8 ECOLOGY

8.1 INTRODUCTION

RPS-MCOS undertook a walkover of the entire site area in June 2003. The survey comprised an assessment of the vegetation in terms of plant species present on the site and an assessment of the site's potential to support species of flora and fauna.

Nearby areas of vegetation were also visually inspected. Current information regarding ecological designations was consulted prior to the site survey and consultation with the Eastern Regional Fisheries Board, Department of Environment, the Irish Wildlife Trust and Birdwatch Ireland.

Considering that the existing nature of the site (approximately 90% concrete cover and 10% gravel) is hard-standing the overall impact on terrestrial ecology is deemed to be minimal.

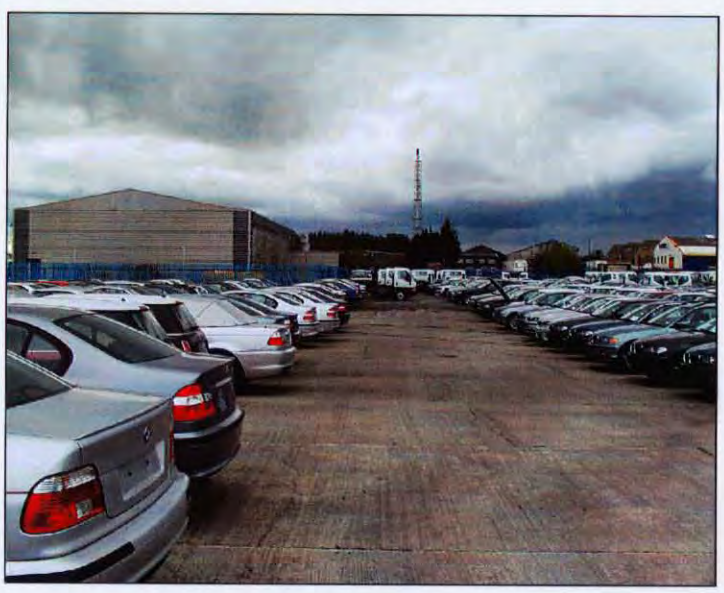
8.2 EXISTING ENVIRONMENT

The site is currently of a hard standing nature, overlain with approximately 90% concrete and the remainder being a gravel coating (See **Photograph 8.1**).

It is estimated that the site has been in industrial and commercial use for at least the past twenty years and as a result are no natural or semi natural habitats present on it. No conservation designations apply to the site either in terms of habitat or species (flora and fauna).

An examination of previous planning records indicate that the site has been of a hard standing nature for a number of years. There are a few areas throughout the site where breaks in the concrete have allowed some common grass species and intrusive weed species to grow. However, the ongoing frequent movement of cars and heavy vehicles have kept their progression very limited. The noise levels and constant human activity and movement of vehicles act to deter animals from entering onto the site.

An existing hedge running up to the northern boundary of the site that screens the railway line contains mature species of native small tree, shrub and hedge plants. However as the site boundary metal fence is quite high the hedgerow is contained and overgrowth is kept to a minimum.



Photograph 8.1: Current site hard standing surface condition

8.2.1 Aquatic Ecology

There are no watercourses on the existing site. The Grand Canal, which is a designated Natural Heritage Area (NHA), is located approximately 2km south of the proposed development. It is separated from the site by a number of roads and several buildings. The only visible surface water close to the site is a small feeder stream which receives the drainage discharge from Crag Avenue. This stream runs down to and along the Grand Canal before it discharges into the River Camac at Bluebell Avenue.

The River Camac rises in the Dublin Mountains and flows generally in a northwesterly direction through south Dublin before discharging into the Liffey from a culvert under Heuston Station at Islandbridge weir. The lower reaches of the catchment are located in either developing areas with existing major suburban conurbanations, or in highly industrialised areas. The river also drains two major roads, the Western Parkway Motorway (M50) and the N7, Naas Road. The upper 7km of river length has a rural catchment. The river is 24km in length and has a catchment area of 59km^2.

The nearest EPA monitoring station is at Toyota Ireland where water quality results since 1999 indicate that the river is seriously polluted (Q value of 2). **Figure 8.1** shows the locations of water quality monitoring stations on the River Camac.

Photograph 8.2: Feeder stream which discharges to the Camac at Bluebell Avenue

8.3 POTENTIAL IMPACTS /MITIGATION

8.3.1 Terrestrial Flora & Fauna

It is proposed to create a "green area" within the site boundary which will be landscaped accordingly. The "greening" of a hard-standing environment within an industrial estate will help to create habitats, and may lead to an increase in localised biodiversity, resulting in an overall improvement in ecological value.

In order to control vermin in the vicinity of the site, all waste material handling will occur in-doors. A vermin control programme will be maintained in accordance with the waste licence for the development. Regular litter controls will also be installed on site.

In summary, the creation of green areas in conjunction with the implementation of appropriate landscaping measures and overall layout design of the proposed Sustainable Resource Recovery Facility will help promote and encourage the development of the overall ecological environment.

Legend

River Water Quality
(2000)

- Seriously Polluted
- Moderately Polluted

Source:
Three Rivers Project
EPA

River Network

- Major Tributary
- Minor Tributary

3R's: Reduce, Re-Use, Recycle

Project Sustainable Resource Recovery Facility

Title River Water Quality (2000)

Figure 8.1

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8.3.2 Aquatic Environment

In order to prevent or reduce the potential risk of contamination of water quality in adjacent watercourses a number of steps will be incorporated into the design and construction phase as well as the operational phase.

It is a requirement of the Eastern Regional Fisheries Board that proper attenuation measures and petrol/oil interceptors are installed to ensure only clean uncontaminated surface waters discharge to the public surface water network. The main operational warehouse will not release any leachate since waste is predominately dry packaging. Any spills will be collected by the on-site suction sweeper and disposed of off-site.

The existing storm water drainage system on the site is sufficient in its capacity to efficiently collect precipitation falling on the site during flood events. The receptor for all drainage from the site is the River Camac. An interceptor when installed will help improve the water quality of the discharge.

A drainage survey when complete will give rise to the proposals needed to ensure appropriate upgrading of the drainage network. This will help ensure that problems such as suspended solids entering storm water drains etc. will not occur.

8.4 RESIDUAL IMPACTS

It is envisaged that when the proposed development reaches its operational stage and that the landscaping measures proposed are allowed to mature the terrestrial ecological value of the site will improve.

Following the implementation of the appropriate mitigation measures as discussed it is not envisaged that the proposed development will have any significant negative impacts on water quality or ecology (terrestrial or aquatic).

9 AIR QUALITY & CLIMATE

9.1 INTRODUCTION

RPS McHugh Planning & Environment carried out an Air Quality Impact Assessment of the proposed *Sustainable Resource Recovery Facility development at Crag Avenue, Clondalkin, Co Dublin.* The study was undertaken in June/July 2003 and the finds of the study are summarised in this chapter.

A copy of the full report can be found in **Volume 3, Appendix 5** of this report.

9.2 METHODOLOGY

The assessment included undertaking baseline noise & vibration level monitoring to determine the existing noise environment in the vicinity of the proposed development, predication of future noise levels associated with the construction and operational phases and the recommendation of suitable mitigation measures.

The baseline monitoring survey was carried out at the site of the proposed development using a range of air monitoring techniques. A total of seven sample locations were chosen to represent the baseline air quality in the vicinity of the proposed development. These locations are presented in **Table 9.1** below and shown on **Figure 9.1.**

Table 9.1: Baseline Air Quality Monitoring Locations

Reference	Description
A1	Existing site entrance on Crag Avenue
A2	Eastern site boundary
A3	Northern site boundary
A4	Western site boundary
A5	Junction between Crag Avenue and Cloverhill Road
A6	Residential receptors at "Palmerstown Woods"
A7	Security hut on-site

As a result of the existing site conditions and the potential for traffic derived pollution, the following parameters were monitored;

Benzene

The sources associated with individual volatile organic compounds (VOCs) tend to be dependent on the nature of industries in the sample region. Methane is a naturally occurring VOC from plants and animals but is also generated as a by-product of certain industries. Benzene and other aromatic compounds and alkanes are most likely derived from petrol driven vehicle exhausts. Heavier semi-volatile organic compounds are frequently derived from diesel-powered engines. Benzene is a known carcinogen, poisonous by inhalation and a severe eye and moderate skin irritant.

At six of the locations (A1 – A6) the air was monitored for benzene, over a 35-day period, using benzene diffusion tubes. The sample tubes were analysed for benzene at a UKAS accredited laboratory (Gradko International, Winchester).

NO_2 (Nitrogen Dioxide)

Nitrogen dioxide is classed as both a primary pollutant and a secondary pollutant. As a primary pollutant NO_2 is emitted from all combustion processes (such as a gas/oil fired boiler or a car engine). Potentially the main sources of primary NO_2 for the proposed development will be from domestic heating emissions and vehicle exhausts.

Legend

- A1 - Exisitng site entrance on Crag avenue.
- A2 - Eastern site boundary
- A3 - Northern site boundary
- A4 - Western site boundary
- A5 - Junction between Crag avenue and Cloverhill road
- A6 - Residential receptors at "Palmerstown Woods"
- A7 - Security hut on site

3R's — Reduce, Re-Use, Recycle

Project *Sustainable Resource Recovery Facility*

Title

Baseline Air Quality Monitoring Locations

Figure 9.1

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Issue Details

Drawn: S.K		Project No.	MDE0163
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Notes

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As a secondary pollutant NO_2 is derived from atmospheric reactions of pollutants that are themselves, derived mainly from traffic sources (e.g. volatile organic compounds). Secondary pollution is usually derived from regional sources and may be used as an indicator of general air quality in the region. Nitrogen Dioxide has been shown to reduce the pulmonary function of the lungs. Long term exposure to high concentrations of NO_2 can cause a range of effects, primarily in the lungs, but also in the liver and blood.

At six of the locations (A1- A6), levels of NO_2 were measured using diffusion tubes, which were left on site for a 35-day period. The tubes were then analysed using UV spectrophotometry, at a UKAS accredited laboratory (Gradko International, Winchester), giving an average concentration over the period.

SO_2 (Sulphur Dioxide)

Sulphur dioxide is classed as a primary pollutant principally emitted from the combustion of fossil fuels (diesel, coal, oil, etc.) and in the case of the proposed development the main source of SO_2 would be from burning fuel and traffic related sources (in particular diesel engines). As a traffic based pollutant, SO_2 is mainly emitted from vehicles running on diesel fuel, which will include most light goods vehicles (LGVs) and heavy goods vehicles (HGVs). SO_2 emissions from domestic heating may be significant as SO_2 is a major constituent of sulphurous smog. However, in recent years the government has significantly reduced the importance of SO_2 as an air pollutant with the introduction of smokeless fuel. Consequently, concentrations of SO_2 in major urban areas are typically low and this is likely to decrease in future years with the broadening of the ban on non-smokeless fuels. Sulphur Dioxide is a known contributor to respiratory illness and respiratory symptoms. People with asthma are the most susceptible in the community to elevated SO_2 levels.

At six of the locations (A1 – A6), the air was monitored for sulphur dioxide over a 35-day period, using SO_2 diffusion tubes. The sample tubes were analysed for SO_2 at a UKAS accredited laboratory (Gradko International, Winchester).

Particulate Matter (PM_{10})

PM_{10} may be emitted as a primary pollutant from road vehicle exhausts, which is the main source in urban areas such as the existing site. Also point sources such as combustion, i.e. domestic fires, industrial boilers etc. are primary sources of PM_{10}.

PM_{10} may also be formed as secondary pollutants from the condensation or reaction of chemical vapours in the atmosphere.

Health effects associated with PM_{10} in the long term include chronic effects such as increased rates of bronchitis and reduced lung function.

At one location (A7), the air was monitored for PM_{10} over a 7-day period, using a *Rupprecht & Patashnick Model 2000 Partisol Analyser*. This analyser has been designed to meet with US EPA Reference Method Designation RFPS-0694-098. The special filters were analysed gravimetrically for PM_{10} at a UKAS accredited laboratory (RPS Laboratories, Manchester).

9.3 EXISTING AIR QUALITY ENVIRONMENT

In the vicinity of the current brown field site there are several major roads that frequently carry large volumes of traffic. This road network includes the M50 motorway to the east, the Nangor Road to the south of the site, the Newlands Road to the west and the Cloverhill Road to the north. The road network in the immediate vicinity of the site is less congested on Crag Avenue, Besser Drive and Crag Crescent.

To the immediate south of the site with an entrance opposite that of the proposed development is a concrete tile manufacturing facility. This facility has a number of scheduled emissions (i.e. stacks and vents) and unscheduled emissions (i.e. fugitive emissions such as from dusty roads, stockpiling etc.). This may have an existing impact on PM_{10}, general dust, nitrogen oxides and sulphur oxides in the ambient air.

To the north of the site there is an existing lead works which accepts waste lead for re-casting and use in industry. As part of this facility there is a large emission point several metres high emitting waste gas from the process. This point source may have an impact on the ambient concentrations of lead and/or metal in the area. The facility is IPC licensed by the EPA under licence Register 401.

The site is generally isolated from sensitive receptors, the nearest residential premises are located along Station Road and within James Connolly Park approximately 500m to the west of the site.

A baseline air quality survey was carried out in June/July 2003 to establish the existing air quality conditions. The results of this survey are presented in the tables below. An interpretation of the results is also included.

9.3.1 Baseline Monitoring Results

Benzene

Table 9.3.1: Average Benzene concentrations at each location

Location	Sampling Period	Average Benzene ($\mu g/m^3$)
A1	11/06/03-15/07/03	3.73
A2	11/06/03-15/07/03	4.86
A3	11/06/03-15/07/03	4.70
A4	11/06/03-15/07/03	4.79
A5	11/06/03-15/07/03	4.80
A6	11/06/03-15/07/03	-(2)
Limit Value	-	5(1)

Note: (1) EU Directive 2000/69/EC
(2) Tubes had been vandalised

The results above in **Table 9.3.1** for benzene show typical levels of pollutants at all locations, probably due to the high traffic volumes experiences on the road network in the vicinity of the site. Although the results are slightly more elevated than expected all locations are in compliance with the EU limit value which is $5\mu g/m^3$.

Nitrogen Dioxide NO_2

Table 9.3.2: Average Nitrogen Dioxide concentrations at each location

Location	Sampling Period	Average NO_2 ($\mu g/m^3$)
A1	11/06/03-15/07/03	24.65
A2	11/06/03-15/07/03	25.60
A3	11/06/03-15/07/03	27.49
A4	11/06/03-15/07/03	25.60
A5	11/06/03-15/07/03	30.34
A6	11/06/03-15/07/03	-(2)
Limit Value	-	40(1)

Note: (1) EU Ambient Air Standard (1999/30/EC) (as an annual average)
(2) Tubes had been vandalised

The dominant source of $N0_2$ in the area appears to be from motor vehicle exhausts. This is confirmed as the NO_2 results vary with distance from the junction of the Cloverhill Road ad Crag Road with the highest result at A5 (at the junction).

However, all locations measured are within the EU annual limit (EC Directive 2000/30/EC).

Sulphur Dioxide SO_2

Table 9.3.3: Average Sulphur Dioxide concentrations at each location

Location	Sampling Period	Average SO_2 ($\mu g/m^3$)
A1	11/06/03-15/07/03	6.81
A2	11/06/03-15/07/03	6.52
A3	11/06/03-15/07/03	6.96
A4	11/06/03-15/07/03	8.55
A5	11/06/03-15/07/03	8.99
A6	11/06/03-15/07/03	-(2)
Limit Value	-	20(1)

Note: (1) EU Ambient Air Standard (1999/30/EC) (as an annual average)
(2) Tubes had been vandalised

The domestic source of SO_2 in the area would appear to occur from fuel burning in domestic houses in James Connolly Park and Cappaghmore Estate. This is suggested by the higher levels to the west of the site at A4 and in particular A5. The number of heavy goods vehicles entering and leaving the industrial estate along Crag Avenue may also contribute to diesel generated SO_2.

All locations indicate typical suburban concentrations of sulphur dioxide with compliance of the annual limit (EC Directive 1999/30/EC)

Particulate Matter PM_{10}

Table 9.3.4: Average PM10 concentrations at location A7 as measured by Partisol Analyser

Location	Sampling Period	Average SO_2 ($\mu g/m^3$)
A7	15/07/03	48.31
A7	16/07/03	33.48
A7	17/07/03	11.79
A7	18-20/07/03	10.01
A7	21/07/03	10.99
A7	22/07/03	14.05
A7	23/07/03	12.48)
Limit Value	-	40(1)

Note (1) EU Directive 1999/30/EC (refer to Appendix 1 of full Air Quality Report)

The results from the 17th to the 23rd July show typical levels of PM_{10} for an industrial site. Weather on these days was noted to be typically warm and wet (Mean Temperature 16.5^{0}C, Total Rainfall 13.5, Met Eireann Dublin Airport), which would have effected the PM_{10} concentrations in the atmosphere. In comparison the levels of PM_{10} detected on the 15th and 16th of July were high, possibly as a result of the very warm and dry conditions experienced on those days (Mean Temperature 19^{0}C, Total Rainfall 1.2 mm, Met Eireann Dublin Airport).

On average the PM_{10} level determined at the site is 20.16 $\mu g/m^3$. With the exception of the 15th July all other dates are in compliance with the EU limit (EU Directive 2000/69/EC). The main source of PM_{10} in

the area would appear to be from motor vehicle exhausts from cars and HGVs in the immediate road network and from the surrounding major road network.

9.4 PREDICATED IMPACTS ON AIR QUALITY

The proposed new Sustainable Resource Recovery Facility at Crag Avenue will involve the transfer, sorting bailing and recycling of waste products, all of which will be housed within a purpose built facility on an existing brown field site.

The potential impacts to air quality as a result of the proposed development are addressed in terms of scheduled emissions (i.e. stacks & vents) and traffic impacts.

9.4.1 Scheduled Emissions

Regarding operations at the proposed development, the activities to be located in the development are planned for transfer, sorting, baling and recycling. As a result, there are no major scheduled emissions (i.e. through stacks, vents, etc.) planned for the development and sites activities are unlikely to cause any deterioration in local air quality.

There may be an impact from unscheduled emissions of dust from HGV movements on the site. This impact will be directly related to the working practices on the site. If a satisfactory dust minimisation plan is implemented (i.e. truck washes, road sweepers, etc), the potential impacts of fugitive dust are expected to be minimal.

As there is no waste deposited on the site, there is no potential for the build up of methane and landfill gas. Consequently, the odours and emissions from a landfill gas flare unit will not be generated at the proposed development.

Odours are a potential nuisance from any facility that involves waste storage or transfer. Fugitive odours (i.e. not through stacks or vents) from landfills, waste transfer stations, baling stations, etc. arise mainly from the uncontrolled anaerobic biodegradation of waste to produce unstable intermediates. Odours are generated by a number of different components, the most significant being the sulphur containing compounds (thiols, mercaptans, hydrogen sulphide), volatile fatty acids (butyric acid. Valeric acid), amines (methlamine, Dimethylamine), phenols (4-methyphenol), chlorinated hydrocarbons (tichlorethylene, tetrachloride). Most of these compounds have been in very low concentrations. Different concentrations and mixtures of these compounds can intensify or reduce odour threshold concentration, determined as synergism and antagonism respectively.

A series of design features, work practices and mitigation measures for the reduction of fugitive odour emissions are outlined later in this chapter. In addition to these design features, working practices and mitigation measures it should be noted that the site of the proposed development is within an existing industrial estate approximately 500 meters for the nearest sensitive receptor (James Connolly Park). This distance would indicate that any fugitive odour emissions from the proposed facility are unlikely to cause any odour nuisance.

The operators of the proposed development will apply to the EPA for a Waste Licence for all on site activities. Consequently the EPA will require a level of operation that will not impinge on the surrounding environment and decide on the extent and nature of any environmental monitoring (e.g. dust or odours) to be carried out. Any complaints arising during the operation of the proposed facility regarding an environmental nuisance will be logged by the EPA who will require corrective action to remove the source of that nuisance.

9.4.2 Road Traffic

Emissions of pollutants from road traffic can be minimised by either controlling the number of road users or by controlling the flow of traffic. For the majority of vehicle-generated pollutants, emissions rise as speed drops, although the opposite is true for oxides of nitrogen. Emissions are also higher under stop-start conditions when compared with steady speed driving. The free flow of the traffic as a result of the scheme is desirable in order to minimise the generation of traffic-generated pollutants.

Detailed traffic flow information has been used to assess whether any significant impact on sensitive receptors may occur. This examined daily traffic counts for the traffic in the area of the proposed development. The percentage HGVs (Heavy Goods Vehicles) in the traffic volumes for each road is detailed as this has a direct bearing on emissions. Traffic flow predictions have been presented under two scenarios:

- 2003 – Existing Conditions
- 2006 – Proposed Development in operation

Prediction of traffic derived pollutants have been modelled using procedures given in Annex 1 of the Design Manual for Roads and Bridges (February 2003), Volume 11, Section 3, Part 1 *Air Quality*.

The screening model uses a worst-case scenario and thus deliberately overestimates emissions. Firstly, the emission factors for each pollutant are biased to overestimate the actual emission rate (but without generating unrealistically high results). Additionally, wind speeds are assumed to be 2 m/s, which is lower than that typically found in Ireland. Furthermore, background concentrations are incorporated into the model and represent worst-case values for the site. These background concentrations are derived from the procedures outlined in the May 1999 edition of the manual as no site specific data is available.

As a number of features of the procedure are designed to overestimate likely pollution levels, it can be assumed with some confidence that a project will not produce air pollution problems if none are identified by this method. In addition, the model also incorporates expected improvements in engine and fuel technology (typically legislation driven) resulting in a lowering of emissions in future years. As a result, the model balances the rise in pollution as a result of increased traffic volumes against the drop in pollution as a result of technological improvements to determine a net increase/decrease in pollution levels.

As the average speed of vehicles has a significant effect on the generation of pollutants, calculations have been carried out for 2 different traffic speed scenarios. These speeds are 20 km/hr (to represent traffic gridlock conditions) and 50 km/hr (to represent free-flowing traffic conditions). Average concentrations of carbon monoxide, benzene, nitrogen dioxide and PM_{10} have been determined for receptor points at James Connolly Park and Cappaghmore Estate. The results of these calculations are presented in **Tables 9.4.2** and **9.4.3** below.

For carbon monoxide (CO) under both traffic scenarios at both speeds, the predictions indicate that even under worst-case scenario conditions the CO level will not breach the EU limit at either location. The predictions show a variation with speed resulting in lower levels of CO produced under normal traffic conditions (50 km/hr). The model predicts that for the future scenario year, with the development in operation, the resultant increase in traffic volumes will be offset by improvements in engine technology leading to a net lowering of the ambient CO concentration at both receptors.

The predicted results for benzene at both speed scenarios indicate that the benzene concentrations are below the relevant EU limit at both locations. Again, the predicted levels drop with increases in speed. As with CO, there is a net lowering in ambient benzene concentrations in the future scenario year as a result of the improvements in engine technology.

The predicted levels of nitrogen dioxide (NO_2) under both speeds at both receptors are below the EU limit. Again there is an increase in NO_2 concentrations as speed drops and a net drop in ambient concentrations as a result of improvements in technology.

For particulate matter (PM_{10}) the predictions indicate that even under worst-case scenario conditions the annual average will not breach the EU limit at either location. The predictions show a variation with speed resulting in lower levels of particulates produced under normal traffic conditions (50 km/hr).

In summary, the screening model predicts that pollutant concentrations in the immediate vicinity of the site will not be adversely affected by the operation of the proposed development. In terms of both long-term pollution and regional pollution, the potential impact to air quality as a result of the proposed development is not considered significant. In addition, the subsequent impacts to climate as a result of the development are considered minimal.

Table 9.4.2: Screening Air Quality Assessment-Summary of Predicted Air Quality at James Connolly Park (R1)

Scenarios	Traffic Speed km/hr	Carbon Monoxide (mg/m^3)	Benzene ($\mu g/m^3$)	Oxides of Nitrogen ($\mu g/m^3$)		Particulates (PM_{10}) ($\mu g/m^3$)	
		Annual Average	Annual Average	Annual Average NO_x	Annual Average NO_2	Annual Average	Days >50$\mu g/m^3$
2003 "Baseline"	50	0.38	1.11	82.53	35.76	22.15	6.56
	20	0.59	1.31	98.31	38.54	25.95	14.77
2006 "Operation"	50	0.30	0.97	80.15	34.61	21.13	4.93
	20	0.44	1.10	101.18	38.24	24.84	12.02
EU Standards	-	**10**[(1)]	**5**[(2)]	-	**40**[(3)]	**40**[(4)]	-

Notes:
1. 2000/69/EC 8-hour limit for the protection of human health
2. 2000/69/EC Annual limit for the protection of human health
3. 1999/30/EC Annual limit for the protection of human health
4. 1999/30/EC Annual limit for the protection of human health

Table 9.4.3: Screening Air Quality Assessment-Summary of Predicted Air Quality at Cappaghmore Estate (R2)

Scenarios	Traffic Speed km/hr	Carbon Monoxide (mg/m^3)	Benzene ($\mu g/m^3$)	Oxides of Nitrogen ($\mu g/m^3$)		Particulates (PM_{10}) ($\mu g/m^3$)	
		Annual Average	Annual Average	Annual Average NO_x	Annual Average NO_2	Annual Average	Days >50$\mu g/m^3$
2003 "Baseline"	50	0.35	1.08	72.07	33.76	21.12	4.92
	20	0.53	1.26	84.02	36.03	24.15	10.44
2006 "Operation"	50	0.28	0.95	66.92	32.09	19.78	3.13
	20	0.40	1.06	82.25	35.00	22.60	7.35
EU Standards	-	**10**[(1)]	**5**[(2)]	-	**40**[(3)]	**40**[(4)]	-

Notes:
1. 2000/69/EC 8-hour limit for the protection of human health
2. 2000/69/EC Annual limit for the protection of human health
3. 1999/30/EC Annual limit for the protection of human health
4. 1999/30/EC Annual limit for the protection of human health

9.4.3 Mitigation Measures

Road Traffic

Emissions of pollutants from road traffic can be controlled by either controlling the number of road users or by controlling the flow of traffic. For the majority of vehicle-generated pollutants, emissions rise as speed drops, although the opposite is true for oxides of nitrogen. Emissions are also higher *under stop-start conditions when compared with steady speed driving. The free flow of the traffic* as a result of the scheme is essential in order to minimise the generation of traffic related pollutants.

Odours

The potential for odour emissions may be minimised by a series of design features, work practices and mitigation measures. Each of these measures is outlined briefly below:

- All in-house operations to be housed indoor.
- Use of roller shutter doors to minimise exposure to outside environment.
- Site layout should be designed to ensure any outdoor operations are as far as possible from the nearest sensitive receptors.
- Regular cleaning of all work surfaces and floors.
- Residence time for waste, including non-odorous should be kept to a minimum before transfer.
- Employment of a suitable masking agent/deodorant system.

As all waste process operations will be carried out indoors and given that the nearest sensitive receptor identified approximately 500m away from the site it is not anticipated that there will be a significant impact as a result of fugitive odour emissions.

Construction Impacts and Mitigation

Due to the nature of the work involved during the construction activities quantities of dust may be generated particularly in drier weather conditions. This problem is exaggerated when vehicles transporting sands/gravels/soils etc. to and from the site have the potential to cause an environmental nuisance several kilometres from the facility.

The potential impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and as such any impacts from dust deposition will typically be within several hundred metres of the construction area.

The construction vehicles, generators etc., will also give rise to petrol and diesel exhaust emissions, although this is of minor significance compared to dust.

If a satisfactory environmental impact minimisation plan is implemented, the effect of construction on air quality will not be significant. The main environmental nuisance associated with construction activities is dust. However, if the construction contractor adheres to good working practices and dust mitigation measures the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance.

Good working practices and mitigation measures are outlined below.

- Regular cleaning and maintenance of site roads.
- Regular watering of any road that has the potential to give rise to fugitive dust during dry and/or windy conditions.
- Speed restriction applied to site roads.
- All vehicles exiting the site should use the wheel wash facility to ensure mud and other wastes are not tracked onto public roads.
- Public roads outside the site should be regularly inspected for cleanliness, and cleaned as necessary.

- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind.
- Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.
- In the event that dust from the proposed development is creating an environmental nuisance during the construction phase of the develop, an ambient dust deposition survey is recommended. This should be carried out by a qualified person using EPA approved Bergerhoff gauges.

9.5 RESIDUAL IMPACT

During the construction phase, it is anticipated that there will be no residual impact from construction-generated dust, provided the relevant mitigation measures are implemented.

The relatively low increase in traffic volumes as a result of the development is not predicated to have any adverse impact on air quality in the vicinity of the development. Once traffic volumes remain low and traffic speed is not significantly altered then it is not anticipated that there will be residual impacts on air quality.

9.6 CLIMATE

9.6.1 Introduction

Climate can refer to both the long-term weather (macro-climate) patterns in an area and also to the more localised atmospheric conditions, referred to as the microclimate. Climate has implications for many aspects of the environment from soils to biodiversity and landuse practices. This section deals with the existing climate in the area and how the proposed development may impact on the microclimate.

9.6.2 Description of Existing Environment

The nearest meteorological station to Clondalkin is at Casement (approximately 5 km to southwest) and long-term measurements of wind speed/direction and air temperature for this location are representative of prevailing conditions experienced at the proposed development.

Wind

The windfield characteristics of the area are important climatological elements in examining the potential for the generation of fugitive dust emissions from the site. Fugitive dust emissions from a surface occur if the winds are sufficiently strong and turbulent and the surface is dry and loose, together causing re-suspension of particulate matter from the ground. A wind speed at ground level in excess of about 5 m/s is considered to be the threshold above which re-suspension of fine sized material from an exposed surface may occur. The mean annual wind speed in the Casement area is approximately 5.5 m/s. The surface needs to have a relatively low moisture content for this type of dust emission to take place and any wetting either by rainfall or sprayers, will greatly reduce the potential of fugitive dust emissions. Mitigation measures such as the use of sprinklers will ensure that re-suspension of dust will not be a major impact.

Long-term wind observations over the period 1968-1996 indicate that the prevailing wind direction, in the Casement area, is from the SW and blows NE across the proposed development.

Rainfall

Precipitation data from the Casement meteorological station for the period 1961 - 1990 indicate a mean annual total of about 711 mm. This is below average for most of the eastern half of the Ireland which has between 750 mm and 1000 mm of rainfall in the year.

Temperature
The annual mean temperature at Casement (1961 – 1990) is 9°C with a mean maximum of 15°C and a mean minimum of 5°C. Given the relative close proximity of this meteorological station to the proposed development, similar conditions would be observed.

9.6.3 Impact on Macro Climate

Greenhouse gases occur naturally in the atmosphere (e.g. carbon dioxide, water vapour, methane, nitrous oxide and ozone) and in the correct balance, are responsible for keeping the lower part of the atmosphere warmer than it would otherwise be. These gases permit incoming solar radiation to pass through the Earth's atmosphere, but prevent most of the outgoing infrared radiation from escaping from the surface and lower atmosphere into the upper levels. However, human activities are now contributing to an upward trend in the levels of these gases, along with other pollutants with the net result of an increase in temperature near the surface.

Motor vehicles are a major source of atmospheric emissions thought to contribute to climate change. A concern would be the additional emissions generated from vehicles that will be attracted to this proposed development and the potential for increases in air pollutants, which may contribute to climate change. During site visits it was observed that there was already a high number of Heavy Goods Vehicles (HGVs) in the vicinity of the proposed development. Smooth inflow and outflow of traffic incorporated into the site design and future improvements to existing road will result in free flowing traffic which will reduce the impact arising from vehicle emissions, compared to the emission pattern associated with congested driving conditions.

9.6.4 Impact on Micro Climate

The physical structure of the warehouse will produce slight changes in shelter, microclimate: the spatial distribution of temperature, light, shade and rainwater runoff. There are no plants on the site of the proposed development that will be affected by this slight change in the microclimate. There are also no particularly sensitive life forms that will suffer. The scheme will not have a significant effect on shading or temperature profiles at the nearest residential properties.

9.6.5 Mitigation Measures

The proposed Sustainable Resource Recovery Facility will have no impact on the climate or microclimate at the site and therefore no mitigation measures are proposed.

10 NOISE & VIBRATION

10.1 INTRODUCTION

RPS McHugh Planning & Environment carried out a Noise Impact Assessment of the proposed development at Crag Avenue. The study was undertaken in June 2003.

This chapter summarises the main report and identifies, describes and assesses the impact of the proposed development in terms of its impact on noise on the surrounding environment particularly at residential areas adjacent to the site. The full report can be found in **Volume 3, Appendix 6** of this report.

The assessment was carried out with reference to the following documentation and methodologies:

- A baseline survey at the nearest noise sensitive locations surrounding the proposed development site has been carried out to establish baseline noise levels. The survey was carried out in accordance with ISO 1996 Acoustics: *"Description and measurement of environmental noise"*
- An assessment of increased traffic noise has been made with reference to the Department of Transport (Welsh Office) Document "Calculation of Road Traffic Noise" (CRTN) 1998
- The potential impact of the site has been assessed with reference to BS4142 1997 *"Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas"*
- Noise from construction activities has been considered with reference to BS5228: *"Noise and Vibration Control on Construction and Open Sites"*

10.2 EXISTING ENVIRONMENT

The location of the proposed Sustainable Resource Recovery Facility at Crag Avenue, Clondalkin, is situated with in an industrial estate to the west of the M50 motorway. The site is currently a hard standing site used as a storage and distribution compound for motor vehicles.

The site is bounded to the north, south, east and west by industrial units and is accessed from the M50 and Cloverhill Road.

The site is generally isolated from noise sensitive locations, the nearest residential premises are located along Station Road and within James Connolly Park to the western site boundary approximately 500m from the site.

A baseline noise survey was carried out on the 11th June 2003 to establish the existing noise climate throughout both day and night-time periods within and surrounding the site boundary. Details of baseline noise survey are given in **Table 10.1.**

10.3 METHODOLOGY

10.3.1 Noise Measurement Parameters

During the baseline noise survey a total of five noise parameters were measured. Theses are defined defined below:

L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an "average" value.

L_{Amax} is the maximum A-weighted sound level measured during the sample period.

L_{Amin} is the minimum A-weighted sound level measured during the sample period.

L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period; this parameter is typically used to quantify traffic noise.

L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period; this parameter is typically used to quantify background noise.

A-weighting is the process by which noise levels are corrected to account for the non-linear frequency response of the human ear.

All noise levels are quoted in dB(A) relative to a sound pressure of 20μPa.

10.3.2 *Noise Measurement Locations*

Noise measurements locations are described in **Table 10.1** below and illustrated **on Figure 10.1.**

Table 10.1: Noise Measurement Locations

Location	Description
N1	South of site at entrance gates along Crag Avenue.
N2	Mid eastern site boundary adjacent to warehouse units in neighbouring site.
N3	Mid western site boundary adjacent to workshop of neighbouring facility.
N4	1st house on corner of Palmerstown Woods
N5	House at end of Cul de Sac in James Connolly Park, opposite Crag Avenue.

Measurements were made during the day and night time period at the five monitoring locations on 11th June 2003. For the purpose of this assessment Day time is defined as 08:00 hours to 22:00 hours and Night time is defined as 22:00 to 08:00 hours.

Noise level measurements were performed over sampling periods of 30 and 15 minutes during the day and 15 minutes at nighttime. The results were noted onto survey sheets following each period and all measurements were carried out in general accordance with ISO1996 "*Acoustics; Description and measurement of environmental noise*".

Weather conditions were noted to be dry and relatively still. Wind speeds ranged between 0-3m/s. Cloud cover was typically 40% and temperatures were nominally in the range of 10-14 degrees Celsius.

Table 10.2: Baseline Noise Survey Results

Location	Time	LAeq	LAmax	LAmin	LA10	LA90	Comments
N1	10.57	66	85	51	70	53	Industrial estate traffic, approx. 10 HGV's. General noise from industrial estate. 1 aircraft overhead
	14.00	65	84	50	69	53	
	23.35	55	82	43	51	45	Distant road traffic, 1 car transporter vehicle entered the site at 23.40
N2	11.22	57	68	54	58	55	Main sources noted-car transporter idling within site, air extraction units from adjacent facility, 3 no. trains, general background industrial noise.
	14.20	61	72	67	69	68	

Legend

N1 - South of site at entrance gates along Crag avenue

N2 - Mid eastern site boundary adjacent to warehouse units in neighbouring site

N3 - Mid western site boundary adjacent to workshop of neighbouring site

N4 - First house on corner of Palmerstown Woods

N5 - House at end of cul de sac in James connolly park, opposite Crag avenue

Project Sustainable Resource Recovery Facility

Title Baseline Noise Monitoring Locations

Figure 10.1

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Issue Details

Drawn: S.K		Project No. MDE0163	
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Date: 10.10.2003		MI0013	A01

Notes

1. This drawing is the property of RPS-MCOS Ltd. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. All levels are referred to Ordnance Datum, Malin Head.
3. NOT TO SCALE, use figured dimensions only, if in doubt ask.
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Location	Time	LAeq	LAmax	LAmin	LA10	LA90	Comments
	23.00	51	77	49	58	52	Extraction fan from neighbouring facility main source of noise. 1 no. train passed.
N3	11.43	57	78	52	57	54	Noise from neighbouring facility main source particularly workshop noise and idling vehicles.
	14.40	61	77	47	63	50	
	23.18	51	70	43	48	45	Distant road traffic, background industrial plant noise audible. 1 no. train passed.
N4	10.15	62	78	46	67	49	Road traffic dominant noise sources including HGV's. During traffic lulls, banging noise from metal yard audible.
	12.05	64	93	46	66	49	
	00.17	57	79	43	60	46	Local and distant traffic main noise source.
N5	10.37	64	76	49	68	57	Busy traffic along Cloverhill Road and Crag Avenue main noise source. Two aircrafts passed overhead.
	13.40	64	86	48	67	56	
	23.55	57	74	41	62	43	Road traffic main noise source.

Noise characteristics of the area are typical of an industrial estate zoned for light industrial activity. Additional noise sources emanated from nearby passing trains, overhead aircraft and banging sounds associated with industrial activity. Existing road traffic was the dominant noise source for the majority of the time.

10.4 POTENTIAL IMPACTS

When considering a development of this nature, the potential noise impacts on the surrounding environment must be considered for each of two distinct stages; the short term impact of the construction phase and the longer term impact of the operational phase.

10.4.1 Construction Noise

The construction phase will involve the use of a variety of equipment including excavators, breakers, lifting equipment, dumper trucks, compressors and generators. There will be vehicular movements to and from the site that will, out of necessity, make use of existing roads. All of these construction activities have the potential to generate noise and vibration.

Therefore, in order to minimise the impact on nearby sensitive locations, it is usual to limit the times of day and week during which it is permissible to carry out construction work that could create high levels of noise. These are normally set down by the local authority and are typical 08:00 to 18:00 hours Monday to Friday, 09:00 to 13:00 hours on Saturday and none on Sunday or bank / public holidays.

Higher noise levels are generally accepted during the construction phase than the operational phase, as these works are temporary in nature. Furthermore, if construction noise does not exceed the existing ambient noise climate (L_{Aeq}) by more than 10dB, it is unlikely to cause complaint. Location N4 and N5 were chose to represent the nearest noise sensitive locations in the vicinity of the site. Lowest daytime ambient noise levels measured were 62dB L_{Aeq} at location N4 and 64 dB L_{Aeq} at N5.

Although there will be vehicular traffic to and from the construction site, the number of additional vehicles is unlikely to have any affect on existing flows on Cloverhill Road and Station Road and consequently the existing noise climate will remain nominally unaffected during this stage.

10.4.2 Operational Noise

Once operational, the main sources of noise impact associated with the development will be additional vehicles on the existing road system, vehicle movements within the site and noise from the operation of the site.

Road Traffic

Increased traffic, particularly from heavy goods vehicles (HGV) during the operational phase of the proposed development, has the potential to increase noise levels at noise sensitive locations along the routes surrounding the site. The nearest residential estates which would potentially be affected by operational traffic are James Connolly Park and Palmerstown Woods along Cloverhill Road and properties along Station Road.

A traffic assessment has been carried out by MCOS of current and predicated flows at the Crag Avenue site assuming a worse case scenario of the site operating at full capacity. In general the number of HGV's on surrounding routes is predicated to increase should the development proceed. However, the number of light good vehicles (LGV's) is predicted to decrease.

An assessment of the predicated noise impact of traffic generated from the proposed development has been carried out with reference to the UK's Department of Transport (Welsh Office) document entitled "Calculation of Road Traffic Noise" using the predicated traffic flow information supplied of AM and PM peak hour flows. The results of this assessment are included in Tables **10.3** and **10.4** below. The significance of change in noise levels is summarised in **10.5**.

Table 10.3: Predicted traffic noise values for AM peak hour flows along surrounding routes

AM peak hour flow	2006 without development (dB L_A10 1hour)	2006 with development (dB L_A10 1hour)	Difference in dB
Station Road	70	70	0
Cloverhill Road	66	67	+1
Crag Road	62	65	+3

Table 10.4: Predicted traffic noise values for PM peak hour flows along surrounding routes

AM peak hour flow	2006 without development (dB L_A10 1hour)	2006 with development (dB L_A10 1hour)	Difference in dB
Station Road	70	70	0
Cloverhill Road	66	67	+1
Crag Road	64	66	+2

Table 10.5: Classification of predicated noise impacts (EPA 7 DMRB)

Change in sound level	Subjective reaction	Impact
<3	Imperceptible	Not significant/Imperceptible
3-5	Perceptible	Minor/Slight
6-10	Up to a doubling of loudness	Moderate/Significant (Minor)
11-15	Over a doubling of loudness	Major/Significant (Major)
>15	-	Severe/Profound

With reference to **Tables 10.3** and **10.4** above, traffic noise levels on surrounding routes between do something and do nothing during the year 2006 are predicted to increase by a maximum of 3dB during AM peak hour flows along Crag Avenue. This road is predominately industrial with no residential

locations. Along Station Road and Cloverhill Road, the distribution of LGVs and HGVs have resulted in changes in noise levels by a maximum of 1dB between the do nothing and do something scenario. In subjective terms, this increase is not considered to be significant.

Waste Transfer Facility

The operation of the waste transfer facility will involve the delivery, sorting, bailing and storing of waste materials. Each on site process has the potential for noise generation. The combined noise level from all sources operating within the facility has been assessed assuming all machinery is operating simultaneously for 100% of the time.

In order to ensure that noise levels from the operation of the facility do not significantly impact the nearest residential properties, reference has been made to BS4142 1997 *'Method for rating industrial noise affecting mixed residential and industrial areas'.* It is proposed that the specific noise from combined operating equipment do not increase existing background noise levels at the nearest noise sensitive locations by more than 5dB(A). The lowest background day time noise level was 49dB L_{A90} measured at location N4. Location N5 recorded the lowest night time background level of 43dB L_{A90}. Therefore if operating noise from the facility does not exceed 54dB L_{Aeq} during the day time period and 48dB L_{Aeq} during the night time period at the nearest residences, the operational noise impact will be of marginal significance.

Table 10.6: Predicted noise level at nearest noise sensitive location

Operating Machinery	Sound pressure level dB
2 x BOA bailer	85
1 x Finlay Trommel	96
2 x FUCS grab	85
1 x Front Shovel Loader	92
Total from all machinery at 10m	**98**
Sound level at location N4 at 300m (un-attenuated)	68*
Additional attenuation required to achieve 48dB L_{Aeq}	20

*Note- this level does not take account of any screening afforded by existing buildings between the proposed site and the nearest sensitive location.

It is not known at this stage of the assessment the exact design and construction form of the main site building, however a basic industrial building wall consisting of 38mm plaster coated steel cladding with 60mm insulation and 9.5mm industrial plasterboard will result in a mean sound reduction index (Rw) of 37dB. A basic industrial building roof consisting 38mm plaster coated steel cladding sheets with 140mm purlins at 1500mm centres, 60mm insulation and 9.5mm grade board will result in a mean sound reduction index (Rw) of 43dB (Source: British Gypsum).

The building structure therefore if constructed of similar form to the type above will achieve the attenuation required. Modern building designs however are likely to exceed these specifications.

10.5 MITIGATION

Of the likely impacts described above, the greatest potential impact will be from construction works, and increased traffic flows.

10.5.1 Construction Phase

With regard to construction activities, the main contractor will need to refer to BS5228: *Noise control on construction and open sites*, which offers detailed guidance on the control of noise from construction activities.

It is proposed that various practices be adopted during construction, including:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted. These should be clearly outlined in the contractors document and specified by South Dublin County Council;
- selection of plant with low inherent potential for generation of noise and/or vibration;
- erection of temporary barriers around items such as generators or high duty compressors;
- sitting of noisy/vibratory plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

Controlling noise from construction works at neighbouring dwellings to no more than 10dB greater than the existing ambient (L_{Aeq}) noise levels will normally ensure local residents are not significantly impacted by noise. With regard to the existing noise levels noted previously, if construction noise does not exceed 72dBL_{Aeq} at location N4, the quietest location, noise impacts will be minimal.

Although not quantified at this stage, the number of additional vehicles associated with the construction works is not expected to affect the present road traffic noise levels.

10.5.2 Operational Phase

During the operational phase of the development, the total noise from all internal operations should be designed to not significantly affect the existing ambient noise over both day and night time periods. If the equivalent continuous sound level (L_{Aeq}) of the plant noise at the nearest noise sensitive premises is limited to 54dB(A) during the daytime period (08:00 to 22:00 hours) and 48dB(A) during the night time period (22:00 to 08:00 hours) the impact of noise from this source will be not significant.

Predictions of typical noise levels from the operation of the facility have been assessed with reference to previous measurements made on the existing Reduce Reuse Recycle site at Knockmitten Lane. It is anticipated that with attenuation provided by the building construction and distance attenuation between the site boundary and the nearest residential properties, this guidance level will be achieved.

With respect to any mechanical plant required to service the building, the following mitigation measures may be applied:

- Air handling plant should be located at roof level and adequately screened by the use of acoustic louvres and acoustic enclosures.
- Generator (standby and peak usage) should be located at ground level. The use of acoustic screens at the perimeter of plant area and adequate noise control to the unit should be considered.

It is also proposed that the following noise and vibration control principles will be employed:

- splitter attenuators or acoustic louvres providing free ventilation to plant areas;
- solid barriers screening any external plant;
- anti-vibration mounts on all reciprocating plant.

10.6 RESIDUAL IMPACT

10.6.1 Construction Phase

During the construction phase of the project the noise impact will vary depending on the location of noise sensitive properties to the development. Limiting noise levels to 72dB L_{Aeq} at the most sensitive dwelling surrounding the development site (Location N4) through the use of guidelines within BS5228 and limited hours of operation, will ensure noise during this short term phase is kept to a minimum.

10.6.2 Operational Phase

Once fully operational, traffic flows along surrounding routes will not experience any significant increase in noise levels above those predicated for the "do nothing" scenario.

A worst-case scenario would entail the full operation of the development with all plant operating continuously at full load. This has been assessed within the body of the report. The operation of the development is not predicated to give rise to any significant increases in traffic noise levels along surrounding routes. Noise from operational equipment and mechanical services are additional potential noise sources from the development.

The operation of mechanical and electrical plant during worst-case scenario would be the same under normal operating conditions. With careful site design and the use of proven noise control techniques, noise from this source will be kept to a minimum.

11 LANDSCAPE & VISUAL IMPACT

11.1 INTRODUCTION

Brady Shipman Martin were commissioned by RPS-MCOS to carry out a landscape & Visual Impact Assessment of the proposed new Sustainable Resource Recovery Facility at Crag Avenue, Clondalkin, Co. Dublin. This chapter summarises the findings. A copy of the full report can be found in **Volume 3, Appendix 7** of this report.

The assessment is made with regard to the vulnerability of the landscape to change and to the location of visual receptors relative to the proposed development.

The methodology is based on the EPA Guidelines on the information to be contained in Environmental Impact Statements (March 2002) and Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 1995.

11.2 METHODOLOGY

11.2.1 Landscape

Landscape has two separate but closely related aspects. The first is visual impact, that is the extent to which a new structure in the landscape can be seen. The second is landscape character impact, i.e. responses that are felt towards the landscape and draws on the appearance of the land, including shape, form and colour, and that interaction to create specific patterns and pictures that are distinctive to particular localities.

Visual impacts are categorised under 'Visual Intrusion' and 'Visual Obstruction', where: -

- Visual intrusion is impact on a view without blocking; and
- Visual obstruction is impact on a view involving blocking thereof.

Two principal assessments of visual impact are made: -

In developing the proposed project the scheme can cause either a deterioration or improvement or may have no change in the visual amenity. Any considered change is rated as per the significance criteria given in **Table 11.1.**

The character of the existing landscape setting is evaluated taking account of the various natural and man-made features, such as topography, landform, vegetation, land-use, built environment etc. together with the visibility of and the views to and from the site.

11.2.2 Significance Assessment Criteria

The significance criteria are based on the impact levels given the EPA Guidelines on the information to be contained in Environmental Impact Statements (March 2002).

Table 11.1: Impact Significance Criteria

Level of Impact	Definition
Imperceptible Impact	An impact capable of measurement but without noticeable consequences
Slight Impact	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate Impact	An impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends
Significant Impact	An impact which, by its character, magnitude, duration or intensity alters a sensitive aspects if the environment
Profound Impact	An impact which obliterates sensitive characteristics

11.3 EXISTING ENVIRONMENT

11.3.1 Landscape Context

The site for the proposed new Sustainable Resource Recovery lies within Clondalkin Industrial Estate at the Sub-urban/Industrial edge of the Ronanstown /Clondalkin area in west Dublin.

The industrial estate is bound by the Dublin-Kildare rail line to the north, with Clondalkin Commercial Park and Cloverhill Industrial Estate further north, the elevated M50 Western Parkway to the east, the Grand Canal to the south and Cloverhill Road and residential development to the west.

Within the estate, the site has a relatively central location with industrial style warehouse development to the west, south and east. The rail line defines the northern boundary of the site. At present the site is in use by 'Transcar Ltd', a car distribution operation, which principally comprises a centrally located two-storey office building surrounded by extensive car parking.

The landscape of the surrounding environment is flat and typical of mixed industrial/commercial/ residential/open space suburban character. The elevated nature of the M50 is a prominent feature while the Grand Canal, the principal amenity in the area, is only prominent at proximity.

Views to the industrial estate from the M50 are in reality only facilitated from the northbound carriageways and are typically of a passing nature as truly open views are limited to the bridge crossing of the canal.

Further north, developing roadside screening is increasingly effective in providing screening towards the estate. The screening is particularly effective when travelling on southbound carriageways or from the Cloverhill Road Overbridge.

Cloverhill Road to the west, together with Clondalkin Commercial Park and Cloverhill Industrial Estate to the north of the proposed development, are well screened with existing mature rail-side and road-side trees and hedgerows.

The Grand Canal defines the southern boundary of the industrial estate, but due to intervening development, has no direct visual relationship with the site, which is, located some 250m north of the waterway.

11.3.2 Site Description

The site comprises 4.5 hectares and is currently operated by 'Transcar Ltd.' as a car storage and distribution facility. The entrance to the site is located to the north from Crag Avenue from a relatively central location within Clondalkin Industrial Estate.

Photo 11.1: View looking northwards from within the site. The taller tree-lined hedgerow visible in background on Clondalkin Commercial Park/Rail line boundary provides good existing screening.

Generally speaking, boundaries to the existing site are a mix of palisade fencing and palisade type-fencing set on concrete block walls of various heights. The entrance is comprised of understated brick wall construction with low walls and railings fronting the remainder of the site.

Warehouse developments surround the site to the east, south and west. In particular to the east, warehouse/office developments of some 6 or 7m in height closely bound the site. The units all have blank walls overlooking the actual site of the proposed new development.

On the northern boundary a hedgerow of variable height (1.5 to 4.0m average) and security fence defines the site and rail boundary. The boundary detail ensures that even passing views are not possible from trains. The boundary between the rail line and Clondalkin Commercial Park further north is a mature tree-lined hedgerow over 5 or 6m in height.

With regard to National Landscape Designations or Listings, there are no listings for Areas of Outstanding Landscape in the immediate area of the proposed development. The nearest is The Phoenix Park and Liffey Valley (Nr 39) some 3km to the north/north-east

Amenity uses in the wider vicinity are limited to: -

- The Grand Canal and associated 'Grand Canal Way', forms the southern boundary of the industrial estate. The canal, which is the principal amenity in the environs, is over 250m south of the site and existing industrial and warehouse development lies on the intervening area.

- Small areas of Public Open Space in and around the various residential developments to the south, west and north of the industrial estate. All are located over 500m from the site and include:

  -To the south - Yellow Meadows, Mayfield, Riversdale;
  -To the south-west – Michael Collins Park, Patricks, Road;
  -To the west – Ninth Lock Road, Ballymanagin Lane, James Connolly Park, Cappaghmore;
  -To the north-west and north – Palmerstown Woods, Collinstown Grove.

- A larger park is located more distantly at Collinstown Park.

There are no preserved views or additional landscape or scenic designations listed within the South Dublin Development Plan, which relate to the environs of the site.

The Grand Canal has been designated a Proposed Natural Heritage Area as indicated and is some 250m south of the site (see also section on Flora and Fauna).

In summary, the character of the site and its immediate surrounds is largely industrial or commercial in nature and the site has no visual distinctiveness either from within or outside its context.

11.4 POTENTIAL IMPACTS

11.4.1 *Introduction*

Reduce Reuse & Recycle Limited proposes to develop a Sustainable Resource Recovery Facility comprising principally:

- a 15.4m high materials recycling facility building of 4,645m^2 (50,000sq.ft.) to be located in the north-west corner of the site;
- a 9.3m high two storey administration/office building of 452m^2 to be located near Crag Avenue to the south of the site, including a small wind turbine;
- a maintenance building, car parking, weighbridges and new fencing.

11.4.2 Visual Impact of the Development

Given the presence of surrounding warehouse/commercial development and despite the 15.4m height of the main building, the proposal will have no appreciable visual impact beyond the boundaries of the Clondalkin Industrial Estate. The proposed wind turbine has been located centrally within the site and as such will be fairly hidden amongst the surrounding built structures. While limited, certain locations may have line of sight views to the proposed development, especially the upper roof of the main building. In such instances distance and intervening screening or built development together with the nature of the surrounding context will ensure no adverse visual impact or any deteriotion to existing views. This would include any views of a passing nature, which may arise from the M50 Motorway to the east.

Within the estate, visual impacts will be most pronounced during the construction stage while general construction and visual disturbance is at its greatest. However, given the industrial context of the surrounds it is not considered that such construction will have any adverse or result in any deterioration to existing views.

On completion of construction it is considered that there will be no appreciable change or alteration to the visual environment.

Figure 11.1 overleaf is a photomontage of the proposed development on completion.

11.4.3 Impact on Landscape Character

Setting the development within an existing industrial/commercial area with surrounding buildings comprising a range of heights and uses will ensure that the proposed buildings will be adequately incorporated in to the existing landscape. Therefore it is not anticipated that there will be an impact on existing landscape character. A landscaping master-plan (see **Volume 3, Appendix 8** of this report) which has been produced for the development will help to improve the aesthetic quality of the site when fully mature.

It is not anticipated that Illumination will have no negative impact in the context of the existing industrial environment of the proposed development.

11.4.4 Other Impacts

There will be no impact on landscape planning aspects. The proposed development avoids, in its entirety, any impact on trees and woodlands to be protected or preserved, amenity, landscape or scenic designations or listed views or prospects.

Figure 11.1 SITE ENTRANCE

There will be no impact on trees or woodlands. The entire site is already developed to building, hard-standing and parking use and has no tree or shrub planting. The only planting on or near the site lies along the northern boundary of the site, which runs along the Dublin to Kildare Rail-line. The development does not propose any interference with this boundary planting, which is to be retained in full.

11.5 MITIGATION MEASURES

11.5.1 Construction Stage

Contracts should be drawn up in accordance with the Environmental Impact Statement to ensure good working practices that will help reduce any negative impacts arising from the construction period and to ensure that machinery operates within the scheme construction area.

Storage areas should be located so as to avoid impacting on surrounding properties and such areas will be fully re-instated at the end of the construction contract.

The works will have continuous monitoring so as to ensure adequate protection of areas outside of the construction works.

11.5.2 Lighting Mitigation

For the purposes of mitigation, it is recommended that horizontal cut-off light fittings should be used to minimise any potential that might exist in terms of increased illumination.

11.5.3 Landscape Mitigation Measures

The following landscape mitigation measures are recommended for the proposed development: -

- Avoidance of any impact to the hedgerow boundary with the Dublin to Kildare rail line to the north of the site.
- Upgrade and refurbish existing entrance and fronting boundary wall/railing.
- Carry out heavy standard lime (*Tilia Cordata* 'Greenspire') tree planting within the verge along Crag Avenue.

11.6 RESIDUAL IMPACTS

It is considered that, given the 'developed' context of the proposed scheme and the presence of existing roads along much of the proposed scheme, no residual or permanent landscape or visual impacts of an adverse residual nature will arise as a result of the development.

12 IMPACT ON HUMAN BEINGS

12.1 INTRODUCTION

This chapter of the Environmental Impact Statement deals with the potential impact of the proposed Sustainable Resource Recovery Facility on Human Beings. This chapter is divided into:

Social & Economic Activity including residential, recreational and commercial properties

Nuisance Control including pests, litter, odours, dust, noise, traffic and impacts on health and safety.

12.2 SOCIAL & ECONOMIC ACTIVITY

12.2.1 Introduction

RPS-MCOS carried out a study of the potential impacts associated with the proposed Sustainable Resource Recovery Facility on social and economic activity in the area. The study identifies the likely significant impacts to affect the social and economic functioning of the study area as a result of the proposed development Impacts are assessed and mitigation measures proposed. The social and economic aspects of the study have been appraised with particular attention given at a local level, but also on regional and sub-regional levels.

12.2.2 Methodology

The assessment of the socio-economic impact of the proposed development was carried out broadly in accordance with the EPA publications giving *Advice Notes on Current Practice* and *Guidelines on Information to be Contained in Environmental Impact Statements (EIS)* (1995,2002). Government strategies relating to land use and economic development for the area were consulted, including the South Dublin County Development Plan, 1998. Demographic characteristics of the area were ascertained from the results of the 2002 Census of Population published by the Central Statistics Office.

Existing residential, community, commercial and industrial properties were identified and mapped during two windshield surveys in July 2003. The map was then used to evaluate the existing environment with regard to socio-economic functioning. Existing land use was determined with the aid of aerial photography, Ordnance Survey maps scale 1:15,000 (2002) and 1:20000 (2001) and visual inspections. This was further complimented with consultation with the IDA.

12.3 DESCRIPTION OF THE EXISTING ENVIRONMENT

12.3.1 Introduction

In this section, the existing (receiving) environment is described at a regional, sub regional and local level. The study area encompasses a radius of 0.5km of the proposed development. The sub regional describes the existing environment between 0.5km and 3km of the proposed development. While the regional existing environments describes the Dublin Region beyond 3km of the proposed development.

12.3.2 Regional

According to the Waste Management Plan for the Dublin Region (1998) there are approximately 3.5 million tonnes of waste arising in the Dublin Region. Approximately 53% of this waste is of

construction/demolition origin, some 17% is industrial in origin while household and commercial sectors each contribute about 13% of the waste stream handled. 80% to 90% of Dublin Regions waste is being sent to landfills. To meet emerging new EU and national legislation, alternatives to landfill must be found. The Waste Management Plan for the Dublin Region recognises that this will involve the provision of additional sorting and baling facilities in the Dublin Region for recyclables collected prior to transport to markets. The proposed development will sort, bale and recycle packaging and other commercial waste and thereby divert waste material away from landfills.

12.3.3 Sub-regional

Recreational/Community Facilities

Clondalkin is situated in the south west of County Dublin and was previously a village but has now grown into a large urban area. It has extensive residential, industrial and warehousing areas and is served by a range of social, service and commercial facilities.

Community facilities in the area include: Cherry Orchard Hospital, Health Centres, Community Centres, Training and Education Centres, Schools, Colleges, Library, Post Office, Churches, Cemetries, Belgard Quarry, Cherry Orchard Train Station, Garda Stations, Fire Brigade Station, banks and shops.

Retail and banking activity are mainly concentrated in the village centre.

Local community amenities include: the Grand Canal, the Camac River, a Round Tower, Le Fanu Park, Sport grounds, Newlands Golf Course and Clondalkin Sports and Leisure Centre.

Economic Functions

In terms of economic functions in Clondalkin, the following businesses exist; South Dublin County Council Offices, Park West Enterprise Centre, Nangor Road Business Centre, Riverview Business Centre, Clondalkin Enterprise Centre, Oakfield Industrial Estate, Knockmitten Business Park, Grange Castle International Business Park, Kilcarberry Industrial Park, Willow Business Park and Elmfield Industrial Estate. The Nangor/Fox and Geese area to the east of Clondalkin Village contains the largest concentration of industry and warehousing in County Dublin.

Population

The growth of Clondalkin from a village to today's population happened very rapidly. The smallest division for which population data is available is at the Electoral Division (ED) level, which is formerly known as District Electoral Division (DED). Clondalkin is contained within seven Electoral Divisions namely, Ballymount, Cappaghmore, Dunawley, Monastery, Moorfield, Rowlagh and Clondalkin Village. The Census of Population 2002 describes the combined Electoral Divisions of Clondalkin, as having a population of 43,038 (CSO, 2002). This is an increase of 11% from 1991 to 2002. The provision of the M50 to the east of Clondalkin village centre, the re-opening of the railway station and a rapid increase in house building programmes have contributed to this population increase.

However, not all of Clondalkin's population has benefited from improved infrastructure and employment opportunities. Rowlagh situated in North Clondalkin has an unemployment level of 44%. According to the South Dublin County Development Plan, 1998 it is council policy to encourage the provision of a wide range of employment opportunities in Clondalkin.

Transportation Network

The N7 extends along the southern edge of Clondalkin in a north east to south west direction. The route serves as a link between Dublin to Limerick and reduces the necessity of regional traffic to enter Clondalkin.

The proposed site can be accessed via the M50 at the Liffey Valley interchange, approximately 2.5kms northeast of the proposed development or the Red Cow roundabout, about 3kms to the southeast.

12.3.4 Local

A description of the existing environment within a radius of 0.5km of the proposed development is described under the headings:

- Land Use
- Transportation
- Population
- Community/Amenity Facilities
- Economic Functions

Land Use

The proposed Sustainable Resource Recovery Facility will be located in Clondalkin Industrial Estate, which is zoned for industrial use. The South Dublin County Development Plan, 1998 describes the Industrial Estate as being zoned Objective E 'to provide for industry and related uses'. The Industrial Estate is currently occupied by a number of mainly light industrial and logistic companies, with the exception of Roadstone and BOC gases which are involved in heavy industry. The activities to be carried out at the proposed development will therefore necessitate no change in the pattern of land use. In the immediate vicinity of the proposed development are the IDA Cloverhill Industrial Estate to the north and Weatherwell Business Park to the west.

A number of cottages located along Station Road and Ballymanagin Lane and a new housing estate-Station Close are within 500m south west of the proposed development. There are also properties within 500m of the proposed development to the northwest - Palmerstown Woods, west - James Connolly Park and south - Mayfield Park.

Transportation Network

The M50 Motorway runs northwest – southeast approximately 400m east of Clondalkin Industrial Estate. Clondalkin Industrial Estate is accessible from Cloverhill Road, via Newlands Road/Naas Road to the south and Coldcut Road/Ballyfermot Road to the north.

Clondalkin station is located just off Palmerstown Bridge and the rail tracks run along the northern boundary of the proposed development, in an east-west direction. The Arrow Rail line serves Clondalkin as it travels between Dublin and Kildare.

It is noted that a number of Dublin Bus services operate along the Newlands Road approximately 500m south west of the proposed development. These are the 76, 76A, 76B, 51, 613 and the 210.

The Grand Canal runs east west to the south of Clondalkin Industrial Estate and is navigable.

Current Traffic

According to a recent traffic assessment undertaken in the area of the proposed development, local traffic has an AM peak at 07.00 – 08.00. Crosbie Transcar currently occupies the existing site and operate on a 24 hour a day basis. Incoming and outgoing traffic at the site are made up of HGV's and cars travelling from the docklands area of the city and to areas outside Dublin respectively.

Average peak times are quite variable as they depend on when the ferries arrive. Traffic survey results show that on Monday and Tuesday AM peak times occur between 03.00 – 04.00. On Wednesday, Thursday and Friday the AM peak is 12.00 – 13.00. Crosbie Transcar had only half the amount of traffic flows during the summer months when compared to the start of the year, as this is their quietest time. Therefore the figures used for the existing site traffic in the Traffic Impact Assessment are conservative.

Cyclists and Pedestrians

There are footpaths throughout Clondalkin Industrial Estate and along the routes leading to the estate and a footpath runs from Clondalkin village to the proposed development. There is dedicated pedestrian crossing points, dropped kerbs and surface marking at the T junction of Station Road and Newlands Road and at the T junction of Cloverhill Road and Coldcut Road. There are no cycle lanes in the vicinity of the proposed development.

Community/Amenity Facilities

Community Facilities

There are no schools, medical centres or churches within 500m of the proposed development.

Amenities

Clondalkin enjoys the amenity of the Grand Canal to the south of the proposed development. The Office of Public Works initiated a five-year fish-stocking programme in 1990, which has resulted in an improvement in the fishing potential of this Canal. This has lead to an increase in fishing competitions and in the number of local residents who fish the canal. Fishing stands were observed on the banks of the canal to the south of the proposed development. Boats and barges use this stretch of the Canal.

The Grand Canal Way which extends along the Canal to the south of the proposed development and attracts people from local communities and further afield.

Economic Functions

Industrial activity in the area is concentrated in the Industrial Estates off the Station Road and Cloverhill Road. Clondalkin Industrial Estate is characterised by a number of light industries including; stationery businesses, furniture, light engineering, and specialist builder providers. There are a number of large landholdings including: Eircom Logistics, Roadstone Roof Tiles, BOC Gas, Cappaquin Chickens and a number of headquarters including: P J Hegarty building contractors, G & T Crampton Building Contractors and Crosbie Transcar Warehousing and Car Delivery which currently occupies the site of the proposed development.

IDA Cloverhill Industrial Estate, which is north of Clondalkin Industrial Estate, contains a number of industries including; Everbrite Europe Ltd, Zormax Ltd, Sercom Solutions, Alfa-Laval (Ireland) Ltd, Lufthansa and Marchmont Packaging Ltd.

Weatherwell Industrial Estate to the west of Clondalkin Industrial Estate contains a number of industries including: Clondalkin Auto Clinic, Capital Brake & Clutch Specialist, Koni and Davenham. A delivery office of An Post is also located in this Industrial Estate.

Weatherwell Business Park is adjacent to Weatherwell Industrial Estate to the south west.

Other businesses within 500m of the proposed include the Lough and Quay pub, Ladbrooks, Esso Station and associated shop and a number of small businesses.

12.4 POTENTIAL IMPACTS

The potential impacts of the operation and construction of the proposed development are presented in this section.

12.4.1 Operational Impact

This section addresses the regional, sub-regional and local socio-economic impacts of the proposed development when it is operational. The impacts are examined under the headings:

- Regional impact;
- Sub-Regional impact;
- Local impact on communities;
- Impact on local community/amenity facilities;
- Impact on the local economy;
- Local impact on road users;
- Local impact on traffic volumes;

Regional Level

At a regional level, the proposed development will have a beneficial impact on industrial and commercial facilities in the Dublin Region by recycling waste that previously would have been sent to the landfill.

Sub-Regional Level

The existing Waste Transfer Facility at Knockmitten Lane employs approximately 30 people. It is expected that the new Sustainable Resource Recovery Facility will create employment on a sub-regional level by employing an additional 30-50 people on a phased basis as the business develops.

Local Level

Communities

The values of houses in the vicinity are unlikely to be impacted as a result of the proposed development.

Community/Amenity Facilities

Impacts of the proposed development on Community and Amenity facilities within 500m of the proposed site are discussed below.

- Grand Canal

Drainage from the proposed facility will enter a small stream to the southwest which will meets the River Camac further downstream, at Bluebell Avenue. The proposed facility will have no impact on the Grand Canal's water quality, fishing or boat users.

- Grand Canal Way

No significant impacts are anticipated on patrons of this walk along the Grand Canal.

Changes in Traffic Patterns

The proposed Sustainable Resource Recovery Facility at year of opening (2004) will operate 24 hrs a day 7 days a week. The traffic generated by the proposed development and the directions of approach and departure are described here in brief and in more detail in **Chapter 6 Traffic Impact Assessment**.

Traffic 2008

Assessments were carried out for the year of opening and the design year at 3 junctions leading to the proposed development. This is summarised in **Table 13.4** below.

Table13.4: Junction assessments for year of opening and the design year

Junction Location	Junction Type	Year of Opening (2005)	Design Year (2019)
T junction between Station Road and Crag Avenue	Priority junction with a major road and a minor road	Will operate within capacity	Will operate within capacity
T junction between Station Road and Newlands Road	Priority junction with signalised pedestrian crossings	Will operate within capacity at the AM Peak. Heavily saturated at the PM Peak.	Operates within capacity at the AM Peak. Heavily saturated at the PM Peak
Junction between Coldcut Road and Cloverhill Road	Signalised Junction	Will operate within capacity	Reaches saturation during the AM Peak

If the proposed development is not built (do nothing scenario) the future capacity problem with the T junction between Station Road and Newlands Road will still arise within the next year.

Vehicles

Table 13.4 above compares the total number of cars and HGV's at the existing site and the proposed development. Although the total number of traffic movements will be similar, there will be a higher amount of HGV's going to and from the proposed development.

Cyclists and Pedestrians

Traffic flow will not increase to a level that will significantly reduce journey amenity for pedestrians or cyclists.

Public Transport

Increased use of public transport in future years as encouraged by the Dublin Transport Initiative may reduce the number of cars on road networks.

12.4.2 Construction Impacts

The short-term socio-economic impacts that can potentially be generated during the construction phase are considered under the following headings:

- Road Users;
- Facilities and their Users;
- Local Economy;

Road Users

Construction near existing roads can temporarily disrupt road users and the extent of this disruption depends on the type and duration of the works. Works vehicles using or crossing public roads can also disrupt motorists, cyclists and pedestrians.

Facilities and their Users

Local business in the Clondalkin Industrial Estate can be affected by the nuisances of noise and dust during the construction of the facility. The construction phase of the facility may cause temporary disruptions to water and electricity supplies, and disrupt access to properties. Business located adjacent to the proposed development are likely to be particularly sensitive to these temporary construction impacts.

Local Economy

Construction of the Sustainable Resource Recovery Facility will generate employment for construction employees and will increase economic activity. Employees at the proposed facility may purchase their lunch at Pop's deli, which is approximately 250m from the proposed development, and this may generate an increased turnover. Local businesses that supply construction goods are likely to also experience an increased turnover.

12.5 CONSTRUCTION IMPACTS AND MITIGATION

For those who work adjacent to the proposed development the construction phase would have the potential to disrupt social or economic travel patterns due to delays, diversions or impaired access to facilities/businesses. However this impact will only be temporary & short term in nature.

- The construction programme will be phased to minimise the disruption to road users and to prevent temporary trading difficulties encountered by existing businesses in the vicinity of the proposed development.
- Noise abatement measures will be taken implemented to control noise and a dust minimisation plan should be put in place to prevent the spread of dust onto public roads.
- Local business could be consulted during construction to advise when they will be impacted.
- A construction traffic management plan will be implemented.
- There will be restrictions on hours of working.

12.6 RESIDUAL IMPACTS

The reduction of waste going to landfill brought about by the completion of the proposed development will have a positive impact at national, regional, sub-regional and local level. With the implementation of the mitigation measures suggested in this report, the socio-economic advantages of the proposed facility will outnumber the disadvantages.

No residual impacts on socio-economic functioning are anticipated once all suggested mitigation measures are put in place.

12.7 NUISANCE CONTROL

12.7.1 Introduction

This section of the Environmental Impact Statement also deals with potential impacts on human beings examining the likely impacts of the proposed new development associated with nuisance. The EPA waste licence covers issues such as pests, litter, odours, dust, noise, traffic and health and safety. A waste licence is a single integrated licence, which deals with emissions to all environmental media, in addition to the environmental management of the facility.

Reduce Reuse & Recycle Ltd. will be submitting a separate application to the EPA for a waste licence, which will deal with the above listed environmental issues in more detail, while the following section of the EIS will deal with these issues in more general terms.

12.7.2 Pests

Pests, which are normally associated with more disposal sites and landfills include rodents, scavenging birds and insects.

Both a stream, that emerges from a culvert approximately 300m southwest of the proposed facility and runs in a southerly direction from Crag Avenue to the edge of the Industrial Estate, along with The Grand Canal, which is approximately 500m south of the proposed development, could provide suitable habitats for birds and rodents. On the other hand however, the area in the vicinity of the proposed development is currently unlikely to be suitable for attracting pest populations due to noise existing and predicted traffic levels.

However, specific attention should be given at the design and operation stages to reduce the potential nuisance of pests. The Waste Licence will have stipulations and will require programmes to prevent with the nuisance of pests.

12.7.3 Mitigation Measures

The following mitigation measures should be taken into account:

1. The removal all waste delivered to the proposed facility by the end of the each day.
2. Washing the tipping floor and picking up litter on a daily basis.
3. Ensuring all operations, including waste handing, is performed inside the enclosed facility.
4. Installing bird-deterrent measures including fixing wire mess to horizontal surfaces where birds can gather.
5. Ensuring all vehicles, especially refuse collection vehicles to and from the facility are covered.
6. Eliminating or screening any cracks or openings to prevent entry of pests.
7. Routinely visually inspecting the facility for potential pest habitats, and taking corrective action when needed.
8. Hiring a professional licensed pest control specialists with expertise in controlling specific pest populations, when needed, and using rodent baits/ poison and insect sprays.

As the site will be unsuitable for rodents and given the mitigation measures mentioned above, it is unlikely that this will be an issue of likely concern.

12.8 LITTER

12.8.1 Introduction

Wind blown litter either from the proposed site, or from vehicles travelling to and from the site, may become unpleasant and classified as a nuisance. Dry, light waste material can be blown from trucks or from the tipping area of the facility. Waste is baled, wrapped securely and placed in enclosed articulated lorries before exiting the facility, which will help reduce the impact of litter.

12.8.2 Mitigation Measures

Implementation of some of the following control measures will minimise the potential of litter problems:

- Carrying out all waste handing and processing in the enclosed facility only.
- Ensuring that all incoming and outgoing vehicles are covered.
- A daily litter patrol of the site and nearby roads, carried out by a site operator, and a daily inspection sheet completed. Collection of litter on site, around the perimeter, on immediately adjacent properties and on approaching routes. Positioning doors away from litter producing material stored inside the facility.
- Making sure the building is positioned so that the prevailing south westerly winds do not blow through the facility and carry litter outside. This can be done by having the blank side of the building, where there are no openings, doors or windows, facing the prevailing winds.
- Erecting windbreaks to deflect wind away from the waste handling areas.
- Regular tipping floor cleaning and practicing good housekeeping measures will minimise the amount of loose waste blown outside.

The EPA Waste Licence sets down conditions for litter control and it is a requirement of the licence that these conditions are adhered to. It is envisaged that there will be no significant impact associated with litter from the proposed Sustainable Resource Recovery Facility.

12.9 NOISE

Elevated noise levels associated with day-to-day operations of the proposed Sustainable Resource Recovery Facility, especially due to vehicles and machinery in the unloading area, would be expected. Vehicles to and from the proposed development will also be a source of noise (see also **Chapter 10**).

12.9.1 Mitigation Measures

Some of the following can be used to combat the effects of noise:

- All operations will be carried out indoors.
- All equipment and vehicles to be regularly cleaned and inspected.
- All noise generating process will be carried out in an insulated area.
- Having wing walls at areas where vehicles enter the facility will block noise.
- Locating administration area between noise source and the local community to minimise noise levels experienced by owners of neighbouring sensitive residential properties.
- Placing doors and opening in the proposed building away from sensitive receptors.

Compliance with the EPA waste licence will ensure that noise restrictions are enforced and that impact of noise is reduced.

12.10 DUST

Dry periods of weather can lead to the generation of dust. Dust is expected to be generated during the construction phase of the proposed development. During the operation phase waste deliveries will mainly consist of dry solid material, packaging etc. However the facility may also accept small quantities of Construction and Demolition waste which has the potential to generate dust.

12.10.1 Mitigation Measures

The following measures can be used to mitigate against the impact of dust:

- Cleaning facility roads regularly with street-sweeping equipment.
- Washing waste delivery vehicles before they leave the proposed facility to remove dust-generating dirt.
- Installing an odour control system over entrances with mist sprays/odourisers. These also suppress dust.
- Aligning building away from the line of the prevailing wind.
- Installing dust suppression systems over tipping floor, to keep dust down, fitted with odour-neutralising compounds.
- Ensuring all waste is removed at end of each day and washing of tipping area to minimise the impact of odour.
- When landscaping is mature trees around the proposed facility may absorb odour.
- Organic material will be separated from the mixed waste and then tipped into an enclosed lorry in an enclosed section of the facility. Automated doors and curtain skin metal to separate processes in the proposed facility will prevent dust escaping to the outside.

12.11 TRAFFIC

The following measures can be used to mitigate against the impact of traffic.

- Future improvements of roads may facilitate ease of traffic congestion.
- Ensuring the free flow of traffic into and out of the facility by widening the entrance road, separating entrances and exits to the site, one-way traffic flow, clear sign posting and markings.
- Ensuring that there are adequate parking spaces on the site of the proposed development, when the tipping area is full, to prevent vehicles queuing on access roads causing congestion and safety concerns.
- Positioning buildings and roads to reduce intersection, the need to reverse vehicles and sharp turns.
- Ensuring that the fleet is flexible to respond to the requirements of the local traffic network. Refuse Collection Vehicles and Articulated lorries should avoid rush hour traffic.
- Complying with restrictions on HGV sizes to less than 3 tonne through Clondalkin village.
- Maintain a clean and well serviced fleet.

12.12 ODOURS

The potential for odour emissions may be minimised by a series of design features, work practices and mitigation measures. Each of these measures is outlined briefly below:

- All waste handling operations to be housed indoor.
- Use of roller shutter doors to minimise exposure to outside environment.
- Site layout should be designed to ensure any outdoor operations are as far as possible from the nearest sensitive receptors.
- Regular cleaning of all work surfaces and floors.
- Residence time for waste, including non-odorous should be kept to a minimum before transfer.
- Employment of a suitable masking agent/deodorant system.

As all waste process operations will be carried out indoors and given that the nearest sensitive receptor identified approximately 500m away from the site it is not anticipated that there will be a significant impact as a result of fugitive odour emissions.

12.13 HEALTH & SAFETY

Health and safety issues will be covered by the Health and Safety plan for the proposed development.

12.14 RESIDUAL IMPACTS

No residual impacts on socio-economic functioning are anticipated once all suggested mitigation measures are put in place.

References

USEPA (2002) Waste transfer Stations: A manual for decision-making .

EPA (1995) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.

EPA (2002) Guidelines on Information to be contained in Environmental Impact Statements.

(1998) Waste Management Plan for the Dublin Region.

(1998) South Dublin County Development Plan.

13 ARCHAEOLOGY & CULTURAL HERITAGE

13.1 INTRODUCTION

RPS-MCOS carried out a desktop study of the site and immediate area in May 2003. The assessment was also complimented by a site visit and walkover visual inspection in June 2003. The walkover of the site for the proposed Sustainable Resource Recovery Facility sought to inspect areas of cultural heritage potential e.g. water-bodies, land features etc. Consultation took place with Duchas The Heritage Service and the Record of Monuments and Places (RMP) was consulted. Historical maps dating back to the nineteenth century were consulted as well as previous planning files.

13.2 HISTORY OF CLONDALKIN

The parish of Clondalkin is situated on the banks of the River Camac approximately five miles south west of Dublin City Centre. It derives its name from the gaeilge "Cluain Dolcain"-meaning Dolcan's meadow. The village has had a turbulent history as it was burned in 832 AD, 1071 and 1076. A monastic settlement was founded in the 7th Century and a round tower still stands in Clondalkin village which reaches a height of 90ft forming a focal point in the village centre.

13.3 SITE DESCRIPTION

The site of the proposed Sustainable Resource Recovery Facility at Crag Avenue is currently utilised by Crosbie Transcar Limited as a bonded car storage and distribution facility. Almost the entire existing surface of the site is covered in concrete. There are no recorded structures within the boundary of the existing site or on existing adjacent sites.

Figure 13. 1 shows all the recorded sites and monuments in the vicinity of the proposed development. It can be seen that there are no recorded sites and monuments within 3 km of the proposed site at Crag Avenue.

13.4 POTENTIAL IMPACTS

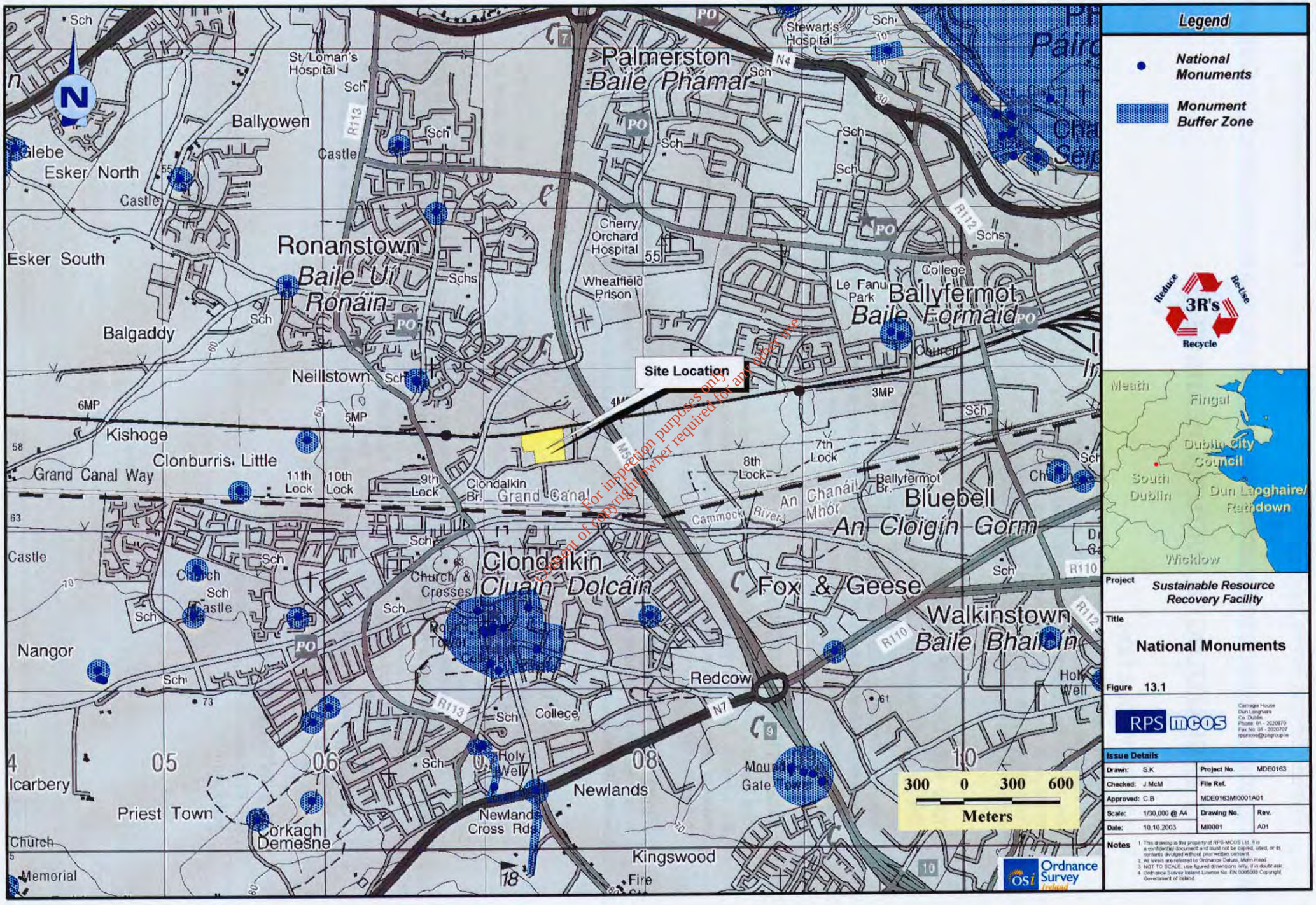
As no recorded items of archaeology or cultural heritage have been recorded on the site or in the immediate vicinity it is not anticipated that any significant impacts will occur during the construction or operation of the proposed development.

Areas that traditionally have archaeology potential such as bogs, drains/streams and larger watercourses are absent from the site of the proposed development.

Given the location and nature of the site, and the fact that very little excavation is envisaged apart from laying of drains and services and in the area of the new waste building, it is not envisaged that the proposed development will impact on items of historical, archaeological or architectural significance or interest.

13.5 MITIGATION MEASURES

No mitigation measures are required during the construction and operation of the proposed development.



Legend

- National Monuments
- Monument Buffer Zone

3R's: Reduce, Re-Use, Recycle

Project	Sustainable Resource Recovery Facility
Title	National Monuments
Figure	13.1

RPS mcos

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Issue Details			
Drawn:	S.K	Project No.	MDE0163
Checked:	J.McM	File Ref.	
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Notes
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14 NATURAL RESOURCES

14.1 INTRODUCTION

This section of the EIS deals with the impact of the proposed development on Natural Resources. Natural Resources includes excavatable materials as well as considering energy requirements for the new development.

14.2 ENERGY USAGE

It is estimated that between 650-750 kilowatts of electricity will be required to provide energy for the new facility when fully operational. This requirement will be somewhat reduced by the fact that some "eco-friendly" design elements are included with the new development, including a small wind turbine and solar panels on the windows of the office building. The main recovery building also incorporated flow lighting through roof panels and panels on the northern elevation.

14.3 WATER DEMAND AND USAGE

14.3.1 Demand

There is an existing 150mm diameter water main on Cragg Avenue from where the existing site obtains its water supply.

Expected demand was computed based on the following:-

- 30 employees with a per capita consumption of 150l/h/d
- Truck washing – 15m³/d (assuming no rainwater)
- Miscellaneous usage – 15m³/d

It is estimated that daily demand will be between 35m^3 and 45m^3 of water per day.

This main will satisfy the recommendations in BS 5598 (capable of supplying 1500 l/min). Calculations were carried out to check that there would be sufficient pressure at the highest proposed hydrant location, assuming normal mains pressure.

14.3.2 Rainwater Collection and Reuse

It is proposed to collect and reuse roof runoff from the proposed MRF facility as well as from the workshop/truck washing bay. It is proposed that this water will be filtered using inline downpipe filters. The water will then be drained to an underground tank. Water would be distributed to the truck wash and to tappings in the MRF. The water would be further filtered on the pump intake. The outlet for rainwater will be clearly labelled as "non-potable" and used for washing and for road sweepers etc.

Should the level of the tank drop below the daily demand it would be topped up by a connection to the water main. During long periods of rainfall excess water will be spilled to the surface water network. It is estimated that the rainwater system will cater for approximately 50% of all washing needs outside of prolonged dry spells.

The proposed use of this rainwater is for truck washing and cleaning only and the pipework and tappings will be marked as such.

14.4 EXCAVATABALE MATERIALS

The current site is overlain with a layer of concrete that will be excavated and removed during the construction of the new buildings and services.

The floor level of the main recovery building has been chosen to minimise the generation of spoil and requirement of import of stone. It is not anticipated that there will be any significant deep excavations associated with the installation of new services and the upgrading and retention of existing services (water pipes, drainage etc.) with the exception of the oil-water interceptor and the rainwater tank.

Any excavated materials removed during the construction of the main recovery and recycling building will be retained and reused on site as far as possible. Additional materials will be sent to an authorised Construction and Demolition waste recovery facility.

It is not anticipated that any blasting of ground material will be required during the construction phase.

14.5 RESIDUAL IMPACTS

As a result of the design features listed above and given the anticipated energy consumption requirements, it is not expected that the proposed development will have a significant negative impact on natural resources.

The recovery and recycling of materials and subsequent diversion from landfill compensates for the consumption of energy for processing, lighting and heating purposes.

15 OTHER IMPACTS AND INTERACTIONS

15.1 INTRODUCTION

In addition to the assessment of impacts on human beings, flora, fauna, soils, the landscape, water quality, air quality, climate, material assets, including architecture, archaeology and cultural heritage, the inter-relationship between these factors was also taken into account as part of the scoping and assessment process. Where the potential exists for interaction between two or more environmental topics the relevant specialists have taken the potential interactions into account when making their assessment.

Table 15.1 below shows a matrix of significant interactions likely to occur as a result of the proposed Sustainable Materials Resource Recovery Facility at Crag Avenue. The level of interaction likely between the various topics will greatly vary but the table allows the interactions to be recognised and further developed where necessary.

15.2 SIGNIFICANCE OF PREDICTED IMPACTS

Table 15.2 summarises the environmental impacts, outlines measures that will be used in their amelioration and highlights the significance of residual effects i.e. the impact remaining after mitigation. The structure used fro assessing the significance of effects of the development is based on specialist sub-consultants reports and the following criterion taken from the EPA "*Draft Guidelines on the information to be contained in Environmental Impact Statements*" (EPA 2002).

Table 15.1: EPA Classification Criteria

Impact	Description
Negative	A change which reduces the quality of the environment
Positive	A change which improves the quality of the environment
Neutral	A change which does not affect the quality of the environment
Temporary	Impact lasting for one year or less
Short-term	Impact lasting one to seven years
Medium-term	Impact lasting seven to fifteen years
Long-term	Impact lasting fifteen to sixty years
Permanent	Impact lasting over sixty years
Slight	An impact which causes changes in the character of the environment which are not significant or profound
Significant	An impact which by its magnitude, duration or intensity alters an important aspect of the environment

Table 15.2: Summary of Potential Environmental Effects

	CATEGORY	POTENTIAL ENVIRONMENTAL ISSUES/EFFECTS	POTENTIAL IMPACT	DURATION	MITIGATION	RESIDUAL IMPACT
NATURAL ENVIRONMENT	TERRESTRIAL					
	Noise & Vibration	Site construction activities	Negative	Short term	Regular monitoring Restriction on working hours Use of plant with inherent potential for generation of noise and/or vibration Sitting of noisy/vibratory plant as far away from sensitive properties as permitted by site constraints All processing operations to be carried out indoors.	Slight
		Operational activities			Regular noise monitoring	
	Air Quality	Dust & Aerosol emissions	Negative	Medium / long term	Regular cleaning & maintenance of site roads Regular watering of dry/dusty roads Speed restrictions Employment of a dust minimisation plan Recommendation that an ambient dust deposition survey be carried out on site during construction, should dust become an environmental nuisance. Regular monitoring	Slight
	Flora & Fauna	Contamination of watercourses/ Loss of habitat	Negative	Short-term	Installation of oil interceptor Collection of rainwater Immediate collection of any on-site spillages	Slight
		Increase in opportunistic species of flora & fauna	Negative	Short-term	Vermin control, Bird control, and Weed Spraying	No impact
		Overall ecological value of site	Positive	Short-term		Slight

	CATEGORY	POTENTIAL ENVIRONMENTAL ISSUES/EFFECTS	POTENTIAL IMPACT	DURATION	MITIGATION	RESIDUAL IMPACT
	Freshwater/ Groundwater	Risk of Contamination	Negative	Short-term	Handling of any wet waste on impermeable surfaces only Using suitable impermeable backfilling material only Good vehicle fleet management Install oil interceptor for surface water drainage	Slight
	LANDSCAPE	Visual Impact on local Community	Positive	Short-term	Suitable Planting Measures / site landscape master plan	Slight
	ARCHAEOLOGY/ CULTURAL HERITAGE	Disturbance of Archaeological Finds	Negative	Long-term	Archaeologist to supervise excavation if required.	No impact
	CLIMATE	Contribution of greenhouse gases	Negative	Long-term	Fast acting door system	No Impact
HUMAN BEINGS	COMMUNITY	Fire Hazards	Negative	Short term	Inspection of all materials	No impact
		Spread of Litter	Negative	Short term	Covering of vehicles with suitable covers Processing of materials carried out indoors High compacting of materials Daily cleaning of working area Establishment of stable high boundary fence on the perimeter of the site	
		Scavenging birds	Negative	Short term	The working area will be indoors and fully covered Regular cleaning and good housekeeping measures to ensure a well kept and clean site	No Impact

	CATEGORY	POTENTIAL ENVIRONMENTAL ISSUES/EFFECTS	POTENTIAL IMPACT	DURATION	MITIGATION	RESIDUAL IMPACT
		Vermin & Pest infection	Negative	Medium term	The working area will be indoors and fully enclosed Regular cleaning of working and tipping areas Good housekeeping practices Daily removal of organic wastes or waste for disposal elsewhere Installing bird deterrent measures Eliminating openings or cracks to prevent entry of pests Hiring a professional pest control specialist if required	No impact
HUMAN BEINGS	**COMMUNITY (Cont)**	Odours	Negative	Medium term	All processing of waste material to be carried out indoors Use of roller shutter doors Considerate site layout design Regular cleaning of work surfaces and floors Minimum residence time for waste material prior to transfer off site Employment of a suitable masking agent/deodorant	No Impact
		The creation of employment Provision of a sustainable resource recovery facility	Positive Positive	Short term	This will have a knock on effect on the service industry of the locality The new facility will benefit the environment generally by diverting materials away from landfill	- -
	TRAFFIC	Increase in traffic	Negative	Medium term	24 hour operation in which drivers will utilise transport network at non peak times	Slight
	ENERGY& NATURAL RESOURCES	Use of electricity /water consumption	Negative	Short term	Use of solar panels, rainwater collection and reuse system and small wind turbine will help reduce the requirement of power and water for the proposed development	Slight

- Indicates impact could not be quantified at this stage

15.3 INTERACTION OF PREDICTED RESIDUAL IMPACTS

Specialist sub-consultants assessed the environmental factors of the development individually. Therefore, it is necessary that the interactions between these environmental factors be considered to ensure that potential interactive affects of the project can be identified.

Interactions are usually very complex. A change to any one of the environmental factors could affect one or all of the other related factors.

The potential interactions between identified socio/environmental issues/effects and the proposed development are assessed to determine potential effects. Table 15.3 below illustrates the direct impacts of the development that may result in relevant interactions between receptors associated with the new facility. A receptor is defined as a factor of the natural or man made environment such as water, air or a plant that is potentially affected by an impact.

Potential interactions identified mainly relate to a reduction in residential quality. Therefore, human beings are the impacted receptor. However, as suitable mitigation measures will eliminated/reduce the possibility of potential effects, the above interactions will be avoided.

As the potential negative interactions between factors associated with the operation of the proposed sustainable resource recovery facility will be mitigated appropriately, it is anticipated the overall new facility will result in a net slight positive impact to the local environment.

Table 15.3: Summary of Potential Interactions

RECEPTOR	POTENTIAL EFFECT	IMPACTED RECEPTOR	POTENTIAL IMPACT
NATURAL ENVIRONMENT			
Water Quality	Contamination of waters	Flora & Fauna	Loss of habitat
		Human Beings	Reduced recreational amenity & residential quality
HUMAN BEINGS			
Flora & Fauna	Improvement in ecological value of the site once fully landscaped		
Community		Human Beings	Positive financial impact on local economy due to creation of employment and knock on effects on the services industry
Traffic	Increase in traffic	Human Beings	Reduced recreational amenity & residential quality
Air	Increase in dust/ aerosol/odour emissions	Human Beings	Reduced recreational amenity & residential quality
Noise	Increase in noise	Human Beings	Reduced recreational amenity & residential quality
Tourism	N/A		
Material Assets	N/A		

16 CONCLUSION

This EIS has examined in detail the impacts, both positive and negative, that the proposed new facility will have on the environment. A number of potential impacts on both the natural and socio-economic environments have been identified and where necessary suitable mitigation measures to reduce negative impacts have been recommended.

The principal conclusions and recommendations presented within this Environmental Impact Statement for the proposed development are summarised below.

Community Effects

The careful design and proper management of the facility and the implementation of suitable mitigation measures to control vermin, odours, litter, etc. will greatly reduce the level of concern for the population in the surrounding area of the development.

It is anticipated that the new development will give rise to the creation of additional jobs in the area, both during its construction stage and when operational. These are likely to include technical, administrative and non-skilled workers.

Traffic

It is clear from the analysis that the proposed Sustainable Resource Recovery Facility can be introduced into the area will little disruption to the existing levels of traffic. It will replace the car distribution business and the number of additional vehicles will not be significant. The vehicles associated with the new facility will typically be much smaller than those associated with the existing car business.

The junction on Crag Avenue and Station Road can accommodate the predicted increase in traffic flows. The 'T' junction between Station Road and Ninth Lock Road experiences capacity problems at present but this cannot be solved in isolation of improvements to the narrow humpback bridge on Newlands Road. A number of major infrastructure projects planned will have a positive impact on traffic movements in the Clondalkin area in the future.

The possibility of introducing a left turn flare at the junction of Cloverhill Road and Coldcut Road can be investigated further by South Dublin County Council in the future in terms of land acquisition and overall feasibility.

Air Quality

The relatively low increase in traffic volumes as a result of the proposed development is not predicated to have any adverse impact on air quality or climate. Once traffic volumes remain low and traffic speed is not significantly altered then it is not anticipated that there will be residual impact. A series of odour mitigation measures both design and operational have been adapted. Coupled with careful site layout and design these will help to ensure that unpleasant odours will not have a significant impact on the local environment.

Noise & Vibration

Baseline monitoring carried out shows a typical background noise environment associated with an industrial estate and associated transportation infrastructure.

The impact of the proposed development on the existing noise environment in the area will be negligible/insignificant once the recommended mitigation measures are in place.

Land-use

Proper management and operational practices in accordance with strict EPA Guidelines will ensure that the proposed development at Crag Avenue in Clondalkin Industrial Estate will have no adverse impact on the surrounding lands.

Water Quality

Mitigation measures during the construction and operational phase of the proposed development will minimise negative impacts to surface water and groundwater. The capture of rainwater for reuse will have a beneficial impact on surface waters as will the installation of an oil interceptor.

Terrestrial Flora & Fauna

Due to the hard standing nature and ecological value of the existing site no special measures are required on ecological grounds. However the implementation of the landscaping and planting recommendations will help improve the ecological value of the site.

Archaeology

No special measures are required on archaeological, architectural or cultural heritage grounds

Landscape

The general landscape character of the area is one of a typical industrial/commercial landscape. The overall layout of the site and sympathetic design of the infrastructure will help minimise any landscape/visual impacts that may arise.

A Landscape Master Plan will provide screening and will help improve the visual appearance of the new facility.

Energy & Natural Resources

The sustainable aspects of the proposed development (e.g. the harnessing of renewable energy, rain water recycling) will have an overall positive environmental impact and may demonstrate the viability of theses systems to other businesses in the future.

16.1 OVERALL CONCLUSION

Having regard to National Waste Policies, the Dublin Waste Management Plan, the South Dublin County Development Plan and the details outlined within this EIS, it can be concluded that the proposal to develop a new state of the art sustainable resource recovery & recycling facility- which will receive 250,000 tonnes/annum of material when fully operational- will not have an adverse impact on the environment.

The future landscaping proposals will lead to a significant improvement on the current industrial appearance of the site. In terms of impacting on the local community, potential effects have been examined and mitigation measures advised to eliminate any potential serious environmental risks. Once regard is had to the EPA's Waste Licence for the proposed facility, negative environmental impacts will be minimised.

The ultimate result of the operation of this proposed development would be the diversion of waste material from landfill, which is no longer a viable and sustainable option, while helping Dublin achieve its recycling targets. It will also lead to the creation of employment in the area which would have beneficial knock-on economic effects for Clondalkin which currently suffers from levels of high unemployment.

Therefore, it is recommended that this development should proceed, provided recommended mitigation measures are implemented.