bodies and local community organisations were formally consulted about the proposed remediation scheme. A detailed consultation document was prepared and circulated to the following individuals, organisations and statutory bodies on 5 October 2004 :-

- Dublin City Council (Ballymore Eustace Water Treatment Works)
- Eastern Regional Fisheries Board
- National Parks and Wildlife Service (DoEHLG)
- National Monuments Service (DoEHLG)
- South Western Area Health Board
- Environmental Protection Agency
- Wicklow County Council
- Local Authority Members (Baltinglass Area)
- Blessington Forum
- Wicklow Uplands Council

The consultation document provided

- (i) background information about the discovery of waste on Roadstone Dublin's lands
- (ii) details on the environmental risk assessment and environmental risk management strategy;
- (iii) the proposed remediation scheme (including waste removal procedures, engineered landfill design and temporary site infrastructure);
- (iv) outline impacts of the remediation scheme on human and natural environment.

A copy of the consultation document is provided in Appendix 1C, together with a copy of the accompanying cover letter.

The public consultation on the proposed remediation scheme prompted considerable coverage in print and broadcast media, both local and national. A number of residents of the Woodleigh Estate, immediately east of the unauthorised landfill in Area 6, subsequently contacted Roadstone Dublin to express concern about the health and safety implications of landfill gas emissions. In response, Roadstone Dublin circulated a letter to all residents of the estate on 8 November 2004 specifically addressing concerns about landfill gas emissions at Area 6. A copy of this letter is also provided in Appendix 1C.

A number of issues and concerns were highlighted by the public consultation. The principal issues raised are listed below, together with the relevant section of the Environmental Impact Statement where they have been addressed :

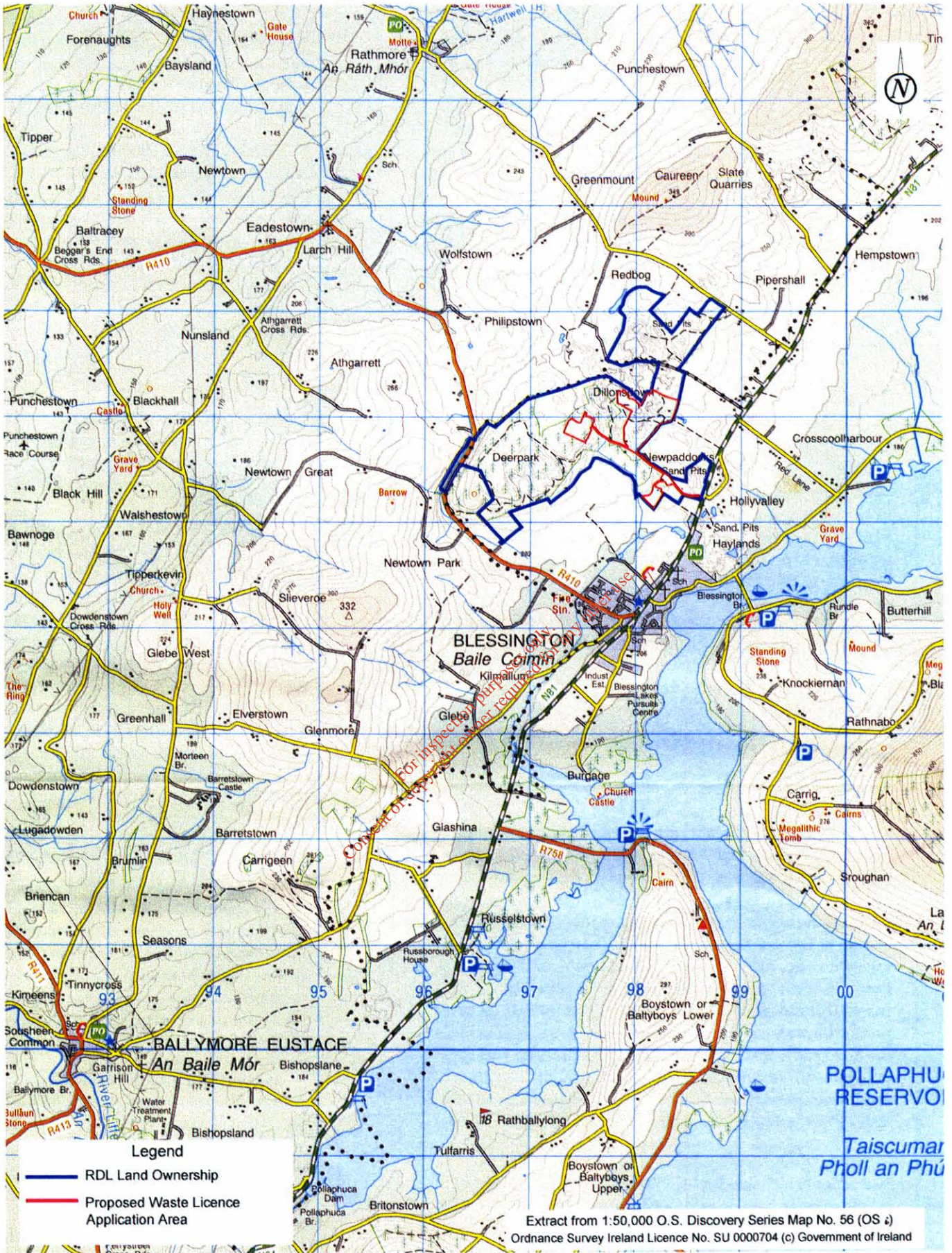
Consultee	Issues Raised	Issue Addressed in EIS
Eastern Regional Fisheries Board	Leachate Disposal	Section 2.3.12
Eastern Regional Fisheries Board	Surface Water Management	Sections 2, 6.3, 6.4
Eastern Regional Fisheries Board	Construction Quality Assurance	Section 2.3; Appendix 2H
Eastern Regional Fisheries Board	Leachate Management System	Section 2.3.12
Eastern Regional Fisheries Board	Leachate Volumes	Appendix 6M
Eastern Regional Fisheries Board	Hardstanding Areas	Sections 2.2.3, 2.2.7, 2.2.9, 2.2.13
Eastern Regional Fisheries Board	Sewerage / Drainage Systems	Section 2.2.9
Eastern Regional Fisheries Board	Biological Monitoring	Section 2.7
Eastern Regional Fisheries Board	Restoration	Section 2.8
National Parks and Wildlife Service	Controls on Scavenging Birds	Sections 2.6.2, 4.3.2, 4.4
National Parks and Wildlife Service	Nesting Falcons	Section 4.3.2
South Western Area Health Board	Nuisance Controls	Section 2.6
South Western Area Health Board	Environmental Monitoring	Section 2.7
South Western Area Health Board	Contingency Arrangements	Section 2.8; Appendix 2J
South Western Area Health Board	Surface Water Contamination	Sections 2, 6.3, 6.4

Correspondence received from statutory bodies and community groups is reproduced in Appendix 1D.

Three meetings were held between Roadstone Dublin and 43 of the 48 members of the Blessington Forum on October 26 and 27 and November 10, 2004. The issues discussed are covered in a set of written questions given to Roadstone Dublin at the meetings, to which it duly replied in writing. A copy of the questions and the answers thereto is also provided in Appendix 1D.

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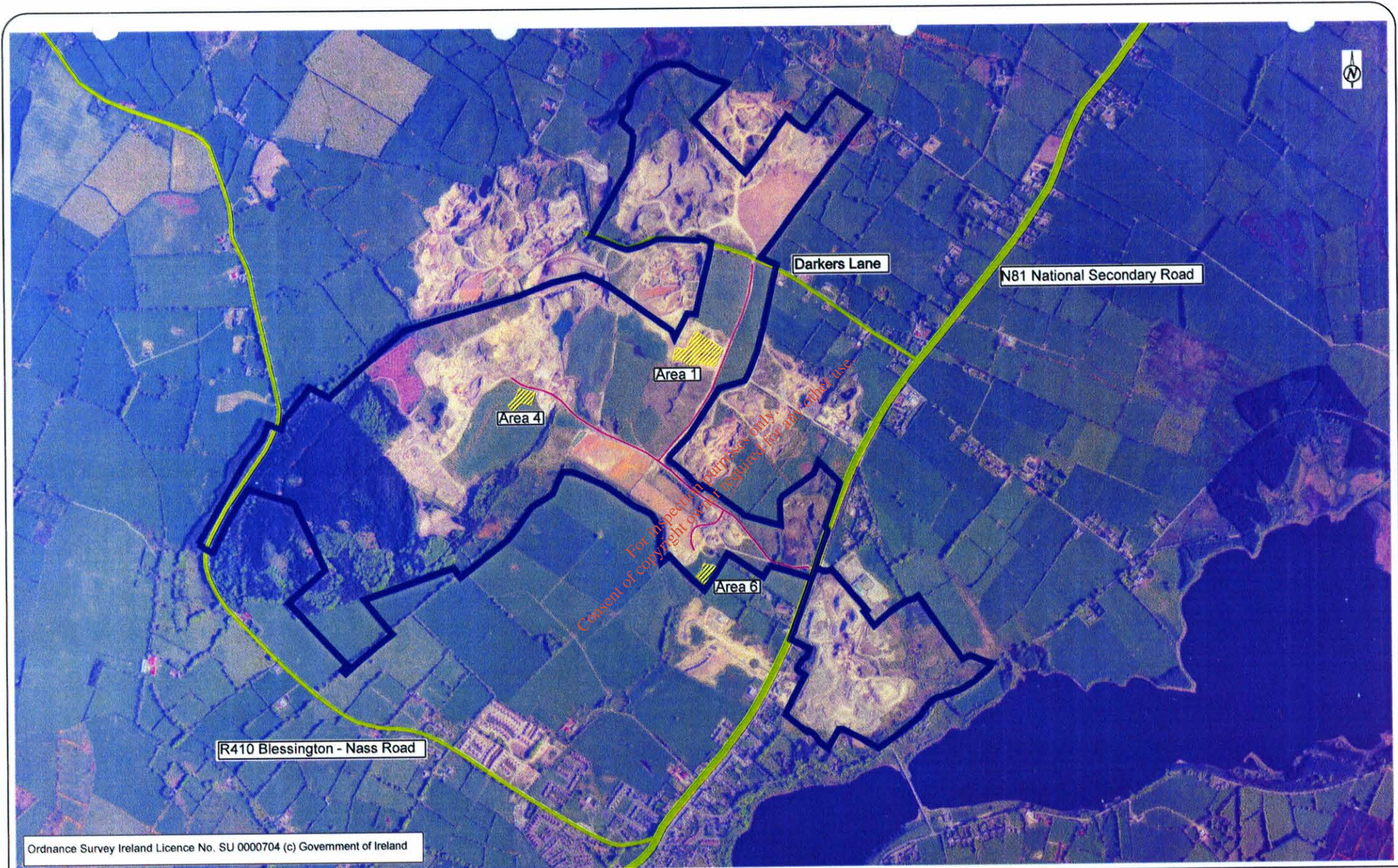
FIGURES



JADSTONE DUBLIN LTD.
 FORTUNESTOWN
 TALLAGHT
 DUBLIN 24

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

Site:	Lands at Blessington, Co. Wicklow	
Project:	Remediation of Unauthorised Landfill Sites	
Title:	Site Location	
Drawn: pmc	Scale: 1: 50,000	FIGURE 1.1
Job. No: 2901/10	Date: Dec 2004	



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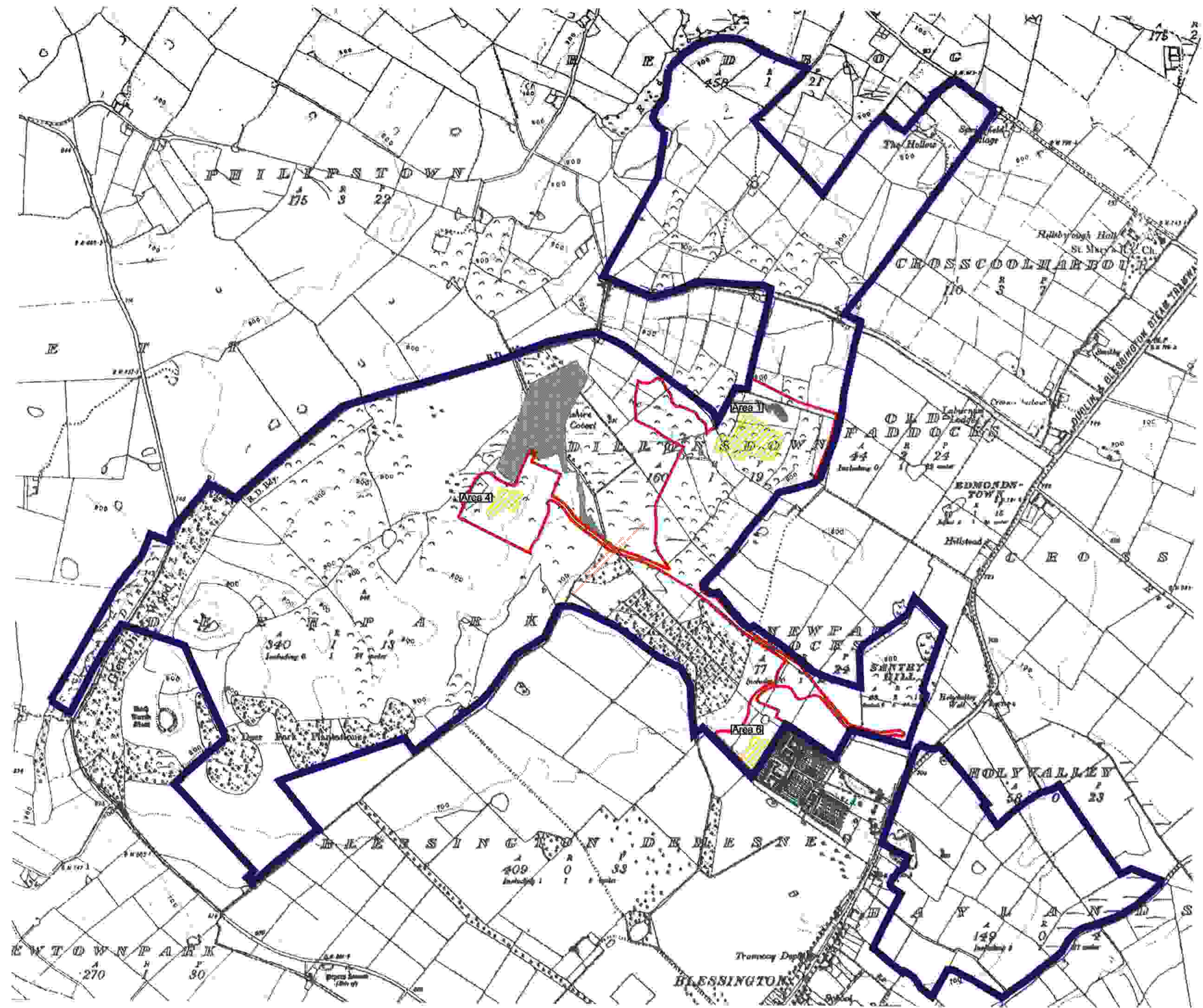
- Land Ownership (c. 233.8ha)
- Internal Hauf Roads
- Public Roads
- Unauthorised Landfill Sites

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Rev.	Date	By	Description
0	Dec 03	SMD/PMC	

Site: Lands at Blessington, Co. Wicklow	
Project: Remediation of Unauthorised Landfill Sites	
Title: Unauthorised Landfill Sites / Road Network	
Drawn: PMC	Scale: 1:20,000
Job. No: 2901/10	Date: Dec 2004

FIGURE 1.2



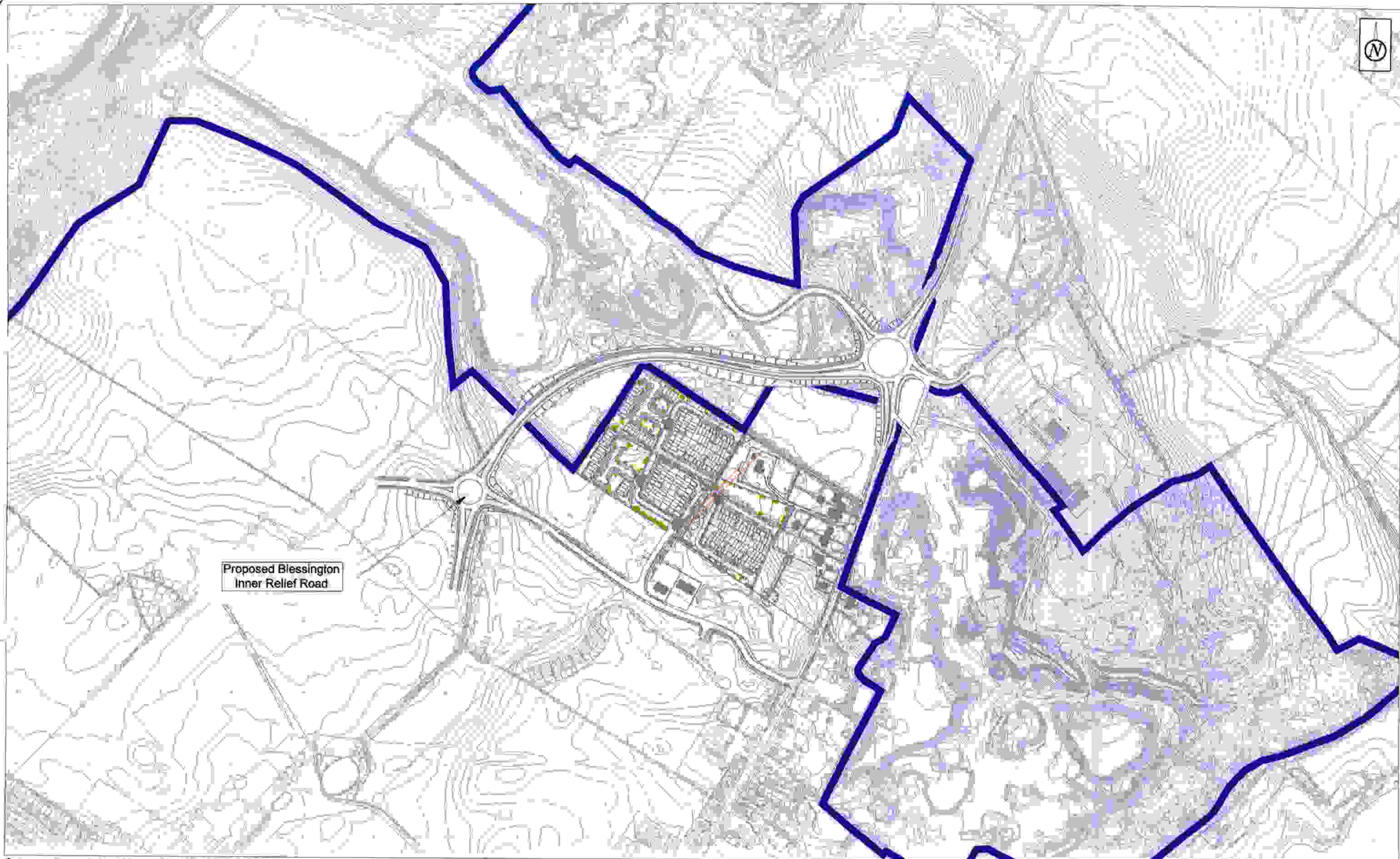
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Legend
 — Land Ownership (c. 267ha)
 — Application Area (c. 27.6ha)
 ■ Unauthorised Landfill Sites
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Rev.	Date	By	Description
0	Dec 03	SMD/PM	

Site: Lands at Blessington, Co. Wicklow
 Project: Remediation of Unauthorised Landfill Sites
 Title: Application Area/Applicants Land Holding
 Drawn: PMC
 Job. No: 2901/10
 Scale: 1:10,560
 Date: Dec 2004
FIGURE 1.3



Proposed Blessington
Inner Relief Road

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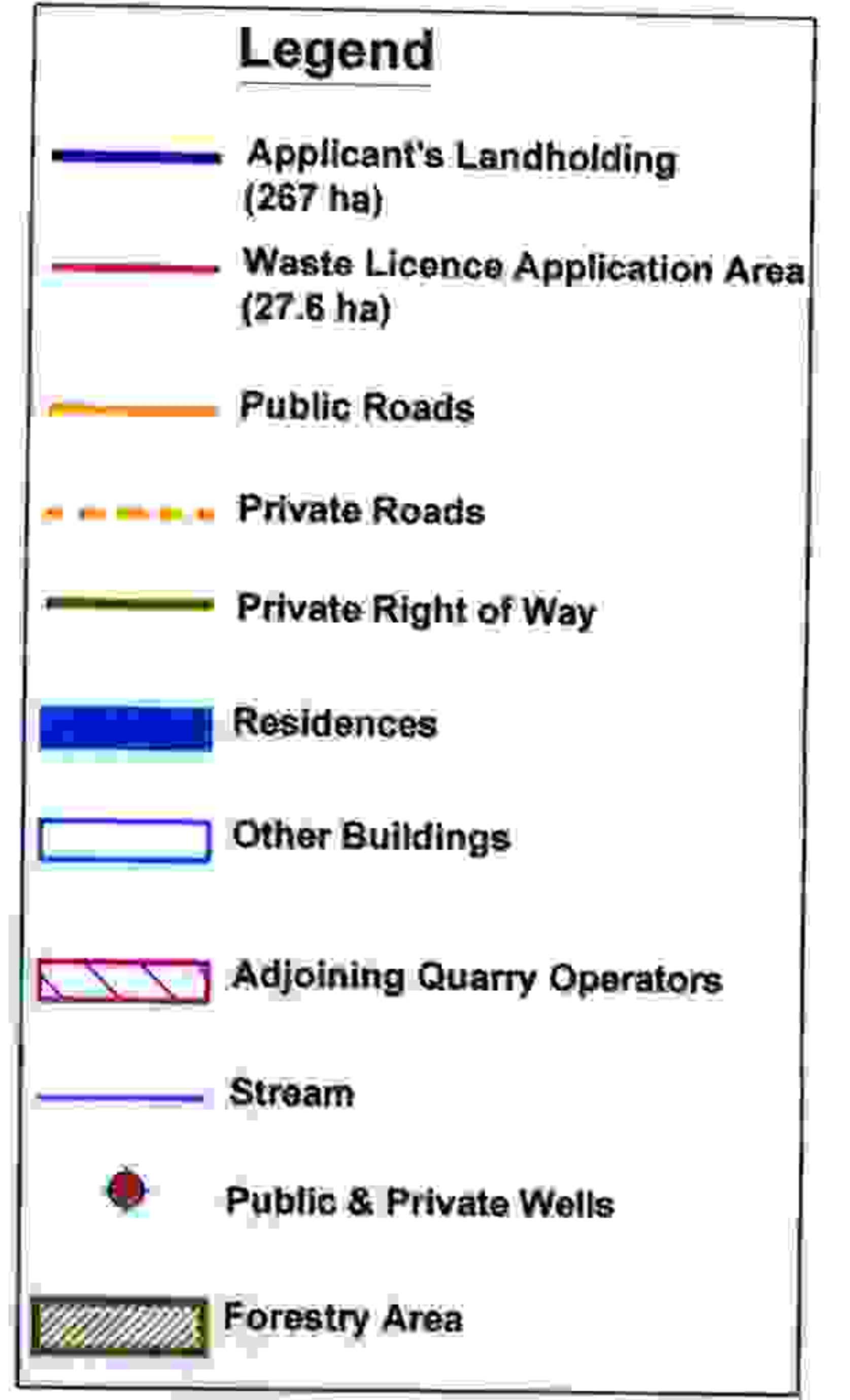
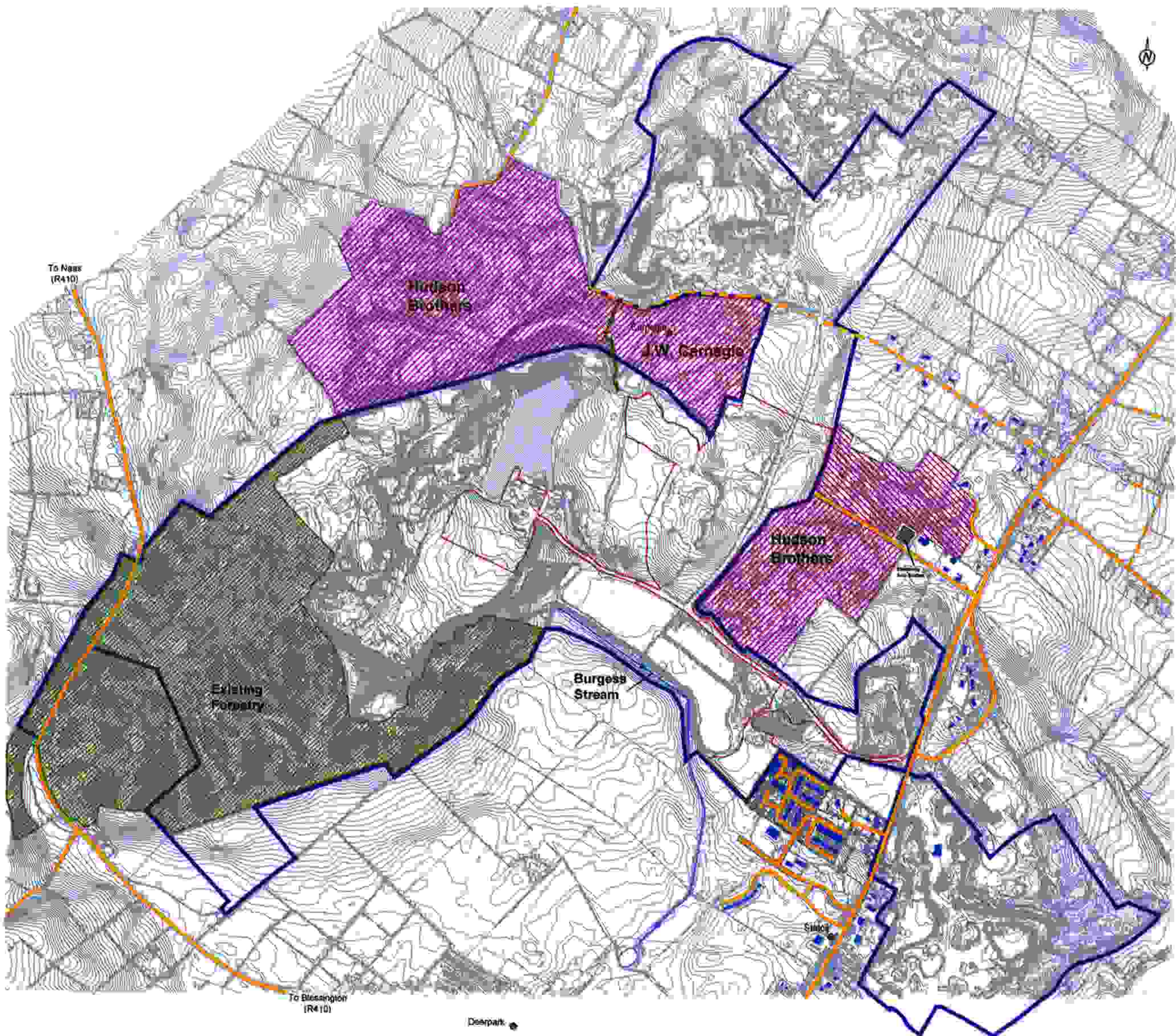
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 Land Ownership

Rev	Date	By	Description
0	Dec 03	SMD/PM	

Site:	Lands at Blessington, Co. Wicklow	
Project:	Remediation of Unauthorised Landfill Sites	
Title:	Proposed Inner Relief Road	
Drawn:	PMC	Scale: 1:5,000
Job. No:	2901/10	Date: Dec 2004

FIGURE 1.4



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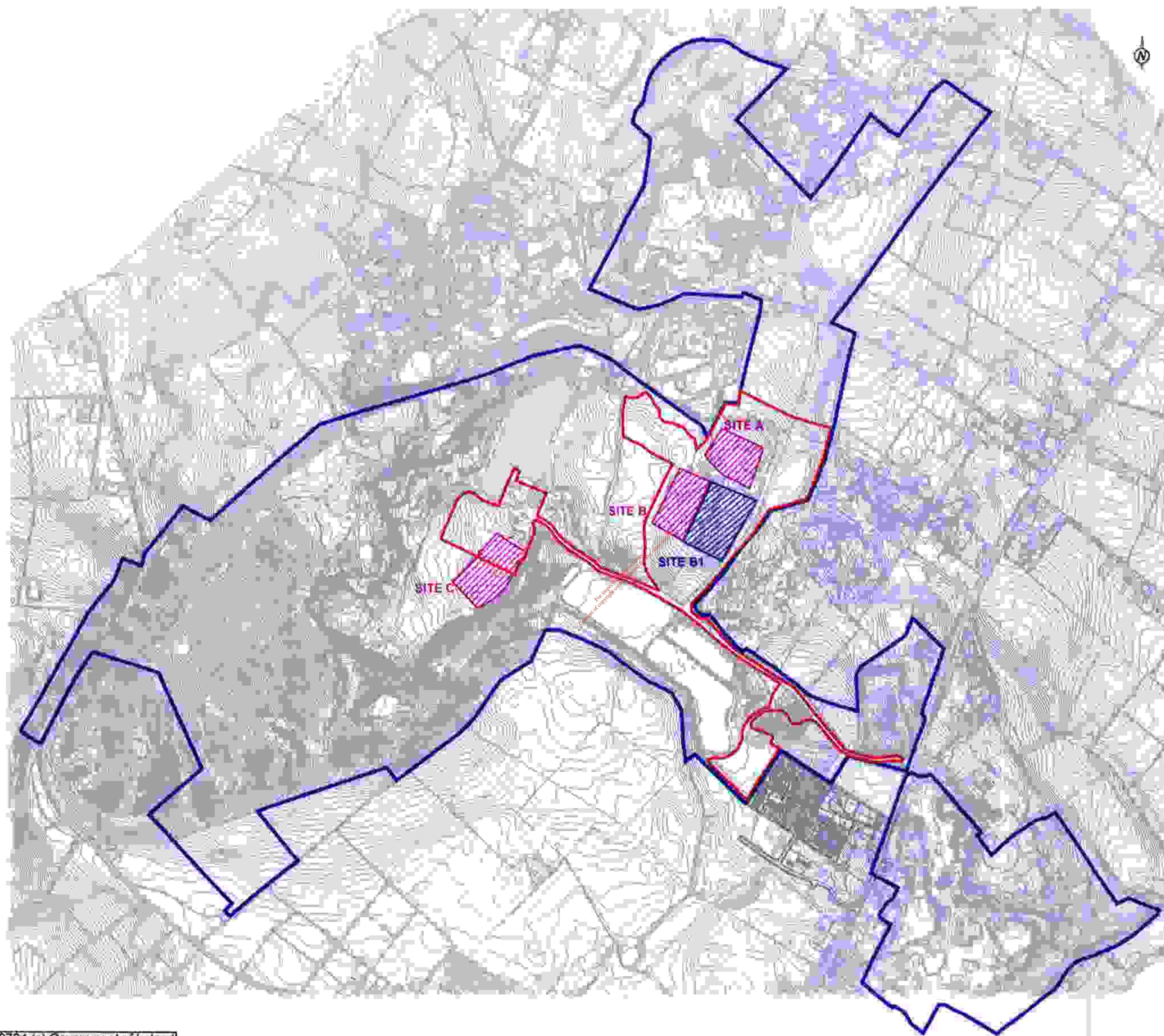
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Rev.	Date	By	Description
0	Dec 03	SMD/PM	

Site: Lands at Blessington, Co. Wicklow	
Project: Remediation of Unauthorised Landfill Sites	
Title: Surrounding Land Use	
Drawn: PMC	Scale: 1:12,500
Job No: 2901/10	Date: Dec 2004

FIGURE 1.5



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- Land Ownership
- Alternative Landfill Sites

0	Dec 03	SMD/PMC	
Rev.	Date	By	Description

Site:	Lands at Blessington, Co. Wicklow	
Project:	Remediation of Unauthorised Landfill Sites	
Title:	Alternative Landfill Sites Considered	
Drawn: PMC	Scale: 1:12,500	FIGURE 1.6
Job. No: 2901/10	Date: Dec 2004	