3 PLANNING AND DEVELOPMENT CONTEXT

3.1 Planning

3.1.1 Planning Context of the Site

The RILTA site is situated in the at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, County Dublin and is within the functional area of SDCC, and as such is subject to the planning regulations of that authority. The original Greenogue Industrial Estate was set up as a mushroom farm in 1959. In the 1970's the site was developed as an enterprise centre, with a number of small storage/workshop units. The current site is home to about 70 small to medium sized businesses, employing about 500 people.

The site was zoned for agricultural use until 1998 when the 1998 South Dublin County Development Plan changed the zoning to industrial. In the 2004-2010 South Dublin County Development Plan the land has been given a specific local zoning objective 'LZ 011-Greenogue, Newcastle', which is zoning for Office Use. It has also been given a general Zoning Objective 'E' which is an objective to provide for enterprise, employment and related uses.

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3.1.2 National Spatial Strategy

In 2002, the government published the National Spatial Strategy (NSS) for Ireland 2002 to 2020. NSS is a coherent national planning framework that centres on the following five core messages:

- A wider range of work opportunities;
- A better quality of life;
- Better places to live;
- Effective urban and rural planning; and
- Getting things done.

The Spatial Strategy covers Ireland's seven regions, and also provides the framework for spatial policy for the Greater Dublin Area. There is a strong emphasis placed upon securing Greater Dublin's vital national role through improved mobility, urban design, social mix and transport (both national and international).

This Strategy calls for more compact urban forms and brownfield redevelopment, hence urban renewal and demolition likely to take a bigger share of development. This leads to an increase in demolition waste (concrete, brick, timber, metal) and contaminated soil.

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3.1.3 Regional Planning Guidelines for the Greater Dublin Area (2004 –2016)

The Dublin Regional Authority and the Mid-East Regional Authority, the two Regional Authorities that make up the seven counties of the Greater Dublin Region, have published 'Regional Planning Guidelines (RPG) Greater Dublin Area (2004 – 2016)'. The document provides a strategic development and planning vision and the framework for the delivery of that vision.

Under the Planning and Development Act 2000, planning authorities must have regard to any regional guidelines in force for the area when making and adopting their development plans. The RPG structure consists of two parts:

- Part A – An overall regional development report for the region; and
- Part B – Regional Planning Guidelines.

Part A: Regional Development Report for the Region

This Report provides the key issues relevant to strategic planning and socio-economic and physical planning in terms of broad trends, housing, employment, provision of services, accessibility, environmental issues, social and cultural development, and overall goals for the region.

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Part B: Regional Planning Guidelines (RPG)

The Guidelines reflect a shared vision and consensus for the future development of the region.

Section 3

Section 3 of the RPG provides the goals and objectives for the Greater Dublin Area which include, *inter alia*:

- "*Goal 2 – creating a region functioning well with regard to sustainability, attractiveness and quality of life which is cost effective and properly functioning in its physical, economic, social and cultural dimensions;*
- *Goal 4 – to promote sustainability in relation to water management (objective – to co-ordinate settlement pattern with strategic plans for waste management and disposal); and*
- *Goal 5 – to provide sustainable infrastructure corridors."*

3.1.4 South Dublin County Development Plan 2004-2010

The Development Plan sets out South Dublin County Council's policies and objectives for the development of the County from 2004 to 2010. The Plan seeks to develop and improve in a sustainable manner the social, economic, cultural and environmental assets of the county.

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In this plan lands surrounding the facility have been given a specific local zoning objective 'LZ 011-Greenogue, Newcastle', which is zoning for Office Use. It has also been given a general Zoning Objective 'E' which is an objective to provide for enterprise, employment and related uses.

'These zoning objectives state that within the industrial zoned lands at Greenogue, Newcastle, designated as Zoning Objective 'E' on Development Plan Maps, the use classes Office-Based Industry and Offices shall not be permitted as stand alone developments independent of industrial/warehousing type uses. Office use of not more than 20% of total floor area which is wholly ancillary to industrial or warehousing uses will however generally be acceptable.'

Light industry and refuse transfer stations are permitted in principle within this zoning category and therefore the facility is a suitable use for this land.

3.2 Environmental Policy

3.2.1 National Waste Management Policy

Since the publication of Changing our Ways in 1998, the policy framework has been firmly rooted in the "integrated waste management" approach, based on the internationally adopted hierarchy of options which places greatest emphasis on waste prevention, followed by minimisation, re-use, recycling, energy recovery and, finally, the environmentally sustainable disposal of residual waste.

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The Department of the Environment, Heritage & Local Government's waste management policy document "Environment in Focus 2006" identifies that contaminated soil was the largest single hazardous waste type generated in 2004, accounting for 45.6 per cent of total reported hazardous waste. The continuous increase in the quantity of contaminated soil reflects the scale of redevelopment of brownfield sites.

3.2.2 National Hazardous Waste Management Plan

The National Hazardous Waste Management Plan was published by the EPA in 2001 and quantifies the current position, examines trends and develops proposals with regard to hazardous waste management in Ireland. The National Hazardous Waste Management Plan recognises that there is a deficit in both hazardous waste management infrastructure and services. It is predicted that there will be a 50% growth in hazardous waste arisings in Ireland by the year 2006. Some of the recommendations of the Plan include:

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Ireland should be nationally self sufficient in recovery and disposal capacity for hazardous waste;
A significant increased collection rate of most waste types to ensure that full use is made of existing and new hazardous waste facilities; and
Investment is likely to be required at some facilities in order to improve environmental performance.

For these reasons, the RILTA facility offers a viable and an economically sustainable means of treating a considerable quantity of hazardous waste. The existing Hydrocarbon Waste Treatment Facility (previously Pipe and Drain Ltd.) and Drum Recovery Facility (previously Dempsey Drums Ltd.) are both highlighted in the National Hazardous Waste Management Plan as being integral components of the hazardous waste management infrastructure in Ireland.

The Integrated Waste Management Facility at Greenogue Business Park improves the national capacity for hazardous waste recovery and disposal, and the transfer operation supplements the existing national hazardous waste collection service. The facility promotes the proximity principle both nationally and locally where considerable quantities of hazardous waste are produced.

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3.2.3 Dublin Waste Management Plan 2005-2010

The WMP was developed jointly by Dublin City Council, South Dublin County Council, Fingal County Council and Dun Laoghaire-Rathdown County Council. The Dublin Region adopted a *Regional Waste Management Strategy* in 1997, which set out to replace a system that over-relied on landfill disposal with a new approach based on integrated waste management over a 20-year period. The Plan is based on EU and Irish national waste management policy, and sets out a policy to implement a balanced, sustainable and affordable waste management system in the Dublin Region.

In 1998 a total of 16,000 tonnes of contaminated soil was produced in the Dublin Region. In 2003 a total of 179,416 tonnes of contaminated soil was reported in the Dublin Region. The majority of this was produced in the Dublin City Council functional area and almost 70% of this was generated by brownfield regeneration projects.

Contaminated soil is not generated on a continual basis and tends to result from once off construction projects. For this reason it is impossible to predict the quantities that may be generated in the future. Due to the nature of the material and the cost of remediation it is difficult to manage within Ireland and specialised treatment is required abroad.

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4 HUMAN BEINGS/SOCIO ECONOMIC

4.1 Introduction

Human Beings are a vital element to be considered as part of the EIA process. The purpose of this assessment is to examine the existing environment, the current and potential impacts of the existing integrated waste management facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on human beings. As this facility is already in existence this section will provide an assessment of socio-economic issues that may be affected by an increase in the annual volume of contaminated soil. This section will focus on the population, employment, tourism and amenities, and material assets. The current mitigating measures will be assessed and re-enforced and potential additional measures will be examined.

4.1.1 Methodology

A desk study was carried out in order to examine all relevant information pertaining to planning and socio-economic activity in the study area. The relevant national, regional and local planning guidelines were examined along with the South Dublin County Development Plan 2004-2010. Fáilte Ireland tourist literature for Dublin was examined in relation to tourism amenity in conjunction with websites of relevant tourism sites and amenities for the area. In addition, Ordnance Survey maps were used to identify land use and possible amenity and tourist sites that may be located in proximity to the existing facility.

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4.2 Existing Environment

The site located in southwest County Dublin is adjacent to Newcastle and approximately 1.5km north of the village of Rathcoole. Access to the site is from the south from the R120 that joins the N7 (Dublin-Limerick road). The land immediately surrounding the facility is industrial in nature. To the south and the west internal industrial estate roads bound the site. The Casement Aerodrome, which is a military airfield, is located approximately 2.1km north-east of the site (measured to the centre of the aerodrome). One off residential developments are located in the vicinity of the site along the R120 and College Lane.

4.2.1 Population

To understand an area its population must be examined. This section will look at the population change over the period 1996-2006. The subject site is located within the townland and subsequent District Electoral Division (DED) of Rathcoole. Table 4.1 illustrates the population change between 1996-2006 in the State, Leinster, South Dublin and Rathcoole DED.

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Table 4-1 Population Change 1996-2006

	1996	2002	2006*	% Change 1996-2006
State	3,621,035	3,917,336	4,234,925	17%
Leinster	1,924,702	2,105,579	2,292,939	19%
South Dublin	218,728	238,835	246,919	13%
Rathcoole DED	3,448	3,204	3,618	5%

Source: CSO 2002 and 2006* Preliminary

Table 4.1 shows that the population of the Rathcoole DED (5%) increased at a lower rate than the State (17%). The population of the State increased by 17%, Leinster by 19% and in South Dublin by 13%. 1.5% of the population of South Dublin live in Rathcoole DED.

Due to the facility's location in a Business Park, there are a limited number of residences likely to be directly or indirectly affected by the facility. As shown on Drawing No. 3684/01/201 there are only 8 dwellings within 500m of the facility and the nearest dwelling is approximately 250m from the facility. This dwelling is located to the west of the site.

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4.2.2 Socio-Economic Profile of the Locality

According to the South Dublin County Development Plan 2004-2010, South Dublin possesses a number of key opportunities for its long-term strategic development. These will allow the County Council to achieve the Strategy and Aims of the Plan and to meet the housing, employment, transport, leisure and cultural needs of its population over the period of this Development Plan, 2004 – 2010, and beyond. The Strategic Opportunities include the development of a high technology crescent around the western edge of the county, connecting Citywest, Baldonnell, Greenogue and Grange Castle Business Parks, capitalising on the existing enterprise areas and the linking of this area to parallel research and education networks such as the Institute of Technology and the Regional Hospital. Statistics in relation to occupational group are provided in the Census for Rathcoole and are shown in Table 4.2 below.

Table 4-2 Occupational Group, Rathcoole

Occupational Group	Percentage
Farming, fishing and forestry workers	0.3%
Manufacturing workers	17%
Building and Construction workers	6%
Clerical, managing and government workers	24%
Communication and transport workers	9%
Sales and commerce workers	14%

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Professional, technical and health workers	13%
Service workers	9%
Other	9%

Source: CSO, 2002

Clerical, managing and government workers represent the highest percentage of workers (24%), while farming, fishing and forestry workers represent the lowest percentage (0.3%).

Enterprise Ireland (EI) assists 167 companies in South Dublin, 2 of these are located in the Greenogue Business Park and are listed in Table 4.3 below.

Table 4-3 Enterprise Ireland Companies Greenogue Business Park

Name	Sector	No. of Employees
B M Burke & Co Ltd.	Other Food	1-10
Mackwood Interiors Ltd.	Furniture	1-10

Source: Enterprise Ireland, March 2006

The Industrial Development Agency (IDA) has 10 Business Parks in Dublin. The IDA assists approximately 425 companies in the County. Approximately 3 of these companies are located in the Newcastle/Rathcoole area.

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4.2.3 Employment

Employment is an important indicator of the economic standing of an area. This section examines unemployment levels, employment status and industrial groups in Rathcoole. The Quarterly National Household Survey (QNHS) provides details of unemployment on a regional level. Rathcoole is located in the Dublin Region therefore this Region will be used to illustrate unemployment in the area. The Dublin Region consists of Dublin City, Dun Laoghaire-Rathdown, Fingal and South Dublin.

Table 4-4 Quarterly National Household Survey (Q4 2006)

	Unemployment Rate	Participation Rate
State	4.1%	63%
Dublin Region	4.2%	65.3%

Source: CSO, 2007

Table 4.4 illustrates the findings from the most recent QNHS quarter four (September to November 2006). The unemployment rate is the number of unemployed persons expressed as a percentage of the total labour force. The unemployment rate for the State was 4.1% while the unemployment rate for the Dublin Region, was 4.2%. The Dublin Region has a slightly higher unemployment rate than the State.

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The participation rate is the number of persons in the labour force expressed as a percentage of the total population (over the age of 15 years). Currently the participation rate in the State is 63%. The Dublin Region's participation rate is 65.3%, which is higher than that of the State.

The Central Statistics Office (CSO) publishes figures relating to the live register. These figures are not strictly a measure of unemployment as they include persons who are legitimately working part time and signing on part time. However they can be used to provide an overall trend within an area.

Table 4-5 Live Register 2006-2007

	February 2006	**February 2007**	**% Change**
State	159,617	159,399	-0.1%
Dublin Region	41,054	39,670	-3.4%
Clondalkin	3,700	3,483	-5.9%
Tallaght	3,458	3,598	4%

Source: CSO 2007

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The figures in Table 4.5 show that over the period February 2006 - February 2007 the number of persons on the live register decreased and it decreased in both the State (-0.71%) and in the Dublin Region (-3.4%). Live register data was also sourced for the two nearest live register offices to the site i.e. Tallaght and Clondalkin. Clondalkin has seen a decrease in numbers (-5.9%) and Tallaght has seen an increase in numbers on the live register for the period February 2006 and February 2007.

The facility currently provides employment for 65 persons. As the scale of activity will not increase, the number of people employed for the continuation of the facility operation should not change. Staffing numbers include operations managers, general managers, accountant, yard managers, maintenance engineer, vehicle drivers, general operatives and office staff.

4.2.4 Landscape Character and Land Use

According to the current County Development Plan Greenogue Business Park is located in the Landscape Character Area of Newcastle. The northern boundary to the Newcastle Character Area is the Grand Canal; to the south it is bounded by the N7, to the west lies the Kildare county boundary and the Casement Aerodrome Baldonnell is situated to the east. The R120, R405 and a series of county roads serve the area. Settlement is mainly linear and centred around Newcastle village, radiating out towards Athgoe.

According to the CSO, 581ha or 38% of the total land of Rathcoole is farmed. There are 26 farms in Rathcoole. All of these farms are less than 20hectares in size. In relation to

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livestock there are 738 cattle and 746 sheep. Pasture is the most popular farm type (50%). Silage is the least popular farm type accounting for 20%.

4.2.4.1 Zoning

In the South Dublin County Development Plan 2004-2010, lands surrounding the facility have been given a specific local zoning objective 'LZ 011-Greenogue, Newcastle', which is zoning for Office Use. It has also been given a general Zoning Objective 'E' which is an objective to provide for enterprise, employment and related uses.

'These zoning objectives state that within the industrial zoned lands at Greenogue, Newcastle, designated as Zoning Objective 'E' on Development Plan Maps, the use classes Office-Based Industry and Offices shall not be permitted as stand alone developments independent of industrial/warehousing type uses. Office use of not more than 20% of total floor area which is wholly ancillary to industrial or warehousing uses will however generally be acceptable.'

Light industry and refuse transfer stations are permitted in principle within this zoning category and therefore the facility is a suitable use for this land.

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4.2.5 Tourism and Amenities

4.2.5.1 Dublin Tourism

The latest available statistics for Dublin from Failte Ireland are for the year ending December 2005. According to these statistics approximately 6.8 million overseas visitors arrived in Ireland in 2005 generating total revenue of €3.5 million. The peak period for visitors to Ireland is October – December accounting for 22% of all visits. With the least number of visitors in April accounting for only 8% of all visits. Table 4.6 below provides a breakdown of overseas tourism to Dublin.

Table 4-6 Overseas Tourism to Dublin, 2005

	Britain	Europe	N. America	Other	Total
Number of Visitors (000's)	1,931	1,175	625	206	3,937
Revenue Generated (€m)	412.7	490.5	260.5	118.1	1,283.8

Source: Failte Ireland, 2006

Table 4.6 shows that there were nearly 4 million visitors to Dublin in 2005 and they generated a total revenue of €1,283.8 million.

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The South Dublin County Development Plan 2004-2010 states that:

'It is the policy of the Council to co-operate with the County Development Board and other appropriate agencies in identifying and promoting the tourism assets of the county and to support the development of tourism infrastructure in a sustainable and sensitive manner in the County.

The Council recognises and encourages the employment potential of tourism in the local economy. Many of the policies and objectives of the Plan have as their ultimate aim the protection and enhancement of the natural and built environments, which are such an attractive feature of the County and an important element in terms of promoting tourism.'

4.2.5.2 Tourism South Dublin

Views and Prospects

It is the policy of the Council in the South Dublin County Development Plan 2004-2010 to protect views and prospects of special amenity value or special interest.

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Dublin contains many scenic areas and vantage points from which views of great natural beauty may be obtained, over adjoining counties and the rural landscape in general. In addition to scenic views, the County also contains important "prospects" i.e. prominent landscapes or areas of special amenity value or special interest, which are visible from the surrounding area. Views and prospects for protection have been identified in the South Dublin County Development Plan.

It is an objective of the Council to preserve the viewpoints illustrated in Table 4.7 below.

Table 4-7 Protected Prospects

Viewing Points	Prospects	Viewing Point Location
Rathcoole-Lucan Road (R120) (Between Newcastle and Naas Road, vicinity of Commons/Rathcreadan)	Athgoe Hill	Approx 2km southeast of site.
Naas Road (Brownsbarn area)	Saggart Hill, Verschoyle's Hill	Approx 1km southwest of site.

Walking and Cycling Routes

The South Dublin County Development Plan 2004-2010 states that:

'It is the policy of the Council to promote and facilitate the development of cycling and walking facilities in the County and to ensure that all developments facilitate access by foot

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and bicycle to public transport facilities and local services.'

It is also an objective of the Council to secure retention of established public rights of way. Among the most important of these are the Grand Canal Way (Waymarked Walk), a short section of the Wicklow Way (Waymarked Walk), and public rights of way in the Dublin Mountains. None of these are located in proximity to the facility.

Casement Aerodrome, Baldonnell

It is the policy of the Council in the current South Dublin County Development Plan to promote the development of Casement Aerodrome, Baldonnell for joint military/civilian uses.

The Council recognises the strategic location of Casement Aerodrome in the County and within the Metropolitan Area and in proximity to the rapidly developing major enterprise and employment areas e.g. Grange Castle, Citywest and Greenogue. The Council will co-operate with the County Development Board, State authorities, statutory bodies and other agencies in examining the potential of the development of the aerodrome for joint military/civilian use to contribute to the future economic development of the County. It is an objective of the Council that Casement Aerodrome shall retain its current status in the Plan while accepting the need to investigate the future of the airport.

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4.2.6 Transportation in the Existing Environment

The facility is located in Greenogue Business Park, which is adjacent to the R120/College lane roundabout junction. The R120 runs from Newcastle to the N7, which is the national route that connects Dublin to Limerick. College Lane accesses the N7 via the Rathcoole Interchange, as shown in Figure 1.2.

It is an objective as listed in the South County Dublin Development Plan 2004-2010 that, 'Prior to the commencement of development of the industrial lands at Greenogue, newly-zoned in this Development Plan, the Greenogue Road West, northwards as far as the Newcastle Road, shall be completed'. This roadway has been completed.

An additional entrance to RILTA, via College Road, has been completed recently. This roadway is accessed via a roundabout junction between College road and the R120.

4.3 Significant Impacts

4.3.1 Effects on Population

The facility is located in a Business park, which is zoned for enterprise, employment and related uses. There are a limited number of residences likely to be directly or indirectly affected by the facility. As shown on Drawing No. 3684/01/201 there are only 8 dwellings within 500m of the facility. The nearest dwelling is approximately 250m from the facility.

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This dwelling is located to the west of the site.

Issues that may cause concern for local population include: -

4.3.1.1 Traffic

The significant impacts in relation to traffic are dealt with in Section 10 (Traffic) of the EIS. It is anticipated that with the increase in soil tonnage allowances, an additional 36 vehicles movements per day will be encountered, bringing the total to 88.

4.3.1.2 Noise

The noise emissions from the integrated waste management facility will continue to have a negligible noise impact at all residences and is dealt with in Section 9 (Noise and Vibration) of the EIS.

4.3.1.3 Visual Amenity

The significant impacts in relation to Visual Amenity are dealt with in Section 11 (Landscape and Visual Assessment) of the EIS.

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4.3.2 Effects on Health and Safety

It is considered that the nature of the operation does not pose a major risk of fire, however safety procedures have been put in place. These are dealt with more fully in Section 2.5.12 of this EIS.

4.3.3 Effects on Employment

The development is located in an area zoned for enterprise, employment and related uses. It currently provides 65 jobs and this number will be sustained for the lifetime of the facility.

4.3.4 Effects on Landuse

As the facility is located in a Business park, there will be no impacts on agricultural or residential landuse.

4.3.5 Effects on Amenities and Tourism

The nearest protected view is of Athgoe Hill and the nearest protected view is located approximately 1km southwest of the facility. The facility and the proposed increase in tonnages do not impact on any views. There are no designated or proposed walking and cycling routes in the vicinity of this facility and therefore none will be impacted upon. Casement Aerodrome is located 21.km northwest of the facility and will not be impacted upon by the proposed developments at the facility.

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4.4 Mitigation Measures

4.4.1 Population

The increase in the annual volume of contaminated soil at the facility will have limited effects on the local population, as the facility is already in operation. The facility will be managed in such a way as to limit the impact of its operation on the surrounding environment.

4.4.1.1 Traffic

Pedestrian movements are already sufficiently catered for in the vicinity of the development, therefore no pedestrian improvements are considered necessary. It is not considered necessary to provide any additional cycle facilities as part of this application. See Section10 (Traffic) for mitigation measures.

4.4.1.2 Noise

The mitigation measures recommended in the EIS accompanying the original planning application should remain in place. See Section 9 (Noise and Vibration) of the EIS for mitigation measures.

4.4.1.3 Visual Amenity

As there will be no predicted impacts on the visual assessment or landscape within or surrounding the facility as a result of the proposed change of use at RILTA, there are no recommended mitigation measures.

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4.4.2 Health and Safety

The mitigation measures recommended in the EIS accompanying the original planning application should remain in place. This includes and is not limited to the following fire safety measures:

- Training of all site operatives and employees in fire prevention and control by a fire prevention company;
- Prominent posting of emergency response contact numbers (fire service, police, ambulance and other agencies);
- The provision of on-site water supply;
- The provision of fire fighting equipment including fire extinguishers in all buildings, fire hydrants and fire hoses adjacent to all buildings;
- Fire alarm and detection system in all buildings;
- There will be no long term storage of waste on-site;
- A fire assembly point will also be posted on-site at the site entrances;
- The designation of smoking and non/smoking areas.
- A secure storage area is provided externally for the secure night-time storage of the oxy-acetylene tanks used in welding.

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4.4.3 Employment

The continued operation of this facility will maintain 65 jobs. This impact is positive therefore there are no mitigation measures.

4.4.4 Landuse

No mitigation measures are proposed as the facility is located in a business park and on lands which have been zoned with the objective to provide for enterprise, employment and related uses.

4.4.5 Amenities and Tourism

There is no public right of way through or near the facility and the increase in the annual volume of contaminated soil will not have a negative impact on amenities and tourism in the area.

4.5 Conclusion

In summary the facility has a positive impact in relation to the socio-economic standing of the area. This takes the form of direct and indirect job creation. All activities at the facility will be carried out with regard to strict guidelines. When all mitigation measures are complied with there should be no significant impacts arising from an increase in the annual volume of contaminated soil. It is anticipated that the development will not have a negative impact on the everyday activities and lifestyles of the people residing in the area.

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5 ECOLOGY

5.1 Introduction

TOBIN Consulting Engineers were retained by RILTA Environmental Ltd. to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on ecology. As this facility is already in existence, this section will provide an assessment of ecology that may be affected by an increase in the annual volume of contaminated soil.

This section addresses the impacts of the increase in annual waste throughput on the existing floral, faunal and aquatic ecology environments.

5.2 Existing Environment

Information presented in the original EIS baseline studies, as cited above, for this facility states that previously the site consisted of an area where topsoil material had previously been deposited on the site and subsequently vegetation had colonised this deposited material. The habitat survey for the original EIS classified habitats according 'A Guide to Habitats in Ireland' (Fossitt, 2000) and identified five No. Habitat types:

- Recolonising Bare Ground (ED3)
- Hedgerows (WL1)
- Treeline (WL2)
- Spoil and Bare Ground (ED3)
- Depositing/Lowland river (FW2)

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The existing site (following development of the waste management facility) now covers 1.1 hectares and is compromises of made ground. The site is bounded to the north by the Griffeen River. A 3m wide pathway is adjacent to the Griffeen River north of the RILTA site. A two metre strip of landscaping has also been left inside the site boundary around the perimeter of the site.

5.2.1 Aquatic Ecology and Water Quality

The study undertaken for the original EIS looked at water quality by carrying out a biological assessment of the Griffeen River. This method involves taking samples of the freshwater invertebrates and then analysing these samples to determine a 'Q' rating for the sample location. This methodology follows procedures adopted by the EPA (see Toner *et al*, 2005).

The relationship between 'Q' values and water quality is shown in Table 5.1 below

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Table 5-1 The Biological River Quality Classification System (Q Value)

Biotic Index	Quality Status	Quality Class
Q5, Q4-5, Q4	Unpolluted	Class A
Q3-4	Slightly Polluted	Class B
Q3, Q2-3	Moderately Polluted	Class C
Q2, Q1-2, Q1	Seriously Polluted	Class D

The original assessment took samples from two locations, one upstream and one downstream, of the development site. This assessment was carried out in 2002. This assessment was repeated in 2005, in accordance with the waste licence issued for operation of the facility. The same two locations were sampled using the same methodology. The results from the two separate assessments are given in Table 5.2 below:

Table 5-2 The Biological River Quality Results

Location	'Q' value, 2002	'Q' value, 2005
KS1	2-3	3-4
KS2	2-3	3-4

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These results indicate that water quality in the Griffeen river has improved since the initial assessment in 2002.

5.3 Significant Impacts

The original development involved the removal of the Recolonising Bare Ground (ED3) and Spoil and Bare Ground (ED2) habitats, both of which were of low ecological value.

As the proposed changes to the facility do not involve any changes to the physical environment at the RILTA site, i.e. no additional buildings or infrastructure will be required, there will be no direct impacts on the ecology of the site.

The waste management facility is currently comprised of made-ground, a highly modified habitat, with the exception of a 2m landscaped boundary surrounding the perimeter which has been planted and maintained since the facility was constructed. Any remnant semi-natural vegetation on the periphery of the site will be unaffected by this proposal.

The increase in soil to be stored and transferred from the facility will not impact on the surrounding environment as this material will be stored as per current operational procedures in the soil storage buildings. No additional storage is required at the RILTA facility as the number of truckloads of soil transferred off site will be increased to meet demand.

During the period following development of the site, the water quality in the Griffeen river,

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as shown by the biological assessment, has improved, indicating that the systems in place within the facility to prevent any indirect impacts on the river are effective. Providing these systems and procedures are maintained and continue to be followed, there will be no direct or indirect impacts on the Griffeen river.

An increase in dust levels at the site is the only potential impact of an increase in soil volumes to be transferred to and from the site, with interim storage. Dust monitoring is carried out at the facility in accordance with Schedule D of Waste Licence 192-1, and, as such, dust is monitored 3 times per annum, including twice between the period May to September. The results of all dust monitoring to date has been submitted to the EPA as part of the Annual Environmental Reports (AER) for 2005 and 2006.

5.4 Mitigation Measures

The facility is covered in made ground, with the exception of a 2m area of landscaping along the perimeter of the site.

There will be no direct impacts on the ecology of the existing site and no mitigation measures required. There is potential for wind blown dust to reach the Griffeen river and it is recommended that biological assessment of the river be undertaken every three years. The biological assessment should follow the same methodologies and be carried out at the same locations (KS1 and KS2) as the previous assessments. However, the soil is transferred directly to an internal building where it is contained until it is transferred off site. Therefore, the impact of dust is insignificant.

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5.5 Conclusion

As the site is currently covered in made ground, with the exception of a 2m area of landscaping along the perimeter of the site, no direct or indirect impacts on the existing ecology of the site are predicted.

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6 GEOLOGY

6.1 Introduction

TOBIN Consulting Engineers were retained by RILTA Environmental Ltd. to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on geology. As this facility is already in existence, this section will provide an assessment of soil, subsoil and bedrock environments that may be affected by an increase in the annual volume of contaminated soil.

6.2 Existing Environment

Information presented in the original EIS baseline studies, as cited above, for this facility states that previously the site consisted of unmanaged grassland that had been disturbed in the past.

The existing site covers 1.1 hectares and is covered in hardstanding made ground. The site is bounded to the north by the Griffeen River. A 3m wide pathway is adjacent to the Griffeen River north of the RILTA site. A two metre strip of landscaping has also been left inside the site boundary around the perimeter of the site. The underlying geology has been described in the original EIS as follows:

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6.2.1 Regional Setting

6.2.1.1 Soil

Reference to the Soil Map of Ireland (National Soil Survey, 1980) indicates that the principal soil type in this area comprises Luvisols and Gleysols. The parent subsoil material from which this material is derived is limestone glacial till.

It should be noted that mapping of the soils of Ireland was undertaken on a regional basis and grouped into broad categories. Small localised changes in soil cover over short lateral distances cannot be distinguished on the map.

The information detailed in this section relates to works undertaken within the property. The site investigation programme was undertaken by TOBIN Consulting Engineers (formerly known as TES Consulting Engineers), in April of 2002. Site investigations undertaken by Byrne Looby Partners (BLP) in September 2001 in the vicinity of the site, as part of a previous EIS for the development of the Greenogue Industrial Estate, are also discussed in this section.

A trial pit programme, comprising the excavation of 4 No. trial pits in the vicinity of the site, was undertaken in September of 2001 by BLP using a JCB Excavator. The trial pit depths

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varied within the range of 1.6 m to 1.8 m. Most trial pits were terminated due to hitting bedrock. A series of 3 No. monitoring boreholes were also drilled on site. These boreholes were drilled to between 15m and 18m deep.

6.2.1.2 Soil

The dominant soil types noted within the boundaries of the site were podzols and organic rich peat soil. This material concurs with the materials indicated on the Soil Map of Ireland (Soil Survey of Ireland, 1980), which indicates that the dominant soil type in the area varies between degraded brown podzolics and basinal peats.

6.2.1.3 Subsoils

The subsoils encountered on the site were generally tills, with limestone clasts. Additional information on the nature and thickness of the subsoils was obtained from the material returned during the drilling of 3 No. boreholes to determine the true thickness of the unconsolidated material and the nature of the bedrock.

The thickness of the subsoils is generally less than 2.5 m across the site. The final depth of the trial pits ranged from 1.6 m to 1.8m, with an average penetration depth of 1.75 m. With respect to the boreholes, depth to bedrock ranged from 2.9m to 3.3 m below ground level, with an average thickness of 3.1m of unconsolidated material across the site.

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The descriptions of subsoils from both TOBIN drilling and BPL trial pits generally concur, with the succession being described as CLAY with cobbles/boulders or Till. No fluvial/fluvio-glacial type clean gravels or sands were found at the site, with the deposits being only of glacial origin i.e. high silt and clay content, poorly sorted and poorly rounded.

6.2.1.4 Monitoring Boreholes

No outcrops were noted on site during the works, however bedrock was encountered during drilling operations and bedrock was also encountered during trial pitting operations. The rock encountered during trial pitting by BLP was described as weathered limestone.

All the boreholes drilled encountered bedrock proper and this was generally dark shales with some very thin quartz veins. This is consistent with the shale horizons of the Calp Limestone Formation. However, it is notable that calcite rather than quartz veins would have been expected in the Calp Limestone.

The difference in description is understandable in that the Calp limestone consists of very shaley intervals as well as argillaceous limestone, with gradational boundaries between the two rock types.

It should be noted that mapping of the soils of Ireland was undertaken on a regional basis

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and grouped into broad categories. Small localised changes in soil cover over short lateral distances cannot be distinguished on the map.

6.2.1.5 Quaternary Geology

The origin of the unconsolidated materials in this area are associated with the movement and deposition from Irish Ice Sheet during the last Ice Age, which is part of the Quaternary Period, the most recent period in the geological timeframe. The ice sheets ripped and ground down the underlying bedrock, breaking it and grinding it into smaller pieces as it advanced and depositing the material during its retreat.

The 19th Century geological field sheets of the area, at 6-inch to 1-mile scale, show no particular reference to the thin subsoil covering which was encountered on the site.

6.2.1.6 Bedrock Geology

Reference to the relevant geological information for this area, the 1:100,000 scale Sheet 16 – Bedrock Geological Map of Kildare-Wicklow (*GSI* 1995) see Figure 6.1, indicates that the entire property is underlain by Calp Limestones (CD). The Calp Limestone is described as predominantly dark laminated, argillaceous calcisiltites and calcareous shales, with some limestone turbidites.

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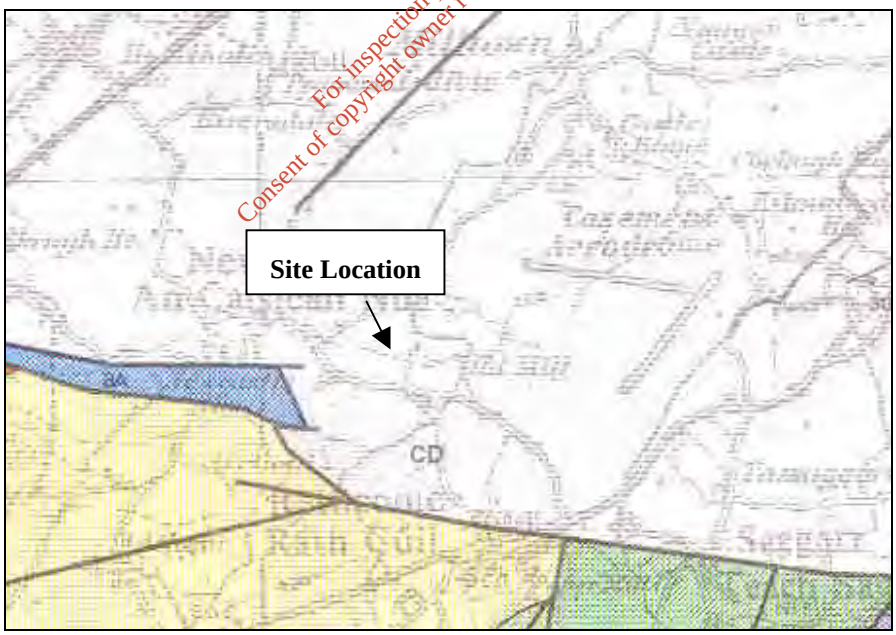

Figure 6-1 Bedrock Geological Map of Kildare -Wicklow.

Tectonic deformation is indicated from the geological map, with several faults within 3 kms of the site. However, the Calp Limestone actually post dates and actually overlies most of the faulting to the south of the site. The nearest fault to the site is 1.4 km to the south and

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forms the boundary between Calp Limestone (CD) and the (CZ) Carrighill Formation, which comprises calcareous greywacke siltstones and shales. The nearest fault in the Calp proper is 2 km to the northeast of the site. There is no expression or any evidence of faulting on the site.

6.3 Significant Impacts

As the proposed changes to the facility do not involve any changes to the physical environment at the RILTA site, i.e. no additional buildings or infrastructure will be required, there will be no impact on the geology of the underlying the site.

The surface is currently comprised of made-ground, with the exception of a 2m landscaped boundary surrounding the perimeter which has been planted and maintained since the facility was constructed.

The increase in soil to be stored and transferred from the facility will not impact on the surrounding environment as this material will be stored as per current operational procedures in the soil storage buildings. No additional storage is required at the RILTA facility as the number of truckloads of soil transferred off site will be increased to meet demand.

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6.4 Mitigation Measures

The facility is covered in made ground, with the exception of a 2m area of landscaping along the perimeter of the site. Therefore, no direct or indirect impacts on the underlying geology are predicted and no mitigation measures are recommended.

6.5 Conclusion

As the site is currently covered in made ground, with the exception of a 2m area of landscaping along the perimeter of the site, no impacts on the existing geological environment are predicted.

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7 WATER

7.1 Introduction

TOBIN Consulting Engineers were retained by RILTA Environmental Ltd. to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on surface water and groundwater. As this facility is already in existence, this section will provide an assessment of surface water and groundwater that may be affected by an increase in the annual volume of contaminated soil.

7.2 Study Methodology

This report has been prepared using the recommendations set out in the Environmental Protection Agency (EPA) document 'Guidelines on Information to be contained in Environmental Impact Statements' (2002).

This section describes the hydrological and hydrogeological setting of the site and refers to the information available from a number of published sources.

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The information contained in this section has been divided into sub-sections, so as to describe the various aspects pertaining to water environment. In the preparation of this section the following protocols were used in order to assess the hydrological and hydrogeological context and character of the site: -

- The site was assessed using published information and regional hydrological data;
- All available information was collected from the Environmental Protection Agency with respect to historical water quality in this region;
- All available information from the Geological Survey of Ireland was assessed and collated;
- Consultation with the Eastern Regional Fisheries Board as part of the Scoping process;
- Intrusive investigations were undertaken within the site to gather site specific information on groundwater conditions;
- Routine surface water and groundwater monitoring is carried out as required under Schedule C of Waste Licence 192-1. The most recent results of this monitoring are included herein;
- Site specific information with respect to the existing services; and
- This water report (Surface Water and Groundwater) was prepared following the interrogation and collation of all available information.

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The characterisation of the site is considered detailed and sufficient to adequately characterise the hydrological and hydrogeological setting of the site.

All projects and developments that require an EIS are of a scale or nature that they have the potential to have an impact on the environment. It is therefore crucial that the significance of the potential impact is determined. In this section the potential impact on the surface water environment and groundwater resulting from an increase in the volume of contaminated soil handled at the facility is assessed and appropriate mitigation measures are submitted.

7.3 Existing Environment

7.3.1 Hydrogeology Data

7.3.1.1 Regional Hydrogeological Information

The existing regional hydrogeological and hydrological environment surrounding the site was described in the original EIS and as such the following information has not been altered:

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At present there is no groundwater protection scheme for County Dublin. However, the aquifer rating of the bedrock underlying the site can be inferred from previous groundwater protection schemes.

Previous correspondence from the Groundwater Section, Geological Survey of Ireland (GSI), suggests that the aquifer potential of the (CD) Calp Limestone or Basinal Limestone Unit as it is known in other counties is generally classified as a Locally Important Aquifer, which is moderately productive only in local zones (Aquifer Code: Ll). This aquifer classification means that the site is generally acceptable (response R1 or R2) for such activities as siting a Septic Tank or a Landfill; i.e. it is acceptable for the operation of the current facility.

7.3.1.2 Water Abstractions

There are no water abstractions in the immediate vicinity of the site. The closest recorded well is located ca. 1 km to the south of the site at NGR 30154,22722, in a different groundwater catchment. It is not known if this well is still in use.

7.3.1.3 Site-Specific Hydrogeological Information

In the original EIS baseline studies, 3 No. Rotary-ODEX boreholes were drilled within the property boundary. All drilling was undertaken by Hilliard Hilltwister Ltd. in April 2002, under supervision of TOBIN.

The purpose of the monitoring boreholes was threefold:

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(a) to establish the geological succession at various locations throughout the site;
(b) to determine the hydraulic conditions of the aquifer; and
(c) to allow sampling of the groundwater to determine the existing quality of the water before any development occurs within the site.

The 3 No. boreholes were drilled at 200mm diameter in unconsolidated material and at 150mm diameter in competent bedrock to depths ranging from 15 m below ground level (bgl) (GW2) to 18m bgl (GW1). Unconsolidated material was encountered to depths from 2.9m bgl (GW3) to 3.3 m bgl (GW2). The unconsolidated material comprised gravelly Silt/Clay till.

Groundwater was encountered in each of the boreholes, with the first minor inflows generally at the subsoil/bedrock interface. The exact level at which inflows were encountered during drilling could not generally be recorded due to the compressed air flush used in the drilling method, but an estimate of depth of water strikes was made.

All three of the boreholes were retrofitted with 50mm standpipe, which is slotted throughout the saturated material, with blank casing throughout the unsaturated zone. A gravel pack was placed around the void between the 150mm drill casing and the 50mm standpipe to reduce the ingress of fine material carried by the groundwater. The gravel pack was placed to a level above the slotted section. The 150mm steel drill casing was jacked out of the ground to allow groundwater inflow from all levels throughout the depth of the borehole. A bentonite seal was placed above the gravel pack to ensure that surface water was prevented from entering the standpipe. The standpipes were covered with an airtight cap and the boreholes were secured with a metal, lockable cover, which was cemented into the ground, to maintain the quality of samples obtained from the boreholes and to ensure that foreign matter from the surface does not affect the integrity of the samples.

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A summary of the information gathered from the monitoring boreholes, with specific regard to their location and elevation, relative to Ordnance Datum, is shown in Table 7.1 below.

Table 7-1 Location and Elevation of Watertable (2002)

Reference	Grid Reference	Elevation to top of casing (m OD)	Measured Water Level (m bgl)	Static Water Level (m OD)
GW1	E 301570 N228446	88.921	1.18	87.741
GW2	E 301629 N228538	86.952	1.115	85.837
GW3	E 301516 N228531	87.382	1.075	86.307
SW1	E 301622 N228562	Direct	Direct	86.019
SW2	E 301523 N228553	Direct	Direct	84.511

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The saturated thickness was noted in all boreholes on site. The average elevation of the watertable was 86.627 m OD. The groundwater elevation in the boreholes ranged from 1.18 m to 1.075 m below ground level, with an average elevation of 0.84m below ground level.

3 No. replacement boreholes were constructed within the site boundary for groundwater sampling purposes in 2004. 2 no. of these boreholes are located downgradient of the facility (BH2 and BH3) while BH1 is located upgradient of the facility near the entrance to the site. These boreholes are the only boreholes remaining on site within the RILTA site. The locations of each of these boreholes and the water levels in each as measured in March 2007, are included in Table 7.2 below.

Table 7-2 Location and Elevation of Watertable (March 2007)

Reference	Grid Reference	Elevation to top of casing (m btc)	Height of Upstand (m)	Measured Water Level (m bgl)
BH1	E 301566 N228562	2.26	0.65	1.61
BH2	E 301607 N228557	2.17	0.46	1.71
BH3	E 301633 N228562	1.97	0.59	1.38

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It appears, based on a comparison of the two tables above, that the water level at the site has not altered significantly between 2002 and 2007 as the water level is within 2m of the ground level. It should also be noted that slight fluctuations in the water table occur throughout the year due to seasonal factors.

7.3.2 Bedrock Aquifer Characteristics

7.3.2.1 Groundwater Piezometry

The groundwater levels across the site are generally less than 2 m below the surface, with the water table generally represented as a subdued version of the topography. The regional groundwater flow in the area is to the north, towards the Griffeen River.

7.3.3 Groundwater Chemistry

The most recent monitoring and reporting of groundwater within the site boundary was carried out during 2006. Monthly, quarterly and annual groundwater monitoring was carried out during the period from 01/01/06 to 31/12/06. All monitoring results and reports have been submitted to the agency as required by Schedule E of the licence, on a quarterly basis throughout 2006 and in the AER submitted on March 30th 2007. This AER is included in Appendix 2.1.

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Three boreholes were sampled as part of the routine monitoring. 2No. of these samples were collected from boreholes downgradient of the facility on site (samples BH2 and BH3), and another upgradient of the facility, to the south (sample labelled BH1). The locations of these monitoring points are shown on Figure 7.1. These samples were collected in order to establish a groundwater quality dataset, both upgradient and downgradient of the production plant

A Waterra inertial lift pump and dedicated hosing was used to purge 3No. well volumes from the borehole prior to sampling. The laboratory-supplied sample containers were filled directly from the dedicated hosing. The sample containers were stored in a coolbox for transport to the laboratory.

ALcontrol Geochem, who are an ISO 17025 and UKAS accredited laboratory, carried out chemical and microbiological analyses on the water samples. A comprehensive suite of parameters was requested for analysis so that the groundwater could be fully characterised and a groundwater quality dataset could be acquired, based on the quarterly and annual parameters listed in Waste Licence 192-1. Conductivity, pH and Temperature were recorded on site by personnel from TOBIN Consulting Engineers. The full groundwater analysis datasets are available in Appendix 7.1.

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7.3.3.1 Groundwater Results

The results of all water analyses for 2006 are summarised below, together with the Maximum Admissible Concentrations (MACs) quoted in Statutory Instrument No. 81 of 1988 (Drinking Water Standards in respect of water intended for human consumption), and the Parametric Values quoted in Statutory Instrument No. 439 of 2000 (European Community Drinking Water Regulations). S.I. No. 439 of 2000 is the current legislation for drinking water having come into force on the 1st January 2004. However, where parametric values are not quoted for certain parameters, reference is made to the MACs for those parameters quoted in S.I. No. 81 of 1988. These are considered the most appropriate standards with which to compare the groundwater analytical results. It was also considered prudent to include the EPA Guideline Values for the Protection of Groundwater as listed in the Interim Report entitled 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland', for reference.

Groundwater monitoring point 1 (BH1)(upgradient)

Location: **E301555 N228440**

pH, Conductivity:

The pH of the analysed groundwater from BH1 ranged from 7.35 in February 2006 to

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7.97 in November 2006. The values are within the normal range and reflect the natural conditions of this groundwater.

The conductivity was ranging from 602µS/cm in August 2006 to 669µS/cm in November 2006. This range of values is considerably lower than the Drinking Water Regulations.

Heavy metals:
Arsenic at BH1 was recorded as below the detection limit for all monitoring events with the exception of the May monitoring event when the value was reported as 2µg/l. All groundwater sampled from BH1 was also found to contain a value of Mercury below the detection limit.
Copper, Chromium, Cadmium, Nickel and Zinc were all analysed as part of the annual groundwater set of parameters for BH1. All were below the regulatory limits set by the Drinking Water Regulation standards and the EPA Guideline Values.

Inorganic:
All inorganic parameters were within the limits set by the Drinking Water Regulation standards and the EPA Guideline Values.

List 1/11 Organic Substances, Mineral Oil, BTEX: For all groundwater sampled at BH1 from January to December 2006, List1/11 Organic Substances, Mineral Oil, BTEX were all found to be below the detection limit.

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Groundwater monitoring point 2 (BH2) (downgradient)

Location: **E301600 N228550**

pH, Conductivity:
The pH of the analysed groundwater from BH2 ranged from 10.6 in August 2006 to 12.29 in May 2006. These values are elevated in comparison to the Drinking Water Standards which have a pH range of >6.5 and <9.5. However, the pH value for groundwater in the area was above the limits of the Drinking Water Standards when the samples were taken in September 2004, prior to commencement of activities. Therefore, the elevated pH value throughout 2006 is not thought to be as a result of activities on site, as this baseline assessment indicates that the pH of the groundwater was elevated in September 2004 with values of 11.63 and 11.73 reported for BH2 and BH3 respectively. Rilta Environmental has already furnished a detailed report on elevated pH levels to the Agency.

The conductivity was ranging from 760µS/cm in November 2006 to 1941µS/cm in May 2006. These values are considerably lower than the Drinking Water Regulations but are higher than the EPA Guideline Values.

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Heavy metals:
Arsenic at BH2 was recorded within the range 2-8µg/l and this is well within the limit of 50µg/l set in the Drinking Water Regulations. Similar to 2005, all groundwater sampled from BH2 was found to contain a value of Mercury below the detection limit.

Chromium, Copper, Cadmium, Nickel and Zinc were all analysed as part of the annual groundwater set of parameters for BH2. All were below the detection limits set by the Drinking Water Regulation standards and the EPA Guideline Values with the exception of Nickel. Nickel was recorded as 32µg/l, which is elevated in comparison to the EPA Guideline Value of 20µg/l.

Inorganic:
All inorganic parameters were within the limits set by the Drinking Water Regulation standards and the EPA Guideline Values with the exception of Chloride, Potassium and Sodium. Chloride was within the limit set by the Drinking Water Regulations but above the EPA Guideline value. Potassium was elevated with a value of 13mg/l compared with the EPA Guideline Value of 5mg/l and slightly elevated in comparison to the Drinking Water Regulation Limit of 12mg/l. Sodium was also elevated in comparison to the EPA Guideline Limit and the Drinking Water Regulations.

List 1/11 Organic Substances, Mineral Oil, BTEX: Similar to 2005, for all groundwater sampled at BH2 from January to December 2006, List1/11 Organic Substances, Mineral Oil and BTEX were found to be below the detection limit.

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Groundwater monitoring point 3 (BH3)(downgradient)

Location: **E301630 N228555**

pH, Conductivity:
The pH of the analysed groundwater from BH3 ranged from 11.96 in February 2006 to 12.43 in May 2006. The values are elevated in comparison to the Drinking Water Standards which have a pH range of >6.5 and <9.5. However, the pH value for groundwater in the area was also above the limits of the Drinking Water Standards when the samples were taken in September 2004, prior to commencement of activities. Therefore, the elevated pH value throughout 2006 is not thought to be as a result of activities on site, as this baseline assessment indicates that the pH of the groundwater was elevated in September 2004 with values of 11.63 and 11.73 reported for BH2 and BH3 respectively. Rilta Environmental has already furnished a detailed report on elevated pH levels to the Agency.

The conductivity was ranging from 1310µS/cm in August 2006 to 1992µS/cm in

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November 2006. These values are elevated in comparison to the EPA Guideline values. However, all values are within the S.I. No. 439 of 2000 Drinking Water Regulation limit which is 2500µS/cm., compared to the results of the 2005 monitoring period when two quarterly conductivity results were elevated in comparison to this limit.

Heavy metals:
Arsenic at BH3 was recorded within the range 2-8µg/l and this is well within the limit of 50µg/l set in the Drinking Water Regulations. All groundwater sampled from BH3 was also found to contain a value of Mercury below the detection limit.

Chromium, Copper, Cadmium, Nickel and Zinc were all analysed as part of the annual groundwater set of parameters for BH3. All were below the detection limits set by the Drinking Water Regulation standards and the EPA Guideline Values with the exception of Copper. Nickel was recorded as 32µg/l, which is elevated in comparison to the EPA Guideline Value of 20µg/l.

Similar to the results of the 2005 monitoring at this facility, Copper was elevated when compared to BH1 and BH2 but was well within the Drinking Water Regulation standards. The value of 40µg/l reported for Copper was elevated in comparison to the EPA Guideline Value of 30µg/l.

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Inorganic:
All inorganic parameters were within the limits set by the Drinking Water Regulation standards and the EPA Guideline Values with the exception of Chloride, Sulphate and Potassium. Chloride and Potassium were elevated above the EPA Guideline Value but within the Drinking Water Regulations. Sulphate was elevated in comparison to both the Drinking Water Regulations and the EPA Guideline limit with a value of 408µg/l.

List 1/11 Organic Substances, Mineral Oil, BTEX: For all groundwater sampled at BH3 from January to December 2006, List1/11 Organic Substances, Mineral Oil, BTEX were all found to be below the detection limit.

7.3.3.2 Groundwater Vulnerability

Groundwater vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The permeability and thickness of the soils, which influences the attenuation capacity, are important elements in determining the vulnerability of groundwater.

A groundwater vulnerability map for County Dublin is not yet available, however the Geological Survey of Ireland have prepared guidelines which help categorise the

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vulnerability on a site specific basis, based on the properties of the subsoil. The vulnerability category assigned to a site is based on the relative ease with which infiltrating water and potential contaminants may reach groundwater in a vertical or subvertical direction.

Although the unconsolidated subsoils appear to be low permeability, the shallow depth to bedrock across the site means that the vulnerability rating is assessed as Extreme.

As there are no specific response matrices for Integrated Hazardous Waste Management Facilities published by DoELG /GSI, the most applicable response matrix to apply is Landfill Response matrix. The Groundwater Protection Response Matrix for Landfills has defined hydrogeological situations, which are considered suitable or unsuitable for landfill facilities. The groundwater protection responses outline the likely acceptability of landfills in each Groundwater Resource Protection Zone(e.g. Ll/E for this site) and the recommended level of response/ restriction, which depends on the groundwater vulnerability, the value of the groundwater environment and the contaminant loading.

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Using the aquifer classification, in association with the vulnerability rating, a groundwater resource for the particular site is determined. With regard to the current facility the existing groundwater resource protection rating is determined to be Ll/E (locally important aquifer with a vulnerability rating of extreme). The response matrix deems that a landfill is acceptable, subject to guidance outlined in the EPA design manual or conditions of a waste licence and is subject to the following conditions:

- *Special attention should be given to checking for the presence of high permeability zones. If such zones are present then the landfill should only be allowed if it can be proven that the risk of leachate movement to these zones is insignificant. Special attention must be given to existing wells downgradient of the site and to the proposed future development of the aquifer: and*
- *Groundwater control measures, such as cut-off walls or interceptor drains may be necessary to control high watertable or the head of leachate may be required to be maintained at a level lower than the watertable, depending on site conditions.*

With reference to the above conditions for Landfill Site selection, no high permeability zones were found during the original site investigations. The condition with regard to leachate management was not relevant to the current facility as no such material occurs or is stored on-site. However it should be noted that the acceptability of the site for a Landfill is a good indicator of its suitability as an Integrated Hazardous Waste Management Facility, which is even more stringently engineered.

Currently, the site is bunded and paved areas are covered with an impermeable hard-

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standing, with all rainfall being diverted to the storm water management system. This effectively means that all recharge or potential contamination of groundwater is eliminated.

7.4 Surface Water

7.4.1 Drainage

Reference to existing information indicates that the current site is located within the Griffeen River and the Greater Liffey Catchment. All surface water within this catchment drains to tidal water in Dublin Bay.

Reference to the information available from the Environmental Protection Agency river quality data indicates that the site lies wholly within the River Liffey catchment.

The Griffeen River flows outside the northern boundary of the site. The Griffeen River, is tributary of the River Liffey comprises a catchment area of approximately 13 km^2. The origin of the Griffeen River lies ca. 2km to the south west of the current site. The Griffeen River flows north for ca. 500 m (to the east of the site) and then flows west flowing outside the northern boundary of the site. The Griffeen River then trends in a northerly direction and meets the River Liffey at Lucan, ca. 7.5 km north of the site.

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In general, the principal drainage within the site is from the south towards the north towards the Griffeen River. A shallow east-west trending drainage ditch was noted in the northwest corner of the site prior to any construction taking place, but no flow was noted.

The total flow in the surface water channels is composed of two different flow mechanisms.

The dominant flow mechanism, due to the low permeability soil cover in the area, comprises overland run-off of surface water. The flow in the surface water features responds quickly to rainfall. There is no hydrometric data available for the Griffeen River and so the runoff/flow characteristics of the catchment cannot be determined. However the Calp Limestone generally results in high run-off/low baseflow flashy river flow.

The second flow mechanism comprises a slow release of groundwater baselow to the surface water environment. This portion of the total surface water flow is quite small during heavy rainfall events, compared to the surface run-off portion. However during periods of low precipitation and during summer droughts, the groundwater contribution comprises almost all the surface water flow. This slow release of the

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groundwater maintains a surface water flow throughout the year.

7.4.2 Surface Water Flow Measurements

There is hydrometric data available for the Griffeen River. The nearest hydrometric station is on the River Liffey, due to the substantial flow and large number of tributaries contributing to the River Liffey compared to the Griffeen River, any use of such data would be meaningless in inferring any conclusions about the Griffeen River.

As part of the original EIS baseline survey for the current site, hydrometric measurements were taken on surface water bodies as they entered or exited the current site. A total of 2 No. hydrometric readings were taken, using an OTT Hydrometric C2 Current Meter. The locations at which all hydrometric readings were taken are shown on Drawing No. 2501081/01/204. All hydrometric measurements were recorded on the 29th of April 2002.

A hydrometric reading was taken in the River Griffeen, upstream of the site boundary at the eastern site boundary. The stream gauge was taken at a location where the river flows has an irregular gravel bed and the channel is irregular. The flow at this point in the river was calculated as transmitting 0.3223m^3/sec (27,850 m^3/day).

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A hydrometric reading was also taken downstream, at the start of the concrete culvert that passes under an internal Industrial Estate road, where the Griffeen River passes under the road. The concrete culvert provided an accurate regular structure and so was ideal for flow gauging. The flow in the river was calculated as transmitting 0.273m^3/sec (23,596m^3/day), with a water depth in the channel of 0.114 m.

The difference in the readings is not surprising due to the irregular nature of the river bed and the downstream reading is likely to be more accurate than upstream reading. The flow in the Griffeen River can therefore be said to be in the region of 0.2731 m^3/sec (23,600 m^3/day).

7.4.3 Regional Surface Water Quality

All available information for the Griffeen River catchment was referenced to determine the quality of the surface water environment.

Reference to Environmental Protection Agency information indicates that the Griffeen River is located within Hydrometric Area No. 9. There is no water quality data available for the Griffeen River. There is data available for the River Liffey where water quality upstream of the Liffey-Griffen confluence is moderately polluted (Q value 2-3), however, as with the flow data, discussion/extrapolation of such results

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to the Griffeen River would essentially be meaningless.

The Camac River which is in another catchment to the east of the Griffeen catchment is also moderately polluted (Q value 2-3). Again as this river is in another catchment no conclusions about the water qaulity of the Griffeen River can be drawn from this data.

Baseline biological monitoring carried out in 2002 indicates Q Values for the Griffeen River of Q2-3. This would suggest that the river was moderately polluted. However, based on quarterly surface water monitoring results of the Griffeen River (2004-present) at the northern boundary of the facility, the surface water quality is described as "unpolluted".

The results of the Biological Assessment of the Griffeen River (as described in the Ecology section herein) in 2005 describe the river as "slightly polluted". These results indicate that water quality in the Griffeen river has improved since the initial assessment in 2002.

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7.4.4 Site-Specific Surface Water Quality

Based on information obtained during a walkover survey of the site, the Griffeen River, which flows from east to west, forms the northern boundary of the site for approximately 110m. The stream continues to flow in a westerly direction to the north of the site and intersects the western road adjacent to Greenogue Business Park.

The Griffeen River is sampled at 3 No. locations as part of the ongoing routine quarterly and annual monitoring of water quality of Waste Licence 192-1 contained in Appendix 1.1. Two of the sampling stations are positioned upstream (SW1) and downstream (SW2) of the site along the northern boundary. In addition, a third sampling point (SW3) is located at the surface water outfall, as agreed with the EPA. The locations of these monitoring points are shown in Figure 7.1.

Water sampling was undertaken by TOBIN Consulting Engineers, using the "grab" sampling method. The laboratory supplied containers were submerged beneath the surface of the water and squeezed gently when screwing on the cap to ensure an airtight seal. The filled sample containers were stored in a coolbox for transport to the laboratory.

There was no visible or olfactory evidence of contamination observed in the water at the monitoring points during the sampling events. A visual inspection of all surface water streams on and adjacent to the site is also carried out by site personnel on a weekly basis.

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Alcontrol Geochem, who are an ISO 17025 and UKAS accredited laboratory, carried out chemical and microbiological analyses on the water samples. A suite of parameters based on the quarterly and annual requirements of Schedule D of the Waste Licence was requested for analysis. These parameters included pH, Chemical Oxygen Demand, Total Suspended Solids and Mineral Oils.

In the event of the facility closing down, surface water monitoring will continue at six month intervals until a closure license has been issued by the EPA. After care and monitoring of the facility once it has closed down would be agreed as part of the closing licence.

7.4.4.1 Surface Water Results

The results of all water analyses for 2006 are summarised below, together with the Maximum Admissible Concentrations (MAC's) quoted in Statutory Instrument No.294 of 1989 (European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations), and the MAC's quoted in Statutory Instrument No. 293 of 1988 (European Communities (Quality of Salmonid Waters) Regulations). These are considered the most appropriate standards with which to compare the surface water analytical results. In cases where MACs are not quoted in these statutory instruments with which to compare results for certain parameters, the reported concentrations for each of these parameters at the different monitoring points, were assessed relative to each other.

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7.4.5 Surface Water Emissions

The reports in respect of Surface Water Emissions have been submitted to the EPA on a quarterly basis throughout 2006 as required by Schedule E of the licence. The following is a summary of the values recorded for each parameter. The full surface water analysis datasets as issued by Alcontrol Geochem, are available in Appendix 7.1.

Surface Water Monitoring Point 1: (SW1)

Location: E301670 N228562

pH:

The pH of the analysed groundwater from SW1 ranged from 7.19 in February 2006 to 8.25 in November 2006. The values are within the normal range and reflect the natural conditions of this surface water.

Chemical Oxygen Demand:

Similar to 2005, the chemical oxygen demand for SW1 was below the level of

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detection for all monitoring events.

Suspended Solids:
The level of suspended solids in the samples taken for SW1 were below the level of detection for all monitoring events, with the exception of the February sample. This sample recorded a level of suspended solids above the MAC limits, most likely due to meteorological conditions at this time.

Mineral Oils:
Similar to 2005, the level of Mineral Oil recorded for SW1 was below the level of detection for all monitoring events.

Surface Water Monitoring Point 2: (SW2)

Location: E301565 N228555

pH:
The pH of the analysed groundwater from SW2 ranged from 7.37 in February 2006 to 8.30 in August 2006. The values are within the normal range and reflect the natural conditions of this surface water.

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Chemical Oxygen Demand:
Similar to 2005, the chemical oxygen demand for SW2 was below the level of detection for all monitoring events in 2006.

Suspended Solids:
The level of suspended solids in the samples taken for SW2 were below the level of detection for all monitoring events, with the exception of the February sample. This sample recorded a level of suspended solids above the MAC limits, most likely due to meteorological conditions at this time.

Mineral Oils:
Similar to 2005, the level of Mineral Oils recorded for SW2 was below the level of detection for all monitoring events in 2006.

Surface Water Monitoring Point 3: (SW3)

Location: E301558 N228560

pH:
The pH of the analysed groundwater from SW3 ranged from 7.38 in February 2006 to 8.26 in November 2006. The values are within the normal range and reflect the natural conditions of this surface water.

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Chemical Oxygen Demand:
Similar to 2005, the chemical oxygen demand for SW3 was below the level of detection for all monitoring events.

Suspended Solids:
The level of suspended solids in the samples taken for SW3 were below the level of detection for all monitoring events, with the exception of the February sample. This sample recorded a level of suspended solids of 14mg/l, which although elevated in comparison to other quarterly results was within the limits set in the Drinking Water Regulations.

Mineral Oils:
Similar to 2005, the level of Mineral Oils recorded for SW3 was below the level of detection for all monitoring events.

7.4.6 Surface water sources

The main types of surface water generated at the current facility:

- Surface runoff from all external concrete hardstand areas. The composition of this runoff is generally the same as surface water runoff from roads.
- Stormwater from the roofs of the facility buildings.

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Surface water run-off from the current facility is managed independently. The surface water is discharged to the river at the northern boundary of the site. As outlined on Drawing No. 3684/01/205 and 3684/01/222 a Grit Trap, Oil Interceptor and Water Attenuation Tank are provided for the site. All surface water passes through these processes before being discharged to the river at a controlled flow rate of no more than 6 litre/second/hectare (6 l/sec/ha).

The Water Attenuation Tank for the site has a retention capacity of 600,000 litres, allowing for an attenuation rate of 6 litres/second/hectare (l/s/ha.).

The water attenuation tank is fitted with a cut-off valve, which can be operated both manually and remotely. This allows for the retention of all surface water on site in the unlikely event of an accidental spillage on site. In the event of such a spillage all contaminated surface water will firstly be diverted to the fire retention tank on site. If the capacities of the fire retention tank proves insufficient for the spill the capacity of the attenuation tank can then be used. This procedure insures that any water that is in the attenuation tank cannot be mixed with contaminated water and unnecessarily increase the volume of water that will have to be discharged to the foul sewer. The same procedure applies to any fire-water used for fire-fighting in the unlikely event of

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a fire on-site.

7.5 Wastewater

7.5.1 Waste Water Sampling and Analysis

As per Schedule D of Waste Licence 192-1, monthly wastewater monitoring is carried out at the RILTA Environmental Ltd. facility. The wastewater monitoring point is located to the north-eastern corner of the waste treatment facility.

Wastewater samples were collected from the facility throughout 2006 and a summary of the results of this analysis is included below. ALcontrol Geochem, who are an ISO 17025 and UKAS accredited laboratory, carried out chemical and microbiological analyses on the water samples. Each sample was analysed for the monthly and quarterly parameters listed in Waste Licence 192-1.

Waste Water Monitoring Point (WW1)

Location: E301655 N228530

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The reports in respect of "Wastewater Emissions to Sewer" have been submitted to the EPA on a quarterly basis throughout 2006 as required by Schedule E of the licence. The following is a summary of the values recorded for each parameter.

Volume Emitted:

The total volume emitted during the reporting period was 17,990m^3, which is an average of 74m^3 per day, on each of the 243 days on which effluent was discharged to the sewer. The maximum volume discharged was 140m^3 on 3rd February 2006.

BOD: [1]

The average value for BOD during the reporting period was 735mg/l, with a maximum and minimum value of 1504mg/l and 20mg/l respectively. The values were well within the limit emission value of 1000mg/l for all events, with the exception of March, August, September and November 2006 when BOD values of 1037mg/l, 1131mg/l, 1307mg/l, 1504mg/l were recorded respectively.

COD:

[1] It should be noted that Waste Licence 192-1 is currently under review and the emission limits for COD and BOD are being assessed under this review. An increase in the current limits is being requested in accordance with emission limits permitted from adjacent facilities within Greenogue Business Park. SDCC and the EPA have been consulted in March 2007 regarding this issue.

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The average value for COD during the reporting period was 1492mg/l, with a maximum and minimum value of 3512mg/l and 198mg/l respectively. The values were well within the limit emission value of 3000mg/l for all events, with the exception of November 2006 when a COD value of 3512mg/l was recorded.

Mineral Oils:

The average value for Mineral Oils during the reporting period was 88µg/l, with a maximum and minimum value of 511µg/l and <10µg/l respectively. The values were well within the limit emission value of 10,000µg/l for all monitoring events, with only the August and September mineral oil results above the detection limit of <10µg/l.

Suspended Solids:

The average value for Suspended Solids during the reporting period was 72.75mg/l, with a maximum and minimum value of 340mg/l and <10mg/l respectively. The values were well within the limit emission value of 500mg/l for all monitoring events.

Sulphates:

The average value for Sulphates during the reporting period was 477mg/l, with a maximum and minimum value of 1146mg/l and 77mg/l respectively. The values were well within the limit emission value of 1000mg/l for all monitoring events, with the exception of the value in May 2006 -1146mg/l.

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pH:

The average pH value during the reporting period was 6.73 with maximum and minimum values of 7.08 and 6.07 respectively. These values lies within the emission limit band of pH 6-10 for this parameter.

Temperature:

The average temperature of effluent discharged to the foul sewer during the reporting period was 13.8ºC. This value is dependent solely on ambient temperature as there is no heat generated during the chemical treatment process and therefore no ELV breaches.

Detergents as Methylene Blue Active Substances (MBAS):

The average value for Detergents during the reporting period was 9.9mg/l, with a maximum value of 85.5mg/l and a minimum value of 0.7mg/l. These values are significantly lower than the emission limit of 100mg/l, with all below 10mg/l except for the maximum value cited above.

Toluene:

The average value for Toluene during the reporting period was 121µg/l, with a maximum and minimum value of 370µg/l and 30µg/l respectively. The values were well within the limit emission value of 1000µg/l for all monitoring events.

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Benzene:

The average value for Benzene during the reporting period was 85µg/l, with a maximum value of 219µg/l and a minimum value of 16µg/l. These values are significantly lower than the emission limit of 1000µg/l.

Ethylbenzene:

The average value for Ethylbenzene during the reporting period was 13µg/l, with a maximum value of 29µg/l and a minimum value of <10µg/l. These values are significantly lower than the emission limit of 1000µg/l.

Total Xylene:

The average value for Xylene during the reporting period was 47µg/l, with a maximum value of 137µg/l and a minimum value of <10µg/l. These values are significantly lower than the emission limit of 1000µg/l.

Zinc (as Zn):

The average value for Zinc during the reporting period was 521.6µg/l, with a maximum value of 1572µg/l and a minimum value of 9µg/l. These values are significantly lower than the emission limit of 5000µg/l.

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Copper (as Cu):

The average value for Copper during the reporting period was 8µg/l, with a maximum value of 44µg/l and a minimum value of <1µg/l. These values are significantly lower than the emission limit of 5000µg/l.

Metals Screen:

A number of metals were analysed quarterly according to Schedule D of the waste licence. The metals included Lead, Nickel, Selenium, Cadmium, Chromium, Mercury, Boron and Arsenic. The majority of the metals were valued at less than 5µg/l for all monitoring events, with many below the level of detection. Nickel and Boron were the exceptions.

Nickel recorded an average value of 309µg/l, with a maximum and minimum value of 538µg/l and 107µg/l respectively. No wastewater emission limits for Nickel are available in the waste licence.

Boron recorded an average value of 6857µg/l, with a maximum and minimum value of 7811µg/l and 6028µg/l respectively. No wastewater emission limits for Boron are available in the waste licence.

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7.6 Significant Impacts

There will be no direct impacts on the surface water or groundwater environments at the facility due to an increase in the volume of contaminated soil accepted for storage and transfer. The site is covered in made ground and all contaminated soil is stored carefully in the hazardous waste transfer station.

If the incoming contaminated soil is moist, there is a risk of run-off from the soil. This contaminated water, if not managed correctly could enter the surface water runoff that is collected from the hard-standing areas and be ultimately discharged to the Griffeen River.

7.7 Mitigation Measures

In order to avoid any possible risk of surface water or groundwater contamination from the increased stockpiles of contaminated soil, it is important to manage any runoff from the hazardous waste transfer station.

The hazardous waste transfer station is a bunded reinforced concrete area, which has been previously tested and certified as leak proof. Waste is inspected on arrival to ensure its suitability for storage.

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Waste is stacked using an earth-moving machine on tracks. This allows for storage of up to 5,000 tonnes of waste at any one time. When enough waste has accumulated for export (~1,500 – 3,000 tonnes) and a Trans-frontier Shipment notification is in place, waste is re-loaded onto tipper trucks and transported to port where the waste is tipped on to a specialised bulk storage tray on a ship. In this way, no additional infrastructure or extensions are required at the facility to store additional soil.

Due to the 'made ground' nature of most of the contaminated soil product, very little leachate is produced while it is being stored on site, therefore the soil storage building does not include a drainage system. Any leachate that is produced will be disposed of in the on-site wastewater treatment plant, using the waste vacuum tankers for facilitating transfer to the wastewater treatment plant.

7.8 Conclusion

Overall, the impact on the surface water and groundwater environments at the facility will be minimal as long as the surface water runoff from the hazardous waste transfer station is managed and controlled.

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Figure 7-1 Environmental Monitoring Locations

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Monitoring Point Locations (to National Grid Reference)

Groundwater Monitoring Points
BH1 E301566, N 228562
BH2 E301607, N228557
BH3 E301633, N228562

Underground Settlement Tank Monitoring Points
GW1 E301664, N228566
GW2 E301650, N228540
GW3 E301625, N228540

Surface Water/Invertebrate Monitoring Points
SW1/KS1 E301664, N228566
SW2/KS2 E301567, N228562
SW3 E301603, N228563

Dust Monitoring Points
D1 E301536, N228449
D2 E301567, N228562
D3 E301664, N228566
D4 E301639, N228427

Noise Monitoring Points
N1 E301536, N228449
N2 E301567, N228562
N3 E301664, N228566
N4 E301639, N228427

Air Monitoring Points
A1 E301620, N228440
A2 E301630, N228445
A3 E301630, N228460

Waste Water Monitoring Point
EFF E301655, N228530

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Legend:

- Licence Boundary
- Surface Water Monitoring Points
- Invertebrate Kick Sampling Monitoring Points
- Dust Monitoring Points
- Noise Monitoring Points
- Waste Water Monitoring Point
- Groundwater Monitoring Points
- Underground Settlement Tank Monitoring Points
- Air Monitoring Points

KS1 SW1 D3 N3 BUNDED TANK AREA BH3 SW3 BH2 VEHICLE WASH AREA SW2 KS2 D2 N2 DOCK LEVELLER GW2 GW3 EFF GW1 STATION 1859 SQ.M HAZARDOUS WASTE TRANSFER CONTAMINATED SOIL STORAGE WASTE TREATMENT CENTRE 1858 SQ.M A3 A1 DRUM CENTRE 1858 SQ.M OFFICE BLOCK 400 SQ.M WEIGHBRIDGE A2 DOCK LEVELLER D1 N1 BH1 GATE ELECTRICAL SWITCHROOM D4 N4

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Notes:

1. Figured Dimensions only to be taken from this drawing
2. All Drawings to be checked by the Contractor on site
3. Engineer to be informed of any discrepancies before any work commences
4. All levels relate to Ordnance Survey Datum at Malin Head

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A		11-04-07	

Client: RILTA Environmental Limited

Drawing Title: ENVIRONMENTAL MONITORING LOCATION

Project: INTEGRATED WASTE MANAGEMENT FACILITY, GREENOGUE, CO. DUBLIN

Scale: 1/500

Drawn by	Checked by	Date
RADOSLAWKRAINSKI	DAMIENGREHAN	APRIL 2007

ENGINEER IN CHARGE: DAMIEN GREHAN

TOBIN
Patrick J Tobin & Co. Ltd
Block 10-3
BLANCHARDSTOWN CORPORATE PARK,
DUBLIN 15,
IRELAND
TEL. 01 8030401
FAX. 01 8030410
email Info@tobin.ie

Drawing No.: FIGURE7.1

Rev.

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8 AIR QUALITY AND CLIMATE

8.1 Introduction – Air/Dust

Air Quality is a vital element to be considered as part of the EIA process. The purpose of this assessment is to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on air quality. As this facility is already in existence, this section will provide an assessment of air quality that may be affected by an increase in the annual volume of contaminated soil.

As per Schedule D of Waste Licence 192-1, air monitoring is carried out at the RILTA Environmental Ltd. facility. The dust and air monitoring points are shown on Figure 7.1. Dust monitoring is carried out three times a year. Annual air emission monitoring for T.A. Luft Organics Class 1 and Characterisation of the VOC emission is carried out along with bi-annual monitoring of total organic carbon as set out in the Waste Licence.

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8.2 Existing Environment – Dust

Currently in Ireland there are no statutory limits for dust deposition. In recent years, the TA Luft/VDI 2119/Bergerhofff Method of dust monitoring has become the most commonly used method. Reference is made to the Technical Instructions on Air Quality Control – TA Luft Guideline. In this guideline the limit set for Total Dust Fallout is a mean value of 350 mg/m²/day. All compliance monitoring for licences granted by the Environmental Protection Agency is based on the TA Luft Method.

Total dust deposition is regularly monitored at the site using the Bergerhoff Horizontal Gauge specified in the German Engineering Institute VDI 2119 document entitled *"Measurement of Dustfall using the Bergerhoff Instrument (TA Luft Method)"*. According to Schedule D of the waste licence, dust monitoring is required three times a year (twice between May and September).

Samples were collected at 4No. sampling locations (D1 –D4), with the location of dust monitoring points shown on Figure 7.1. Dust monitoring was carried out at four separate locations along the northern boundaries of the subject site. The results for each sample location, are presented in Table 8.1 below.

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Table 8-1 Total Dust levels for the Site 2005/2006

Monitoring Period		D1	D2	D3	D4
From	To	$mg/m^2.d$	$mg/m^2.d$	$mg/m^2.d$	$mg/m^2.d$
01.03.05	01.04.05	165	116	493*	319
29.04.05	30.05.05	360**	112	892*	396**
04.07.05	02.08.05	258	115	203	242
18.05.06	19.06.06	470**	130	711*	311
12.07.06	09.08.06	149	62	336	252
29.08.06	28.09.06	411**	326	487*	101
Average Dust Levels		**302**	**144**	**520**	**270**

Note: Source of Dust * Dust and spray from neighbouring industry truck wash,

** Dust from road construction adjacent to boundary of subject site.

On average, three of the above samples meet with the guideline limits namely D1, D2 and D4.

However, some of the individual samples at D1, D3 and D4 were above the guideline limit of 350 mg/m²/day. As way of explanation for the elevated levels of dust recorded on site, the results can be explained by –

- **D1** – located at the boundary of the site next to the roadway
- **D3** – located at the eastern boundary of the site next to adjoining company yard. On three occasions, personnel from TOBIN have witnessed trucks and vans being "power-hosed" approx. 5m from D3. This dust spray was travelling in a westerly direction and could explain the elevated levels of dust at this monitoring point.
- **D4**– located south of D3 and likewise likely to be affected by the adjoining industries.

Construction is ongoing in the vicinity of the site. Construction of the roadway approximately 70m from the SITA site boundary has now been completed however this construction involved,

- Stripping of topsoil/subsoils
- Importation of gravel
- Laying of tarmacadam.

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8.3 Existing Environment – Air

Odour Monitoring Ireland (OMI) carried out the annual air emission monitoring for T.A. Luft Organics Class 1 and Characterisation of the VOC emission. The reports (included in the AER, Appendix 2.1) conclude that all emissions to air for 2006 are within the limits of Section C3.1, C3.2 and C3.3 of Waste Licence 192-1 with some exceptions:

Round 1 –Monitoring

- The mass emission rate of VOCs (as Carbon) from monitoring locations A1 and A3 were found to be in compliance with the emission limit values stated in Schedule C.3.1 to C.3.3 of Waste Licence No. 192-1. Monitoring location A2 was not in compliance due to the non-compliant airflow rate. If the airflow rate was in compliance then VOC's as Carbon should be compliant with the regulatory agency requirements.

- The volumetric flows from monitoring locations A1 and A3 was found to be in compliance with the emission limit value stated in Schedule C.3 of Waste Licence (No. 192-1). Monitoring location A2 was not in compliance with Schedule C.3. of Waste Licence No. 192-1. According to OMI, this monitoring point was in excess of the regulatory requirement due to the large airflow rate.

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Round 2 –Monitoring

- The mass emission rate of VOCs (as Carbon) from monitoring locations A1 , A2 and A3 were found to be in compliance with the emission limit values stated in Schedule C.3.1 to C.3.3 of Waste Licence No. 192-1. It should be noted that on the day of sampling process flow was not continuous therefore results obtained from the monitoring were lower than expected.

- The volumetric flows from monitoring locations A1 and A3 were found to be in compliance with the emission limit value stated in Schedule C.3 of Waste Licence (No. 192-1). Monitoring location A2 was not in compliance with Schedule C.3 of Waste Licence No. 192-1

Please note that the Waste Licence is currently under review and the limits set within this licence, in particular volumetric flow rates for A2, are being re-assessed. This particular limit is thought to be impractical for the operations at this location as A2 is located at a paint spray booth and increased air extraction volumes are necessary for health and safety reasons.

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8.4 Potential Impacts – Air

The air emission monitoring points highlighted above have been analysed by OMI following receipt of the bi-annual and annual reports by RILTA Environmental Ltd. At present, action is being taken to assess the air flow rates at the site in order to facilitate balancing of the extraction system. The change of use at the site will not have any effect on air emissions.

8.5 Mitigation Measures –Air

Annual monitoring of air emissions will continue into the future as per the Waste Licence.

8.6 Potential Impacts – Dust

Construction activities at the site have the potential to result in wind blown dust at the site. The RILTA facility, however, is fully constructed and the continued use of the site will not lead to any change in infrastructure or processing within the site. All operations take place within fully enclosed buildings and this will mitigate potential dust impacts.

An increase in dust levels at the site is a potential impact of an increase in soil volumes to be transferred to and from the site, with interim storage.

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8.7 Mitigation Measures – Dust

As the level of dust at the facility may increase due to an increase in soil stored at the site, the future results of the ongoing routine monitoring (Waste Licence 192-1) will be analysed for any change in current dust levels. However, the dust monitoring locations nearest to the soil storage bay have not highlighted any impacts to date. The soil is transferred directly to an internal building where it is contained until it is transferred off site. Therefore, the impact of dust will be insignificant.

In addition, staff at RILTA will try to ensure that all deliveries of soil to the site will be covered in order to prevent soil blowing from the tipper trucks prior to storage in the soil shed.

8.8 Existing Environment – Climate

8.8.1 Introduction

In this section a general overview of the climate in the Dublin region and more specific meteorological data for the existing site at Greenogue is outlined. Information on rainfall and potential evapotranspiration for the area is provided. This is based on

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information obtained from the Meteorological Service. Wind speed and orientation is also detailed.

8.8.2 Study Methodology

All information contained in this report has been received from Met Éireann. All calculations detailed in the report are advised methods as described by Met Éireann personnel.

8.8.3 General

Over the summer months the influence of anti-cyclonic weather conditions on the Western and North-western regions results in dry continental air interspersed by the passage of Atlantic frontal systems. During much of the winter period the climate is characterised by the passage of Atlantic low-pressure weather systems and associated frontal rain belts from the west. Occasionally the establishment of a high-pressure area or anticyclone over Ireland results in calm conditions and during the winter months these are characterised by clear skies and the formation of low-level temperature inversions with light wind conditions at night time. If anticyclonic conditions become established for a few days or more during the summer months, high temperatures during the day might be recorded, especially at inland locations. Long spells of dry weather are relatively rare but should continental air masses or anticyclones persist over Ireland a period of drought conditions may occur which could last up to 2 or 3 weeks.

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8.8.4 Weather Observing Stations

Synoptic Stations

Synoptic stations are those which observe and record all the surface meteorological data. These observations include rainfall, temperature, wind speed and direction, relative humidity, solar radiation, clouds, atmospheric pressure, sunshine hours, evaporation and visibility. They report a mixture of snapshot hourly observations of the weather known as synoptic observations, and daily summaries of the weather known as climate observations.

There are 14 synoptic stations throughout the country:

- Malin Head
- Clones
- Belmullet
- Knock Airport
- Claremorris

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- Mullingar
- Dublin Airport
- Birr
- Shannon Airport
- Kilkenny
- Valentia Observatory
- Cork Airport
- **Casement Aerodrome, Baldonnel**
- Rosslare

Rainfall Stations

In addition there are a number of rainfall measuring stations throughout the country. These stations measure the daily rainfall in millimetres (mm). A number of these will also measure additional parameters such as soil moisture, temperature, humidity, etc.

8.8.5 Rainfall

In order to give reliable climatic data on a particular area a weather station should be within 10 km of the site and in operation for at least 30 years. A climate station and synoptic station is in operation at Casement Aerodrome and is located approx 2km northwest of the Greenogue site. There has been a station here since 1944.

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Specifics of this measuring station relative to the facility are outlined in Table 8.2.

Table 8-2 Designated Meteorological Station for Greenogue

Location	Grid Reference	Elevation (m O.D. MH)	Height Difference (m)
Greenogue Business Park	O017285	90	-
Casement Aerodrome	O041295	94	4

The elevation of the rainfall gauge at Casement Aerodrome measuring station is 94m O.D. The elevation of Greenogue Business Park is approximately 90m O.D. According to Met Eireann, annual precipitation levels increase by 200 – 300 mm per 100 m elevation. The height difference between the rainfall gauging station and the facility is approximately 4m. Therefore, the annual precipitation due to the elevation of the facility shall be adjusted by 10mm.

Table 8-3 Average Monthly and Annual Precipitation (mm)

Location	Ht. mOD	J	F	M	A	M	J	J	A	S	O	N	D	Annual (mm)

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Greenogue Business Park	90	65	50	51	52	59	54	48	70	64	70	67	75	723
Casement Aerodrome	94	64	49	50	51	58	53	47	69	63	69	66	74	712

At the site, approximately 52% of the total annual rainfall is recorded during the winter period (October – March). This amount of precipitation (including snow) will normally be associated with more prolonged Atlantic frontal weather depressions passing over the region compared to the summer.

8.8.6 Evapotranspiration and Effective Rainfall

The nearest Meteorological Station with evapotranspiration measuring equipment is located at Casement Aerodrome synoptic station. Evapotranspiration is the return of water vapour to the atmosphere by evaporation from land and by the transpiration by plants, generally measured from a short-grass covered surface (such as a permanent pasture) adequately supplied with water. Evaporation is the return of water vapour to the atmosphere by evaporation from a free water surface such as a pan of water, known as a "Class A Pan", fitted with a depth measuring gauge. The evapotranspiration figures for the Casement Aerodrome Synoptic Station are detailed in Table 8.4.

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It can be noted that evapotranspiration is very low during winter months, when plant growth is minimal. The vast majority of evapotranspiration during winter months is attributable to direct evaporation from ground surfaces. During summer months the rate of evapotranspiration increases and often exceeds the monthly rainfall. This is due to increased free evaporation from the surface and from transpiration from leaves and plants.

Using the rainfall data and the potential evapotranspiration data for the nearest measuring station, i.e. Casement Aerodrome Synoptic Station, the effective rainfall for the subject site can be calculated. Table 8.4 also shows the effective rainfall to the site. Any rain falling on the site will either infiltrate to the ground, evaporate from the surface or become surface water runoff.

Table 8-4 Hydrological Data for the Site

Month	Rainfall (mm)	Potential Evapo-transpiration	Actual Evapo-transpiration (mm)	Effective Rainfall (mm)

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		(mm)	(PE x 0.92)	
January	64.9	7.2	6.6	58.3
February	49.7	18.1	16.7	33.0
March	50.7	35	32.2	18.5
April	51.7	53.9	49.6	2.1
May	58.8	75.7	69.6	-10.8
June	53.7	87	80.0	-26.3
July	47.7	85.5	78.7	-31.0
August	70.0	68.4	62.9	7.0
September	63.9	45.9	42.2	21.7
October	70.0	22.3	20.5	49.5
November	66.9	7.5	6.9	60.0
December	75.0	3.7	3.4	71.6
Total	723	510.2	469.4	253.6

The surface water runoff drainage system is discussed in more detail in Section 2 of this EIS.

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8.8.7 Wind

The closest synoptic weather station with the capability of measuring wind and that has been in operation for at east 30 years is also Casement Aerodrome Synoptic Station.

The wind rose for Casement Aerodrome Synoptic Station shows that the prevailing winds are from the southwest. The mean wind speed at Casement Aerodrome Synoptic Station is 11.1 knots (5.5 m/s). This value is also applied to the site at Greenogue.

8.9 Significant Impacts – Climate

The site and the proposed increase in tonnages will not impact on the regional climate.

8.10 Mitigation Measures - Climate

As there will be no significant impact on the local or global climate, there are no mitigation measures proposed, other than the operation of the facility to BAT guidelines.

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9 NOISE & VIBRATION

9.1 Introduction

The main purpose of the noise study undertaken was to:

- Establish the existing noise levels in the environs of the proposed development;
- Project and assess the noise levels generated by the development; and
- Specify appropriate ameliorative measures where deemed necessary.

9.1.1 Acoustic Terminology

Sound is simply the pressure oscillations that reach our ears. These are characterised by their amplitude, measured in decibels (dB) and their frequency, measured in Hertz (Hz). Noise is unwanted or undesirable sound, it does not accumulate in the environment and is normally localised. The criteria for environmental noise control are of annoyance or nuisance rather than damage. In general a noise level is liable to provoke a complaint whenever levels exceed by a certain margin the pre-existing noise level or when it attains an absolute level.

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The units of measurement of noise must reflect our overall response to it. The basic difficulty in measuring noise is the huge range in the sensitivity of the ear. Audible sound pressures range between the threshold of hearing ($0.00002 N/m^2$) and the threshold of feeling ($20 N/m^2$), which corresponds to a ratio of 1:1,000,000. In order to cover this wide range, a logarithmic unit, the decibel (dB) is used. The dB scale ranges from 0 to 120/140 dB. While the size of the pressure fluctuations is measured in dB, the rate of pressure fluctuations is measured in cycles per seconds or Hertz (Hz).

The human ear has a limited frequency range from about 20 H z to 20 kHz, the upper end depending on the age of the person and previous exposure to high levels of noise. Within that range the ear can tolerate low frequencies more than middle to high frequencies and one must ensure that any measurement device elicits a numerical value, which matches the ear's response. This is achieved by introducing an electronic filter (called an 'A' weighted filter) into the measuring system. This weighting characteristic provides good correlation with the noise annoyance and since its maximum lies in the frequency region where the ear is most sensitive, it takes into account the hearing damage potential of the noise. For this reason environmental noise levels are generally measured in terms of 'A' weighted decibels, dB(A). A noise level in excess of 85 dB(A) gives a significant risk of hearing damage. A noise level increase of 3 dB(A) is barely perceptible, while an increase in noise level of 10 dB(A) is perceived as a twofold increase in 'loudness'.

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Where noise levels vary in time, statistical analysis of the variation can be carried out. The results are usually stated in the form L_N (L for level), where N is the percentage of time a level is equalled or exceeded. Hence if L_{90} = 40 dB(A), the noise level exceeds 40 dB(A) for 90% of the time measured period i.e. background noise level is 40 dB(A). Consequently, background noise level could be described as the lowest 10% of noise level over a given period.

In addition to the statistical units, the equivalent continuous level is also measured. The equivalent continuous level, L_{eq}, is measured in dB(A) and is a notional steady level that has the same sound energy as the real fluctuating sound over the same measurement period. It is measured using an integrating sound level meter (SLM). L_{eq} is often described as the total noise level for a specified period.

9.2 Existing Environment

9.2.1 Noise Survey Methodology

Noise monitoring was carried out on 20th December 2006 during the day (for 30 minute intervals) at four agreed EPA locations (see Figure 7.1). Night time noise monitoring was also carried out on the 20th December 2006. The following conditions were adhered to in undertaking the survey:

- Measurement of noise levels was undertaken using Type 1 instrumentation;
- Cognisance was taken of the EPA's 'Environmental Noise Survey Guidance Document, 2003;
- The survey was carried out in accordance with ISO 1996 Acoustics - Description and Measurement of Environmental Noise: Parts 1/2/3.

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The noise monitoring locations are described in Table 9.1 and illustrated in Figure 7.1.

Table 9-1 2006 Annual Noise Monitoring Locations –EPA Agreed

Monitoring Location	Description
N1	South western boundary of site
N2	North western boundary of site
N3	North eastern boundary of site
N4	South eastern boundary of site

Weather conditions during the December 2006 survey were suitable for noise assessment.

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The following instrumentation was used in the survey:

- One Larson Davis 824 Precision Integrating Sound Level Analyser/Data logger with *Real-Time* Frequency Analyser Facility
- Wind Shield Type: Larson Davis 2120 Windscreen.
- Calibration Type: Larson Davis Precision Acoustic Calibrator Model CA200.

All the environmental noise analysers had data logging facilities set on real-time, the logged data was later downloaded via a personal computer using software. One third octave frequency analysis were taken at the locations using the 824 Precision Integrating Sound Level Analyser/Data logger with *real-time* frequency analyser facility.

At each noise measurement point the Sound Level Meter (SLM) was mounted on a tripod so that the microphone was maintained at 1.5 metres above ground level and at least 3.5 metres from any potential noise reflecting surfaces. The monitoring equipment was manned throughout the 30 minute sampling intervals and comments were recorded in order to aid the interpretation of the results.

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All acoustic instrumentation was calibrated before and after the survey period and no drift of calibration was observed (calibration level 114dB at 250Hz).

At each of the monitoring locations the following data was recorded:

- $L(A)_{eq}$: Equivalent Continuous A-weighted Sound Level. The continuous steady noise level, which would have the same total A-weighted acoustic energy as the real fluctuating noise measured over the same period of time;
- $L(A)_{10}$: The noise level that is equalled or exceeded for 10% of the measurement period; and
- $L(A)_{90}$: The noise level that is equalled or exceeded for 90% of the measurement period.

At present there are no statutory limits for environmental noise levels, however, the EPA recommend that ideally, on sites of industrial nature or similar, if the total noise level from all sources is taken into account, the noise level at sensitive locations should be kept below an L(A)eq value of 55dB(A) by daytime (08.00 to 22.00) and 45 dB(A) at night-time (22.00 to 08.00).

9.3 Existing Noise Survey Results

The noise survey carried out in December 2006 reflects the existing day and night time noise environment at the boundary of the site during a period of operation of the transfer station. Note that the EPA agreed noise monitoring locations are all on site

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and do not reflect emissions at noise sensitive locations. The results of the noise monitoring carried out at the four monitoring locations are summarised in Table 9.2 an shown in Figure 7.1.

Table 9-2 Noise Monitoring Results–daytime and night time(dB(A),30min interval)

Location	Date	Time	Leq	L_{10}	L_{90}	Comments
DAYTIME MONITORING						
N1	20th Dec 06	10.04	62.0	64.6	57.4	Site activities, site traffic and Business Park traffic contributed to noise levels.
N2	20th Dec 06	12.08	60.5	61.9	55.8	Site activities were the dominant source of noise emissions. Activity is adjacent premises, birdsong and aircraft also contributed to noise levels.
N3	20th Dec 06	11.27	73.5	77.9	57.9	Site activities and activities in adjacent premises were the dominant noise sources. Occasional aircraft, and bird song also contributed to noise levels. The adjacent flowing river was also audible.
N4	20th Dec 06	10.46	68.3	71.9	63.0	Noise emissions from the drum centre were audible due to the open door (including a radio). Site traffic and passing traffic also contributed to noise levels.
NIGHT TIME MONITORING						
N1	20th Dec 06	23.50	46.6	48.6	43.8	Traffic on Business Park roads was the dominant noise source. Occasional passing traffic and aircraft also contributed to noise levels.
N2	20th Dec 06	22.40	47.7	49.2	45.4	The adjacent river was audible at this location along with distant traffic and occasional aircraft. Occasionally activity in adjacent premises contributed to noise levels.
N3	20th Dec 06	22.04	46.3	47.8	44.0	Noise emissions from RILTA were audible mainly from adjacent pipes. Traffic on Business Parks roads and occasional aircraft also contributed to noise levels.
N4	20th Dec 06	23.16	46.7	48.4	44.3	Traffic on Business Park roads contributed to noise levels along with occasional aircraft.

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Location N1

Noise monitoring location N1 is located at the south western boundary of the site, adjacent to the site car park and to the access road to RILTA within the Greenogue Business Park. Daytime noise sources included activities on site, site traffic and traffic on the Business Park roads. Night time noise sources included traffic on the Business Park roads, noise from neighbouring premises and occasional aircraft.

Location N2

N2 is located in the north western corner of the site, behind the racked storage building. During daytime monitoring periods noise emissions from RILTA were audible, and the dominant sources of noise included heavy goods vehicles (HGVs) within the site, aircraft and traffic on Business Park roads. Aircraft and distant traffic were audible during the frequency analysis measurement. During night time monitoring periods noise emissions from RILTA were not audible and the dominant noise sources included the adjacent river and traffic on Business Park roads.

Location N3

N3 is located at the north eastern boundary of the site, adjacent to the bunded tank area. Noise emissions from RILTA were audible at N3 during the daytime noise monitoring period. The dominant noise sources included activity within the site and from activity in adjacent premises. During night time measurement periods, the dominant noise sources included emissions from adjacent pipes within the RILTA premises and traffic on Business Park roads.

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Location N4

Noise monitoring location N4 is located in the south eastern corner of the site. During the daytime noise monitoring periods activities in the drum centre and site traffic were the dominant sources. During the night time noise monitoring periods aircraft and distant traffic were the dominant sources of noise emissions. Occasional passing traffic also contributed to noise levels.

9.4 Significant Impacts

9.4.1 Characteristics of Proposal

RILTA Environmental Ltd. (hereafter referred to as RILTA -formerly known as SITA Environmental Ltd.) currently operates an Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin.

This EIS is submitted in conjunction with an application for planning permission to increase the annual volume of contaminated soil that is stored at RILTA prior to transfer off-site. Based on the terms of the current Planning Permission for the site at

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Greenogue, the threshold of waste accepted on site shall not exceed 62,500 tonnes save with a prior grant of Planning Permission. TOBIN wish to submit an application, on behalf of RILTA, for an increase in the annual throughput of waste at the site from 62,500 tonnes per annum to 111,000 tonnes per annum. The increase in annual tonnage will be due to an increase in soil accepted and transferred into and from the site.

9.4.2 Noise Criterion

The criterion is one of annoyance or nuisance rather than damage. The relevant standard currently used is the ISO 1996 (3 Parts). This standard does not use the criteria of differentials, however an increase in noise level of 5 dB(A) is considered as one of only marginal significance. In general, a noise is liable to provoke a complaint whenever its level exceeds by a certain margin the pre-existing noise level, or when it attains an absolute level. The method of deriving a criterion is related to the existing ambient noise level, taking into account the various features of the total noise environment at the nearest relevant residences to the development.

EPA waste licence 192-1 licences the operation of the subject hazardous waste transfer facility and limits noise emissions arising from the activity (measured at any noise sensitive locations) to 55 dB(A) L_{Aeq}(30 minutes) during the day time and 45 dB(A) L_{Aeq}(30 minutes) during the night time. Schedule D of waste licence 192-1 requires that annual monitoring be carried out for the following parameters:

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- L_{Aeq}(30 minutes)
- L_{A90}(30 minutes)
- L_{A10}(30 minutes)
- 1/3 octave band frequency analysis

The results of annual noise monitoring carried out in December 2006 are presented in Table 9.2.

9.4.3 Noise Impacts from Integrated Waste Management Facility

The application relates to the increasing of the quantity of soil accepted at the facility, stored on site and transferred off site. There are no infrastructural changes required and hence there will be no construction activities associated with the current proposal.

The main source of noise emissions from the integrated waste facility are those activities associated with the reconditioning of steel drums, the pumping of liquid/waste and the recycling centre. All the aforementioned noise sources are contained within a housing envelope. The continued use of the RILTA facility will not lead to any change in infrastructure or processing within the site and thus no

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change in noise emissions associated with these activities. However an increase in traffic (heavy goods vehicles) movements associated with the site will result and thus an increase in road traffic generated noise levels at receiving noise sensitive locations along the route of road traffic.

In the course of the original planning application and EIS for the site a noise impact assessment was carried out which identified the main noise sources associated with site operations and predicted noise levels from these operations at the boundary of the site and at the nearest noise sensitive location. The main noise sources are presented in Table 9.3. The noise levels given in this table were recorded from similar type of plant and facilities at various locations throughout the country. The noise levels were recorded when the plant (mobile and fixed) were in normal operating mode processing material.

Using data in Table 9.3 and the methodology described below, the noise levels from on site activities that were predicted in the original EIS are presented in Table 9.4, which gives the predicted noise levels with all fixed and mobile plant in operation. Note that levels recorded in December 2006 (Table 1.2) include predominantly noise emissions from activities off site and also the movement of heavy goods vehicles within the site.

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The predicted noise levels generated by on-site activities at a particular location (the boundary) can be calculated according to the following formula:

$Lp2 = Lp1 + \Delta L\psi - \Sigma\Delta L$

Where;

Lp2 = Sound Pressure level in decibels at Boundary.

Lp1 = Sound pressure level in decibels at 20 metres.

$\Delta L\psi$ = correction for direction effects in a horizontal plane,

$\Sigma\Delta L = \Delta Ld + \Delta La + \Delta Lr + \Delta Ls + \Delta Lv + \Delta Lg + \Delta Lw$, and

where;

ΔLd = geometric spreading (spherical radiation) and is calculated according to:

$\Delta Ld = 20 \log_{10} (d1/d2)$, where, d1 is the residence distance in metres, while d2 is 20 metres.

ΔLa = air absorption

ΔLr = reflection and diffraction

ΔLs = screening

ΔLv = vegetation

ΔLg = ground absorption

ΔLw = wind gradients

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The attenuation effects due to air absorption, reflection and refraction are small and in the predictive calculation the attenuation from these factors is assumed to be zero. The other attenuating factors have been accounted for in the prediction calculations.

Table 9-3 Main noise sources for the facility and associated noise level emissions

Noise Source	**Housed / Un-housed**	**Noise Level dB(A)**
Mechanical Granulator	Housed	82 @ 4m
Road Tanker Pumping	Housed	88 @ 4m
Shot Blasting	Housed	89 @ 4m
Air Denter	Housed	83.8 @ 1m
Spray Booth	Housed	88
Spray Booth Extraction Vent	Housed	83.8 @ 1m
Conveyor at Drying Tunnel	Housed	83.1 @ 1m
Trucks moving within yard	Un-housed	56.0
Front End Loader	Un-housed	77

Note Noise level @ 10m unless stated otherwise stated

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Table 9-4 Predicted Noise Levels at Key Locations

Receiver	Predicted Maximum Levels $L_{eq\ 1\ hour}$ dB(A)
N1 (Boundary of site)	47.0
N2 (Boundary of site)	51.5
N4	<25
N5	<25

Note Predictions are based on housing envelope giving a minimum reduction of 20 dB(A)

In Table 1.4 above N4 and N5 represent predicted noise levels from on-site activities at the nearest residences (i.e. noise sensitive location) to the site.

9.4.4 Road Traffic Generated Noise Impacts

The Integrated Waste Management Facility currently generates 52 heavy goods vehicle movements per day, as recorded during a traffic survey at the site access junction, which was carried out during the hours of operation of the development. It is anticipated that with the increase in soil tonnage allowances, an additional 36 vehicle movements per day will be generated, bringing the total to 88.

The total traffic generated by the facility equated to 0.36% of traffic passing through the R120/Grants Road roundabout junction during the same period. The proposed

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increase in soil transferred to, stored on and transferred from the site will result in an increase in heavy vehicles from the RILTA site of 0.25% of total traffic.

There is a logarithmic relationship between noise levels and traffic volume and the higher the existing traffic volume the greater is the traffic increase required to produce a perceptible noise change. Typically doubling the road traffic flow produces a 3 dB(A) change in noise level. An increase in vehicular movements of the order proposed will continue to have a negligible noise impact along the local road network.

9.5 Mitigation Measures

The mitigation measures recommended in the EIS accompanying the original planning application should remain in place:

- The operation of all fixed plant is carried out within a housing envelope giving an overall sound reduction of 20 dB(A);
- All doors of the building to be kept closed except for truck movement in/out
- All fixed plant, mobile equipment (trucks etc.) are properly serviced and maintained in good condition
- All machinery operators are instructed to avoid unnecessary revving and observe good noise control practice
- All areas where skips are loaded on / off trucks have a hardstand overlain with a wood material (sleepers) or alternative material to avoid impulsive sounds; and
- The air extraction system, where necessary is contained within the main buildings inside an acoustic enclosure.

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9.6 Conclusion

The noise emissions from the Integrated Waste Management Facility will continue to have a negligible noise impact at all residences and there will be no tonal or impulsive components in the emission.

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10 TRAFFIC

10.1 Introduction

TOBIN Consulting Engineers Ltd have been appointed by RILTA Environmental Limted, to prepare a Transport Assessment Report, as part of an Environmental Impact Statement for an application to increase the tonnage allowance for soil stored and transported to and from the site.

In preparing this report, TOBIN Consulting Engineers has made reference to

- The South Dublin County Development Plan 2003 – 2009;
- The NRA 'Traffic and Transport Assessment Guidelines';
- The NRA 'Future Traffic Forecasts 2002 to 2040';
- NRA Design Manual for Roads and Bridges (DMRB) TD 41/95;
- NRA DMRB TD 16/93;
- Geometric Design Guidelines RT180;
- NRA Addendum DMRB TD 41/95;
- Department of Transport "Traffic Management Guidelines"; and
- Department of Environment "Traffic Signs Manual".

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10.1.1 Objectives

The objective of this report is to assess the impact the increase in tonnage will have on the operational capacity of the existing road network. This report will quantify the existing volume of traffic that is generated by the development and estimate the future increase in traffic due to the proposed increase in tonnage allowance per annum. In this case the key junction assessed was the existing Greenoge Industrial Estate access roundabout junction.

This report also looks at the effect the development has on road safety and examines the existing junction layouts.

10.2 Existing Environment

10.2.1 Site Location

The existing RILTA site is located along Grants Drive in the Greenogue Business Park, which is situated on land to the north of the regional road R120 approximately 1 kilometre from Newcastle. Figure 10.1 shows the location of the site and the roundabout junction.

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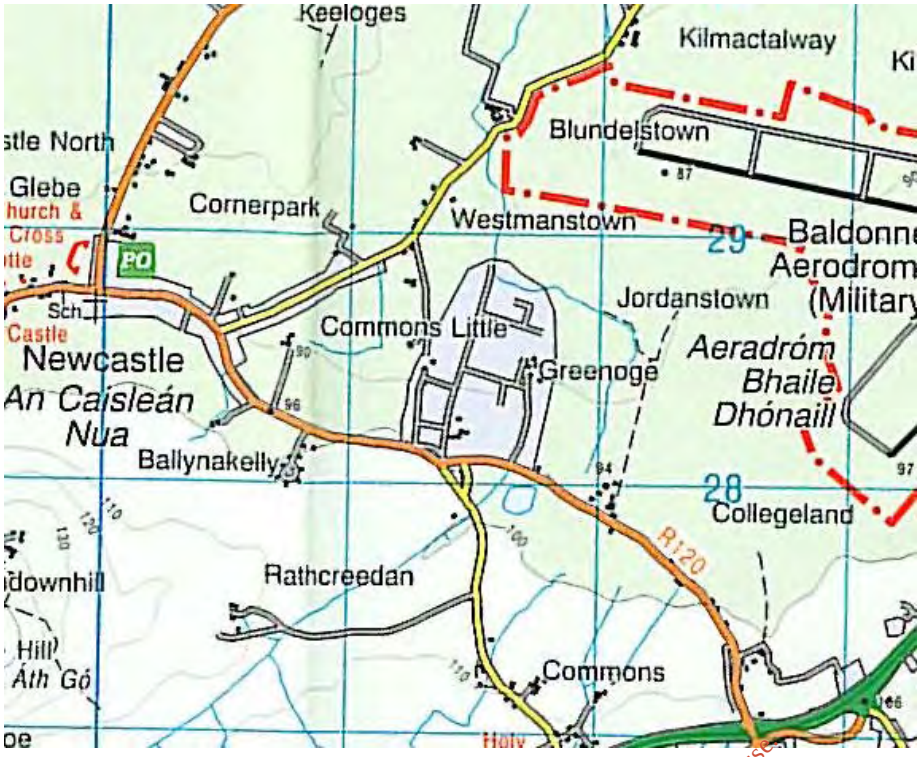

Figure 10-1 Site Location

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10.2.2 Existing Road Network

The existing RILTA site is located along Grants Drive in the Greenogue Industrial Estate. The industrial estate access roundabout junction is located along the regional road R120, within the 50km/h speed limit. The roundabout junction has an approximate inscribed circle diameter of 30 metres, and incorporates an overrun area to facilitate the movement of heavy vehicles. Street lighting is present at this location. The R120 has a carriageway width of 7.7 metres to the west of the junction towards Newcastle, with an entry width of 4.4 metres at the roundabout. A segregated left turn lane is located on this arm of the roundabout to provide access into the industrial estate from Newcastle. Footways front both sides of the carriageway, providing safe pedestrian access to and from Newcastle.

The R120 to the east of the junction has a carriageway width of 7.5 metres, with an entry width of 3.8 metres at the roundabout. A footway fronts the northern edge of the carriageway, while a grass verge fronts the southern edge. The local road to the south of the roundabout has a carriageway width of 7.2 metres, with an entry width of 5.7 metres at the roundabout. A footway fronts the western edge of the carriageway, while a grass verge fronts the eastern edge. The industrial estate access road (known as Grants Road) has a carriageway width of 7.7 metres, with an entry width into the roundabout of 5.5 metres. Footways front both sides of Grants Road, providing pedestrian access into the industrial estate. The local road in the vicinity of the site access junction has a carriageway width of approximately 6 metres, with no road markings located along the local road or at the site access junction.

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Grants Drive has a carriageway width of 7.7 metres in the vicinity of the entrance into the Rilta site. 1.6 metre wide footways front both sides of the carriageway, while street lighting is present at this location. Visibility splays of 3.0 x 70 metres are provided in both directions at the site entrance, which is considered suitable for the 20km/h speed limit.

The R120 has a carriageway width of 7.4 metres to the west of the roundabout junction with College Road, with a roundabout entry width of 4.2 metres. To the east if the junction the R120 has a carriageway width of 7.2 metres and a roundabout entry width of 4.8 metres.

College Road (which provides an additional access to the Greenoge Industrial Estate) has a carriageway width of 9.2 metres in the vicinity of the roundabout junction, with a bus layby to the east of the carriageway. College Road has a roundabout entry width of 4 metres. Deterioration of road markings are evident at this location.

10.2.3 Proposed Network Improvements

A new network and roundabout are currently under construction on the Rathcoole side of the facility, that is, to the east of RILTA.

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10.2.4 Public Transport

Due to the nature of the development and the fact that there will not be an increase in employee numbers as a result of the change of use at the facility, it is not considered that the proposed application will generates any additional demand on the current public transport; therefore it is considered that this application is neutral in terms of public transport.

10.2.5 Traffic Survey

In order to determine the magnitude of the existing traffic flows, the results of a Full Turning Manual Classified Traffic Survey at the roundabout junction at Grant's Road was utilised, this was carried out by ABACUS Traffic Surveys on Tuesday the 27th of February 2007, between the hours of 07.00 and 19.00. These surveys distinguished between cars / light good vehicles, buses and heavy commercial vehicles (HGV's).

The results of this survey indicated that the AM and PM peak traffic levels occurred between the hours of 08:30 – 09:30 and 16:15 – 17:15. Overall there was a HGV content of 16.6%.

Details of a traffic survey carried out immediately at the RILTA site access junction were also available, which was carried out by RILTA staff in hourly intervals between

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07:00 – 18:00 on the same day. This survey distinguished between pedal cycles, motorcycles, cars & light goods vehicles, buses and heavy goods vehicles. This additional survey was carried out to assess the number of vehicles exiting the site on to the R120/Grant's Road junction and on to R120/College Road junction. Details of both traffic surveys undertaken are provided in Appendix 10.1 of this report.

In order to undertake an analysis of the key junctions, it was necessary to apply a correction factor to convert the surveyed traffic figure values into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic surveys. These seasonally adjusted conversion factors were calculated from data taken from a fixed automatic traffic counter, located on the N7 near Kill, over a 12-month period in 2005. It was found that traffic volumes in February are generally lower than annual average daily traffic (ADDT) flows, therefore in order to convert the traffic data into annual average daily traffic flows, a conversion factor of 1.02 was applied.

The traffic, including existing development traffic, for the AM and PM peak hours at the R120/Grant's Road roundabout junction as well as for the total hours of operation of the RILTA site are shown below in Figures 10.2 to 10.4 (Note: Figures in brackets denote HGV's).

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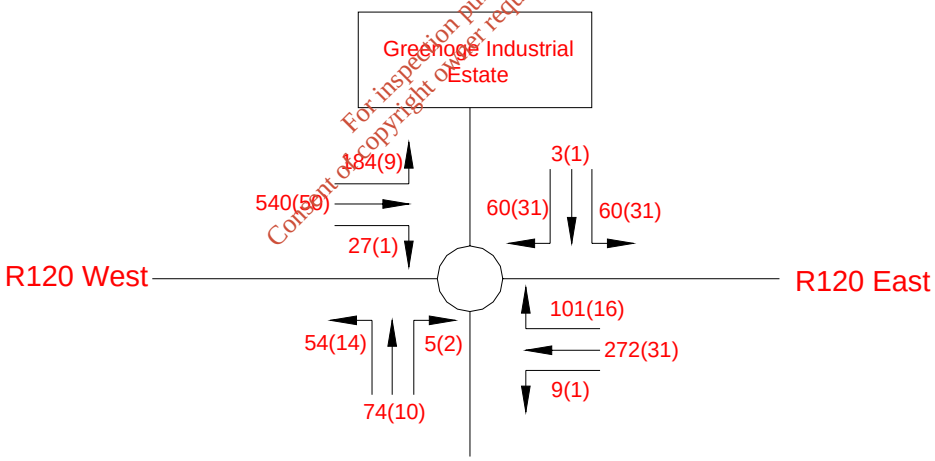

Figure 10-2 Existing Traffic Flows AM

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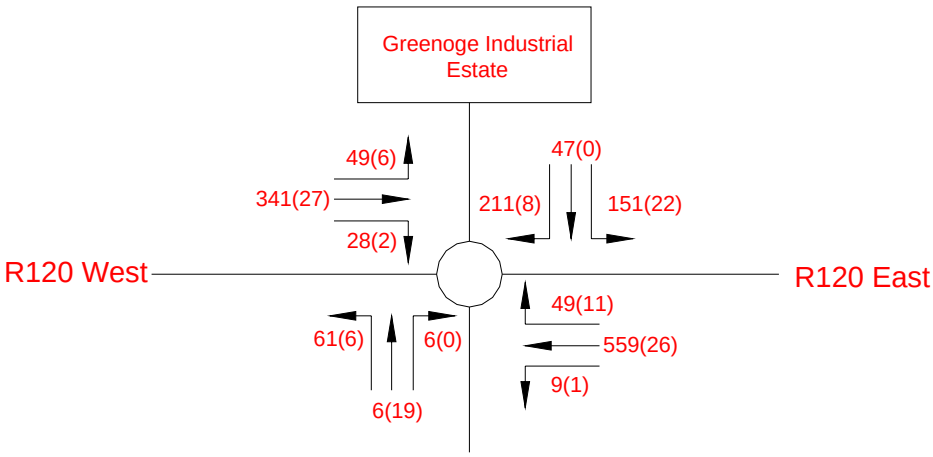

Figure 10-3 Existing Traffic Flows PM

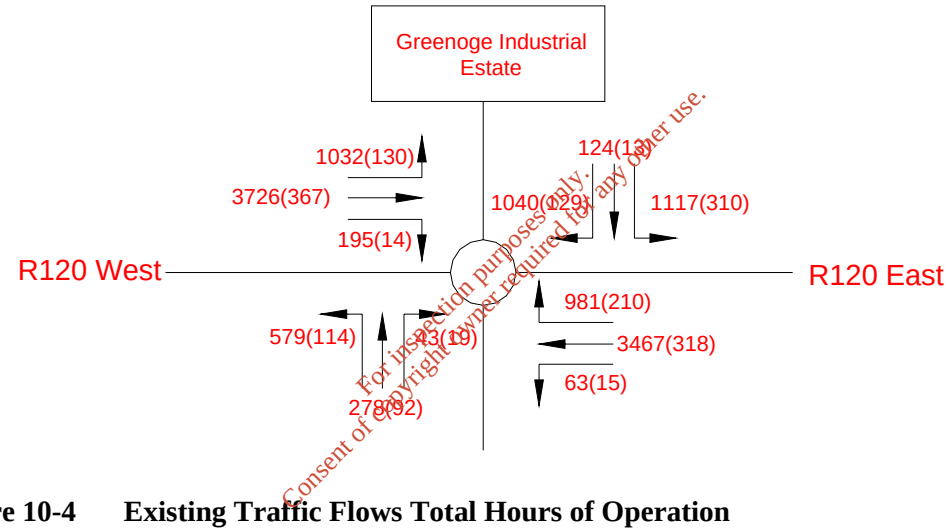

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Figure 10-4 Existing Traffic Flows Total Hours of Operation

10.3 Significant Impacts

10.3.1 Extent of Development

This application relates to the increasing of the annual waste throughput allowance from 62,500 tonnes per annum to 111,000 tonnes per annum, which equates to a 76% increase. It should be noted that no change in infrastructure is required as part of this application, the only change will be in the volume of soil that is taken into RILTA Greenogue, stored and transferred off-site.

10.3.2 Parking Provision

There are currently 32 car parking spaces provided for at the RILTA site. Due to the nature of this application, no further car parking demand will be anticipated due to the increased tonnage allowance, therefore the current number of spaces is considered

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sufficient to deal with demand.

10.3.3 Traffic Impact from Additional Vehicle Movements

10.3.3.1 Trip Generation

In estimating the expected increase in heavy vehicle movements to and from the site, TOBIN used the results of the traffic survey immediately at the RILTA site access junction, which was carried out during the hours of operation of the development. The figures were increased based on the proportional increase in tonnage allowance.

During the hours of operation of the development, a total of 52 heavy vehicle movements were recorded at the RILTA entrance. Therefore it is anticipated that with the increase in soil tonnage allowances, an additional 36 vehicles movements per day will be encountered, bringing the total to 88.

It was noted that the total traffic generated by the RILTA development transporting soil to and from the site over the course of the hours of operation equated to 0.36% of traffic passing through the R120 / Grants Road roundabout junction during the same time period. The increase in tonnage allowances to 111,000 tonnes per annum will equate to an increase in heavy vehicles from the RILTA site of 0.25% of total traffic. The NRA "Traffic and Transport Assessment Guidelines" state that analysis of a junction in relation to a development should be undertaken if development-generated traffic exceeds 10% of total traffic, while this figure drops to 5% in the case where a junction is nearing capacity. In this instance, it is clear that the development-generated traffic falls below both thresholds, and thus no capacity analysis of the roundabout junction is required.

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10.3.3.2 Trip Distribution

For the purposes of this report, it was assumed that all heavy vehicles generated by the RILTA site access the road network via the R120 / Grants Road roundabout junction. However in reality vehicles will use both the R120 / Grants Road roundabout and the R120 / College Lane Roundabout, lessening the impact even further.

10.4 Mitigation Measures

10.4.1 Junction Capacity

As the proposed increase in tonnage allowance does not impact significantly on the operational capacity of the junctions in the vicinity of the development, no junction improvement measures are required to improve capacity.

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10.4.2 Road Safety

It was noted during the site visit that road markings at both the R120 / Grants Road roundabout junction and the R120 / College Road roundabout junction were worn away in places. It is recommended that road markings be reinstated.

It was noted during the site visit that a certain amount of pavement deterioration has occurred at the R120 / Grants Road roundabout junction. It is recommended that the pavement be reinstated in areas where pavement deterioration is evident.

10.4.3 Pedestrians

Pedestrian movements are already sufficiently catered for in the vicinity of the development, therefore no pedestrian improvements are considered necessary.

10.4.4 Cyclists

It is not considered necessary to provide any additional cycle facilities as part of this application.

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10.5 Conclusion

10.5.1 Conclusions

This report concludes that:

- The expected increase in development-generated traffic due to the increased tonnage allowance was found to equate to less than 5% of total traffic accessing the junction. Therefore junction capacity analysis of the R120 / Grants Road roundabout junction is not required.
- Visibility of 3.0 x 70 metres is provided at the site access junction, which is considered sufficient in dealing with
- Road marking and pavement deterioration was evident at the roundabout junction.
- 32 No. formalised car parking spaces are currently provided for on site, which is considered sufficient to deal with demand.

10.5.2 Recommendations

This report recommends that:

- Road markings at the R120 / Grants Road and R120 / College Road roundabout junction be reinstated.
- Pavement to be reinstated in areas where deterioration is evident.

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11 LANDSCAPE & VISUAL IMPACT

11.1 Introduction

TOBIN Consulting Engineers were retained by RILTA Environmental Ltd. to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on landscape and visual aspects. As this facility is already in existence, this section will provide an assessment of the landscape that may be affected by an increase in the annual volume of contaminated soil.

11.2 Existing Environment

A comprehensive landscape and visual assessment report was submitted by TIROS on behalf of Rilta for the original EIS for the facility. The current landscape at the facility and the surrounding area has been established over recent years as part of the Greenogue Business Park. No additional changes are to be made to the RILTA facility as a result of the proposed increase in annual soil intake and transfer off site.

This report uses the 'Guidelines on the Information to be contained in Environmental Impact Statements' prepared in March 2002 on behalf of the Environmental Protection Agency (EPA) as the basis for the landscape and visual impact assessment.

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11.2.1 Purpose and Structure

The guidelines describe the central purpose of an EIS as *"to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts."* In terms of structure, this report includes descriptions of the existing environment, of the proposed development, of likely significant impacts and of mitigation measures.

11.2.2 Landscape in the Description of the Existing Environment

The guidelines describe the term 'Landscape' as covering a range of environmental topics including Landscape Character, Landscape Context, Views & Prospects, Historical Landscapes and Manmade Landscapes.

Landscape impact assessment is a combination of two separate but closely related aspects. The first is visual impacts, that is the extent to which new developments can be seen. The second is impacts on the character of the landscape, that is responses that are felt towards the combined effects of the new development.

The Guidelines recommend systematic, accurate and comprehensive descriptions of

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the following to be included in any assessment:

- **Context -** The areas from which the existing site is visible (with particular attention given to views from roads, residences and designated tourism routes and viewpoints) are described. Those areas from where the site can be seen beyond the boundary are noted. Principal landscape features and areas of distinctive character are mapped.
- **Character -** A description of the landscape character differentiates between subjective assessments and objective description. A description of the character of the site that is perceived both from within the site and from the wider landscape is important, as is a description of the intensity and character of land use.
- **Significance -** Here the quality, value or designation assigned to the aspect are described. The level of visual intrusion upon designated views, designated landscape and designated landscape amenity areas is investigated.
- **Sensitivities or Vulnerability -** Changes that could alter the character of this aspect significantly are listed here. The extent to which the existing landscape or views are capable of being changed in such a way as will not alter the perceived character is analysed, and described as follows:

  High - development of the type proposed will significantly alter the perceived character of the landscape.

  Medium - development of the type proposed will moderately alter the perceived character of the landscape.

  Low - development of the type proposed will not significantly alter the perceived character of the landscape.

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11.2.3 Prediction of Impacts on the Landscape

The report presents an assessment of the likely and significant impacts of the proposed development.

Likelihood of Impacts

Only probable or likely impacts are addressed, including:

- **Predicted Impacts** - impacts that are expected or planned to take place, or that can be reasonably foreseen as inevitable consequences of normal construction and operation of the development are addressed. The character, magnitude, duration and consequence of impacts are described.
- **Potential Impacts** - impacts arising before proposed mitigation measures become fully effective e.g visual impacts before vegetation becomes established.

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- **Residual Impacts** – final or intended impacts occurring after the mitigation measures have taken effect as planned e.g. establishment of tree screening.
- **The "Do Nothing" Impact** - describes the environment as it would be if no development were to take place.

Significance of Impacts

As described in this section, this means either the sensitivity to change of the environment that is affected (often reflects its importance), or the importance of the outcome of the impact (the consequences of the change). It is determined by a combination of objective and subjective concerns.

It will not be assumed that where a view of fields or woods is replaced or intruded upon by a development, this situation is objectively and simply negative. Subjective issues arise. The impact will be noted as negative where it is felt that a significant number of individuals may perceive the impact as negative.

Description of Impacts

The report describes key aspects of impacts, namely *character, magnitude, duration and consequence.*

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11.2.4 Mitigating Impacts on the Landscape

Strategies for impact mitigation as described in the guidelines include:

- **Avoidance** - Avoid developments in sensitive or prominent landscapes, and avoid insensitive or visually intrusive designs.
- **Reduction** – Where the significance of adverse impacts is lessened. Seeks to limit the exposure of the receptor. Reduce the visual intrusiveness of the design and reduce the visibility of the project (e.g. by installing barriers between the location(s) of likely receptors and the source of the impact).
- **Remedy** – Remedy serves to improve adverse conditions by carrying out further works which seek to restore the environment e.g. increased planting of trees/shrubs to offset unavoidable loss of vegetation.

If it is not possible or practical to mitigate an impact (e.g. felling mature trees) this is described as a R*esidual Impact.*

11.2.5 Definition of Visual Impacts

Terminology used in the assessment of impacts is defined as follows:

- **Visual Intrusion** – This occurs where a proposed development impinges on an existing view without obscuring the view.

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- **Visual Obstruction** – This occurs where a proposed development obscures an existing view.

The quality of the impact may be described as:

- **Neutral** – A neutral impact will neither enhance nor detract from the landscape character or viewpoint.
- **Positive** – A positive impact will improve or enhance the landscape character or viewpoint.
- **Negative** – A negative impact will reduce or have an adverse effect on the existing landscape character or viewpoint.

The duration of impacts is defined as follows:

- **Temporary** Impacts lasting one year or less
- **Short Term** Impacts lasting one to seven years
- **Medium Term** Impacts lasting seven to fifteen years
- **Long Term** Impacts lasting fifteen to sixty years
- **Permanent** Impacts lasting over sixty years

also

- **Occasional**
- **Intermittent**
- **Continuous**

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The Significance of impacts may be described as follows:

- None – There will be no change to an existing view. Arises where existing landform, vegetation or the built environment adequately screens the proposal.
- Imperceptible – An impact capable of measurement but without noticeable consequences.
- Slight – An impact, which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate – An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- Significant – An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

11.2.6 Summary

In summary, this report employs recognised guidelines – 'Guidelines on the Information to be contained in Environmental Impact Statements' prepared in March 2002 on behalf of the Environmental Protection Agency (EPA) – as the basis for landscape assessment, and recognises the assessment process as being a combination of assessment of impacts on views from key receptors, and of responses towards the

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combined effects of the development on landscape character.

Landscape Context and Character are addressed; also Significance in relation to planning designations and the inherent Vulnerability of the landscape in question. An assessment of the "do nothing" approach is also carried out alongside the predicted impacts of changes in character, visibility, patterns of land use, followed by broad proposals for mitigating impact.

To ensure clarity, it is deemed important to use stated terminology to define impacts arising from the proposed development.

The significance of impacts on the perceived environment will depend partly on the number of people affected but also on value judgements about how much the changes will matter.

11.2.7 The Receiving Environment

11.2.7.1 Context

The site is located on the outskirts of Newcastle, approximately 0.45 kilometres from Commons Little and 1.5km north/northwest of Rathcoole, in southwest County Dublin. It is accessed via the R120, which runs parallel to the southern boundary, and links with the N7.

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The site occupies a relatively low-lying position, between 87 and 97 metres AOD, within a predominantly flat landscape. Significantly higher ground occurs in excess of 2.5 kilometres to the south and southeast, beyond Rathcoole and Saggart, offering wide panoramas across this area.

11.2.7.2 Character

The area lies a relatively short distance out of Dublin City and as such is heavily influenced by its proximity and accessibility. The rural landscape is interspersed with industrial estates and partly occupied by Baldonnell Airport, conveying an'urban fringe' character.

The site comprises part of the Greenogue Business Park, which is currently undergoing expansion. Industrial units under operation, occur on the lands to the south, west, north and east of the site. Agricultural lands occur a short distance to the east and an existing light industrial site and residential property adjoins the site on the southeastern boundary.

Given the urban fringe nature of the site and the unremarkable agricultural land that

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comprises the rural elements of this landscape, there is nothing unique or highly scenic about the landscape character and consequently its sensitivity to change is relatively low. The RILTA facility is set within an existing industrial estate and as no infrastructural changes are proposed within this site, the landscape will be unaffected.

11.2.7.3 Site Characteristics

The site itself comprises an area of made ground, sloping gently towards the north where the Griffeen River flows north of the site boundary. This boundary is relatively enclosed on account of the existing hedge beyond the river and a small number of trees adjoining the riverbank. A railing and an area of ground approximately 3m in diameter exists between the northern site boundary and the river. Similarly, a boundary railing forms the site's eastern, western and southern boundaries.

An area of landscaping has been incorporated into the design of the facility. An area 2m in diameter has been landscaped within the site's perimeter, has been planted and is maintained by RILTA staff. All existing landscaping is shown on Drawing 3684-01-227.

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11.2.7.4 Visibility

Principal vantage points are from the area within a few hundred metres of the site. On account of the relatively flat topography, intervening vegetation and other buildings frequently screen the site from view. While there is relatively little vegetation in the immediate vicinity of the site, it is more extensive throughout the surrounding agricultural and residential areas. Existing industrial buildings that adjoin the site are particularly significant in screening the site. It is estimated that these buildings are in the region of 7-12 metres high.

To the south and southeast, higher ground affords distant views of the industrial estate as a whole within the much wider context of a panoramic landscape. At this distance, the facility makes no contribution to the nature of these views and is absorbed into the existing industrial estate.

Topography screens the industrial estate as a whole from the N7 to the south and southwest, with partial views afforded from the elevated interchange at Rathcoole and glimpses from the east.

Views from local roads occur along the R120 between Rathcoole and Newcastle. The facility itself is partially or completely screened in all views, with glimpses afforded through gaps in the roadside vegetation and between existing, mostly industrial, buildings. From the road at Commons Little and to the north, there are brief glimpses between the houses towards the industrial estate, but local topography, houses and

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vegetation combine with the existing industrial units to screen the site in almost all instances.

It is essentially from residential properties on these roads where there are potential views of the facility, and for the same reasons, views are also substantially screened.

11.2.7.5 Planning Context

In the South Dublin County Development Plan 2004-2010, lands surrounding the facility have been given a specific local zoning objective 'LZ 011-Greenogue, Newcastle', which is zoning for Office Use. It has also been given a general Zoning Objective 'E' which is an objective to provide for enterprise, employment and related uses.

In landscape and visual impact terms, the facility lies just beyond the periphery of one designated prospect. At approximately 2.0 kilometres north of the site, this prospect is described as "Verschoyles Hill, Knockannaves and Sliabh na mBanog from the Rathcoole-Lucan Road (R120) in the vicinity of Milltown." Analysing this view from an Ordnance Survey Map reveals that this prospect overlooks Baldonnell Airport, with the Greenogue Business Park off to the right. In any eventuality, where views exist of the business park, existing buildings screen the RILTA facility.

There are no other landscape, recreation or amenity objectives affected by the RILTA facility.

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11.3 Significant Impacts

There are no proposals to change the current infrastructure at the site or construct additional infrastructure. Therefore, there will be no impacts on the landscape or the visual appearance of the site due to the proposed increase in the tonnage of contaminated soil at RILTA.

The site is covered in made ground, with the exception of a 2m strip of landscaping within the perimeter of the facility. This area of ground has been landscaped, planted and is maintained by RILTA staff.

11.4 Mitigation Measures

As there will be no predicted impacts on the visual assessment or landscape within or surrounding the facility as a result of the proposed change of use at RILTA, there are no recommended mitigation measures.

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11.5 Conclusion

The proposed increase in tonnage of contaminated soil to the RILTA facility will have no impact on the landscape of the area or the visual appearance of the site, as no change to the current infrastructure or processing is proposed.

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12 CULTURAL HERITAGE & ARCHAEOLOGY

12.1 Introduction

TOBIN Consulting Engineers were retained by RILTA Environmental Ltd. to examine the existing environment, the current and potential impacts of the existing Integrated Waste Management Facility at Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin on cultural heritage and archaeology.

This section of the EIS addresses the impacts, if any, which an increase in annual waste tonnage will have on the cultural heritage and archaeology of the area. The following items were addressed in this study:

- The nature extent and locations of archaeological material on the site of the facility and in the general vicinity of the site; and

- Where archaeological material is shown to be present, the potential impact of the change of use on the archaeology within the site shall be described in detail.

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12.2 Method Statement

A study was carried out as part of the original EIS for the RILTA facility and comprised both a desk study and a field study. The desk study investigated both the archaeological and historical background of this area. It comprised an analysis of:

- Sites and Monuments Record (SMR) for the county of Dublin compiled by the Office of Public Works;
- Ordnance Survey Maps;
- Topographical Files, from the National Museum of Ireland;
- Aerial Photographs;
- General Archaeological files and records; and
- Historical Sources.

12.3 Existing Environment

The existing site covers 1.1 hectares and is covered in made ground. The site is bounded to the north by the Griffeen River. A 3m wide pathway is adjacent to the Griffeen River north of the RILTA site. A two-metre strip of landscaping has also been left inside the site boundary around the perimeter of the site.

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General Historical Background

Newcastle

The hill of Lyons, where the Kings of Leinster were crowned long ago, dominates the village of Newcastle, which is the nearest village situated 1km east of the site. Lyons hill was important in pre-Norman times as a stronghold and it is specifically mentioned in the early twelfth-century *Book of Rights* as a capital of the Dublin Norse (Bradley 1998). It was probably part of the demesne land of the Norse kings of Dublin and this may explain why, after it fell to Henry II, it was granted immediately after the Anglo-Norman conquest to the MacGiolla MoCholmógs, one of the traditionally subject families of the Dublin Norse.

There are a number of medieval and seventeenth century references to dwellings and castles but unfortunately these cannot be reconciled with the existing buildings (Ball), while the Down Survey and the Civil Survey both record seven. All that survives of the manorial centre is a denuded round motte some 5m high (O' Keeffe). This is presumably all that remains of the "new castle" from which the settlement takes its name. St. Finnian's parish church is mentioned in a document of 1228 as the mother church of the manor of Newcastle Lyons (Sweetman). It was attached to St Patrick's Cathedral and from 1468 it was held by the archdeacon of Glendalough as one of the cathedral prebends. Although there are no references to a pre-Norman church at Newcastle Lyons the form of the cross in the churchyard, which is closely paralleled by those at Tallaght and Saggart, together with the dedication to St Finnian, suggest that the modern village began as a pre-Norman church site. It was the Normans, however, who seem to have promoted the church into a more substantial settlement. The church was kept in repair throughout the seventeenth century and it is probably due to the fact that it survives so well today. The remains consist of a nave, chancel and west tower. The nave and tower were built together and date to the early fifteenth century (Leask, 1955). The chancel is an addition and dates to the mid fifteenth century (O' Keeffe, 1986).

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The settlement seems to have remained important into the seventeenth century. In 1614 Newcastle received a charter from James I making it a parliamentary borough and it continued to send members to parliament until the Act of Union.

The Grand Canal, less than 2km from Newcastle, brought prosperity and development in the late eighteenth century and, in the mid-nineteenth century, the Great Southern Railway was opened close to the canal and the townland of Hazelhatch benefited very much. Baldonnel Aerodrome, founded by the British in 1917 and continued by the Irish Free State, was also a great employer and Newcastle prospered and expanded into a thriving village and parish.

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Rathcoole

The village of Rathcoole is situated 1.5km south of the site. The place name of Rathcoole, Rath Chumhaill, is probably derived from the presence of the site of a rath, supposedly constructed by the father of Fionn Mac Cumhaill, a story included by Eugene O' Curry in his letters for the Ordnance Survey. Rathcoole was part of the lands of Dublin before 1170 and this suggests the existence of a pre-Norman church site, the only surviving indication of which is a plain granite cross in the churchyard (Otway-Ruthven, 1961).

During the thirteenth century the town formed a small manor belonging to the Archbishop of Dublin where the principal building of the time was a water mill. Information on the borough after 1326 is sparse but its frontier position, on the edge of the Pale, gave it a strategic importance. The settlement was burned in 1580 by the Irish under Fiach Mac Hugh (Ball, 1902) and again in 1596 when it was described as a "poor town….waste and unmanned, being pillaged by the rebels and burnt by the soldiers" (Bradley, 1998).

In the middle of the seventeenth century Rathcoole is said to have contained many good habitable houses and cabins as well as two old castles. The latter were presumably late medieval fortified houses (Bradley, 1998).

Rathcoole seems to have been first mentioned in the ancient historical records because of its position on the main road south of Dublin. Rathcoole declined in the latter part of the nineteenth century as the railways took most of the prosperous travellers off the roads.

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General Archaeological Background

The following archaeological monuments in the surrounding townlands are included to highlight the type of sites, which survive in the general area of the proposed development. It should be stressed that none of these monuments are directly affected by the proposed development. However Sheet No 21 for County Dublin revealed a number of sites within 2.5km of the existing quarry development, see Table 12.1 for "Areas of Archaeological Interest" in close proximity to the existing quarry.

Table 12-1 Archaeological Monuments in Vicinity of the Existing Quarry

TOWNLAND	ARCHAEOLOGICAL SITE TYPE	SMR NUMBER
Kilmactalway	Ecclesiastical Remains	DU021-003
Kilbride	Castle (site of)	DU021-004

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Kilbride	Church and graveyard Ringfort Earthwork	DU021-005(01-03)
Cornerpark	Enclosure	DU021-018
Collegeland	Potential Site	DU021-019
Baldonnell Little	Ringfort	DU021-020
Collegeland	Ringfort	DU021-021
Brownsbarn	Fulacht Fiadh	DU021-023
Rathcreddan	Earthwork Site	DU021-027
Greenogue	Burial Possible	DU021-028
Commons	Ringfort	DU021-029
Collegeland	Potential Site	DU021-032

See Appendix 12.1 for a detailed list of the RMP Sites in the Vicinity of the Proposed Development.

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12.3.1 Record of Monuments and Places

Archaeological remains in this region are representative of many periods, including from the Neolithic period, to the Bronze Age and the Early Christian Period. Ecclesiastical remains in the townlands of Kilmactalway (DU021-003) is evidence of recent activity in this area.

It is evident that **Neolithic** man was active in this region in or about 5,000 BC by the survival of cairns and remains of buried mounds which crown the summit of the surrounding hills. The earliest form of archaeological activity in this area includes the passage tombs on Knockandinny, Saggart Hill, Verschoyles Hill, Knockannavea and Tallaght Hill.

Bronze Age activity can be seen in the two paired standing stones which are located just south of the Tallaght-Saggart road in the townland of Boherboy (DU021:044). These two stones known as Adam and Eve probably represent a ritual site, perhaps a fertility cult. A somewhat similar monument may have existed on the Commons of Rathcoole where O'Donovan in 1837 observed a long stone in a recumbent position, although he added that there was no evidence that it was ever upright. There are two possible Bronze Age burial sites in the vicinity of the proposed site. One is situated within Greenogue (DU021:028), at the southern most end of the townland, and the other is a tumulus site at Rathcreddan (DU021:027), which was probably a prehistoric burial mound.

There are several enclosures in this area examples include the earthwork on Lyons

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Hill. Such a cairn or mound is a common feature of many royal sites or inauguration places throughout the country as in the case of Tara and Eamhain Macha. Other enclosure include Athgoe Hill and Lugg on Saggart Hill which are probably henges, ceremonial enclosures, usually dated to the Neolithic but also extending into the **Iron Age.**

Ringforts are quite common in this area, with four in the Newcastle area. Ringforts are the most widespread type of archaeological monument in the country with approximately 40,000 in total. They are the classical **Early Christian** settlement type. They consist of circular areas, defined by banks and external ditches, and usually contain dwelling houses and outbuildings for extended families. Two of the four ringforts are located in the townland of Rathcreedan. Early ecclesiastical settlement was mainly, if not exclusively, within smaller or large circular or sub circular enclosures, which generally contained a number of characteristic elements or features. The most important of these, apart from the circular enclosure itself, would have been the church or oratory, a burial area, cross slabs, pillar stones and holy wells. Sites in the immediate area which fall into this category include Kilmactalway, with its "kil" place-name element and its circular surrounding wall. Kilbride again has the "kil" element deriving from the Irish term Cill, universally applied to early religious settlements, as well as its semi-circular outline, and its association with St. Brigid, implied in the "Bride" element.

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Fortified strongholds and castles are the main feature of the Medieval period in this area, however the majority of such sites have disappeared. These include a castle (DUO21:004) in the townland of Kilbride, of which there are no visual surface remains. There was also an earthwork site (DUO21:005) in the townland of Kilbride of which there are also no visible surface remains. Further evidence of **Medieval** settlement is to be found in the medieval villages like Saggart and Rathcoole, indicating a rich and varied archaeology and history.

12.3.2 Recorded Artefacts In The Vicinity Of The Development

The following archaeological artefacts are included to highlight the type of archaeological activity in the area and the importance of archaeological monitoring as stray finds are frequently found in the course of monitoring of groundworks. The discovery of artifacts can be an important indicator of past levels of activity in an area and therefore a useful guide to the archaeological potential of a site. The National Museum in Dublin houses a national archive of antiquities cataloguing artifacts, which were found and reported between 1928 and c. 1995.

An examination of topographical files, housed in the National Museum of Ireland, found no artefacts recorded from the townland of Greenogue, however five finds were recovered from the townland of Saggart. These include a bronze gaming piece, carved

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stones, small bronze ring, carved stone heads and pottery sherds. In addition two finds were recorded from the townland of Newcastle including a flint axehead and an eighteenth century brasshoe buckle.

12.3.3 Cartographic Evidence

John Rocque's map of the City and County of Dublin published in 1760 shows the area around Greenogue as open farmland, scattered with small villages. On this map Greenogue is spelt "Grenoge". The mill buildings at Greenogue are not named but the buildings are marked. There are two lime kiln's marked on this map one to the south east of the proposed site and the other near the college near Rathcoole.

The 1837 OS six-inch map (first edition) of this area shows the townland of Greenogue much as it is on the current edition with field boundaries as they are today. It illustrates the site of the Greenogue Corn Mill, which is adjacent to the proposed development. This is shown as a substantial complex of buildings with a milldam, a millpond and an orchard and gardens.

The 1937 OS six inch map (third edition) of this area is similar to that of the 1837 OS map. It however illustrates the corn mill as being disused in this period.

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12.3.4 Townland Names

Townland names are an important source of information about the topography, land ownership, landuse, landscape, history and archaeology and folklore of an area. Where a monument has been forgotten or destroyed, a place name may still refer to it, and may indicate the possibility that the remains of certain sites may survive below the ground surface. Many of the place names in this area have been names of Anglo-Norman origin such as Newcastle, Hazelhatch, Colganstown and Loughlinstown.

The townland **Greenogue** has been given many meanings. The Irish word *grianán* means a sunny spot, or a sunny hill. The word *grianóg* is a diminutive of *grianán* and so must be taken to mean "a sunny little hill". Another alternative by Dineen is the word *grian*, meaning land or ground (eg. Grian na Cille – the church glebe).

As part of the Manor of Rathcoole **Collegeland,** was the property of Archbishop of Dublin in medieval times. This part of the manor passed from the hands of the Archbishop and became part of the endowment of the newly founded Trinity College in the reign of Queen Elizabeth 1. In the Down's Survey Map, the townland is marked "Lands belonging unto the College of Dublin", hence the name.

The name **Commons Little** is a relict of an important aspect of medieval farming whereby the livestock of the tenants grazed in one herd on "Common" unenclosed

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pastures. There is evidence that enclosures of the commons was going on piecemeal throughout the Middle Ages. These enclosures were known as "Parks" in Ireland, and **Cornerpark** probably received its name from one of them.

Baldonnell contains an Irish personal name; Baile Domhnall is Donal's town or townland. **Ballynakelly** may also contain a personal name, or it may be baile na cille or baille na coille, the town of the church, or the town of the wood.

There are three references to churches. These include **Kilmactalway**, **Kilbride** and **Kilcarbery** all of which contain the word cill, or church. There is also a reference to an archaeological monument in **Rathcreddan**, which contains the word rath or ringfort.

12.4 Significant Impacts

As the proposed changes to the facility do not involve any changes to the physical environment at the RILTA site, i.e. no additional buildings or infrastructure will be required, there will be no impact on the archaeological or cultural heritage.

The surface is currently comprised of made-ground, with the exception of a 2m landscaped boundary surrounding the perimeter which has been planted and maintained since the facility was constructed.

Avoidance or alteration to existing proposals is not required for archaeological reasons.

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12.5 Mitigation Measures

This development has no significant impacts; accordingly no mitigation measures are required.

12.6 Conclusion

As the site is currently covered in made ground, with the exception of a 2m area of landscaping along the perimeter of the site, no impacts on the existing archaeological and cultural heritage are predicted.

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13 INTERACTION OF THE FOREGOING

13.1 Introduction

This application is for permission for an increase in the annual tonnage of throughput of waste at the RILTA Environmental Ltd. Integrated Waste Management Facility, Block 402, Grant's Drive, Greenogue Business Park, Rathcoole, Co. Dublin. The additional increase in tonnage will comprise of contaminated soil only. This soil will be stored on site and subsequently transferred off site without any processing.

The potential environmental impacts of the annual tonnage increase and the measures proposed to mitigate these impacts have been outlined in this report. This section discusses the potential for interaction between impacts of the different environmental aspects.

13.2 Human Beings/Socio Economic

Human Beings will interact with the other relevant topics aforementioned, given the nature of the facility. Noise and traffic, aspects related to air and water quality regimes and the impact on climate and flora and fauna, have minimal potential to change the receiving environment as the existing facility has been established and been in operation since 2004.

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Noise and dust control will be in accordance with EPA guidelines and RILTA will ensure compliance with any specific planning conditions imposed by South Dublin County Council.

The greatest levels of visual impact arising from the facility will be on views along the R120 road in the vicinity. As the facility is within the Greenogue Business Park, any visual impact that may have been caused by the facility is screened by surrounding companies.

Social and travel patterns, pedestrian or otherwise, will not be disrupted by the increase in tonnage at the facility as no roads will be altered. Recommendations are outlined in the Traffic Section (Section 10) which include the reinstatement of road markings at the R120 / Grants Road and R120 / College Road roundabout junction. It is also recommended that the pavement to be reinstated in areas where deterioration is evident.

RILTA Environmental Ltd. will continue to provide employment for approximately 65 persons in addition to creating spin-off employment such as for suppliers of products and services, such as fuel and oil suppliers, machinery suppliers, hauliers, environmental monitoring etc. This employment has a positive effect on the area.
The potential impact on the surface water and groundwater environment is assessed as

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low as a result of the increase in tonnage allowance at the facility. Ongoing monitoring of the surface water and groundwater at the facility is carried out in accordance with Waste Licence 192-1. Regional surface water quality and localised surface water quality has improved since the initial baseline studies were carried out for the original EIS in 2002.

No groundwater is abstracted from within or adjacent to the facility and all water is supplied to RILTA from a council groundwater mains supply.

In relation to Cultural Heritage and Archaeology, there will be no direct or indirect impacts.

13.3 Ecology

The original development involved the removal of the Recolonising Bare Ground (ED3) and Spoil and Bare Ground (ED2) habitats, both of which were of low ecological value.

The subject site is comprised of "made ground" with the exception of a 2m area of landscaping along the perimeter of the site. Any remnant semi-natural vegetation on the periphery of the site will be unaffected by this proposal.

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As the proposed changes to the facility do not involve any changes to the physical environment at the RILTA site, i.e. no additional buildings or infrastructure will be required, there will be no direct impacts on the ecology of the site.

During the period following development of the site, the water quality in the Griffeen river, as shown by the biological assessment, has improved, indicating that the systems in place within the facility to prevent any indirect impacts on the river are effective. Providing these systems and procedures are maintained and continue to be followed, there will be no indirect impacts on the Griffeen river. However, dust could enter the Griffeen River and impact on the river ecology. In this way, the surface water environment and ecology interact.

13.4 Geology

The subject site is comprised of "made ground" with the exception of a 2m area of landscaping along the perimeter of the site. Therefore, there will be no interaction between the geological environment and any other element of the surrounding environment.

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13.5 Water

It is considered that the continued use of the facility will not result in a significant impact on the surface water environment. The River Griffeen flows approximately 3m north of the site boundary. Routine monitoring of the river as part of the facility's waste licence indicates that the surface water quality of this feature is high.

Operations at the facility will not result in the reduction of flows to the surface water channel and particular care will be taken to continue to store soil in the transfer station according to the current stringent management practices. In addition, due to the 'made ground' nature of most of the contaminated soil product, very little leachate is produced while being stored on site. Any leachate that is produced will be disposed of in the on-site wastewater treatment plant, using the waste vacuum tankers for transport.

Groundwater is also monitored as part of the waste licence and the current activities at the facility have not impacted on the quality of the groundwater sampled quarterly in the three on-site boreholes. Any increase in the annual waste tonnage allowance will not affect the groundwater environment underlying the facility.

There is a potential for the surface water and groundwater environments at the facility to interact if the above management practices are not maintained and some leachate from the contaminated soil bay may enter the surface water runoff or the underlying groundwater.

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13.6 Air/ Dust & Climate

Interaction between the dust levels and air quality within the site is minimal at present. It is proposed that this interaction will continue to be minimal as the volumes of soil taken in to the facility will be tipped and stored in internal buildings and will not be exposed to the air at any time

13.7 Noise/ Traffic

The proposed increase in soil transferred to, stored on and transferred from the site will result in an increase in heavy vehicles from the RILTA site of 0.25% of total traffic.

There is a logarithmic relationship between noise levels and traffic volume and the higher the existing traffic volume the greater is the traffic increase required to produce a perceptible noise change. Typically doubling the road traffic flow produces a 3 dB(A) change in noise level. An increase in vehicular movements of the order proposed will continue to have a negligible noise impact along the local road network.

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As a result, as the traffic levels will be insignificant, so too will be the noise related impacts.

13.8 Landscape & Visual Assessment

The subject site is comprised of "made ground" with the exception of a 2m area of landscaping along the perimeter of the site. Therefore, there will be no interaction between the physical landscape and any other element of the surrounding environment. In addition, no infrastructural changes to the facility are proposed.

13.9 Cultural Heritage & Archaeological Heritage

The subject site is comprised of "made ground" with the exception of a 2m area of landscaping along the perimeter of the site. Therefore, there will be no interaction between the Cultural Heritage & Archaeological Heritage of the area and any other element of the surrounding environment.

13.10 Conclusion

While there is potential for the above impacts to interact and result in a cumulative impact, it is unlikely that any of these cumulative impacts will result in significant environmental degradation.

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14 EXPLANATION OF TECHNICAL TERMS

AADT: Average annual daily traffic

Ambient Noise: The total sound in a given situation at a given time usually made up of sound from many sources.

AOD: Above Ordnance Datum

AST: Aboveground Storage Tank

A-weighting: Normal hearing covers the frequency (pitch) range from about 20 Hz to 20,000 Hz. but sensitivity is greatest between about 500Hz and 5,000 Hz'. The 'A-weighting', is an electric al circuit built into noise meters to mimic this characteristic of the human being.

Barony, Parish, Townland: These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the county. The origins of these divisions are believed to be in the Early Medieval/Christian Period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500)

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BAT: Best available technique

BH: Borehole

BOD: Biological Oxygen Demand

C&D: Construction and Demolition

CGS: County Geological Sites

COD: Chemical Oxygen Demand

CSO: Central Statistics Office

cSPA: Candidate Special Area of Conservation

Decibel (dB): The logarithmic measure of sound level. 0dB is the threshold of normal hearing; l40dB is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions.

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dB(A): Decibels measured on sound level meter incorporating a frequency weighting (A-weighting) which, differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessments of loudness. A change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of a sound.

DED: District Electoral Division

DoEHLG: Department of the Environment, Heritage and Local Government

DMRB: Design Manual for Roads and Bridges

DWF: Dry Weather flow

EI: Enterprise Ireland

EMS: Environmental Management System

EPA: Environmental Protection Agency

Frequency (Hz): the number of cycles per second of vibration usually expressed in Hertz (Hz)

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ghg: Greenhouse Gas

gph: Gallons per Hour

GSI: Geological Survey of Ireland

Hertz (Hz): Unit of a frequency (pitch) of a second. Formerly called cycles per second.

HGVs: Heavy Goods Vehicles

IDA: Industrial Development Agency

Impulsive noise: A noise, which is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

ISO: International Standards Organization

L_{10}: The sound level exceeded for 10% of the time over a given period; similarly L_{90}

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= 90%

LAP: Local Area Plans

L_{AeqT} : The equivalent continuous sound level - the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period (T). Used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{ArT}: The equivalent continuous sound level corrected for tonal or impulsive character where these are present. The measurement time intervals typically used are one hour by day or 15 minutes by night.

LEA: Local Electoral Area

MAC: Maximum Admissible Concentration for Drinking Water

Material Assets: In the context of this document, refers mainly to property, architectural and archaeological heritage.
mbgl: Meters Below Ground Level

mOD: Metres above Ordnance Datum

Mitigation: reduction, making less severe; in the context of this document, lessening the impact of the quarry on the environment.

MW: Monitoring Well

NDP: National Development Plan

NHA: Natural Heritage Area

NPWS: National Park and Wildlife Services

NRA: National Roads Authority

NSAI: National Standards Authority of Ireland

NSS: National Spatial Strategy

OPW: Office of Public Works

OS: Ordnance Survey

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PCU: Passenger car units

Peak Particle Velocity (PPV): the maximum rate of change of particle displacement, measured in millimetres per second (mm/sec).

pHNA: Proposed Natural Heritage Area

PSI: Pounds per square inch

QHNS: Quarterly National Household Survey

REPS: Rural Environment Protection Scheme

RPG's: Regional Planning Guidelines

RMP: Record of Monuments and Places

SLM: Sound Level Meter

SPA: Special Protection Area

SPG's: Strategic Planning Guidelines

SW: Surface Water Monitoring Point

TA: Transport Assessment

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Tonality: The degree to which a noise contains audible pure tones. Broad-band noise is generally less annoying than noise with identifiable tones.

TRL: Transport Research Laboratory

UKAS: United Kingdom Accreditation Service

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