

18.0 TRANSPORTATION

INTRODUCTION

- 18.1 This traffic impact assessment (TIA) has been completed for a planning application for a new non-hazardous landfill site, with recycling facility at Meenaboll, County Donegal.

Plate 18.1 Existing Site Access



- 18.2 This TIA has been prepared on the basis of both landfill and recycling with the total site covering 5.7 Ha with recycling facilities. For assessment purposes the year of opening of the site is 2005. The site location and preliminary indicative layout are shown in Appendices. The site location is shown in Figure 18.1 and the proposed site layout is shown in Figure 18.2.
- 18.3 The purpose of the TIA will be to provide a statement addressing the effects of the traffic generated by the proposed development. It will be prepared following the approach set out in the Guidelines published by the Institution of Highway & Transportation. These guidelines represent the most up to date standards for assessing traffic flows for different types of development and are used throughout both Ireland and the UK and are used in relation to traffic and transportation.

- 18.4 Recent 2002 traffic surveys, carried out by Kirk McClure Morton, have been used to assess the existing traffic flows on the surrounding road network. Surveys have been conducted at the junction of the R250 and the connecting road which leads to the site access. The R250 has a steady flow throughout the day but is not highly trafficked. Currently this minor road is used by logging trucks and forestry vehicles. Trip rates for the traffic that will be generated by the proposed development have been determined by using different assessment methods, with the higher generator used in our assessment. Firstly we assessed the trip rates generated by DCC Ballynacarrick landfill site; secondly we used the TRICS database which compares the trip rates for a number of landfill sites across the UK and Ireland. Our assessment found that the trip rates generated by the TRICS database for landfill sites with recycling centre was much higher than the trip rate for the Ballynacarrick site, therefore for the purposes of our analysis we have used the trip rates provided by TRICS for the landfill site and recycling centre. The TRICS database 85th percentile will provide a much higher generator than will use the site thus providing a robust assessment of generated traffic.
- 18.5 Computer analysis has been carried out to determine the effects of traffic from the development on the surrounding road network and the results assessed to determine if the existing road network and proposed site access will cater adequately for the additional traffic generated by the proposed development.
- 18.6 The existing site is currently undeveloped. The operational capacity for the proposed site is based on our TRICS analysis for a 5.7 Ha site and a 10 bay recycling centre.

EXISTING CONDITIONS

- 18.7 The existing road leading to the site is currently unused apart from Glenveagh Nation Park logging traffic. The Connecting R250 links traffic from Letterkenny to Fintown and other local towns and villages in north west Donegal. The site will cater for waste arising from west and mid Donegal. Table 18.1 below and Figure 18.3 provide details of the approach routes to the site from the surrounding areas.

Table 18.1 Approaches to the Site

Surrounding Area	Approach Routes Relative to Site
Mid	R250 and Letterkenny
West	R250 and Fintown

Note: The Glenveagh area near the site is sparsely populated. There are no houses on the approach road up to the site.

18.8 Traffic surveys were carried out on the 4 September 2002. The purpose of the classified count was to assess the existing traffic conditions on the surrounding road network. Surveys are detailed in the Appendices and broadly highlight that the through traffic in relation to the site is minimal. A notable proportion of the existing total traffic are HGV's. In general traffic flow at the priority junction to the south of the site was low throughout the period of assessment.

18.9 The classified count for the site at Meenaboll was conducted from 08.45 to 16.00 on a typical weekday. Analysis of the data highlighted a peak period between 12.45 am and 13.45 am.

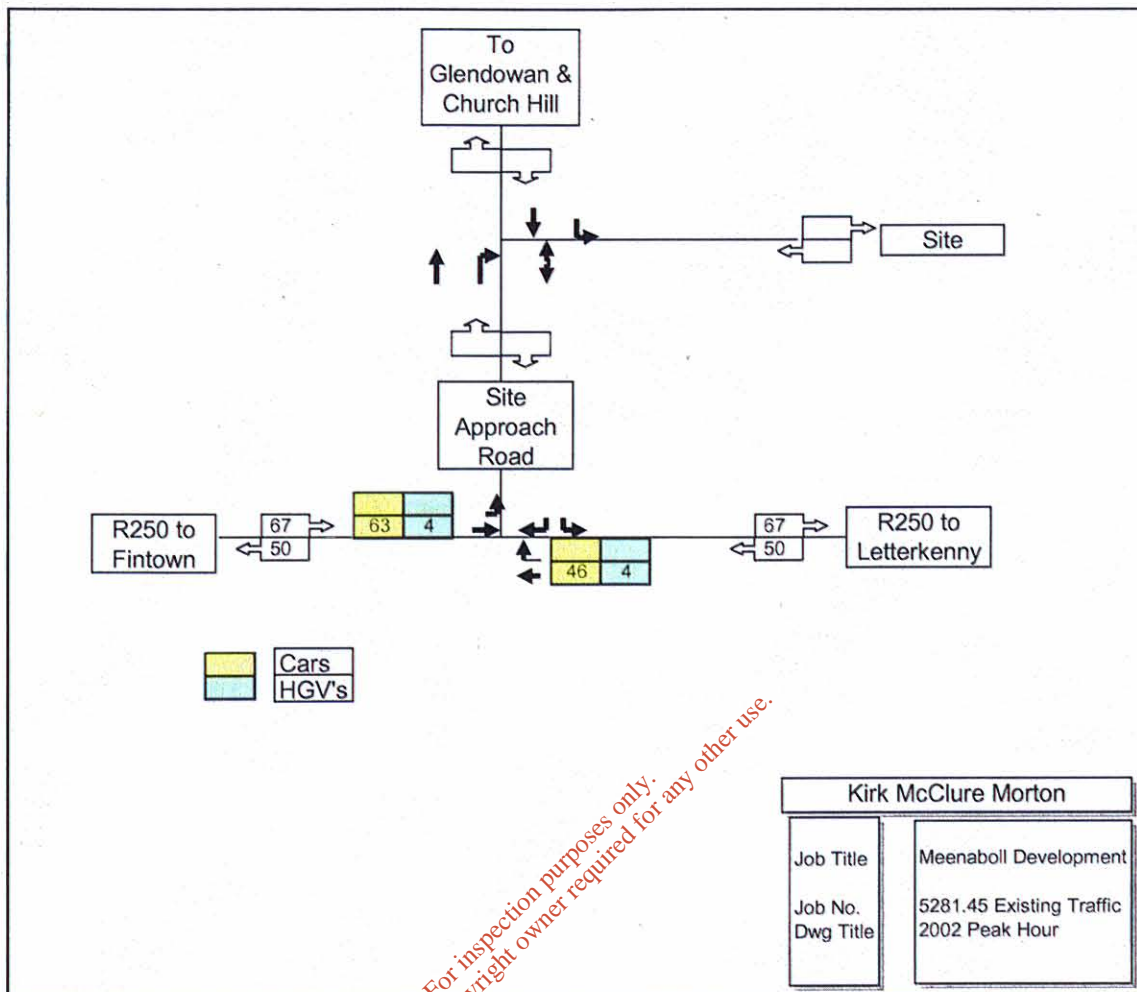
18.10 Table 18.2 and Figure 18.4 details HGV and other vehicle movement (including cars, vans, and single axle vehicles) to and from the site during the peak period. A high percentage of approaches to the site come from the north with a smaller proportion of traffic approaching the site from the west.

Table 18.2 Vehicle Movement at Site Approaches

	ARRIVALS		Total	DEPARTURES		Total
	HGV	Other		HGV	Other	
Daily flow past Site access	1	3	4	1	0	1
Peak Hour Flow past Site access	0	0	0	0	0	0

18.11 The 2002 existing traffic figures will be increased by 3.4% to give an estimate of the existing traffic for the year 2004, and by 20.6% to give an estimate of the existing traffic for the year 2014, assuming central traffic growth. Diagrams in the Appendices illustrate the extent of the existing traffic information for the area.

Figure 18.3 Traffic Breakdown During Peak Hour (12:45-13:45)



18.12 Given the remote site location and the low flows on the rural road network we have deemed that traffic generation using lower growth figures in relation to other sites in larger populated areas an appropriate and realistic traffic assessment in relation to the area.

PROPOSED DEVELOPMENT

18.13 For the purpose of this assessment the proposed development will consist of a 5.7 Ha area. The waste will, similarly to the existing Ballynacarrick site, be landfill material and there will also be a recycling point at the entrance to the new site.

- 18.14 It is anticipated that the proposed development will provide a maximum of 24,000 tonne per year to landfill. The exact tonnage per year is based on the existing use of the Ballynacarrick site, Ballintra at capacity. As such the operational traffic to the site should be similar during peak periods. In order to consider the access routes some sensitivity testing has been considered when assessing the traffic capacity of the site access junction, it should be remembered that site traffic will access and depart the site from the R250 Southern approach route. Site traffic is prohibited and will be restricted from travelling directly from or to Glendowan, and site traffic only travels on the site approach road. As a result site traffic travelling through any of the surrounding towns as traffic will be limited and will travel to the site via the approved route only. This is an important consideration to ensure that HGV movements are controlled and that only one route is permissible. Traffic from the west of the County will approach the site through Fintown and onto the R250. The junction connecting these roads is of a high quality with good visibility from the approaches and adequate forward visibility for turning traffic. Our traffic study considered a very robust assessment and it is envisaged that a low number of vehicles will actually pass through Fintown on any given day. Traffic from the westerly approach (through Fintown) will use the R250. Generally, road conditions are good however, narrower stretches of road at bridges between Fintown and the Site should have signage to restrict vehicle speeds to ensure that design speeds for the roads are adhered to and speed is restricted on the R250.
- 18.15 Vehicular access to the development will be achievable using the existing access for right turn in and left turn out vehicles only. This will be controlled by providing a turning radii for left turn vehicles only with a minimal right turn radii and signage. The site access will be resurfaced and the turning radii improved to provide easy access. Along the R250 the speed limits will continue to be greatly restricted as a result of both the general road alignment and the nature of the material carried (to ensure that spillage does not occur on the public highway). The junction at the R250 and county road will be resurfaced and white lined to improve the current access arrangement.

TRAFFIC GENERATION AND DISTRIBUTION

- 18.16 Traffic generation for the landfill has been assessed using a classified count at the existing Ballynacarrick Landfill site. Using this method has provided a realistic comparison between the existing situation and the new site including construction traffic, which we compared with the weighbridge records for that day giving us an accurate picture of actual tonnage per day deposited at the site by HGV vehicles.

18.17 It is estimated that the new Meenaboll Landfill will take 24,000 tonnes per annum. As a sensitivity test we have used traffic figures calculated by the TRICS program to show the impact of the landfill development on the surrounding road network if the site is operating at full capacity. A breakdown of peak hour flow using the more robust traffic figures is provided in Table 18.3, below.

Table 18.3 Existing and Proposed TOTAL Traffic for 2004 Peak Hour (10.45-11.45) based on Traffic Survey

Generation	Peak Arrivals and Departures (1245 : 1345)	
	Arrivals	Departures
Existing Site based on traffic survey	0	0
Generated Traffic (based on TRICS Mean rates)	29	29
Proposed Traffic (based on Ballynacarrick site)	7	7

Table 18.4 Existing and Proposed Traffic based on Traffic Survey, including sensitivity

Generation	Peak Hour Arrivals and Departures (1245 : 1345) Daily Flow Arrivals and Departures (0845-1600)	
	Arrivals	Departures
Existing Peak hour count	0	0
Generated traffic from new development (based on additional 24,000 tonnes) (as Ballynacarrick site)	7	7
Generated Peak Hour SENSITIVITY count (TRICS calculations including recycling)	29	29
Proposed DAILY Traffic used for analysis	29	29

18.18 This data shows peak hour traffic, i.e. HGV, other and construction traffic during the busiest hour of the day at the site in Figure 18.4 as in the Ballynacarrick site. Figure 18.5 shows the peak hour traffic on a given day using the results gained from TRICS assuming the site is operating at full capacity. We have used the much higher figures based on the TRICS results rather than the more realistic existing site counts from Ballynacarrick. The figures show that even when the sensitivity analysis figures are used, at the busiest periods there is a low volume of vehicles at the site. In reality even during the traffic count there was a number of one hour periods when no vehicles passed the site on the R250.

Figure 18.4 Peak Hour TOTAL Traffic 2005 Including HGV, Other, and Construction Traffic based on 24,000 Tonnes Per Annum From Ballynacarrick Count

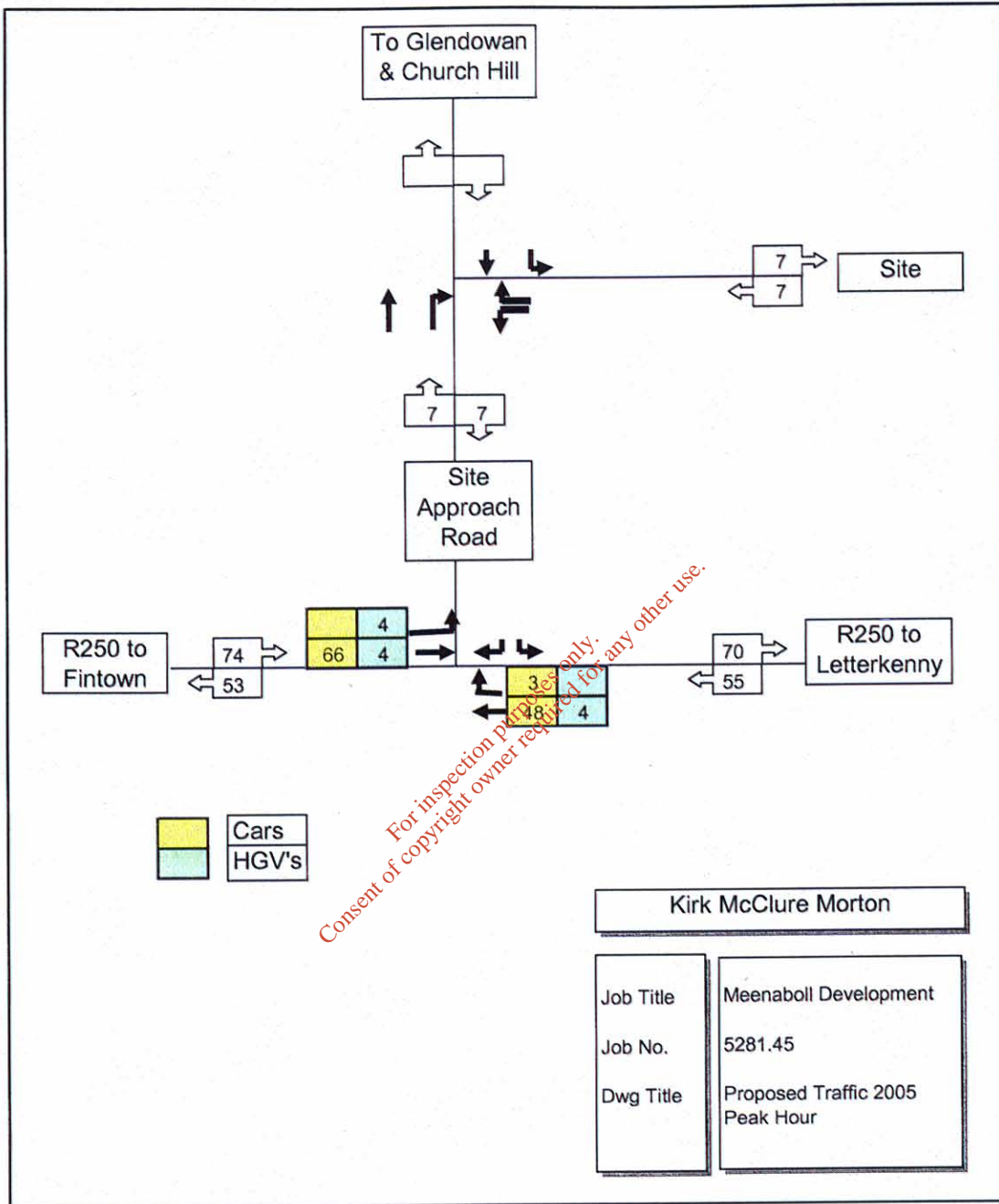


Figure 18.5 Peak Hour TOTAL Traffic 2005 Including HGV, Other, and Construction Traffic based on TRICS results

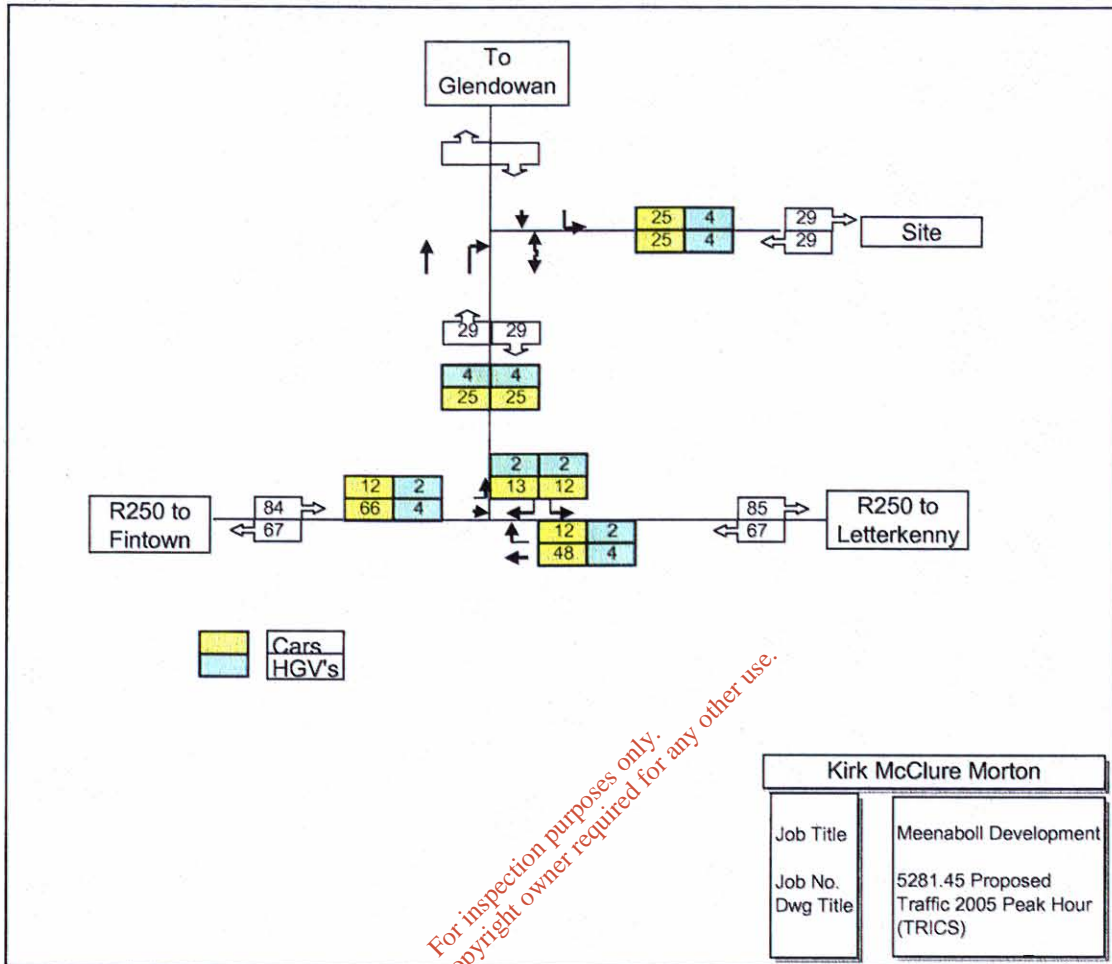
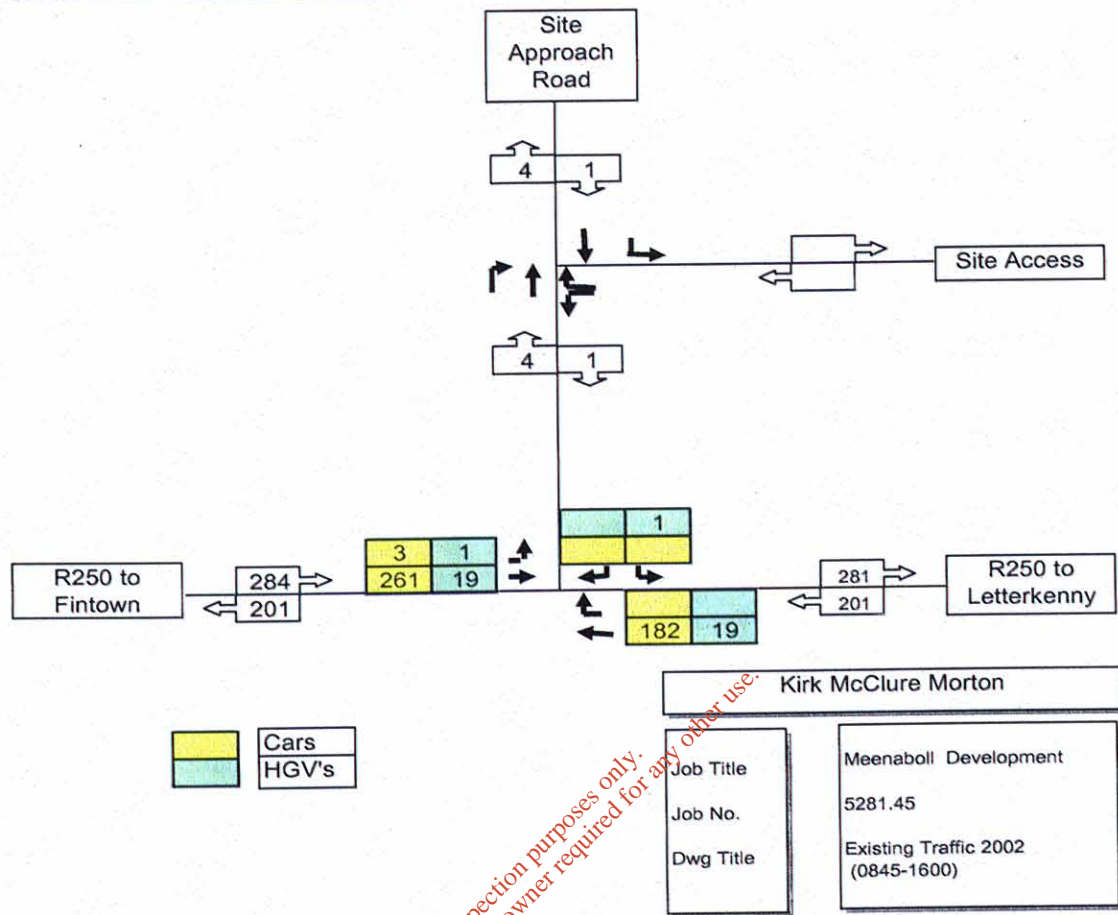


Figure 18.6 Breakdown of All Day Count Data as per Traffic Existing Traffic Count

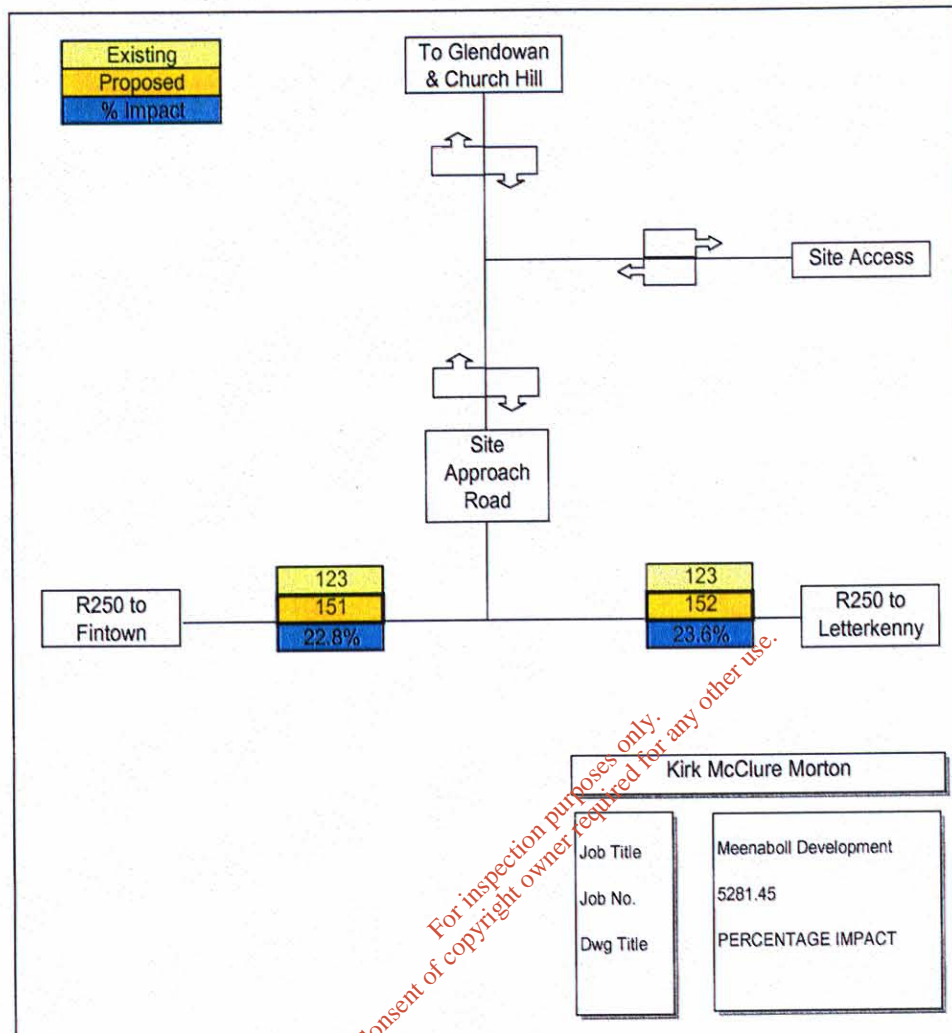


18.19 Figures 18.5 and 18.6 above highlight that based on the robust assessment of existing trips; over the course of a day there will be a change in traffic during the normal working day or peak hour that the road experiences. This will have an impact on the surrounding network. However these figures provide a high sensitivity analysis and include other traffic and construction traffic.

18.20 Peak hour and existing counts for the Ballynacarrick site are shown in Figures 18.3 and 18.4 respectively providing a robust assessment of the traffic entering and leaving the site at the peak hour. By comparing Figure 18.4 based on Ballynacarrick site counts, Figure 18.5 based on the TRICS generated results and Figure 18.6 the all day count breakdown of total existing traffic throughout the day, a complete assessment of generated traffic has been made. It can be seen that during the peak hour the site, including additional traffic and at full capacity, the amount of generated traffic will increase but the overall total traffic flow will remain low.

- 18.21 The Institution of Highways and Transportation (IHT) has published Guidelines for carrying out Traffic Impact Assessments. These Guidelines have been used as a basis for the assessment of the additional traffic.
- 18.22 These Guidelines recommend that a traffic assessment should be produced when one or other of the following thresholds are exceeded:
- Traffic to and from the development exceeds 10% of the existing two-way flow on the adjoining highway.
 - Traffic to and from the development exceeds 5% of the existing two-way flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period, or in other sensitive locations.
- 18.23 This development will have a small impact on the adjoining road network in the year 2005 due to slight increase in vehicles on the existing road network. The movement of vehicles along the minor road may cause minor conflict, with the potential for two vehicles unable to pass on the narrow sections of an unclassified road. We would recommend the introduction of passing bays along the road from the R250 to accommodate two-way traffic and ensure that cars and HGV's can safely pass. In 2015, 10 years after year of opening, there will still a low volume of vehicles using the Meenaboll site; consequently we believe the introduction of passing bays instead of significant road widening would be more appropriate at this location and would provide a significant improvement over the existing site. This is discussed later in this report. Initial resurfacing of the road leading to the site will accommodate larger vehicles.
- 18.24 Existing junctions that exceed the criterion established by IHT guidelines should be assessed 10 years after the proposed development opens. The assumed year of opening has been taken as 2005, as there is an impact we have provided models for 2015 to show that the surrounding junctions of the site operate with capacity. Generally developments are assessed on traffic grounds ten years after a development is opened, on this basis an assessment has been completed in relation to the computer modelling to ensure that the ratio of flow to capacity is below 0.850, or 85th percentile of capacity.
- 18.25 The percentage impact, shown in Figure 18.7 below, compares the impact of the traffic count (24,000 tonnes per annum) with the TRICS Generated traffic counts approved existing yearly tonnage, and shows that there is little to no impact on the surrounding towns. The numbers of vehicles travelling to or from the site from the R250 is relatively low.

Figure 18.7 Percentage Impact between Ballynacarrick Proposed Flow and Flow Generated by TRICS Data



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18.26 In consideration of the impact of the main junctions, detailed analysis was carried out at the site access and the junction directly to the south of the site. The computer program PICADY has been used to analyse the site access priority junction, and the neighbouring priority junction. The software PICADY predicts capacities, queues and delays at traffic junctions. HGV movement on each arm was calculated on the basis of the classified count.

18.27 The results of the analysis for these junctions are summarised in Tables 18.5 and copies of the input and output data for the computer models of the junction are included in the Appendices. Our percentage impact is shown above and appears to be high, however the actual number of vehicles increasing on the road is below 30 in each direction or one every two minutes. The majority of these vehicles will be cars using the recycling centre. It is important to note that these figures reflect the 85th percentile and the mean figures will be more realistic. In actual fact based on the Ballynacarrick site and the locality of the landfill and the recycling centre generated traffic may be lower again.

Table 18.5 Summary of Computer Modelling for the Site Access 2015

Scenario (PICADY)	Movement	Delay (min)	Delay (min/veh)	Max RFC	Max Queue
Existing and proposed Traffic 2015 Based on 24000 Tonnes per annum	B-AC	1.4	0.15	0.019	0
	C-AB	1.4	0.15	0.019	0
Proposed Traffic 2015 With development SENSITIVITY Based on TRICS data	B-AC	4.5	0.11	0.057	0.1
	C-AB	4.4	0.11	0.056	0.1

ARM A – ACCESS ROAD (TO NORTH)
ARM B – SITE ACCESS
ARM C – ACCESS ROAD (TO SOUTH/R250)

18.28 When the Ratio of Flow to Capacity (RFC) exceeds 1.0 the flow arriving at the junction will be greater than the capacity available for a particular movement, hence queuing will become a problem and delays will be imminent.

18.29 Table 18.5 shows the analysis carried out for the proposed site access for the year 2015. This shows that the junction has adequate capacity to deal with the proposed levels of traffic for the year 2015 with a maximum RFC value of 0.057.

18.30 We have increased the existing site traffic figures for Ballynacarrick which accounts for approximately 10,000 tonnes per year by a factor of 2.4 to account for a maximum tonnage accepted at the site of 24,000 tonnes per annum. As a sensitivity measure we have also included the figures derived by TRICS. Based on the analysis of the access the threshold of 0.850 RFC is not reached.

- 18.31 It is our conclusion that the proposed development will not have a significant impact on the surrounding road network.

SAFETY

- 18.32 It is felt that the major element of this traffic impact assessment is not the junction capacity but remedial measures to ensure that the impact of the proposed development does not have a detrimental impact on safety in the vicinity of the site due to the fact there are no local residents on the access road. Care must be taken to ensure that conflict points along the access road to the R250 do not exist. Adequate sightlines for vehicles entering or leaving the site can be provided at the site.
- 18.33 At the junction with the R250 there is not a safety or sightline issue as you can see from Plate 18.2 and Plate 18.3. When approaching the site the adjoining roads are narrow, reducing vehicle speeds. These vehicles may be landfill HGV's or timber Lorries or other agricultural vehicles. Due to existing use of HGV's on these roads remedial actions should be taken to ensure that the good safety record of HGV's and other traffic within the vicinity of the site is maintained.
- 18.34 The low traffic volume does not warrant a significant road-widening scheme; instead the introduction of passing bays at various points along the road should be introduced to ensure that there continues to be a good safety record. These passing bays can be agreed in consultation with DCC.
- 18.35 Natural lay-by sites have been identified along the access road, these are easily achievable lay-by's that could be incorporated in the localised widening.
- 18.36 As the site is located in such a remote location it may also be important to take into account how weather conditions will affect road conditions. This may mean that the road maybe effected by ice at certain times of the year. Donegal County Council may have to look into protecting the road surface. This is especially important where HGV's and other large vehicles use the route. Once resurfaced this road will need to be gritted during icy periods to ensure the safety of all vehicles using the road.

18.37 Other remedial safety measures identified during the survey period include upgrading of the poor road quality in various parts of the main route between the site and the R250. The junction between the access road and R250 has excellent visibility in both directions. As part of improvements in the area pertaining to this scheme, the site access road from the R250 will be levelled and resurfaced to improve the access arrangement in relation to safety. The access is wide enough for two vehicles to pass safely. White lining will better demarcate the access arrangement ensuring that conflict will not occur for vehicles entering and leaving the access road from the R250.

Plate 18.2 Access Road to Main Road (R250)



Plate 18.3 Junction onto R250



- 18.38 A stone wall will be used to define the boundary line at the entrance to the site; this ensures that adequate sightline requirements for vehicles entering and leaving the site are maintained. As vehicles approach the site departing vehicles are clearly visible.
- 18.39 In addition to passing bays other options proposed include signage on the R250. This signage should warn vehicles that HGV's operate in the area and signage directing traffic to the landfill and recycling centre. Vehicles travel at a lower speed on these roads due to the number of bends and the width of the road, this naturally slowing traffic on the approach roads to the site, reducing the overall potential conflict on the roads surrounding the site.
- 18.40 It is the conclusion of this report that the traffic generation of the proposal will not have a significant impact on safety of existing roads. However, safety can always be improved by implementation of remedial measures such as those described above.

INTERNAL LAYOUT AND CAR PARKING

- 18.41 The internal layout has can be seen in the Appendices.

18.42 The infrastructure at the site will include a wheel wash to ensure that debris from vehicles is not deposited on the public road network. The internal network is sufficient to allow vehicles to turn internally without the need for vehicles to reverse on to the public road or use the one way system to manoeuvre around the site.

OTHER ROAD USERS

18.43 The safety of other road users is of paramount importance when designing the layout of internal roads.

18.44 Within the site boundary there is a separation of car parking, office and site to minimise conflict.

18.45 Presently there are no public transport facilities near the site. The nature of the development and the volume of traffic would suggest that a public transport infrastructure would be neither required nor viable.

18.46 Although the county road would not be recognised as a widely used walking route in the area, during the public consultation the use of the road by locals as a bridal path and walking route was discussed. Hence it is proposed to place appropriate signage on the road to ensure vehicle drivers using the site are aware of this. This issue will be further examined and if there is a need to provide a separate walkway and bridal path for users this will be undertaken.

TRAFFIC SUMMARY

18.47 Traffic generations from the proposed development of Meenaboll Landfill have been calculated by counting and analysing the daily flow of existing traffic at Ballynacarrick Landfill, including development traffic to the site to predict peak hour traffic flows. This has included a classified traffic count at the existing access and the adjacent priority junction to the south of the site access. Comparisons have been made with these traffic flows and generated figures from the TRICS program. Existing flows at the R250 at Meenaboll have been used to assign the traffic generation onto the existing road network. The existing traffic volume approaching the site is low.

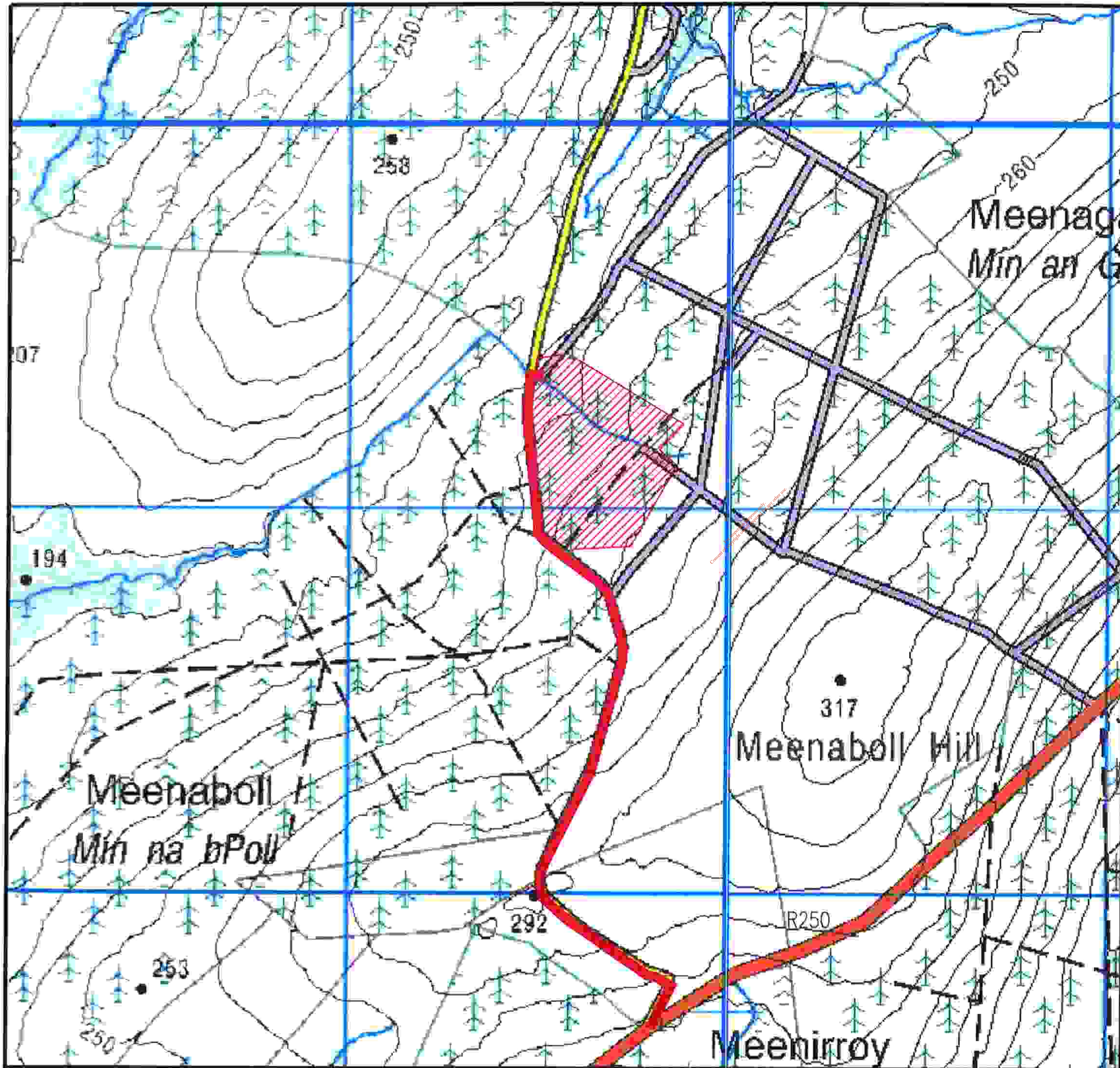
18.48 The projected development traffic has been added to the existing traffic on the surrounding road network. The existing traffic has been increased for future traffic growth using NRTF central growth rates. There will be new traffic generated from the development.

18.49 There will be a slight increase in traffic on all the links, but it is believed that the new site will more likely generate the TRICS mean or lower traffic based on the locality.

- 18.50 The traffic counts included for the Ballynacarrick site included both site traffic and construction traffic, this traffic was factored to provide a robust assessment of 24,000 tonnes of waste per annum. We also used the TRICS database which compares the trip rates for a number of landfill sites across the UK and Ireland. We found that the trip rates generated by the TRICS database was much higher than the Ballynacarrick count, therefore for the purposes of our analysis we have used the trip rates provided by TRICS for the landfill site and recycling centre.
- 18.51 Computer software has been used to carry out an assessment of the adjacent junctions. This analysis shows that the existing road network could adequately deal with the proposed traffic flows to and from the development site if the landfill and recycling centre is fully operational.
- 18.52 Safety is the major issue when considering the proposal. Narrow roads and large HGV's make the need to improve road safety a priority. The proposal includes resurfacing access roads and generally improving road conditions. We would suggest that lay-bys could also be provided along the access roads at identified points to ensure there is no conflict between vehicles entering and leaving the site.
- 18.53 The landfill site will provide a valuable service for much of Mid and West Donegal. The recycling centre will provide a recycling facility for the local community, a service that otherwise would not exist.
- 18.54 Overall we conclude that the impact of the traffic to and from the site will not have a significant impact on the surrounding road network, and with minor improvements, there will be no net detriment on the surrounding road network as a result of this proposal.

FIGURES

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KEY



SITE AREA



NOISE MONITORING POINT AND REFERENCE

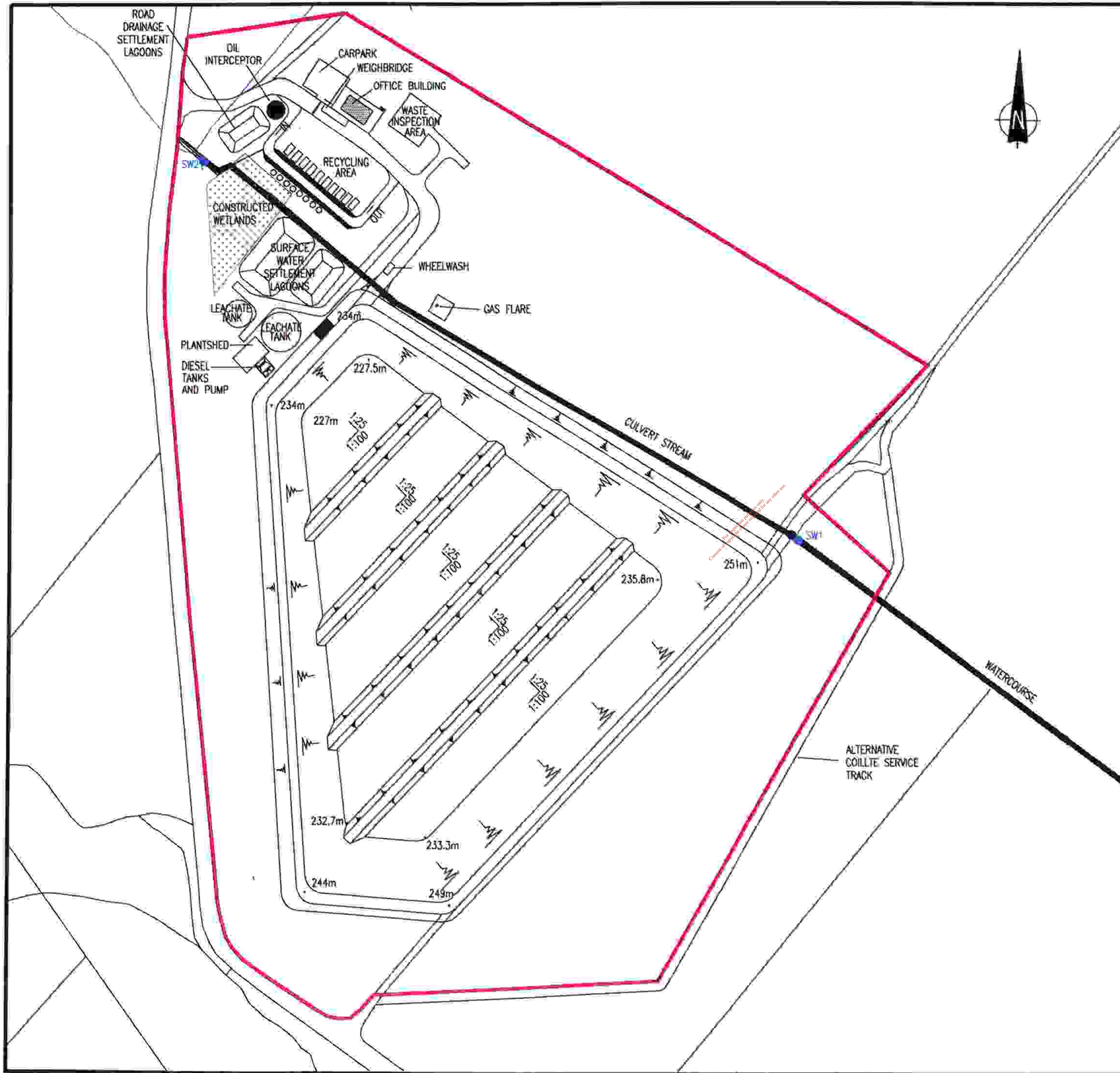
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 SCALE: 1:10,000



PROJECT
 MEENABOLL LANDFILL PROJECT

TITLE
 SITE LOCATION AND
 VEHICLE APPROACH ROUTE

FIGURE
 18.1



KEY
 GENERATOR

SCALE: 1:2000



PROJECT
 MEENABOLL LANDFILL PROJECT

TITLE
 GENERAL LAYOUT

FIGURE
 18.2

19.0 INTERACTIONS

INTRODUCTION

19.1 This Section encompasses a discussion of the interactions of various environmental issues for the proposed landfill facility at Meenaboll, Co. Donegal. This is in fulfilment of the requirements of the European Communities Environmental Impact Assessment (Amendments) Regulations, 1998. The legislation sets a requirement that an environmental impact assessment must provide a satisfactory description of the impacts of proposed developments and the likely effects on the interaction between:

- Human beings
- Flora
- Fauna
- Soils
- Water
- Air
- Climate
- Landscape
- Material Assets
- Noise

19.2 The location of these interactions in the text has been summarised in Table 19.1 and a description of each interaction provided below. For each of the interactions, it is a necessary requirement that the mitigation, avoidance and remediation measures are documented and their location in the text identified.

Table 19.1 Potential Interactions between media at Meenaboll Landfill Site and their location within the text of the EIS Document

	Human Beings	Flora	Fauna	Soil	Water	Air	Climate	Landscape	Material Assets	Cultural Heritage	Noise
Human Beings											
Flora	None										
Fauna	10.144/10.146	10.145									
Soil	None	None	None								
Water	12.9,13.40/41	12.36/12.38	12.36/12.38	12.36/12.38							
Air	9.47	None	None	None	None						
Climate	None	None	None	None	None	None					
Landscape	15.38/15.51,15.71	15.68/15.69 15.71	None	15.69	None	None	None				
Material Assets	14.19-14.32 14.34-14.75	None	None	None	None	None	None	15.38/15.51			
Noise	17.8-17.52	None	17.67/17.68	None	None	None	None	None	None	None	

HUMAN BEINGS AND FAUNA

- 19.3 The nature of impacts on birds and other fauna that may result from the proposed development, are habitat loss, habitat severance, habitat deterioration, disturbance during the construction phase, disturbance during the operational phase, physical hazards of fencing and netting, and changes to the ecological balance of the area. Measures to mitigate these adverse effects are highlighted in Section 10.

HUMAN BEINGS AND WATER

- 19.4 The surface water supply is not used for any potable sources and so the potential impacts are considered to be negligible. Groundwater abstraction wells are not within the sub catchment of the landfill site.

HUMAN BEINGS AND AIR

- 19.5 The proposed landfill site is located in a rural area therefore no long term sensitive receptors were identified in close proximity of the site.

HUMAN BEINGS AND LANDSCAPE

- 19.6 The visual amenity of the site will be affected during the site development and operation. It is proposed however that this will take approximately 20 years and the site will be returned to its original state following filling. The visual impacts likely to occur during the development and filling phase of the landfill are outlined in Section 15. The mitigation measures, avoidance and remediation measures are also described in Section 15.

HUMAN BEINGS AND MATERIAL ASSETS

19.7 During the development and operation of the facility, there will be some impact on the material assets. The proposed development will not adversely impact on the established tourism centres of Glenveagh National Park, Letterkenny or Fintown. It will not impact on the angling tourism of rivers and lakes in the general area such as Owenwee River, Lough Muck or Lough Barra. Indeed the development of the proposed landfill is an important factor in ensuring the required waste management infrastructure is available in Mid and West Donegal to allow the tourism industry to develop.

HUMAN BEINGS AND NOISE

19.8 Potential noise, in the form of road traffic, site preparation and construction traffic as well as potential noise from fixed plant, may have an impact on human beings in the vicinity of the proposed site, however the proposed landfill site is located in a rural area.

19.9 The predicted level of impact from each of these sources has been addressed in Section 17. Remedial or reductive measures for each source have also been addressed within Section 17.

FLORA AND FAUNA

19.10 The impact of the proposed development, in the form of a phased and gradual loss of habitat, will result in displacement of bird species breeding or wintering in the proposed development site area. There will also be a marginal loss of habitat resulting from upgrading of the public road access to the site.

19.11 This effect should not however cause a significant decline in any species in the surrounding countryside. Mitigation measures, designed to reduce these effects are documented in Section 10.

FLORA, SOIL AND WATER

19.12 Removal of flora will increase the exposure of the soil on the entire site and may add to increased suspended solids in the surrounding water body. This process will be exacerbated in periods of heavy rainfall and could have a detrimental effect on the water quality in the vicinity of the proposed development. The potential impacts on water quality and the remediation measures proposed are documented in Section 12.

FLORA AND LANDSCAPE

- 19.13 A period of temporary visual intrusion is envisaged during the construction phase of the development. This will be in the form of a loss of vegetation and grass cover, as recorded in Section 15. The visual intrusion should however be a short term concern as it is planned that the vegetation will increase as progressive site restoration occurs. The mitigation, avoidance and remediation measures, considered as part of the development are documented in Section 15.

FAUNA AND WATER

- 19.14 The most extreme event which could significantly impact upon the quality and quantity of surface water would be a severe rainfall event during the initial site clearance operations. This would generate high suspended solids concentrations in run-off towards the stream. Surface water from these areas will pass through the settlement lagoons and Constructed Wetlands. In addition the stream flow itself will have increased during the event yielding adequate dilution of suspended solids. The mitigation measures are detailed in Section 12.

SOIL AND LANDSCAPE

- 19.15 The development of the landfill site will inevitably lead to the disturbance and/or loss of soil over an area of 4.5 hectares. However, the waterlogged peaty gley soils found over the site are of limited agricultural use, being generally only suitable for rough grazing or coniferous plantation. Therefore the loss of the peaty soils over the area will not be significant in terms of the quality of the land or proportional loss of these types of soils in the area.
- 19.16 This impact is considered to be short term as plans are in place to return the area to its natural state, following filling and closure of the landfill. The measures designed to mitigate and remediate this are described in Sections 11 and 15.
- 19.17 On the basis of the above the construction of the landfill and resultant loss of geological exposures, geomorphic features or soils would not represent a significant environmental impact.

LANDSCAPE AND MATERIAL ASSETS

- 19.18 A change of land use, from forestry will have an impact on potential revenue and economic value of the site. This is also expected to be short term however and will be mitigated on filling and closure of the landfill site. These measures are documented in Section 15.

20.0 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Assessment	Impacts	Mitigation Measures
<p>AIR AND CLIMATE</p>	<ul style="list-style-type: none"> ▪ Generation of landfill gas ▪ Gas Flare Emissions ▪ Traffic Fumes Emissions ▪ Dust Deposition ▪ Odour 	<ul style="list-style-type: none"> ▪ Landfill gas to be collected and vented to atmosphere or flared. Monitoring boreholes to assess efficiency on site gas management. Gas monitoring after closure. ▪ Careful consideration to flare location to ensure it is not allowed to pass directly to human habitation under prevailing wind conditions. Consideration to be given to flare stack and combustion process to moderate dispersions. ▪ No significant impact on the surrounding air quality. Expected to decrease with improvements in engine efficiency and enforcement vehicle emission standards. ▪ Limiting generation by careful choice daily cover, damping down materials in dry weather, landfilling within cells, disposal and immediate burial dusty wastes and providing well designed access road. ▪ Controlled by good working practise - rapid deposition and covering malodorous wastes, effective compaction and covering, installation permanent capping system and flaring landfill gas.
<p>FLORA AND FAUNA</p>	<ul style="list-style-type: none"> ▪ Phased loss habitat to an area of approximately 10ha. This will result in the displacement of bird species breeding or wintering in the proposed development area. ▪ Species outside the of the main impact zone of the proposed development may possibly be exposed and sensitive to combined direct or indirect effects including visual and aural disturbances and a possible increase in scavenger species such as gulls corvids and foxes. 	<ul style="list-style-type: none"> ▪ It is possible that a range of habitat management measures could support and conserve more important and vulnerable species at a favourable conservation status. ▪ Bird-scaring devices in operation when gull numbers are higher or seen to be a nuisance. Avoidance of significant disturbances during the main breeding period. Mitigation of the effects during operation should include all possible controls and preventative measure to limit noise, dust and visual pollution.

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FLORA AND FAUNA	<ul style="list-style-type: none"> ▪ Golden Eagles may be drawn to the area if scavenger such as gulls and corvids are conspicuous. 	<ul style="list-style-type: none"> ▪ Bird-scaring devices in operation when gull numbers are higher or seen to be a nuisance.
GEOLOGY AND SOILS	<ul style="list-style-type: none"> ▪ Potential to destroy features geological interest. ▪ Disturbance and loss soils. 	<ul style="list-style-type: none"> ▪ The site would not be considered one of special interest with respect to its bedrock geology and Quaternary geology. ▪ The development of the landfill site will inevitably lead to the disturbance and/or loss of soil over an area of 4.5 hectares. However, the waterlogged peaty gley soils found over the site are of limited agricultural use, being generally only suitable for rough grazing or coniferous plantation. Therefore the loss of the peaty soils over the area will not be significant in terms of the quality of the land or proportional loss of these types of soils in the area.
HYDROLOGY	<ul style="list-style-type: none"> ▪ Potential escape of leachate to local watercourses. ▪ Increase in suspended solids as a result of exposure on the site. 	<ul style="list-style-type: none"> ▪ The proposed site will be developed on a containment basis. A leachate collection system will be installed. ▪ It is proposed that surface settlement water lagoons will be constructed plus a constructed wetland for surface water arising on the site prior to discharge to local water course. The Sruhanpollandoo will be converted through the site to prevent the possibility of sediment entering the stream.

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HYDROGEOLOGY	<ul style="list-style-type: none"> ▪ Poor bedrock aquifer that is generally considered unproductive. ▪ Environmental pollution with respect to surface and groundwater. 	<ul style="list-style-type: none"> ▪ Site classified as acceptable for development subject to guidance in EPA Landfill Design Manual. Phased development as fully engineered containment landfill facility with a range of leachate collection and management systems designed to minimise leakage and mitigate groundwater impacts. ▪ On basis above, proposed development satisfies requirements Section 40 (4) b of Waste Management Act, 1996.
HUMAN BEINGS	<ul style="list-style-type: none"> ▪ Increase in employment during the construction phase. ▪ Decrease in tourist numbers. ▪ Effects of additional vehicle movements on road safety and air quality. ▪ Change in character of the area. 	<ul style="list-style-type: none"> ▪ To be sourced from the local community where possible. ▪ Will not adversely impact on the established tourism centres Glenveagh Park, Letterkenny or Fintown. Effective screening for the operations through a combination of topography and vegetation.. ▪ The County road which will provide access to the site from the R25 will be improved and will incorporate lay-bys. Site to be operated to EU standard - will reduce risk to air quality. ▪ Character changes will be limited in time and long term significant effects are not expected.
LANDSCAPE AND VISUAL	<ul style="list-style-type: none"> ▪ Changes in landscape character. ▪ Intrusion on views of the area. ▪ Visual impact from site construction traffic and infilling works. 	<ul style="list-style-type: none"> ▪ Effective screening measures and progressive restoration would be the most effective means of limiting visual intrusion. ▪ Will be difficult to screen development from every location, especially higher ground. Planting works around the site will help ameliorate impact of the development. ▪ Construction to be completed relatively quickly with phased infilling programme lasting 20 years.

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MATERIAL ASSETS	<ul style="list-style-type: none"> ▪ Due to the size of the proposed development on the subject site, deep extensive machine excavation is required. This would have negative impact on any archaeological features and deposits that may survive in the area. 	<ul style="list-style-type: none"> ▪ Recommended that all groundworks be monitored by an archaeologist under licence to the Heritage Service, with provision made for full recording and excavation of any exposed archaeological features or deposits. Measures will function as monitoring system to allow further assessment of scale of predicted impacts and effectiveness of mitigation.
NOISE	<ul style="list-style-type: none"> ▪ Potential impacts from landfill operation (dumping, spreading and compacting of refuse and fixed plant items such as electrical generators, leachate treatment system and gas flare system. ▪ Potential impact from vehicle noise. ▪ Potential impact from construction noise (from preparation and restoration of the site including phased lining/levelling). 	<ul style="list-style-type: none"> ▪ Activity assessed as being within target levels. ▪ It is predicted that the potential noise impact from 'worst case' HGV movement on the site road will be significantly below the daytime target noise level. ▪ BS5228 includes a number of guidelines and recommendations, which are considered appropriate of good working practice for all construction contracts.
TRANSPORTATION	<ul style="list-style-type: none"> ▪ Safety in the vicinity of the site. ▪ Generation of excess traffic in vicinity of the site. 	<ul style="list-style-type: none"> ▪ The proposal includes resurfacing access roads and generally improving road conditions. Suggestions that lay-bys could also be provided along the access roads at identified points to ensure there is no conflict between vehicles entering and leaving the site. ▪ There will be new traffic generated from the development. Computer software analysis shows that the existing road network could adequately deal with the proposed traffic flows to and from the development site if the landfill and recycling centre is fully operational.