ACCIDENTS AND THEIR CONSEQUENCES RISK ASSESSMENT

1.0 Introduction

1.1 A risk assessment has been undertaken to determine if any accident or emergency situations at proposed Cardiff Waste Management Resource Centre which may have an effect on any receptors located within close proximity of the facility boundary.

1.2 **Table 1** includes a list of the receptors that have been identified through a desktop assessment of the locality.

1.3 Risks have been considered during the operational phases of both the proposed Hazardous Waste Transfer Station Installation Activity and the proposed Non-Hazardous Waste Transfer Station Operation.

1.4 An accident management plan will be developed/adopted, as appropriate, for the waste facility during the first year of operation. The accident management plan will be regularly reviewed and updated, if deemed necessary. Incidents and near misses will be recorded and investigated, and remedial and preventative measures will be undertaken in accordance with the accident management plan and the site management plan.

Table 1: Identified potential receptors within 1000m of the facility.

Receptor	Approximate distance from the operational area	Direction from the facility
Commercial/industrial Properties	Adjacent up to 1000m	All Directions
Network Rail operated mainline railway	Adjacent	N
Cardiff HWRC	220m	S
Residential Areas of Rumney	50m	N
Residential Areas of Pengam	825m	W
Residential Areas of Tremorfa	990m	SW
Parc Tredelerch	40m	W
Rumney Hill Gardens	860m	NW
Allotments	490m	NE
Rhymney River	590m	W, SW
Rhosog Fach Reen	235m	S, SE

1.5 The assessment of risks from the facility arising from fugitive emissions have been considered with reference to the following guidance documents:

- H1 Environmental Risk Assessment Part 1: Simple assessment of environmental risk for accidents, odour, noise and fugitive emissions.

2.0 Methodology

2.1 The scoring methodology employed in the H1 Guidance is used as a framework for assessing the risk from various accident scenarios identified. The scoring system attributes a nominal score to the likelihood and consequence of an identified scenario, and then uses a matrix to identify whether the risk is acceptable. The scoring system is outlined below.

Likelihood categories

Category	Description	Score
Extremely unlikely	Incident occurs between once per 100 years and once every 1000 years	1
Very unlikely	Incident occurs between once per 50 years and once every 100 years	2
Unlikely	Incident occurs between once per 10 years and once every 50 years	3
Somewhat unlikely	Incident occurs between once per 5 years and once every 10 years	4
Fairly probable	Incident occurs between once per year and once every 5 years	5
Probable	Incident occurs at least once per year	6

Consequence categories

Category	Description	Score
Minor	• nuisance on site only (no off-site effects) • no outside complaint	1
Noticeable	• noticeable nuisance off-site e.g. discernible odours • minor breach of Permitted emission limits, but no environmental harm • one or two complaints from the public	2
Significant	• severe and sustained nuisance, e.g. strong offensive odours or noise disturbance • major breach of Permitted emissions limits with possibility of prosecution • numerous public complaints	3
Severe	• hospital treatment required • public warning and off-site emergency plan invoked • hazardous substance releases into water course with ½ mile effect	4
Major	• evacuation of local populace • temporary disabling and hospitalisation • serious toxic effect on beneficial or protected species • widespread but not persistent damage to land • significant fish kill over 5 mile range	5
Catastrophic	• major airborne release with serious offsite effects • site shutdown • serious contamination of groundwater or watercourse with extensive loss of aquatic life	6

Risk assessment matrix

Likelihood	**Consequence**					
	Minor	Noticeable	Significant	Severe	Major	Catastrophic
Extremely unlikely	1	2	3	4	5	6
Very unlikely	2	4	6	8	10	12
Unlikely	3	6	9	12	15	18
Somewhat unlikely	4	8	12	16	20	24
Fairly probable	5	10	15	20	25	30
Probable	6	12	18	24	32	36

Risk scores

Magnitude of risk	**Score**
Acceptable	6 or less
Acceptable if reduced as much as reasonably practical	8 to 12
Unacceptable	15 or more

2.2 The identification of the hazards and the risk assessment process is documented in **Table 2**.

Table 2: Accidents and emergencies risk assessment matrix

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Spillage during delivery or dispatch of waste materials.	Run-off, absorption to ground and airborne	Land, site personnel, site users, and local population.	Somewhat Unlikely	4	Significant	3	**12**	Acceptable if reduced as much as reasonably practical.	1. Procedures for leaks and spillages are described in the accompanying Supporting Statement (Document Reference BF5023/05). 2. All operations will be closely monitored to allow immediate deployment of mitigation measures in the event of a spillage. 3. All wastes will be stored in containers/bays and/or suitably engineered areas of impermeable concrete. All treatment operations are conducted upon an impermeable concrete pad. 4. Vehicles for dispatch will not be overfilled and will be supervised during loading. 5. All vehicles hauling waste will be sheeted or enclosed.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Spillage of raw materials during delivery/ refuelling of plant/ equipment.	Run-off, absorption to ground and wider site operations.	Land, groundwater, water abstractions and surface water.	Probable	6	Minor	1	**6**	Acceptable.	1. All operational fuels and waste liquid tanks will be self-bunded and/or surrounded by bunds to a minimum of 110% of the tank's capacity. 2. All bund side walls and bases will be impermeable. 3. All refuelling operations will be conducted on impermeable surfaces with dedicated sealed drainage with isolation of discharge possible. 4. Absorbent spill kits will be available for use should any spillage occur. 5. Tank levels will be checked prior to a delivery/ordering dispatch to ensure sufficient capacity is available.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Damage to containment facilities for stored raw materials.	Run-off, absorption to ground and site drains.	Land, groundwater, water abstractions and surface water.	Fairly probable	5	Minor	1	**5**	Acceptable.	1. All operational fuel tanks will be double skinned or surrounded by bunds to a minimum of 110% of the tank's capacity. 2. The effective capacities of all bunds will be maintained. 3. All refuelling operations will be conducted on impermeable surfaces with dedicated sealed drainage with isolation of discharge possible. 4. Any repairs will be affected as soon as possible or within 5 working days (subject to replacement material availability). Mitigation measures will be undertaken immediately if there is a possibility of pollution.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Damage to storage facilities for incoming waste pending treatment /transfer.	Run-off, absorption to ground and site drains, airborne.	Land, groundwater, water abstractions and surface water, adjacent commercial/industrial land users	Somewhat Unlikely	4	Significant	3	**12**	Acceptable.	1. All treatment and storage operations will be conducted on impermeable concrete which has low infiltration capabilities. General surface run off will be directed to a specific surface water management system. 2. Storage areas will be checked to ensure required capacity is available and that they remain in suitable condition and are fit for purpose. 3. Any repairs will be affected as soon as possible. Mitigation measures will be undertaken immediately if there is a possibility of pollution. 4. Good housekeeping will be promoted in order to keep waste confined to storage areas.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Major fire or explosion.	Airborne	Site personnel, site users, local population and air quality.	Very Unlikely	2	Severe	4	**8**	Acceptable if reduced as much as reasonably practicable.	1. Procedures will be incorporated into 'Emergency Action Plan'. 2. No fires are permitted on site. 3. Immediate action will be taken to extinguish all fires if safe to do so. 4. Plant and equipment will be operated in accordance with manufacturers and company guidelines and procedures. 5. Firefighting equipment will be available and maintained, and site operators will be trained in their correct use. 6. The combustion risk of waste types stored on-site which have been identified as potentially combustible; including incidental contaminants (e.g. wood and plastic) is considered to be low. All waste identified as having combustible properties will be proactively monitored by site personnel for potential combustion indications and will be 'conditioned' to limit combustion potential.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Failure to contain firewater.	Run-off, absorption to ground and site drains.	Land, groundwater, water abstractions and surface water.	Very Unlikely	2	Significant	3	**6**	Acceptable.	1. In the unlikely event of a fire in the operational area, all firewater will be contained on site with suitable containment controls emplaced as necessary, utilising the engineered drainage storage tank. 2. The Sustainable Drainage System servicing the external areas of the site is fitted with a flow control valve at the consented discharge point which will be shut in the event if there is a risk of firewater being discharged from the site. 3. Firewater falling on surfaces will be contained as above and removed from site as appropriate. 4. Stocks of firewater containment equipment (including bunds and mats) will be maintained on site.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Flooding.	Saturation of ground, rising groundwater levels and via site drainage.	Land (commercial, industrial, agricultural and residential), surface waters.	Very Unlikely	2	Significant	3	**6**	Acceptable.	1. Site lies in a very low risk flood zone where flooding from rivers or the sea is very unlikely. The site has a less than 0.1% (1 in 1000) chance of flooding occurring each year. The land to the south is situated within a Medium Risk Designated area (1-3.3% probability). 2. Site and general informal drainage will be checked frequently to ensure it is in good condition and free from ponding. 3. Any ponding of surface water found will be removed immediately, or where this is not possible as soon as it is practical.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Loss of power.	Airborne.	Local population, land, surface water, groundwater and water abstractions.	Unlikely	3	Minor	1	**3**	Acceptable.	1. There are no major process plant items which rely on mains power. 2. If power/water is lost for a sufficiently long period of time where it has the potential to affect ancillary functions outside of the main operations (e.g. weighbridge, alternative means of power generation/water supply will be sought).

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Vandalism/ breach in security.	Over land.	Site personnel, site users, plant and equipment.	Somewhat unlikely.	4	Noticeable.	2	**8**	Acceptable if reduced as much as reasonably practicable.	1. Facility has fencing, CCTV and lockable gates. 2. All visitors to the site (including personnel) must report to the site office to sign in.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Operator error.	Airborne and over land.	Local and distant human population, surface water, groundwater and water abstractions,	Somewhat Unlikely	4	Minor.	1	**4**	Acceptable.	1. Technically competent people will oversee the management of activities of the site, in accordance with the fit and proper person requirements. 2. Training (including refresher training) will be given to all site staff on the environmental permit, health and safety and incident response.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Cross-connected drains.	Drainage systems.	Surface water, groundwater and water abstractions.	Somewhat Unlikely	4	Minor.	1	**4**	Acceptable.	1. Suitably qualified engineers will ensure that all drains are installed to approved designs.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Emissions from plant or equipment due to abnormal conditions.	Airborne and over land.	Local human population, land, surface water, groundwater and water abstractions.	Somewhat unlikely	4	Noticeable	2	**8**	Acceptable if reduced as much as reasonably practicable.	1. All machinery used on site will be operated and maintained in accordance with manufacturers' recommendations; 2. All operational areas underlain with a suitable concrete, tarmac or hardstanding surface as is appropriate to the environmental risk posed by that part of the overall operation. 3. All machinery will be subject to regular checks and maintenance.

Hazard	Pathway	Receptor	Likelihood	Score	Consequence	Score	Overall score	Acceptability of risk	Justification for acceptability (description of risk management measures)
Inadequate waste acceptance procedures.	Transported by vehicle.	Site operatives and site users.	Unlikely	3	Significant	3	**9**	Acceptable if minimised as much as reasonably practicable.	1. All wastes will undergo an acceptance procedure in accordance with Duty of Care Requirements. 2. All operatives on site will have knowledge of the Environmental Permit and on the types of waste accepted and prohibited at the site. 3. Accompanying paperwork will be scrutinised to ensure the details are correct and all fields are completed. 4. All waste loads will be visually inspected during deposit in the waste reception areas. 5. Any non-conforming wastes will be segregated as soon as possible and stored in the quarantine area awaiting removal off site.

3.0 Conclusions

3.1 All risks have been categorised as either ‘acceptable’ or ‘acceptable if reduced as much as reasonably practicable’. Of the hazards categorised as ‘acceptable if reduced as much as reasonably practicable’ there are a significant number of mitigation measures available that effectively nullify the hazard identified