Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Bryn Posteg Landfill Site

Sundorne Products (Llanidloes) Ltd

Environmental Setting and Installation Design

Environmental Permit Variation Application

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APPROVAL RECORD

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DISCLAIMER

TABLE OF CONTENTS

Drawings:

Site Location Plan	3400.01
Environmental Monitoring Plan	3400.02
Cross Section A (Typical Basal Lining Detail)	3400.03
Cross Section B (with future cap assessed as clay mineral cap)	3400.04
Gas Extraction and Monitoring Infrastructure Plan	3428-CAU-XX-XX-DR-S-1801
500m Receptor Plan	3428-CAU-XX-XX-DR-S-1806
Proposed Restoration Contours	3495-CAU-XX-XX-DR-S-1813
Jan 2018 Survey Sections Drawing	3456-CAU-XX-XX-DR-G-1808
Restoration Plan	

1. INTRODUCTION

1.1 Report Context

1.1.1 Sundorne Products (Llanidloes) (Ltd) trading as Potters Waste Management (Potters) under Environmental Permit EPR/BU7766IC operate Bryn Posteg Landfill Site. Caulmert Ltd were appointed by Potters to produce an updated Environmental Setting and Installation Design (ESID) report to support a permit variation application.

1.1.2 The ESID provides updated details about the site since the last ESID was produced and takes into consideration the revised landform that is proposed.

1.2 Installation Details

1.2.1 The Bryn Posteg landfill site is located 2.8km to the south east of Llanidloes. It is accessed from the B4518 Llanidloes to Tylwch public highway. The landfill site occupies a total plan area of approximately 20.97 hectares, and generally comprises:

- landfill cells;
- materials recycling facility;
- offices and welfare facilities;
- biomass boiler / electricity generator;
- leachate water treatment components;
- surface water treatment facilities.

1.2.2 The site is broadly rectangular in plan. Its southwest boundary is adjacent to the B4518 highway. The northwest, northeast and southeast boundaries are adjacent to open pasture/grazing land.

1.2.3 The receptors surrounding the site are outlined in the Amenity and Accidents Risk Assessment (3428-CAU-XX-XX-RP-V-0301-A0-C1) and a summary of the nearby receptors is shown in Table 1 below and shown in drawing 3428-CAU-XX-XX-RP-DR-S-1805.

Table 1. Summary of Surrounding Receptors

Receptors		
Boundary of Landfill Site	**Land Use**	**Distance/Direction**
Northern Boundary	Agricultural land Residential	Adjacent 300m N
Eastern Boundary	Agricultural land Bryn-du Road Residential	Adjacent 300m E 200m E

Receptors		
Boundary of Landfill Site	**Land Use**	**Distance/Direction**
Southern Boundary	Agricultural Residential Unnamed road	Adjacent 150m S 420m S
Western Boundary	B4518 Residential	Adjacent 350m W
Human receptors	Visitors and workers on landfill Residential within 500m	On site 150m S nearest point
Groundwater	Non-aquifer	N/A
Surface Water	Stream Afon Dulas	Adjacent NE 1.5km W
SSSIs	Coed Mawr	2.2km

1.2.4 There are no cultural or natural heritage sites within 1km of the site boundary, Llanidloes Museum is located 2.7km north west.

2. SOURCE TERM CHARACTERISATION

2.1 The Development of the Installation

2.1.1 Bryn Posteg Landfill Site is located at the site of a former lead mine. The site has been developed over a number of years with the first waste being accepted into Phase 1 in 1982. The site is currently divided into 9 Phases which, in turn, are divided into subcells (Drawing 3400.HRA.01). The current tipping operations are continuing in Phase 9C and 9D. It is noted that in some documentation Cell 9D is referred to as subcells 9D & 9E.

2.1.2 The site phases are: 1, 2, 3A, 3B, 3C, 4A, 4B, 5, 6, 7, 8, 9A, 9B, 9C, 9D, 9E. Waste is currently accepted in Cell 9C, 9D and Cell 9E; all other cells are complete. Cells 1 to 9B are all capped.

2.1.3 Phases 1-5 were operated by Montgomeryshire, later Powys County Council, between 1982 and 1997. Evans Logistics Ltd operated Phases 6 – 8. Potters acquired the site in 2005. Phases 9A – 9E have been developed in the southern part of the site. Between 2008 and 2017 additional tipping was also 'piggy-backing' onto the existing site (Phases 3A, 3B, 4A and 4B).

2.1.4 Information in letter referenced 3824.CAU.XX.XX.CO.Y.03 discusses recent developments at the site and concludes the latest over-tip figure to be 333,302m^3.

2.1.5 A summary of the over-tip volumes and their locations are presented below:

Waste Related Overtip and Volumes Pertaining to the DRWG9 Profile for the Whole of the Site				
Variance Between DRWG9 and Jan 2018 Profiles				Comments
Area Ref'	Location	Over DRWG9 Overtip (m3)	Under DRWG9 to be Filled (m3)	
1	Central	268,227	-	Central mass increased volume as a result of capping and restoration works between the 2017 and 2018 surveys.
2	Southern	63,648	57,278	Phase 9: Overtipped to steep flanks to the east (lower section capped) and south (temporary capped) with a remaining central waste void.
3	Western	1,427	47,268	Capped and restored: Minimal overtip to steep flank with no intention to strip the capped area and raise waste levels to the west.
4	North Eastern	-	17,383	Phases 1 and 2; Overtip / fill of materials (none waste) in proximity to the leachate lagoons and the underfilled NE hollow which is not proposed to be filled.
Total		**333,302**	**121,929**	*Balance; 211,373 m3 of overtip*

2.1.6 The development history is summarised in Table 2 below.

Table 2. Development History of Site

Phase	Filling Period	Base of Cell (mAOD)	Lining Details	Capping Details	Area m^2
1	1982-	310	1m insitu clay (demonstrated by trial pits)	1m compacted boulder clay	3863
2		310	1m clay "target permeability 1 x 10^{-9}m/s"[1] Permeability range 5.9 x 10^{-10}m/s to 1.7 x 10^{-8}m/s with moisture content 11-14%	1m compacted boulder clay	13677
3A, 3B, 3C	1991-1994	311	1m clay "target permeability 1 x 10^{-9}m/s"[1] Permeability range 5.9 x 10^{-10}m/s to 1.7 x 10^{-8}m/s with moisture content 11-14%	LLDPE cap – lap and lay 0.75m soils	22960
4A, 4B	1994-1995	311	1m clay "target permeability 1 x 10^{-9}m/s"[1] Permeability range 5.9 x 10^{-10}m/s to 1.7 x 10^{-8}m/s with moisture content 11-14%	4A = LLDPE cap-lap and lay 0.75m soils. 4B = re-capped with welded membrane	15175
5	1995-1996	311	1m clay "target permeability 1 x 10^{-9}m/s"[1] Permeability range 5.9 x 10^{-10}m/s to 1.7 x 10^{-8}m/s with moisture content 11-14%	LLDPE cap – lap and lay 0.75m soils	10567
6	1996-1998	310	GCL & HDPE liner with CQA by Aspinwall. Underlying clay permeability 5.9x10^{-10}m/s to 1.7x 10^{-8} m/s	Welded geomembrane with 0.75m soils	6762
7	1998-2002	310	GCL & HDPE liner with CQA by Evans Logistics and CL Associates Geocomposite underdrainage layer connected to vertical riser	GCL with 0.4m soils	8626
8	2002-2003	310	GCL & HDPE liner with CQA by Enviroarm	GCL with 0.4m soils	8346
9A		307	0.5m mineral liner with CQA, GCL and	Geomembrane with	8938

Phase	Filling Period	Base of Cell (mAOD)	Lining Details	Capping Details	Area m²
			Geomembrane 27 perm tests on clay. 4.6×10^{-10} m/s max perm, average 1.36×10^{-10} m/s for base (2)	1m soils	
9B		307	0.5m mineral liner with CQA, GCL and Geomembrane. 30 permeability tests 1.8×10^{-11}m/s to 2.5×10^{-10}m/s (2)	Welded geomembrane with 1m soils	8895
9C	Ongoing	307	0.5m mineral liner with CQA, GCL and Geomembrane	Operational	14432
9D, (&9E)	Ongoing	307	0.5m mineral liner with CQA, GCL and Geomembrane	Operational	22415

1 Enviroarm Ltd, Regulation 15 Risk Assessment, 2002
2 CQA data reported by Potters Waste Management Ltd

2.1.7 It is reported that Phase 9 was excavated to 307 mAOD. The leachate collection system is also reported to comprise a 2m layer of tyres.

2.1.8 This permit variation is to amend the final restoration profile of the landfill to the latest restoration contours (3495-CAU-XX-XX-DR-S-1813) to account for previous over tipping and to enable the satisfactory completion of the site.

2.1.9 Whilst the over-tip has resulted in slopes which are steeper than the criteria specified in the SRA enclosed within this application (3428-CAU-XX-XX-RP-Y-0305-A(0)), most of the external slopes to phases 3 and 9 were capped a number of years ago (from 2009 onwards) using an LLDPE geomembrane overlain by a drainage geocomposite and restoration soils, in accordance with the materials referenced in SRA Addendum 4, but on slopes steeper than the 1 in 5 detailed therein. As a result the overall FoS for these slopes will be between 1.01 and 1.3.

2.1.10 Currently the sections of slope which are steeper than 1 in 5 are not showing signs of distress or instability and on the basis of assessments undertaken and those assessments carried out previously in the development of the site's SRA, the weakest interface and the potential critical plane of instability in the capping design is between the drainage geocomposite and the overlying restoration soils. Failure of the slope along the critical plane would therefore result in the sliding of the restoration soils on top of the drainage geocomposite. Such a failure mechanism would not affect the integrity of the capping liner or the integrity of the containment afforded by the liner. Remediation would also be a simple matter of placing soils back over the affected localised area. Over time the waste profile will settle and the FoS increase as a consequence.

2.1.11 Consequently the completion of the site to the profile proposed within this application is considered to be the environmentally acceptable option, compared with reprofiling the site with the potential impact on public health and safety and the potentially significant risks to the environment.

2.2 Site infrastructure

Phasing

2.2.1 Phasing at the site is summarised in Table 2 above.

Permitted Waste Types

2.2.2 The site accepts municipal waste, which is reported to consist of 60-70% household waste and 30-40% commercial trade waste. Some industrial waste is also accepted. As far as is known, this composition has remained similar during the time Evans Logistics and Potters have operated the site, and it is also assumed that it will remain similar until the site's completion, projected to be in 2018.

2.2.3 The waste accepted at the site is processed in a Materials Recycling Facility (MRF). The outputs from the process included metals which are screened out and recycled, oversized fraction (>80 mm) which is landfilled, and fines (<80 mm) which are composted for two weeks and subsequently landfilled.

2.2.4 Waste types permitted for disposal are listed within the Environmental Permit.

2.2.5 It is also proposed to accept wastes for recovery to enable the restoration of the site. These are detailed in the table below:

01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
02	**WASTES FROM THE PREPARATION AND PROCESSING OF MEAT, FISH AND OTHER FOODS OF ANIMAL ORIGIN**
02 04	**wastes from sugar processing**
02 04 01	soil from cleaning and washing beet
03	**WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD**
03 03	**wastes from pulp, paper and cardboard production and processing**
03 03 05	de-inking sludges from paper recycling
03 03 09	lime mud waste
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 06	dredging spoil other than those mentioned in 17 05 05

19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**
19 05	**wastes from aerobic treatment of solid wastes**
19 05 03	off-specification compost
19 08	**wastes from waste water treatment plants not otherwise specified**
19 08 05	sludges from treatment of urban waste water
19 09	**wastes from the preparation of water intended for human consumption or water for industrial use**
19 09 02	sludges from water clarification
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletizing) not otherwise specified**
19 12 09	minerals (for example sand, stones)
19 13	**wastes from soil and groundwater remediation**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
20 02	**garden and park wastes (including cemetery waste)**
20 02 02	soil and stones

2.3 Installation Engineering

Conceptual Engineering Design

2.3.1 The landfill has been constructed on the principle of containment, using an engineered, low permeability perimeter and basal lining system. Details of the engineering works constructed to date are as detailed in Table 2.

2.4 Groundwater Management

2.4.1 A groundwater collection drain was installed around Phases 2 and 3 which diverted groundwater to the Nant y Bradnant. It is understood that this system remains in operation to date. A groundwater collection drain has also been installed around Phases 6, 7 & 8.

2.5 Basal Lining System

Engineering System

2.5.1 To minimise the potential ingress of groundwater and egress of leachate from the site, prior to placement of the waste a low permeability basal lining system has been constructed in accordance with Landfill Directive requirements. The initial cells of the site were lined with 1 m thick layer of clay with target permeability of $1x10^{-9}$ m/s. Cells

developed since 1996 (Phase 6) were lined with GCL and HDPE liner. Cells of Phase 9 include a combination of GCL and geomembrane and 0.5 m mineral liner.

Leachate Drainage System

2.5.2 To facilitate the drainage and collection of leachate at the site, the base of the landfill has been formed to provide a minimum gradient of 1:50. The drainage layer installed over the basal lining to facilitate transmission of liquid to the collection wells, comprises a layer of tyres. Under phases 7 and 8 this is a layer of loose tyres, which is 2 m thick. Under Phase 9 only bailed tyres up to 600 mm thickness have been used.

2.5.3 Phases 1-5 were operated between 1982 and 1997. This part of the site is believed to be lined with a mineral liner (1 m thick re-compacted clay) but no validation of the construction took place. Phases 6 – 8 are lined with a composite liner consisting of a geosynthetic clay liner and a geomembrane. Phases 9A-9D are lined with 0.5 m mineral liner, geosynthetic clay liner and geomembrane.

2.6 Side Slope Lining

2.6.1 Side slope lining is as per the details provided in section 2.5 and Table 2.

2.7 Capping System

2.7.1 Cells 1 to 9B are all capped. Cells 1 and 2 are capped with 0.5m mineral liner and 0.5m restoration soils. Cells 3 to (some of Cell) 6 have received a 1mm lap-lay geomembrane liner covered with 0.75m restoration soils. Cell 6 has a welded geomembrane cap (1mm HDPE) covered by 0.75m of restoration soils. Cells 7 and 8 have a GCL cap that currently is covered with around 400mm of subsoil. The final restoration of this will have a minimum of 1 metre of soils. Cells 9A to 9C were capped in summer 2017.

2.7.2 Table 4 below shows a summary of the capping details at the site and Table 2 above provides further information.

Table 4. Capping details

Cell	Cap status	Date capped	Area m²
1	Permanent	1986	3863
2	Permanent	1986	13677
3A	Permanent	2009	8504
3B	Permanent	2009	8035
3C	Permanent	1992	6421
4A	Permanent	2017	8239
4B	Permanent	2017	6936
5	Permanent	1998	10567
6	Permanent	2000	6762
7	Permanent	2003	8626

Cell	Cap status	Date capped	Area m²
8	Permanent	2006	8346
9A	Permanent	2009	8938
9B	Permanent	2017	8895
9C	Active		14432
9D &E	Active		22415

2.8 Construction Quality Assurance

2.8.1 During construction of cells the site was supervised full time by a suitably qualified CQA engineer. The reports were submitted to Natural Resources Wales upon completion.

2.9 Restoration and Aftercare

2.9.1 It is proposed that the site will be restored in accordance with the latest plan. Proposed restoration contours are shown in drawing 3495-CAU-XX-XX-DR-S-1813.

2.9.2 It is proposed to import waste soils into the site to enable the restoration of the Site. Soil requirements are detailed within the table below

Table 5. Soil Requirement Details

Phase	Area remaining for restoration m²	Depth of soils required	Volume m³
1	1931 (half of area requires additional soils)	0.5m	966
2	Complete	N/A	N/A
3A, 3B, 3C	Complete	N/A	N/A
4A, 4B	Overtipped by 9b and 9c	N/A	N/A
5	Complete	N/A	N/A
6	Complete	N/A	N/A
7	Overtipped by 9b and 9c	N/A	N/A
8	8346	0.7 m remaining	5842
9A	8938	0.4m remaining	3575
9B	8895	0.4m remaining	3558
9C	14432	1m required	14432
9D, (&9E)	22415	1m required	22415

2.9.3 Suitable long term monitoring and aftercare for the site will be proposed after completion.

2.10 Leachate Management and Monitoring

Leachate generation

2.10.1 The decomposition of waste within a landfill is a highly complex process with microbiological, physical, and chemical processes acting simultaneously to break down waste. Leachate is formed by the decay and release of the waste coupled with the percolation of infiltrating water through the waste mass

Leachate management

2.10.2 2.7.7 Twelve leachate monitoring sumps are identified on Drawing 2601.EMP.01, Sumps 1-6 and Sumps 9A, 9A north, 9a south and 9B-9E. The leachate collection sumps have been erected using concrete rings set on a specifically-designed base in the lowest point of each cell. The leachate sumps site nomenclature are presented below in relation to their designations in the Permit.

Table 6 Leachate Extraction wells identification

Permit Reference (Table S3.1)	Monitoring leachate levels	Monitoring leachate quality
LCP1	Sump 1	Leachate 1
LCP2	Sump 2	Leachate 2
LCP3	Sump 3	Leachate 3
LCP6	(Gas Seal)	(Gas Seal)
LCP7	Sump 4	Leachate 4
LCP8	Sump 5	Leachate 5
RMLP9A	(Gas Seal)	(Gas Seal)
RMLP9B	(Gas Seal)	(Gas Seal)
RMLP9C	Sump 9C	Leachate 6
RMLP9D	Sump 9D	Leachate 7

2.10.3 Electric pumps are installed within the sumps. The pumps have capacity to pump up to 7 litres of liquid per second.

2.10.4 These pumps have individual control panels, which enable the pump to be controlled by time and by level of leachate within the sump. The leachate levels within the sumps are monitored by automatic switches, which control the operation of the pumps in accordance with leachate level fluctuations. The control panels are fitted with warning lights that are triggered if leachate levels exceed the set level of the float. The pumps are inspected on a monthly basis.

2.10.5 The leachate from each sump is pumped along a separate pipe which discharges straight into the treatment lagoon situated in the north-eastern corner of the site (see site layout, drawing 2601.EMP.01). The pumps are operated in a cyclic manner, so that leachate from each part of the site is discharged into the lagoon for a short period of time only; no pump is operated for more than 1 hour at a time. This cyclic pumping is undertaken to avoid step changes to the leachate composition in the treatment plant and thereby protect the activated sludge from shock load and too large variability, as the leachate strength and composition varies across the site.

2.10.6 A leachate management plan for the site has been produced document reference 3428-CAU-XX-XX-RP-V-0304-A0-C1.

2.10.7 The leachate management system is summarised in Table 6 below:

Table 7. Summary of the maintenance requirements for components of the leachate management system at Bryn Posteg

		Daily	Monthly	6-monthly	9-monthly	Annually
Leachate extraction system	**Wells**		Leachate levels, leachate samples for offsite quality analysis. Visual checks of infrastructure			
	Pumps		Inspect pumps, control panel and warning light operation	pump maintenance*		Electric pump PAT testing
	Pipes		Inspect connections to pumps and extraction main integrity			
Treatment plant	**Lagoons**	CCTV of leachate inflow into treatment lagoon	Visual inspection of lagoon conditions			
	Aerators	According to manufacturer specifications				
	Dosing plant	According to manufacturer specifications				
	Monitoring probes	According to manufacturer specifications				
	Boiler	DAILY Inspect combustion chamber, heat exchanger, and fans Check system pressure WEEKLY inspect geared motors, ash removal, burn back flap, rotary valve	Empty and clean combustion chamber and associated components, Check safety valve	Check sensors Check Safety battery valve		Check and service doors Check safety temperature limiter and heating emergency stop switch

		Daily	Monthly	6-monthly	9-monthly	Annually
	CHP unit	Inspect for leakages at the flanges, valves and bolts and inspect oil levels		Inspect unit for mechanical damage, clean the filter, cooling fan, electrical cabinet.	Clean filters, inspect generator lubricant	Refill generator lubricant and inspect cold water side (supplier/ manufacturer). Full service by manufacturer very 2 years
	Heat exchange unit		Look for signs of leakage from plate pack/nozzles	temperature and flows vs commission data		heat exchanger maintenance manufacturer's specification
Discharge		Daily spot sample of effluent quality in relation to probe logger and discharge compliance	Obtain samples for offsite quality analysis			

*(schedule according to gas extraction zones)

2.11 Leachate Monitoring

2.11.1 Leachate at the site is managed according to the EP for the site with the aid of a monitoring programme. The EP for the site details the monitoring schedule, the schedule is summarised below:

Table 8. Leachate Monitoring Frequencies

Parameter	Units	Frequency	Monitoring Point	Comment
Leachate Level	mbgl	Monthly	LCP1/2/3/6/7/8, and RML9A/9B/9C/9D	It is noted only 1,4, 5, 9c and 9a are currently accessibly and that the others have been temporarily sealed. It is recommended that monitoring is instated at the earliest opportunity
Ammoniacal Nitrogen	mg/l as N	Monthly	LCP1/2/3/6/7/8, and RML9A/9B/9C/9D *[subject to accessibility]*	
pH	-	Monthly		
Cadmium	mg/l	6 monthly		
Chromium	mg/l	6 monthly		
Copper	mg/l	6 monthly		
Nickel	mg/l	6 monthly		
Lead	mg/l	6 monthly		
Zinc	mg/l	6 monthly		
Cyanide	mg/l	6 monthly		
List 1 suite	ug/l*	Annually		

2.11.2 A leachate management plan has been produced for the site, reference 3428-CAU-XX-XX-RP-V-0304-A0-C1.

2.12 Leachate Levels

2.12.1 Leachate level and quality monitoring takes place using the leachate abstraction wells and remote leachate monitoring points. Leachate dip levels should be measured relative to cover level (or other agreed datum). The monitoring should include establishing the dip to base of the wells at least annually. The data will be reported as dip level (m BGL), reduced to Ordinance Datum (mAOD) and as head above the cell base (m). This information is used to detect a rise in the leachate levels different parts of the site.

2.12.2 Drawing 3428-CAU-XX-XX-DR-S-1807 shows the location of all leachate collection and monitoring points present across the site.

2.12.3 Leachate levels will be kept below the compliance level in each cell onsite. When leachate levels approach the compliance levels, leachate will be pumped out to reduce levels. The pump control system discussed in Section 3 is designed to automate pump control in relation to this requirement and switch pumps on in relation to the level of leachate in the well.

2.12.4 The leachate will be pumped to the treatment plant onsite. During periods of heavy rainfall, a build-up of leachate may occur despite the leachate treatment plant operating to its full capacity and the volumes discharged being at maximum consent levels. During such periods, the pumping/treatment system shall continue to operate at maximum capacity until levels are reduced back to the compliance limits. Leachate will be tankered offsite if there is no spare capacity at the treatment plant during such events.

2.12.5 The leachate management plan details the actions in the event that a mechanical or electrical failure occurs or if the compliance limit is exceeded.

2.13 Leachate Quality

2.13.1 Leachate quality monitoring is required to characterise the raw leachate at the site and monitor its evolution through the lifetime of the site. Leachate is monitored in accordance with the Environmental Permit and as detailed in the leachate management plan.

2.13.2 Monitoring techniques are outlined in the leachate management plan and the most recent monitoring data for the site is available in the HRA Review 2018.

2.14 Leachate Effluent Quality

2.14.1 The quality of the treated effluent is monitored to verify the efficiency of the treatment process and confirm compliance with the STW discharge consent for the site.

2.14.2 After upgrade of the leachate treatment plant and processes at the site, compliance with conditions set in the trade effluent consent can be assessed continuously through the combination of in-liquid probes in the discharge tank and logging system. This includes the temperature, pH, ammoniacal nitrogen, COD etc. In addition, the daily discharge volume should be recorded. The accuracy of the in-liquid probes will be corroborated by obtaining daily spot samples to be analysed onsite. Any equipment used for such analyses should be maintained according to the manufacturer's recommendations and should be calibrated regularly to ensure its accuracy.

2.14.3 The leachate management plan details actions in the event a discharge consent limit is exceeded.

Landfill Gas Management and Monitoring

2.14.4 The landfill has a landfill gas utilisation plant (flare and two engines), and their role in managing the gases generated as a result of the waste decomposition are considered. A landfill gas management plan has been produced recently, document 3248-CAU-XX-XX-RP-V-0303-A0-C1. The site is monitored in line with the environmental permit.

Landfill Gas Generation

2.14.5 The materials accepted at the site are putrescible, and as such will generate landfill gas (methane, carbon dioxide and a range of trace gases) upon biodegradation. As such the waste at the site represents a source of landfill gas.

2.14.6 Waste inputs are summarised in Table 3 of the landfill gas management plan, from 1982 to 2018.

Landfill gas management

2.14.7 The site has an active gas control system designed for positive collection and combustion of landfill gas in an engine. The gas plant also contains a high-temperature flare stack as back-up should the engine(s) fail. Landfill gas extraction wells are installed in all Phases, and further landfill gas extraction wells are progressively and retrospectively installed as site infilling progresses (the locations of gas extraction wells and the extraction system layout are included on Drawing 3428-CAU-XX-XX-DR-V-1807).

2.14.8 The gas plant is located along the northern boundary of the site, 400 m to the east of the site entrance (Drawing 3428-CAU-XX-XX-DR-V-1807).

2.14.9 Gas generated within the waste will travel along preferential pathways and be emitted into the atmosphere or surrounding strata, unless it is collected via a gas extraction system. The site has an active extraction system, which abstracts the gas and routes it to utilisation and treatment plant (two engines and a flare). Therefore, under normal operating conditions of the system, the exhausts of the engines and flare represent point sources of emissions.

2.14.10 Any residual gases not captured by the gas collection system will be emitted as either:

- point source emissions from parts of the gas or leachate extraction system that are not air-tight; or
- diffuse emissions either though the landfill surface, e.g. from uncapped areas.

2.14.11 Emissions through the surface are controlled by the capping of the waste together with active gas extraction. Diffuse emissions away from the waste and into the surrounding strata are controlled by the engineered liner of the waste. If gas escapes through the liner, the migration of the emissions is then controlled by the properties of the surrounding strata, including porosity and moisture content.

Landfill gas monitoring infrastructure

2.14.12 A landfill gas flare was initially installed on site in August 2000. The flare was installed by Organics Ltd and had a maximum gas flow rate of 750 m^3/h. The Organics flare was replaced with a GTS flare in 2011. The GTS flare is a modern high-temperature enclosed flare which has a maximum capacity of 2000 m^3/h.

2.14.13 The current landfill gas engines consist of a Caterpillar CAT 3516TA, that was installed at the beginning of 2003 by Finnings UK Ltd and then Gwynt Cymru purchased a second-hand CAT 3516 A+ engine, that was installed in 2011.

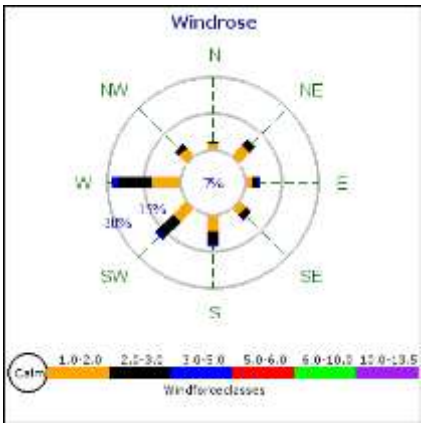
2.14.14 Landfill gas monitoring is undertaken in line with the Environmental Permit.

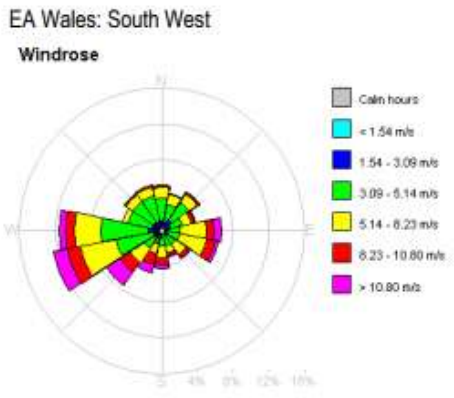
3. PATHWAY AND SOURCE TERM CHARACTERISATION

3.1 Climate

3.1.1 The average annual rainfall at the site is noted by HR Wallingford as being 1172mm.

3.1.2 Wind direction at the site is shown below. The Bryn Posteg Site weather station wind data (Windrose for 2012) is on the left, compared to the windrose used for the Tier 2 assessment, default for Wales (South West) on the right.





3.2 Geology

3.2.1 The site is located in an area of boulder clay overlying the Llandovey Series. Locally the boulder clay is describes as soft grey orange mottled sandy silty clay with mudstone fragments and gravel becoming stiff with depth. These deposits are generally less than 4m in thickness with a maximum depth of 13.5m. Gravel lenses have previously been identified in trial pits within the Phase 9 area and in borehole 3 and 4. Water strikes have been recorded in the drillers logs within the drift deposits.

3.2.2 The Llandovery Series comprises mudstones and shales. Locally these comprise weathered mudstone and clay at the surface with the mudstone rock head reported to be on average 3.4m below the base of the site. The mudstones contain closed spaced fractures with fracture sets reported at 60 and 90 degrees. Fine clays are reported to fill the discontinuities. The general dip of the strata is estimated to be 20 degrees north to northwest.

3.3 Hydrology

3.3.1 The site lies within the River Severn Catchment area. The site specific rainfall data is reported from Garth Fawr station which had an average annual rainfall of 1244 mm/yr between 1993 and 2000. The average annual evapotranspiration from bare soils is presented as 375.5 mm/yr. This indicated that the effective rainfall is approximately 868 mm/yr. It is noted that this is a broad estimate and does not include soil moisture deficits or transpiration by grass. Older data for the area suggests that the evapotranspiration from grassland is likely to be 450 mm/yr (MAFF: The agricultural climate of England and Wales 1976).

3.3.2 The models assume an average infiltration to the waste mass of 868 mm/yr with a normal distribution and standard deviation of 87.

3.3.3 Surface water drainage comprises a perimeter catchment ditch which channels surface water along the southern boundary of Phase 8 and discharges to the Nant Y Bradnant. Water from the north of the site is discharged into the Afon Dulas.

3.3.4 The site is located on a shallow saddle between two summits to the south (400m AOD and 379m AOD), a hill (349mAOD) to the east (with a valley between it and the summit to the south) a low rise to the north (345 mAOD) and a further hill to the west-north-west (>350mAOD). Consequently there are numerous small streams which arise in marshy conditions on the hillside. The closest of these appear to be two 'issues' at elevations of 335 mAOD and 330mAOD on the southwestern installation boundary. A stream to the south of the site appears to disappear down a disused mine shaft in the eastern corner of the site. There are further issues to the north of the site.

3.3.5 The elevation of the issues implies that they are associated with localised groundwater within the boulder clay.

3.3.6 No additional data is available on the hydrological setting. Routine monitoring is undertaken at the site at SW1 (also referred to as P1) SW2 (also referred to as P2) and SW3. Recent data analysis indicated that in general the ammoniacal nitrogen concentrations are generally in compliance at SW1 with the exception of some exceedances in 2015 and 2016 which are accompanied by elevated chloride concentrations. Elevated ammoniacal nitrogen concentrations were also observed in SW2 in 2016. These were accompanied by elevated chloride concentrations during this time period. In 2017 the surface water quality returned to background levels for both monitoring points.

3.3.7 The site is at the head of two natural drainage catchments; the Nant y Bradnant to the east of the site, and an un-named tributary of the Afon Dulas to the west.

Eastern Catchment

3.3.8 The Nant y Bradnant rises at the site boundary at OSGR 297389, 282233, and at a level of 313.5m. The watercourse flows generally northeast/north within a relatively deep and narrow valley to outfall at the River Severn near Clydfanau Bridge at OSGR 298389, 285318, a level of 150m.

3.3.9 It is estimated that the drainage catchment from within the site boundary that contributes to the Nant y Bradnant is 8.0 hectares. This area is likely to change following landfill and landscaping operations.

Western Catchment

3.3.10 There is an un-named tributary of the Afon Dulas to the west of the B4518. The tributary flows west-southwest to join the Afon Dulas at OSGR 295435, 281727, some 1.4km from the B4518, and at a level of 195m. The tributary is shown to flow along a relatively flat, shallow wooded valley. The Afon Dulas itself is a tributary of the Afon Hafren/River Severn some 2.7km further downstream in Llanidloes.

3.3.11 It is estimated that the drainage catchment from within the site boundary that contributes to the western catchment is 8.8 hectares. Again, this is likely to change following site operations.

3.4 Regional Hydrology

3.4.1 The average annual rainfall at the site is noted by HR Wallingford as being 1172mm.

3.4.2 According to HR Wallingford (uksuds.com), the Greenfield runoff estimate for the site Q_{BAR} is 69.8 litres per second. For the 20.97 hectare site, this equates to 3.3 litres per second per hectare.

3.5 Surface Water Monitoring

3.5.1 The monitoring requirements are defined in the Permit are:

Table 9 Surface Water Monitoring Requirements

Parameter	Units	Frequency	Monitoring point
Electrical Conductivity	uS/cm	Monthly	P1-P2
Ammoniacal Nitrogen	mg/l	Monthly	P1-P2
Chloride	mg/l	Monthly	P1-P2
pH	-	Monthly	P1-P2
Suspended solids	mg/l	Monthly	P1-P2
BOD	mg/l	Monthly	P1-P2
COD	mg/l	Monthly	P1-P2
Water flow		Monthly	P1-P2
Dissolved Oxygen	mg/l	Quarterly	P1-P2
Temperature		Quarterly	P1-P2
Hydrocarbons	mg/l	Quarterly	P1-P2
List 1	various	6 monthly	P1-P2

3.5.2 A surface water management plan has been produced for the site, reference 3428-CAU-XX-XX-RP-V-0300-A0-C1.

3.6 Hydrogeology

3.6.1 The site is shown on the Groundwater Vulnerability Sheet 20 to be located on a non-aquifer with negligible permeability. There are no known groundwater abstractions within 500m of the site boundary.

3.6.2 During a site investigation undertaken by CL Associates in 1998, in-situ testing in boreholes indicated permeabilities in the range of 1.28×10^{-4} m/s and 1.4×10^{-6} m/s in the underlying geological strata.

3.6.3 The investigations undertaken during the development of the site have identified two separate water bodies: a shallow groundwater within the boulder clay/drift deposits and a deep groundwater located in the Llandovery Series rocks.

Shallow Deposits (W2 and W9)

3.6.4 As reported in 2010, the groundwater level data indicated that the groundwater levels within the superficial boulder clay are heavily dependent on the presence or absence of sand and gravel lenses such that there does not appear to be a uniform water body or gradient across the site and consequently no groundwater contour plot has been provided. In addition, the base levels of the phases indicate that the boulder clay has typically been removed during the development of the site and consequently the pathway to the shallow groundwater is through the side wall lining system only.

3.6.5 A groundwater collection drain was installed around Phases 2 and 3 which diverted groundwater to the Nant y Bradnant. It is understood that this system remains in operation to date. A groundwater collection drain has also been installed around Phases 6, 7 & 8.

3.6.6 The permeability of remoulded bulk samples of the boulder clay has been shown to be able to attain values of 1 x 10^{-10}m/s. (Enviroarm 2003). Literature values for the insitu permeability of a stiff clay suggests that these are in the order of 1x 10^{-8} to 1 x 10^{-9}m/s (Fetter 1994).

Llandovery Series Mudstone (W1, W3, W4, W5, W6, W7, W8, W10 and W11)

3.6.7 The groundwater levels in the 'deep' boreholes are also complicated partly since it appears that the seal on a number of these wells may be allowing shallow groundwater into the borehole and secondly because the water levels appear to be dependent on the depth of the screened section and the fractures intersected. The hydrographs presented in Appendix 1 of the HRA review indicated that the groundwater levels in all of the boreholes are relatively consistent throughout the year and do not display significant variation during the seasons, with the exception of some anomalous changes due to human/technological errors. Therefore the groundwater flow direction based on this monitoring data is anticipated to be consistent throughout the year. There is no significant change in groundwater levels or flow direction and therefore the hydraulic gradient of 0.025 remains valid.

3.6.8 The Llandovery Series rocks are considered to be strongly anisotropic with vertical permeabilities likely to be significantly lower than the horizontal permeabilities. The core samples, by virtue of the sampling methodology, are likely to represent the vertical permeability of these mudstones, whereas the packer tests and regional data is more likely to represent the bulk transmissivity of these strata.

3.6.9 The borehole logs indicate that groundwater is present in discrete fractures at depth, with some boreholes intersecting fractures and indicating a piezometric surface and other remaining dry.

3.6.10 In addition the historic mining activities beneath the site may influence the groundwater flow direction and fracture connectivity beneath the site. There is a mine adit present at 50m below former ground levels which equates to approximately 290mAOD.

3.6.11 The most recent HRA Review was produced in 2018, reference 3400-CAU-XX-XX-RP-O-0301-A0-C1.

3.7 Groundwater flow

3.7.1 Groundwater flow in the boulder clay will be intergranular flow dictated by the location of the sand and gravel lenses. The mudstones of the Llandovery Series have a very low primary porosity and as such the groundwater flow within these deposits will be governed by fracture flow.

3.7.2 Analysis of groundwater levels in the most recent HRA Review within the perimeter boreholes, and also the perimeter gas monitoring wells, was consistent with previous years. The water levels remain variable across the site which reflects the bedded nature of the underlying geology and the dominantly fracture flow mechanism.

3.8 Groundwater abstractions

3.8.1 There are no known groundwater abstractions within 500m of the site boundary.

3.9 Groundwater quality

3.9.1 The current permit requires the following groundwater monitoring to be undertaken:

Monthly:	pH, electrical conductivity	
Quarterly:	Ammoniacal nitrogen	(2 mg/L),
	Cadmium	(0.0056 mg/l),
	Chloride	(69 mg/l),
	Nickel	(0.12 mg/l),
	Toluene	(0.004 mg/l),
	Xylene	(0.003 mg/l),
	Zinc	(0.85 mg/l),
	Ethylbenzene	(0.001mg/l),
	Mecoprop	(0.0001 mg/l),
	2,4-D	(0.0001 mg/l).
Annual:	Hazardous substance screen.	

3.9.2 The most recent groundwater quality analysis has been done for the HRA review submitted in 2018. The environmental monitoring data was scrutinised and assessed for trends, the report indicated that there is no discernible impact from the site on the groundwater quality within the Llandovery Series.

3.9.3 The groundwater monitoring requirements as presented in the permit include:

Table 10. Groundwater Monitoring Requirements:

Parameter	Units	Frequency	Monitoring point
Levels	mbgl, mAOD	Monthly	W1-W11
pH	-	Monthly	W1-W11
Sulphate	mg/l	Monthly	W1-W11
Electrical Conductivity	uS/cm	Monthly	W1-W11
Ammoniacal Nitrogen	mg/l	Quarterly	W1-W11
Cadmium	mg/l	Quarterly	W1-W11
Chloride	mg/l	Quarterly	W1-W11
Nickel	mg/l	Quarterly	W1-W11
Toluene	mg/l	Quarterly	W1-W11
Xylene	mg/l	Quarterly	W1-W11
Zinc	mg/l	Quarterly	W1-W11
Ethyl Benzene	mg/l	Quarterly	W1-W11
2,4 D	mg/l	Quarterly	W1-W11
Mecoprop	mg/l	Quarterly	W1-W11
Annual suite	ug/l	Annual	W1-W11
Total alkalinity (mg/l) (as Ca CO3 at pH4.5)		Quarterly	W1-W11
PAH	(mg/l)	Quarterly	W1-W11
BTEX		Annually	W1-W11
K	(mg/l)	Quarterly	W1-W11
Ca	(mg/l)	Quarterly	W1-W11
Mg	(mg/l)	Quarterly	W1-W11
Fe	(mg/l)	Quarterly	W1-W11
Cr	(mg/l)	Quarterly	W1-W11
Cu	(mg/l)	Quarterly	W1-W11
Pb	(mg/l)	Quarterly	W1-W11
Bicarbonate HCO3	(mg/l)	Quarterly	W1-W11
Nitrate	(mg/l)	Quarterly	W1-W11
Arsenic	(mg/l)	Quarterly	W1-W11

Parameter	Units	Frequency	Monitoring point
Cyanide	(mg/l)	Quarterly	W1-W11
Mercury	(mg/l)	Quarterly	W1-W11
Selenium	(mg/l)	Quarterly	W1-W11
Manganese	(mg/l)	Quarterly	W1-W11
Silver	(mg/l)	Quarterly	W1-W11
Phenol	(mg/l)	Quarterly	W1-W11
Na	(mg/l)	Quarterly	W1-W11

3.10 Off-site landfill gas monitoring

3.10.1 Monitoring boreholes are shown on drawing 3428-CAU-XX-XX-DR-S-1807. Gas monitoring boreholes surround the site perimeter.

3.11 Receptors and Compliance Points

3.11.1 Potential receptors of water-borne contaminants from the Site are:

- Groundwater
- Surface water bodies
- Abstraction points

3.11.2 The groundwater receptor for hazardous substances is considered to be the point of entry (without dilution) for hazardous substances to enter the water table beneath the base of the site. This is consistent with the Groundwater Regulations 2009.

3.11.3 The groundwater receptor for non-hazardous substances is considered to be groundwater in the down gradient monitoring boreholes within the Llandovery Series rocks. It is noted that the water table intersected in the boulder clay is at a higher elevation than the leachate levels in all cells. The recent groundwater level monitoring does not show a distinct groundwater flow directions, therefore the generalised flow towards the east used in the 2010 review will be applied in the modelling.

3.11.4 Surface water bodies: These include the issues and stream located around the perimeter of the site.

3.11.5 Abstractions: There are no known groundwater abstractions within 500m of the site boundary.

3.12 Conceptual Model

3.12.1 The following sections provide details relating to the specific receptors and compliance points that are considered in the risk assessments:

3.13 Hydrogeological Risk Assessment

3.13.1 The most recent HRA Review to be completed was in February 2018, 3400-CAU-XX-XX-RP-O-3001-A0-C1 the report builds upon the assessments carried out previously and evaluated the impact of overtip at the site and therefore increased waste depth.

3.13.2 The purpose of the review was to review how the addition mass of waste may have changed the hydraulic properties of the waste mass at the base of the Site and therefore whether this would have any perceivable impact on the potential to abstract leachate from the Site in accordance with the leachate management plan.

3.13.3 Review of the impacts of the increase in waste thickness has not changed the overall risk from the site to the groundwater environment. The additional waste mass has not significantly changed the duration of the source term such that there is a discernible change in the predicted impact of the site on the groundwater environment.

3.14 Landfill Gas Risk Assessment

3.14.1 The latest landfill gas risk assessment has been produced as part of the permit variation application, document reference 3428-CAU-XX-XX-RP-V-0311-A0-C1.

3.14.2 An update of the Landfill Gas Risk Assessment for Bryn Posteg Landfill Site was undertaken to reflect the additional waste that the site will have taken upon completion, over what has been previously assessed under the site's Environmental Permit (EP), number EPR/BU7766I, consolidated on the 16th October 2017.

3.14.3 The assessment was undertaken using GasSim 2.5 and the associated Tier 1 and Tier 2 screening modules. The existing conceptual model for the site was updated with waste inputs and recent monitoring data.

3.14.4 Overall, the predicted gas generation rates are similar to those predicted and assessed previously. Validation against extraction flow rates for the engine and flare suggest that the site is more-accurately modelled by the 'average' scenario. However, the currently available data is not sufficient to conclusively exclude the possibility that gas generation rates may be as high as modelled by the 'wet' scenario. Nevertheless, the risk assessment was carried out on the basis of the more-conservative Scenario 2.

3.14.5 The full risk assessment is attached as part of the variation application 3428-CAU-XX-XX-RP-V-0311-A0-C1.

3.15 Stability Risk Assessment

3.15.1 The proposed restoration profile will be developed by waste infill in the Phase 9 are a to form slopes (prior to capping) which are consistent with the SRA issued 2018, specifically that the design slopes pertaining to the external slopes should be;

- no steeper than 1 in 5 and capped using an LLDPE geomembrane overlain by a drainage geocomposite layer (GDL); or
- no steeper than 1 in 6.5 and capped using an LLDPE geomembrane overlain by a protection geotextile.

3.15.2 The remainder of the site has already been capped and most of it covered with restoration soils. It is proposed that these existing capped areas remain at their current levels with some additional restoration soils added as necessary to achieve the proposed restoration scheme.

3.15.3 Most of the external slopes were capped a number of years ago using either clay, GCL or an LLDPE geomembrane overlain by a drainage geocomposite and restoration soils, in accordance with the materials referenced in SRA and the subsequent addenda.

3.15.4 It is recognised that some of the slopes in Phases 3 and 9 are steeper than the maximum 1 in 5 slope gradient detailed SRA 2018. These slopes have been in place since 2009 and do not show signs of distress or any instability. Whilst the Factor of Safety (FoS) associated with these slopes will be less than 1.3. Over time the slope profiles will settle and the FoS increase as a consequence.

3.15.5 On the basis of our assessment and those assessments carried out previously in the development of the site's SRA, the weakest interface and the potential critical plane of instability in the capping design is between the drainage geocomposite and the overlying restoration soils. Failure of the slope along the critical plane would therefore result in the sliding of the restoration soils on top of the drainage geocomposite. Such a failure mechanism would not affect the integrity of the capping liner or the integrity of the containment afforded by the liner. Remediation would also be a simple matter of placing soils back over the affected localised area.

3.15.6 With regards to the current slopes it is considered that leaving them in their currently capped and restored state is the most environmentally acceptable option.

3.15.7 The SRA has been attached as part of the permit variation 3428-CAU-XX-XX-RP-Y-0305-A(0).

3.16 Risk Assessment for nuisance and health issues

3.16.1 A risk assessment has been produced to account for the revised restoration profile and is provided in document referenced 3428-CAU-XX-XX-RP-V-0301-A0-C2.

3.16.2 A summary of receptors is shown in Table 1 in Section 1.2.

4. SITE REPORT

4.1 Introduction and Background information

4.1.1 Bryn Posteg Landfill Site is located approximately 2.8 km south east of Llanidloes, Powys, at NGR SN970822. The site is operated by Sundorne Products (trading as Potters Waste Management). The site is accessed via the B4518, the Llanidloes to Tylwch Road. The site location is marked by the red circle in Figure 1 below.

Figure 1. Site Location

4.1.2 The site is situated amongst predominantly agricultural land. It is bound to the west by the B4518. Few residential properties are situated within close proximity to the site. The site and the surrounding receptors are shown on Drawing 3428-CAU-XX-XX-RP-V-1806.

4.1.3 The landfill site at Bryn Posteg has been developed in the surface void associated with an old lead mine. Approximately 17 hectares of the site have been subject to controlled landfilling since 1982.

4.1.4 The site accepts municipal waste, which is reported to consist of 60-70% household waste and 30-40% commercial trade waste. Some industrial waste is also accepted. As far as in known, this composition has remained similar during the time Evans Logistics and Potters have operated the site, and it is also assumed that it will remain similar until the site's completion, projected to be in 2018.

4.1.5 Historical development is summarised in section 2.1.1, the landfill is located in a former lead mine. Historical OS maps show the lead mine on the earliest available plans from 1886.

4.1.6 Any potential contaminants associated with the site before the landfilling will therefore be most likely linked to the development of the lead mine.

4.1.7 The geology, hydrology, hydrogeology and surface water at the site are outlined in section 3 of this ESID report.

4.2 Objectives of this Assessment

4.2.1 The objective of this report is to provide a summary of the environmental setting of the site, the initial baseline conditions at the site are not established as part of the report as waste was first accepted in 1982, prior to the establishment of the Environmental Permitting Regime.

4.2.2 The approach therefore is to follow existing guidelines to demonstrate the existing site conditions.

4.2.3 Different contamination to be considered is shown in section 2.1 with regard to the development of the existing installation.

4.3 Site Investigation Details

4.3.1 As the installation is already existing there has been no site investigation for the purposes of this report.

4.3.2 Details relating to borehole logs and environmental monitoring are covered in section 3 of this report.

4.3.3 The latest annual monitoring review is attached to demonstrate recent conditions at the site, 3033-CAU-XX-XX-RP-V-0306-A0-C1.

4.4 Summary of Site Investigation and Analysis Findings

4.4.1 The Environmental Permit and recent reports including: HRA Review, Annual Reviews, leachate management plans and gas management plans detail recent analysis findings.

4.5 Data Interpretation

4.5.1 The site is monitored in line with Environmental Permit and data collected is analysed in line with reporting sections of the permit. Data has been interpreted for the most recent reviews as described above in section 4.4.

4.6 Conclusions

4.6.1 The objective of this report is not to determine baseline conditions for the site as the site has been operational for a number of years with the first waste was accepted in 1982. There are no changes to the site setting itself since the previous ESID report.

4.6.2 The implications of the revised restoration at the site are addressed in earlier sections of this report.

5. REFERENCES

NRW Regulation 61(1) Information Notice – Bryn Posteg Landfill Notice No.2: Letter 3824.CAU.XX.XX.CO.Y.03

Amenity and Accidents Risk Assessment	3428-CAU-XX-XX-RP-V-0301-A0-C1
Landfill Gas Management Plan	3428-CAU-XX-XX-RP-V-0303-A0-C1
Leachate Management Plan	3428-CAU-XX-XX-RP-V-0304-A0-C1
Landfill Gas Risk Assessment	3428-CAU-XX-XX-RP-V-0311-A0-C1
HRA Review 2018	3400-CAU-XX-XX-RP-O-0301-A0-C1
2017 Annual Monitoring Review	3033-CAU-XX-XX-RP-V-0306-A0-C1
Surface Water Management Plan	3428-CAU-XX-XX-RP-V-0300-A0-C1
Stability Risk Assessment	3428-CAU-XX-XX-RP-Y-0305-A(0)

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