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KEY:

- Licence Boundary
- Inferred Zone Boundary
- Remediated Waste Extents
- Active Extraction Well - Zones 1 and 3 (Detail 1)
- Perimeter Gas Monitoring Borehole (Detail 2)
- Perimeter Venting Trench
- Zone 1 Carrier Main
- Zone 3 Carrier Main
- 63mm Collection Pipework from Wells to Manifold
- Manifold
- Existing Perimeter Gas Monitoring Borehole
- In-Waste Gas Monitoring Borehole (Subject to Remediation/Development works)

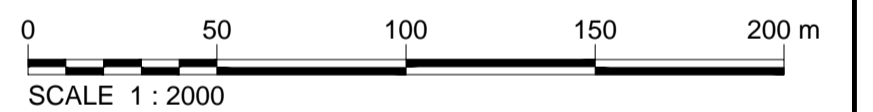
NOTES:

1. For detailed description of Zones, refer to Chapters 3 and 12 of the EIAIR
2. All levels to metres OD (Main Head)

Zone	Description	Gas management
1	Primarily MSW with high methane generation.	Vertical extraction wells, linked to active extraction and flaring.
1A	C&D wastes (hard core, plastic, wood); lower methane generation than Zone 1.	Due to proximity to Zone 1, some wells installed linked to the active extraction system.
2A	Mixed MSW and C&D with some isolated areas of high methane where wastes thickest.	Gas collection layer under low permeability capping, linked to perimeter vent trench. Vent trench installed with vents which can be converted to include vertical stacks and cowls if required. Vent trench can also be adapted to include bio-oxidation layer if required.
2B	C&D waste with some MSW (low methane)	As Zone 2A.
3	Lined cell principally MSW, and fire wastes with high methane generation.	Vertical extraction wells, linked to active extraction and flaring. Extraction lines independent to that of Zone 1 to provide gas field flexibility.
4	Above ground mounds and bunds (C&D or processed waste), majority of which are to be removed during remediation, anticipated limited gas generation.	Natural methane oxidation within capping expected to further limit any fugitive releases of gas, bringing emissions to acceptable levels.
5	Waste largely absent (to be confirmed by GI)	None proposed but to be confirmed following GI, and on-going monitoring.

Table for carrier main falls:

Direction	Minimum pipework fall
Stable ground, fall and gas flow in same direction	1 in 100
Stable ground, fall and gas flow in opposite direction	1 in 50
Over fill, fall and gas flow in same direction	1 in 50
Over fill, fall and gas flow in opposite direction	1 in 25



Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd
2	07/08/2017	EIAIR SUBMISSION	AR	CD	CD	RR
1	30/06/2017	EIAIR SUBMISSION	KMA	CD	CD	RR
0	24/10/2016	EIS SUBMISSION	AR	SC	CD	RR



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Project  
**KERDIFFSTOWN LANDFILL  
REMEDIATION PROJECT**

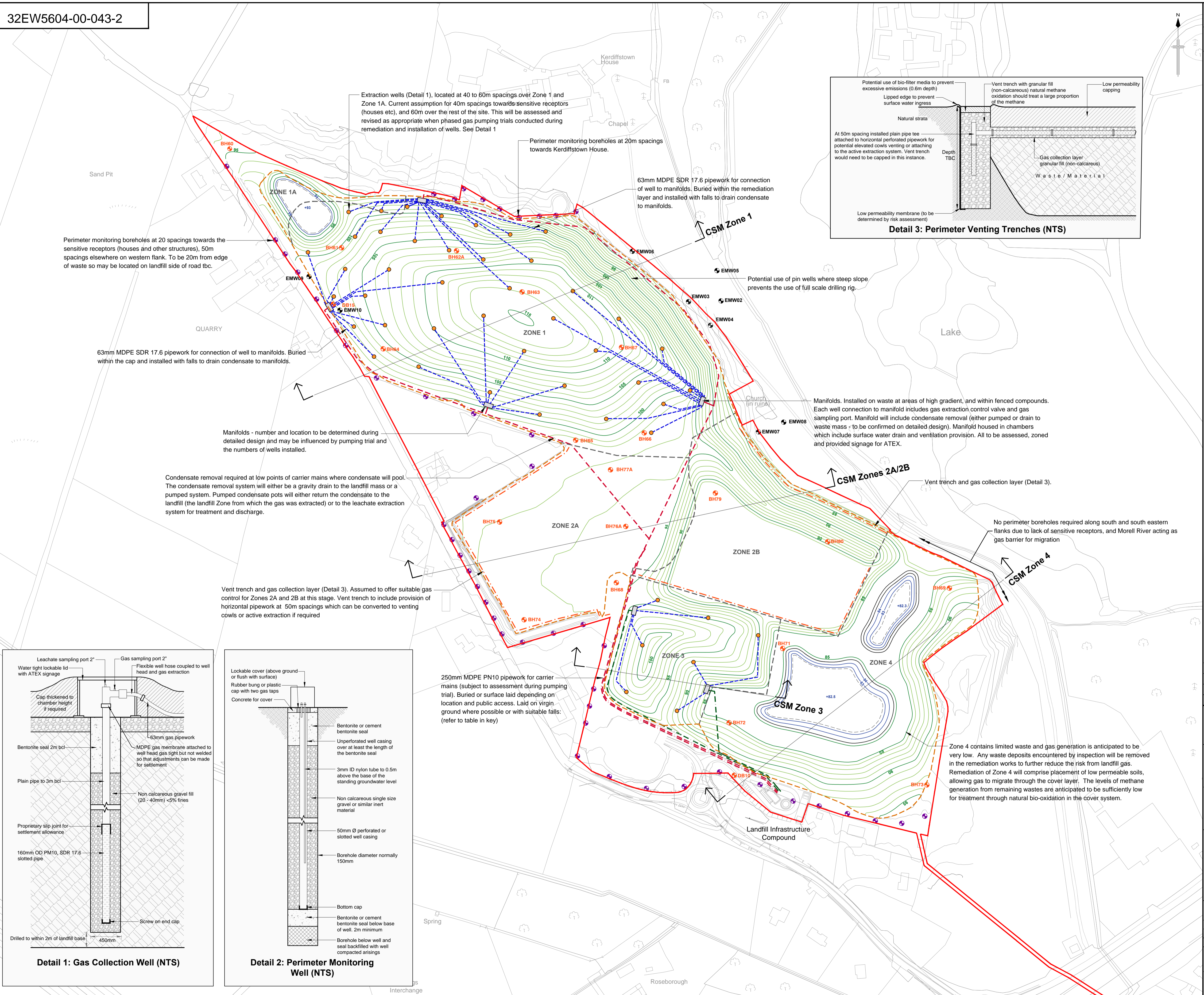
Drawing title  
**FIGURE 4.18  
OUTLINE LANDFILL GAS MANAGEMENT PLAN  
FOR THE PROPOSED PROJECT**

Drawing status  
**EIAIR SUBMISSION**

Scale  
1:2000 @A1 (DETAILS SHOWN ARE NOT FOR CONSTRUCTION PURPOSES HENCE DRAWING SHOULD NOT BE SCALED)

Jacobs No. 32EW5604  
Client no. 6286  
Drawing number 32EW5604-00-043  
Rev 2

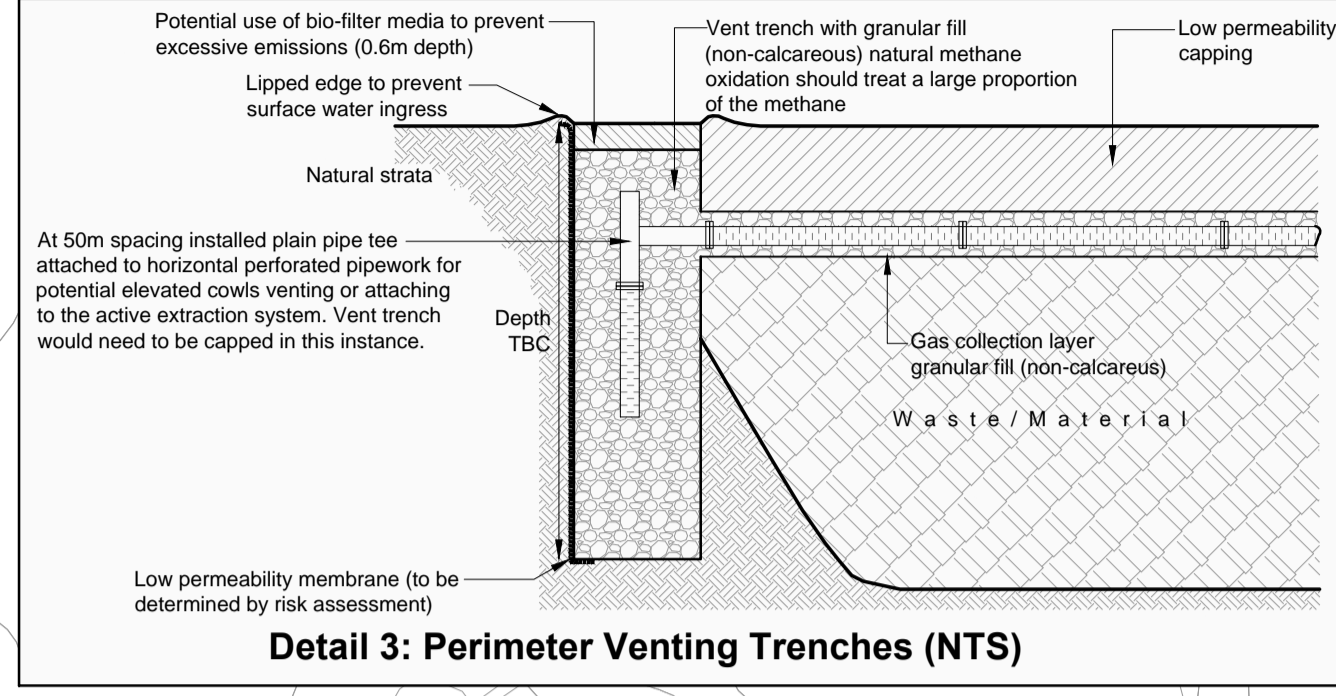
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Extraction wells (Detail 1), located at 40 to 60m spacings over Zone 1 and Zone 1A. Current assumption for 40m spacings towards sensitive receptors (houses etc), and 60m over the rest of the site. This will be assessed and revised as appropriate when phased gas pumping trials conducted during remediation and installation of wells. See Detail 1

Perimeter monitoring boreholes at 20m spacings towards Kerdiffstown House.

63mm MDPE SDR 17.6 pipework for connection of well to manifolds. Buried within the remediation layer and installed with falls to drain condensate to manifolds.



Potential use of pin wells where steep slope prevents the use of full scale drilling rig.

Perimeter monitoring boreholes at 20 spacings towards the sensitive receptors (houses and other structures), 50m spacings elsewhere on western flank. To be 20m from edge of waste so may be located on landfill side of road tbc.

63mm MDPE SDR 17.6 pipework for connection of well to manifolds. Buried within the cap and installed with falls to drain condensate to manifolds.

Manifolds - number and location to be determined during detailed design and may be influenced by pumping trial and the numbers of wells installed.

Condensate removal required at low points of carrier mains where condensate will pool. The condensate removal system will either be a gravity drain to the landfill mass or a pumped system. Pumped condensate pots will either return the condensate to the landfill (the landfill Zone from which the gas was extracted) or to the leachate extraction system for treatment and discharge.

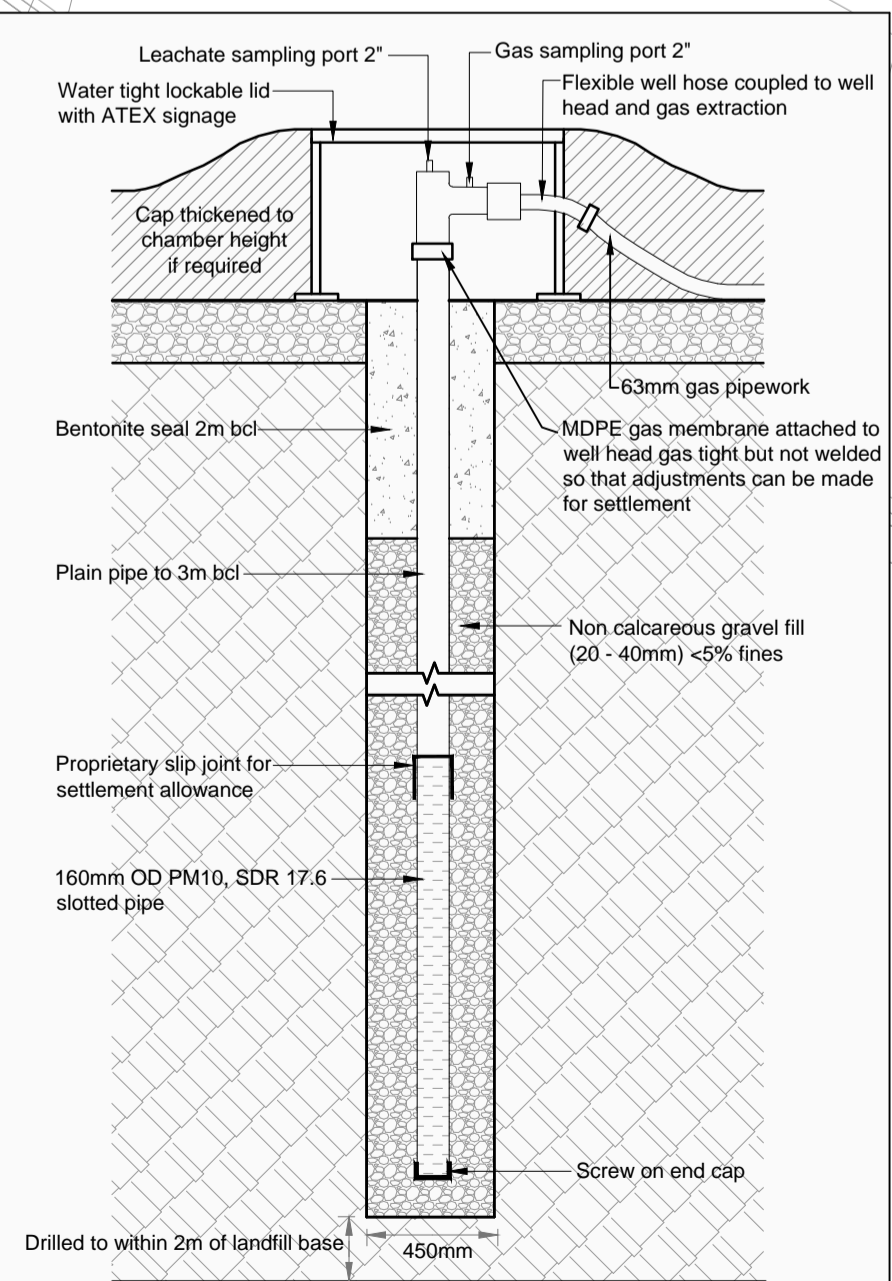
Manifolds. Installed on waste at areas of high gradient, and within fenced compounds. Each well connection to manifold includes gas extraction control valve and gas sampling port. Manifold will include condensate removal (either pumped or drain to waste mass - to be confirmed on detailed design). Manifold housed in chambers which include surface water drain and ventilation provision. All to be assessed, zoned and provided signage for ATEX.

Vent trench and gas collection layer (Detail 3).

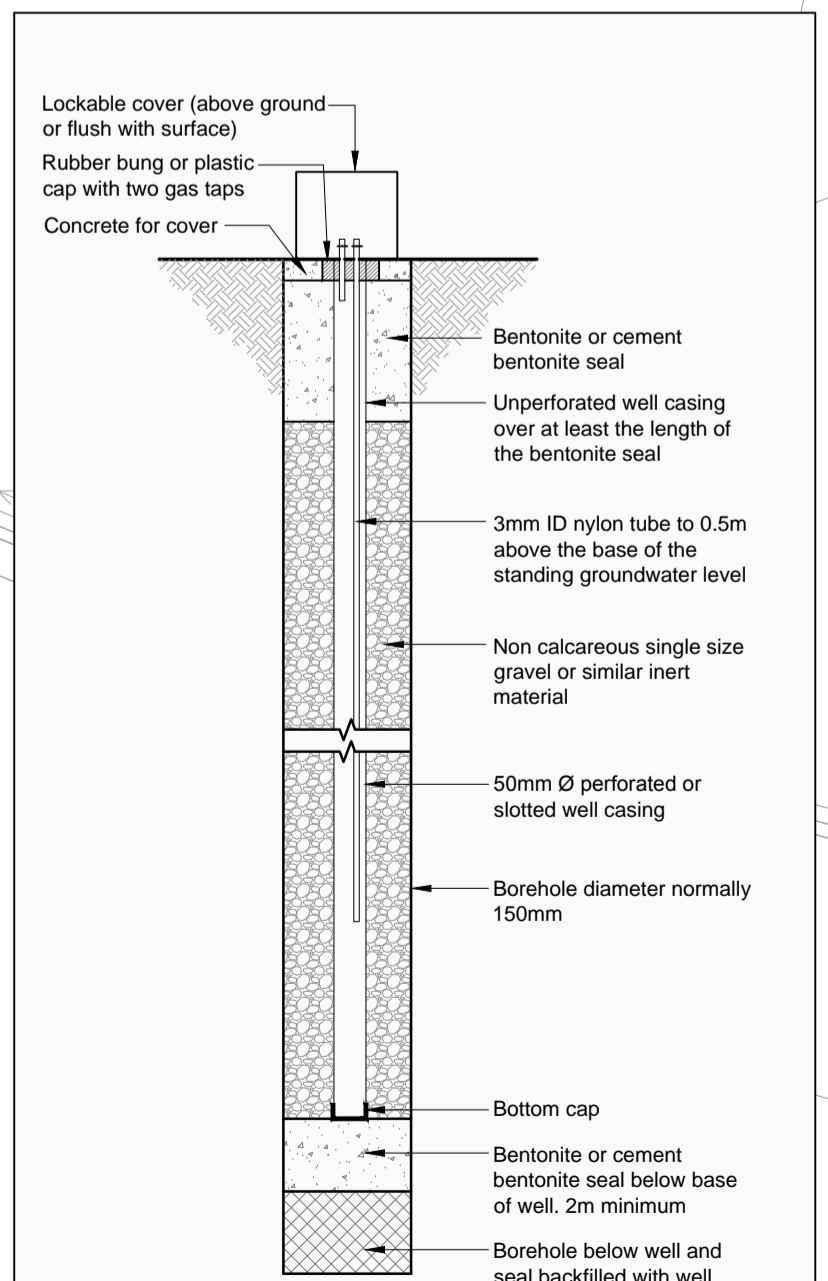
No perimeter boreholes required along south and south eastern flanks due to lack of sensitive receptors, and Morell River acting as gas barrier for migration

Vent trench and gas collection layer (Detail 3). Assumed to offer suitable gas control for Zones 2A and 2B at this stage. Vent trench to include provision of horizontal pipework at 50m spacings which can be converted to venting cowls or active extraction if required

250mm MDPE PN10 pipework for carrier mains (subject to assessment during pumping trial). Buried or surface laid depending on location and public access. Laid on virgin ground where possible or with suitable falls: (refer to table in key)



Detail 1: Gas Collection Well (NTS)



Detail 2: Perimeter Monitoring Well (NTS)