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REPORT ON

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR A NON-HAZARDOUS LANDFILL NEAR RUSTAVI, GEORGIA (RUSTAVI MUNICIPALITY LANDFILL SITE)

Submitted to:

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EXECUTIVE SUMMARY

INTRODUCTION

The Baku-Tbilisi-Ceyhan Pipeline Company (BTC) commissioned Golder Associates Europe Ltd (Golder) to undertake an Environmental and Social Impact Assessment (ESIA) and design services for a proposed non-hazardous solid waste landfill development near Rustavi, approximately 0.5 km north of the BTC pipeline, in eastern Georgia (the "Project").

The Project will comprise the construction and operation of a new landfill to European Union (EU) standards, for the disposal of non-hazardous solid waste collected from the BTC facilities in Georgia. In addition, BTC has committed to the Government of Georgia (GoG) to complete front end studies (design and ESIA) for a future landfill for the municipalities of Rustavi and Gardabani towns in Georgia. This new municipal landfill ("Rustavi Municipal Landfill") is to be located adjacent to the BTC landfill, located approximately 5 km north east of Rustavi town, and approximately 1 km north west of Akhali Samgori village

This report represents the ESIA for the Rustavi Municipality Landfill Site.

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The ESIA objectives include a review and analysis of existing environmental and social baseline information and other technical documentation in undertaking the design and ESIA for the proposed landfill site, to ensure that it complies with EU and national legislation and best practice.

The ESIA will identify potential environmental and social impacts, including residual and cumulative impacts, from baseline data for the entire life-cycle of the project. The ESIA will be conducted based upon the conceptual design for the landfill. The outcomes of the ESIA will then influence the detailed design of the landfill to ensure that identified negative impacts are appropriately mitigated. Included in the detailed design will be an operating Environmental Management System (EMS) for the landfill, which will be developed incorporating the ESIA mitigations and operational commitments.

BP carried out social, botanical / zoological and archaeological baseline surveys of the Site the results of which were provided to Golder. These were reviewed by Golder with relevant information incorporated into the ESIA, as well as further information being obtained where considered necessary.

Regulatory and Policy Framework

The ESIA is being carried out in accordance with relevant Environmental and Social legislation, standards and policies that are applicable to this Project at the national and EU

levels. The BP and Rustavi Municipality landfills will be designed, built and operated such that they conform with national legislative and regulatory requirements.

Project Description

The Site is located approximately 3.5 km northeast of Rustavi and 1.1 km northwest of the village of Akhali Samgori. The Site is approximately 10 hectares (ha) of land, sufficient for the construction of the BP landfill (Parcel 1 – 2.6 ha) and the future Rustavi Municipality landfill (Parcels 2 and 3 – 7.4 ha). This Site was selected as a result of a Site selection process that took place during 2006 (URS, April 2008, Caspian Region – Georgia Waste Management Site Selection Report). The Site is located approximately 0.5 km north of the BTC/SCP pipeline. The Rustavi Municipality landfill site is surrounded by agricultural land with an access track immediately to the south.

The landfill will be EU Directive compliant. The overall requirements for engineering containment to EU standards requires two basic rules to apply:

- There must be no likelihood of unacceptable discharge/emission over the entire lifecycle of the landfill; and
- There must be structural/physical stability over the entire lifecycle of the landfill.

These basic rules can only be assessed by detailed risk screening and assessments using the site specific data determined by site investigations. A conceptual design has been developed as the basis for the design to be utilised in the ESIA and initial risk assessments. The Conceptual Design would potentially need revision in an iterative process to form an acceptable design.

With regards to the engineering design and operation of the landfill site, The Landfill (England and Wales) Regulations 2002 and subsequent amendments 2004 and 2005 (Landfill Regulations) have been used. These Regulations implement the European Union's Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (Landfill Directive) in the UK.

The Landfill Regulations require specific engineered layers to be included that provide a minimum level of environmental protection as listed below:

- Geological barrier;
- Artificial sealing liner;
- Leachate management – drainage layer and abstraction system; and
- Capping- sealing layer, a surface water drainage system and cover soils as minimum.

The landfill design will also comply with the Guidelines for Design and Operation of Solid Domestic Waste Landfill standard adopted by the Government of Georgia.

Project Schedule

Site investigations have been undertaken at the proposed landfill site, comprising a desk study, a ground investigation and baseline surveys.

The detailed design is being developed to allow the commencement of the construction of the landfill site as soon as practicable following the provision of the construction permit.

The duration of landfill activities is dependent on the waste input. No waste statistics are available for the region of Rustavi and Gardabani. However, it has been that 30,000 tonnes per year of non-hazardous municipal solid waste is produced from the towns of Rustavi, Gardabani and adjacent villages the design life is in the region of 13 years.

Following the final capping of the landfill area the site will be closed and enter the closure and aftercare stage until the completion criteria is achieved. This period may be expected to last up to 50 years.

ESIA Methodology

Environmental and social impacts have been defined and assessed against set criteria. The criteria adopted in this ESIA are similar to those used in the main ESIA for the BTC pipeline (BTC Project ESIA, URS, 2002), as instructed by BP. Each of the potential impacts has been ranked by applying a set of formal criteria which are linked to specific measurable and transparent conditions.

The assessment process consisted of the following main tasks:

- Scoping
- Gathering of baseline data
- Impact Assessment, assessment of cumulative impacts and risk assessment
- Development of mitigation measures and residual impacts
- Environmental and social monitoring plan

Baseline

Environmental and social baseline conditions are established by collecting information on which receptors and biophysical / social resources occupy both the site and surrounding area and so may be affected by the development proposals. Once the baseline conditions have

been established, the impacts of the scheme can be identified and measured and their acceptability assessed in terms of environmental and social effects.

The baseline conditions were established between January and March 2008, through a combination of desk studies, field surveys and consultation with key stakeholders.

Meteorological and Climate

A desk based study and assessment has been undertaken using data available from three metrological station in the vicinity of the proposed Site. From these data it was established that mean air temperature ranges between 0.8°C in January and 25°C in July. Relative humidity in the region surrounding the Site varies between 54% in Augusta and 77% in November/December. As with relative humidity, there is a general increase in the amount of annual precipitation from the east to the west of the country. In the region surrounding the Site, the annual average rainfall is between 382 mm and 448 mm. Lying snow is generally possible between September and December and generally snow melts in March and April. North westerly winds dominate the area with winds blowing from this direction nearly 50% of the time.

Air Quality

A series of air quality studies were undertaken as part of the BTC pipeline ESIA in order to determine baseline air quality in the region. For the pipeline assessment, monitoring was undertaken at five locations besides each pump station along the pipeline route. Data for the two closest stations, known as PSG1 and PSG2, to the BP landfill have been used in this ESIA. These stations were located approximately 18 km SSE and 50 km west of the landfill respectively.

Previously measured gaseous and particulate concentrations were found to comply with EU ambient air quality standards at the sampling locations. In addition, all parameters were found to be less than 75% of the EU standards, therefore not warranting further monitoring for the landfill development.

Soil, Geology and Hydrogeology

The geology and soils of the proposed development were evaluated following a desk study review of existing data. The local ground conditions were investigated during 2007 and between January and March 2008.

The region near Rustavi comprises drift deposits underlain by clays, conglomerates, marls, sandstones, lavas, extrusions and volcanic tuffs of basalts. The soils encountered in the 2007 and 2008 intrusive investigations typically comprised of topsoil, overlying clay, overlying loamy clay, overlying shingle (gravel) beds in places, overlying mudstone.

The proposed Site is located in the Eastern Immersion Zone (basin) of the Adzharia-Trialeti fold system and on the edge of the southern slope of the Caucasas Mountains. Any earthquakes and tremors experienced are expected to be at a low intensity at the Site both during and after the operational life of the site.

Hydrology

There are two catchments that potentially impact the Site; a central and western gully. Bed and bank levels of the gullies were used to estimate the flows in these gullies. There is a northern Gully which flows east to west located approximately 430m north of the Site. It is considered that the only significant channel capable of generating a fluvial flood risk to the Site is the Irrigation Channel to the north of the Site. However due to the difference in elevation of the Irrigation channel and the Site (greater than 6 m), and the extensive area at an elevation below the Site, there is not considered to be an existing risk of fluvial flooding at the Site. Groundwater levels which have been measured in the vicinity of the Site, indicate that there is not significant risk of groundwater flooding at the Site.

Traffic and Infrastructure

The sensitive receptors which may be affected by potential increase of the traffic flow include the residential areas (Akhali Samgori and Rustavi located 1.1km to the south and 3.5km to the west of the Site respectively).

Airports at Vaziani (military) and Tbilisi (civilian) are located 3.5 km to the northwest of the site and 10km to the northwest of the site respectively.

A survey was undertaken to provide baseline data on traffic volumes in the project area and was carried out between February and March, 2008.

Noise

Baseline monitoring was undertaken of ambient noise levels at the nearest residential receptors on a week day and a weekend day. Baseline data showed large variations such that an alternative, conservative approach to assumed baseline noise levels has been adopted using the International Finance Corporation[1] guidelines to overcome this problem.

Landscape and Visual

The nearest receptors are villages at Akhali Samgori, 1.2km to the southeast of the proposed Site. Given the profile of the landscape between the village and the proposed Site (see below for details), the proposed landfill development cannot be viewed from any of the properties in

[1] *International Finance Corporation, April 2007, EHS Guidelines: Noise Management*.

the village. Other potential receptors in the area are travellers utilising the road to Akhali Samgori, approximately 250m to the west of the proposed site and herdsmen travelling across local pasture. A field survey has undertaken to evaluate the landscape and visual amenity of the area at and surrounding the proposed landfill development. The landscape was classified as being not sensitive.

Cultural Heritage

The cultural heritage baseline data collection was undertaken by the client BP. The site data collection phase comprised a literature review, consultation and interpretation of available aerial photographs, a walkover field reconnaissance survey, and monitoring during the geotechnical site investigation works. Three features of interest were identified in the vicinity of the Site; an earthen mound located 80m west of the Site boundary, a classic/medieval road remain located 4km to the southwest of the Site and a medieval settlement remains located 4.5km to the southwest of the Site boundary.

Terrestrial and Aquatic Ecology

An ecological assessment was carried out by BPs contractors to identify any sites of national of international importance to nature conservation. This included a desk study and Site survey of the Site and a 500m buffer zone.

The habitats and species identified during the initial field survey (agricultural land, three common bird species and a single common small mammal species) are considered to be of low nature conservation value. The vegetation is represented by various weeds and segetal plants, which do not have any significant value for nature conservation. This agricultural habitat type could easily be re-created in a short time. The birds species recorded (wood pigeon, Blyth's reed warbler and skylark) are relatively common in Georgia, as is the only mammal species recorded during the initial field survey (social vole). No important habitats or species were identified during the initial field survey (covering the development footprint and surrounding 500 metre buffer zone). The desk study did not identify any known designated areas, either within the development footprint or within 5km of the development footprint, protected for their nature conservation value.

Socio-Economics

The socio-economic baseline survey was conducted by BP. The baseline survey includes information on the general demographic and administrative units that will be affected by the proposed project. The baseline also includes an assessment of infrastructure near the proposed site, including its existing conditions. Akhali Samgori, the closest village to the site, was considered an affected community in the construction and operation of the BTC pipeline based on the proximity of the village to the pipeline during the pipeline ESIA process

(URS, 2002). Therefore, the socio-economic baseline also includes details on BTC's previous interaction with the residents of Akhali Samgori.

Impacts and Mitigations

The impacts of the proposed development were identified and measured and their acceptability assessed in terms of the environmental and social effects. The cumulative impacts of the BP and Rustavi municipality landfill site located immediately adjacent to the Site were additionally assessed.

For the proposed landfill development it is also necessary to include in the assessment how both the baseline conditions and the potential impacts will change with time as the various stages of the landfill development progress, i.e., during the construction, operation, decommissioning and restoration phases.

A summary of impacts requiring mitigation identified during this project for air quality and odour (A), soil, geology and hydrogeology (GEO), hydrology and flood risk (H), terrestrial and aquatic ecology (EC), traffic and infrastructure (T), noise and vibration (NV), waste and wastewater management (W), landscape and visual (LV), archaeology and cultural heritage (ARC) and socio-economics (SE) for the construction, operation and closure/aftercare phases are shown below, along with proposed mitigation and an assessment of residual impacts:

Table ES.1 – Summary of Significant Environmental and Social Impact Assessment for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Phase			Unforeseen Events	Potential Significance	Mitigation Measure	Residual Impact	Significance of Residual Impact
		Construc.	Operation	Closure & aftercare					
Air, Odour and Emissions (A)									
A5	Surface emissions – landfill gas. Scenario 2 no flaring	No	Yes	No	N/A	Medium	Good management practices at the site should also be undertaken to reduce and mitigate the impacts when the flare is non operational. Management could consider the use of a backup flare such that duration of time the site is without any active gas management is minimised. in the main flare and or the extension of the site boundary to limit the approach of people to areas where concentrations may be elevated. Good capping and limiting the operational area will also help to minimise surface emissions	No	N/A
Soil, Geology and Hydrogeology (GEO)									
GEO4	Soil Instability – Landslide (deep seated failure)	Yes	Yes	No	N/A – if appropriate factors of safety are used in deciding slope angles	Medium	All slopes to be designed and constructed using appropriate factors of safety	No	N/A
GEO6	Soil Erosion	Yes	Yes	No	N/A	Medium	Stockpiles seeded and re-vegetated before the winter rain and snow; design of slope of the landfill; staged reclamation	No	N/A
GEO7	Reduced Soil Productivity	Yes	Yes	Yes	N/A	Medium	As GEO6 above; plus analysis of soil samples to determine fertiliser requirements and seed type for reclamation.	No	N/A
GEO9	Sediment Transport to Water Courses	Yes	Yes	Yes	N/A	Medium	As GEO6 above	No	N/A

Table ES.1 – Summary of Significant Environmental and Social Impact Assessment for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Phase			Unforeseen Events	Potential Significance	Mitigation Measure	Residual Impact	Significance of Residual Impact
		Construc.	Operation	Closure & aftercare					
GEO10	Soil contamination resulting from contaminants in stockpiled soil, hydrocarbon spills from vehicles or Site facilities equipment, or other potentially contaminating liquids such as on-Site septic tank wastes, etc.	Yes	Yes	Yes	Yes accidental hydrocarbon or other liquid spills	Medium	Clay landfill liner; re-fuelling in designated areas on hardstanding with available spill kits.	No	N/A
GEO11	Groundwater contamination from contaminants in stockpiled soil, hydrocarbon spills from vehicles or Site facilities equipment, or other potentially contaminating liquids such as on –Site septic tank wastes, etc.	Yes	Yes	Yes	Yes accidental hydrocarbon or other liquid spills	Medium	• Re-fuelling in designated areas on hardstanding with available spill kits • Stockpiles of soil to be located away from irrigation channel or other sensitive areas;	No	N/A
Traffic and Infrastructure (T)									
T2	HGVs impacting on the access track during construction, operation and during decommissioning and closure activities.	Yes	Yes	Yes	N/A	Medium	• Improve/upgrade the access track from the Akhali Samgori road to the proposed landfill site to reduce the deterioration of the road and reduce wear and tear to vehicles using the track and likelihood of accidents • Improve/upgrade the junction where the track meets the road to the west of the Site	Yes	Low
Noise and Vibration (NV)									
NV1	Increased noise levels at residential receptors in Akhali Samgori due to construction operational and decommissioning activities.	Yes	Yes	Yes	N/A	Medium	• Appropriate mitigation measures include: • fitting of effective exhaust silencers • plant will be maintained in efficient working order; • plant will be shut down or throttled to a	Yes	Medium (noise levels will be reduced but remain in this ranking)

Table ES.1 – Summary of Significant Environmental and Social Impact Assessment for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Phase			Unforeseen Events	Potential Significance	Mitigation Measure	Residual Impact	Significance of Residual Impact
		Construc.	Operation	Closure & aftercare					
							minimum when not in use.		
Waste and Wastewater Management (W)									
W6	Excess landfill leachate	No	Yes	Yes	N/A	Medium	Leachate control procedures and emergency clean up equipment to be maintained on site.	No	N/A
W9	Used oils and greases from plant during construction, operation and decommissioning of Site	Yes	Yes	Yes	N/A	Medium	Provide equipment servicing off site when possible. Adequate secondary containment, spillage protection and emergency clean up equipment to be maintained on site.	No	N/A
W10	Wind blown litter	No	Yes	No	N/A	Medium	Cover all deposited waste with soil following placement. No deposition during high winds.	Yes	Low – Some wind blown litter off-site likely to occur, but not to any significant degree.
Landscape and Visual (LV)									
LV1	Impact on landscape and visual amenity	Yes	Yes	Yes	N/A	Medium	Appropriate mitigation measures include: • preservation of existing vegetation and keeping to the boundaries of the project area and access road should be undertaken; • painting auxiliary facilities – offices, pressure washing unit, etc. with colour merging with environment. (recommended colours - light green and straw-colour);	Yes	Low

Table ES.1 – Summary of Significant Environmental and Social Impact Assessment for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Phase			Unforeseen Events	Potential Significance	Mitigation Measure	Residual Impact	Significance of Residual Impact
		Construc.	Operation	Closure & aftercare					
							• planting of greenery along the perimeter of the unit after completion of construction works. Species to be recommended by an ecologist with local knowledge. adequate fire safety measures as fire can cause significant damage resulting in negative impact on visual amenity of the landscape.		

Table ES.2 – General Mitigation Measures for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Mitigation Measure
Air, Odour and Emissions (A)		
A1	Dust emission – on site nuisance	Good management practice at the Site would aim to minimise dust impacts by, for example: • Adequate sheeting of vehicle loads up until tipping point when moving around the Site; • During very dry weather the use of wet methods or mechanical road sweeper on all Site access roads; • Securely cover skips and minimise drop heights, regularly dampen down surfaces with water; • Provision of upturned exhausts for vehicles/mobile plant on-Site; • Use of dust filters on fixed plant and machinery.
A2	Dust emissions – off-site nuisance	Good management practice at the Site would aim to minimise dust impacts by, for example: • Prevention of mud or waste deposition on public highways by use of wheel washes; • Adequate sheeting of vehicle loads when moving off-Site or on the public highway; • During very dry weather the use of wet methods or mechanical road sweeper on all roads; • Securely cover skips and minimise drop heights, regularly dampen down surfaces with water; • Provision of upturned exhausts for vehicles/mobile plant on-Site; • Use of dust filters on fixed plant and machinery.
A3	Surface emissions – landfill gas during operation and closure / aftercare.	Surface emission impacts will be minimised by maintaining a minimal operational area, the application of daily cover to operational areas, capping of waste following deposition, gas management and extraction if appropriate.
A4	Odour impacts from landfilled wastes during operation	Odour impacts should be minimised as per surface emission mitigation (A2 above). Waste delivery vehicles should be covered to avoid unnecessary nuisance during transport and delivery.
A6	Odour impacts from landfilled wastes during operation	• Odour impacts should be minimised as per surface emission mitigation • Waste delivery vehicles should be covered to avoid unnecessary nuisance during transport and delivery
Hydrology and Flood Risk (H)		
H1	Change in surface water runoff regime from the catchment upgradient of the Site during construction, operation and closure / aftercare	Maintaining and increasing gully storage and conveyance in accordance with the specification provided in Section 6.3, and locations provided in Appendix H5 Figure H2.
H2	Increased leachate due to surface water runoff from upgradient of the Site during construction, operation and closure / aftercare	Bunds will be constructed around the Site which will prevent the inflow of surface water runoff. In addition, mitigation can be provided by maintaining and increasing gully storage and conveyance in accordance with the specification provided in Section 6.6, and locations provided in Figure H2.
H3	Increased leachate due to rain falling directly on active waste deposition areas	Leachate management (minimise operational area, maximise temporarily and permanently capped areas)

Table ES.2 – General Mitigation Measures for BTC Non-Hazardous Landfill Site, Georgia

Item No.	Impact	Mitigation Measure
	within the landfill excavation during operation	
H4	Surface water contamination - Change in physical, chemical, and biological quality during operation, construction and closure / aftercare	Drainage design, use clean site soils as capping soils; stabilisation of stockpiled soil by re-seeding and re-vegetation.
Traffic and Infrastructure (T)		
T3	Increase in risk to air traffic safety as a result of increased bird activity being attracted to the proposed landfill site during operation and closure / aftercare	Development and implementation of a landfill bird hazard management plan to include: Design of the landfill site, including good stormwater management preventing surface water ponding, limiting source of water for birds. Accepted bird control technique generally includes visual detergents (models, either still or animated, of birds predators), sounds, physical barriers (fine wire nets), etc. Since birds generally adapt to environments in which they can find food bird control methods have limited long-term effect thus the use of varying control methods is advisable. It must be taken into account that closed landfill cells may also attract bird species providing roosting habitats due to elevated ground temperature and freedom from disturbance. Nestling patterns of bird species anticipated on the Site need to be examined and appropriate controls introduced.
Waste and Wastewater Management (W)		
W1	Broken tools and equipment resulting from wear and tear in undertaking construction and operational activities	Remove all tools & equipment not used for construction/operation in working procedures.
W2	Waste items which no not meet acceptance for disposal criteria, such as hazardous waste during operation	Maintain an identified storage area with appropriately protected from weather, accidental collisions from Site vehicles, etc for any hazardous or other non-acceptable wastes.
W4	General mess/welfare/office facility solid waste during construction and operation	Maintain adequate waste bins for disposal to landfill.
W5	General mess/welfare/office facility waste water during construction and operation	Provide a toilet / shower facilities for Site workers connected to a septic tank to be regularly emptied and emergency clean up equipment to be maintained on site.
W7	Vegetation waste from site clearance during construction	Dispose on site or remove waste vegetation off site to a suitable waste management facility, if applicable.
W8	Mud from roads and aprons during construction and operation	Maintain road quality and pressure wash equipment regulalry on site.
W11	Infrastructure decommissioning during closure / aftercare	Remove all plant and equipment from site on completion
Terrestrial and Aquatic Ecology (EC)		
EC4	Increased risk of bird strike	Install bird scaring devices to minimise risk - Gas cannons commonly used, effectiveness dependant on factors such as species involved and availability of alternative nesting habitat

Table ES.2 – General Mitigation Measures for BTC Non-Hazardous Landfill Site, Georgia		
Item No.	**Impact**	**Mitigation Measure**
		nearby (Bishop et al 2003).
Archaeology and Cultural Heritage (ARC)		
ARC1	Accidental disturbance by traffic to Feature 1[1] (located outside the boundary) during construction, operation and closure activities	Demarcation of traffic routes away from Feature 1 will assist in avoiding accidental damage.
ARC2	Discovery of, and possible damage to, unforeseen buried cultural heritage resources revealed during construction.	Provide a monitoring archaeologist undertaking a watching brief during construction activities to record any discovered heritage resources.
Socio-Economics (SE)		
SE4	Community health and safety during construction and operation	Utilise BTC's existing grievance mechanism for any health, safety or other issues raised by the community surrounding the proposed project

Management and Monitoring

BP's approcath to Environmental and Social management is to apply the key principles of environmental and social protection to activities which it is the Operator. These principles include:

- Prior assessment of environmental and social impacts
- Minisiation of potential impact through design and other mitigation controls
- Monitoring of effectivenees of controls
- Auditing of performance

It is recommended that in managing the Rustavi Municipality landfill site, that the operator of this site follows the same principles for environmental and social protection. An environmental and social monitoring plan for the construction, operation and closure/after care phases of the project is shown in Table ES.3 below:

[1] Feature 1 refers to an artificial earth mound of unknown date located to the northeast of the proposed BTC landfill site. Refer to section 6.9 for further details.

Table ES.3 – Summary of Potential Monitoring Measures for BTC Non-Hazardous Landfill Site

Item No.	Impact	Monitoring Measure
Air, Odour and Emissions (A)		
A2	Surface emissions – landfill gas.	• Landfill gas monitoring will be undertaken at the site to a planned programme, as a general indicative measure of landfill condition.
A6	Odour impacts from landfilled wastes	• Routine qualitative odour monitoring will be undertaken by staff during the walk-round boundary inspections, and incidents of abnormal or excessive landfill odour will be noted and investigated.
Soil, Geology and Hydrogeology (GEO)		
GEO2	Deterioration of groundwater quality	• Install four groundwater monitoring wells around the landfill periphery • Monitor groundwater levels and quality on a quarterly basis during operation and closure / aftercare (for as period of X years • Compare results with risk based trigger and control levels that are based on EQS and EU DWS
GEO6	Soil Erosion	• Note any visual impacts to surrounding areas relating to rill or gully formation. • Monitor sediment (total dissolved solids) within irrigation channel on a quarterly basis • If total dissolve solids are above baseline conditions identify source and if from BTC landfill implement appropriate mitigation, which might include re-seeding or providing other protection to stockpiles of earth, reseeding closed section of the landfill, etc.
GEO9	Sediment Transport to Water Courses	• Monitor sediment (total dissolved solids) within irrigation channel. – on a quarterly basis • If total dissolve solids are above baseline conditions identify source and if from BTC landfill implement appropriate mitigation, which might include re-seeding or providing other protection to stockpiles of earth, reseeding closed section of the landfill, etc
Hydrology and Flood Risk (H)		
H4	Surface water contamination - Change in physical, chemical,	• Surface water monitoring of drainage channels and irrigation channel to the north of the Site.

	and biological quality	• Compare results with risk based trigger and control levels that are based on EQS and EU DWS.
Waste and Wastewater Management (W)		
W10	Wind blown litter	• Routine observations of wind blown litter on the boundary and site periphery during regular boundary inspections (need frequency). • Wind blown litter will be collected on a regular basis and disposed of properly within the active portion of the landfill.
Terrestrial and Aquatic Ecology (EC)		
EC4 / T2	Increased risk of bird strike for aircraft / Increase in risk to air traffic safety as a result of increased bird activity being attracted to the proposed landfill site	• Carry out annual bird survey and compare to base-line data to determine success of mitigation. • Maintain log of reports of bird strike in the area.

Conclusions

Providing mitigation is undertaken in line with that indicated in Table ES1 and ES2, no significant impacts on the local environment from the construction, operation and closure/aftercare of the landfill site is expected. There will be no significant benefits or dis-benefits to the surrounding communities.

There are anticipated to be residual impacts from air traffic safety and wind blow litter however, these are considered to be low. There is however, anticipated to be a medium residual impact resulting noise during the construction and operation of the landfill site. However, in practice the construction and operation noise levels may be expected to be lower than those predicted which are for a worst case scenario and are unlikely to occur in practice.