

BLUE SKY RESOURCE RECOVERY LTD.

LISBANE LANDFILL SITE – GAS EXTRACTION
BOREHOLES
CQA PLAN



DOCUMENT CONTROL

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1 Introduction

1.1 General

Taggarts have been appointed by Blue Sky Resource Recovery Ltd. to prepare a Construction Quality Assurance (CQA) Plan for the installation of new gas extraction boreholes. This plan has been prepared in accordance with NIEA requirements and relevant guidance documents.

1.2 Location

Lisbane Landfill Site is located on Aughlish Road, approximately 2.3km southeast of Tandragee. The Irish Grid Reference for the site is J 04803 44531

The site previously accepted a variety of primarily non-hazardous wastes since 1997. The site was constructed as a containment landfill with a groundwater management system and a composite lining system. The immediate surrounding area is primarily agricultural, open farmland with scattered farm buildings and dwellings.

1.3 Project Description

The works will comprise the installation of up to six new gas extraction boreholes

A drawing showing the proposed locations and well details are available in Appendix A.

2 Definitions

For clarification, the following definitions are given:

Construction Quality Assurance (CQA) – A planned and systematic pattern of all means and actions designed to provide confidence that items or services meet contractual and regulatory requirements. Construction Quality Assurance refers to means and actions employed to assure conformity of the lining system, i.e. its preparation, production and installation, to this CQA Plan, the Contract Drawings and Specifications. CQA is provided by a party independent from production and installation.

Construction Quality Control (CQC) – Actions that provide a means of measure and regulation to characteristics of an item or service to contractual requirements. CQC refers to those actions taken by Manufacturers, Installers, Contractors, or the employer to ensure materials and workmanship meet the requirements of the plans and specifications.

Contractor – The person or persons, firm, company or other body to whom the Contract has been / will be awarded by the employer, and includes the Contractor's personal representatives or other parties, e.g. Sub-Contractors, Manufacturer. The Contractor will undertake the execution of the works under the terms of the Contract.

3 Responsibilities

3.1 Project Manager

The project manager will be office based and will:

- Attend all progress or liaison meetings and be the key contact with regulatory officers;
- Review all designs, plans and specifications;
- Review other site-specific documentation, including proposed layout and Contractor's qualifications;
- Administer the CQA program; and,
- Review all changes to the design, plans and specifications.

3.2 CQA Supervisor

The CQA Supervisor will be located at the site and will:

- Manage the daily activities of the CQA regime;
- Attend all CQA related meetings (e.g. Pre-construction and Progress);
- Supervise the ongoing preparation of the as-built drawings;
- Record any relevant observations in the daily report;
- Report any unresolved deviations from this CQA Plan to the Project Manager;
- Provide all logs and relevant data to the Project Manager;
- Assist in the production of the CQA Validation Report; and,
- Report to the Project Manager.

4 Description of the Works

4.1 Parties/Responsibilities

Client:	Blue Sky Resource Recovery Ltd.
Contractor:	South Tyne Drilling
Engineer:	Taggarts
CQA Engineer:	Taggarts

4.2 Scope of Drilling Works

Up to 6 No. gas extraction boreholes will be installed at Lisbane Landfill Site. The gas boreholes drilled at various depths and aim to extract landfill gas from areas of the site currently not fully availed of.

Site geology and the anticipated depth and diameter are required to enable a drilling method to be selected. It is proposed that each gas extraction borehole will be drilled with a bore diameter of 450mm to a maximum depth of up to approximately 15m, ensuring the underlying engineered liner of the landfill is not breached.

The borehole diameters will be primarily dictated by the equipment used and the need to provide an annular space for the installation of a filter pack. The installation diameter is typically defined as the nominal internal diameter of the casing. The standpipe installations shall comprise of a HDPE standpipe comprising a slotted section, with geosoc and gravel pack surround.

A bentonite seal will be provided to prevent a pathway for ingress of surface water and to the escape of landfill gas and leachate from the landfill. The headworks for the gas boreholes will consist of angle seated valves allowing adjustment and balancing of the gas field and will include push lock sample points for monitoring purposes.

The ground will be inspected before drilling commences to minimise impact on site infrastructure. The drilling contractor will ensure the proposed drill rig is serviced as per the manufacturer's requirements. Upon completion of the gas extraction boreholes a sample survey will be undertaken to provide the integrity of the installation.

The contractor will provide a full set of borehole logs and a factual report of the work undertaken. The borehole logs will be compared against the depths proposed in the

Construction Plan and the CQA Engineer will verify the boreholes are the sufficient depth by dipping the borehole upon completion.

4.3 Borehole Locations and Referencing

The gas borehole locations have been selected based on expected flow and location of the existing extraction boreholes that produce good flows and high CH₄ concentration.

Where boreholes are located further into the site and away from any access roads, rubber mats or similar methods will be used to allow access and prevent damage. While the existing boreholes are spread throughout the site, some are not performing to an adequate level. The proposed gas extraction boreholes will allow for more comprehensive coverage and enable better utilisation of the landfill gas produced.

4.4 General Requirements

4.4.1 Contractors Health and Safety Requirements

Health and Safety issues that are to be considered but not limited to include: the risk of striking underground/overhead services, the risk of injury associated with a drilling rig and its ancillary equipment (moving parts, heat, noise, falls, crushing), exposure to potentially contaminated soils and groundwater, confined spaces and the storage and use of hazardous materials on site.

Health and safety considerations should be incorporated into a health and safety plan by the contractor which should be read by all site workers and site visitors with copies of the plan to be kept on site.

4.4.2 Contractors Capital Cost

Cost items for the contractor shall include designers costs, establishment (mobilisation of drilling rig, hire of ancillary equipment, provision of temporary storage space, decontamination and cleaning equipment, traffic management, site security, welfare facilities), drilling costs (PPE, drilling, in situ sampling/testing, disposal of drilling wastes), installation costs (provision of equipment and materials, installation of materials, borehole development), location and elevation surveying, supervision, reporting and decommissioning (when anticipated in advance).

4.4.3 Contractors Professional Attendance

The Contractor shall provide a suitably experienced and qualified person who shall be responsible for the general supervision of drilling. The responsible person shall ensure that all works carried out are in accordance with this CQA Plan and to the satisfaction of the Engineer. This person will also ensure logging of boreholes shall be in accordance with regular standards for engineering purposes.

4.4.4 Direction of the Engineer

The work shall be carried out by the Contractor in accordance with the Conditions of Contract as amended and the Specification to the entire satisfaction of the Engineer and in accordance with any further details or written instructions that may be given by the Engineer.

The number, location and depth of boreholes may be modified due to conditions on site however this will only be directed by the Engineer. The Contractor may consult and suggest holes or other drilling methods, but the decision of the Engineer shall in all cases be final. Any changes in this proposed construction plan will be notified to NIEA as soon as possible.

5 Monitoring and Testing

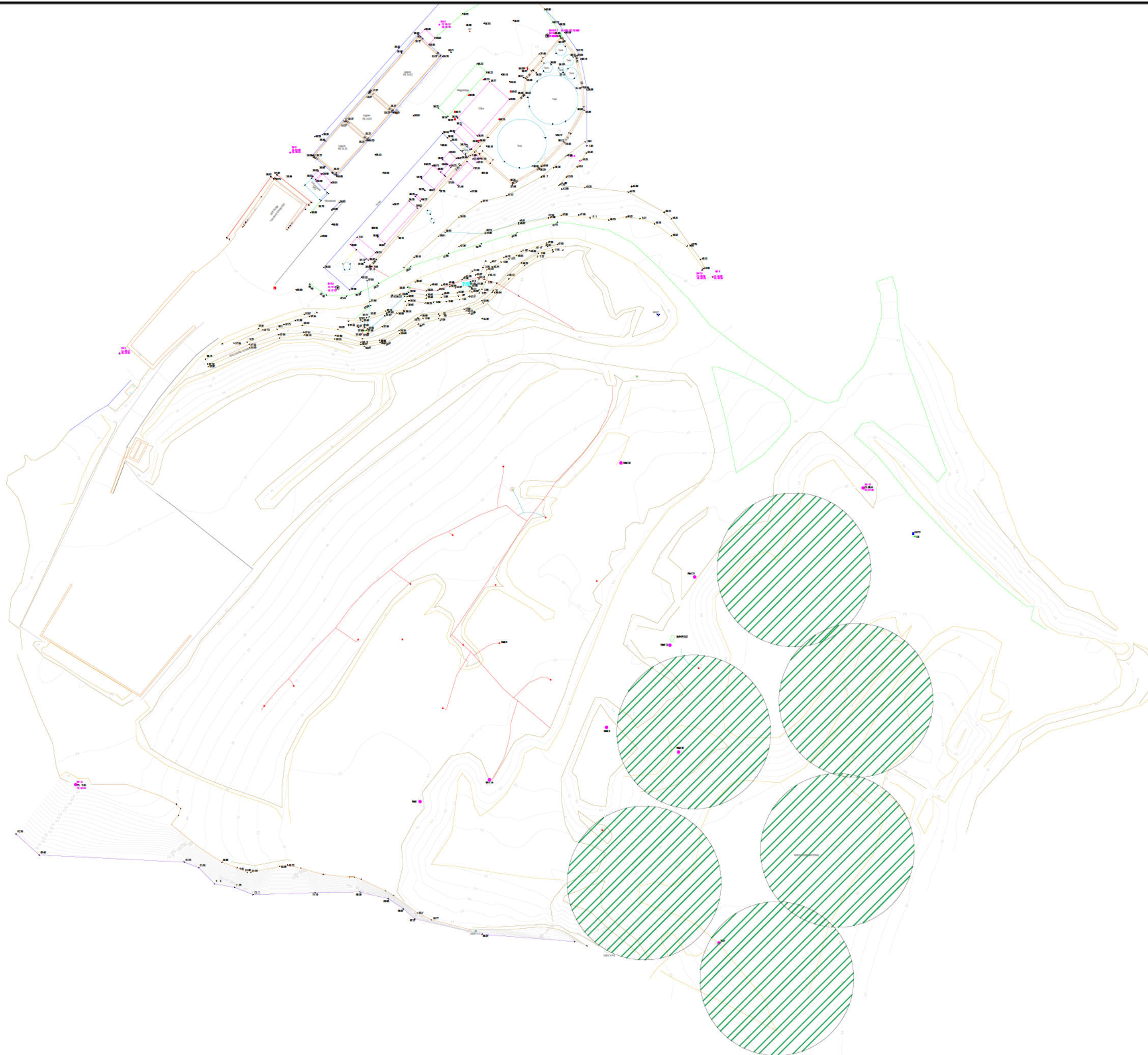
Following the installation of the proposed gas boreholes, monitoring will be carried out as per Table S4.10 of the site permit which includes the following parameters:

- CH₄
- CO₂
- O₂
- Carbon Monoxide
- Atmospheric Pressure
- Differential Pressure.

The results will be monitored carefully, and the angle seated valves of each borehole adjusted accordingly to maximise utilisation of the landfill gas management system. This will help to improve the performance of the gas engine on site while reducing potential lateral migration and surface emissions from the site.

Appendix A

Drawings



Potential Well
Location

REV	DATE	DESCRIPTION	DRN	CKD
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CQA PLAN

Taggarts

CLIENT BLUE SKY RESOURCE RECOVERY
TLD.

CONTRACT LISBANE LANDFILL

DRAWING NEW GAS WELLS (DEC 2022)

SCALE	1:500	DATE	01.12.22
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DRAWN	CHECKED
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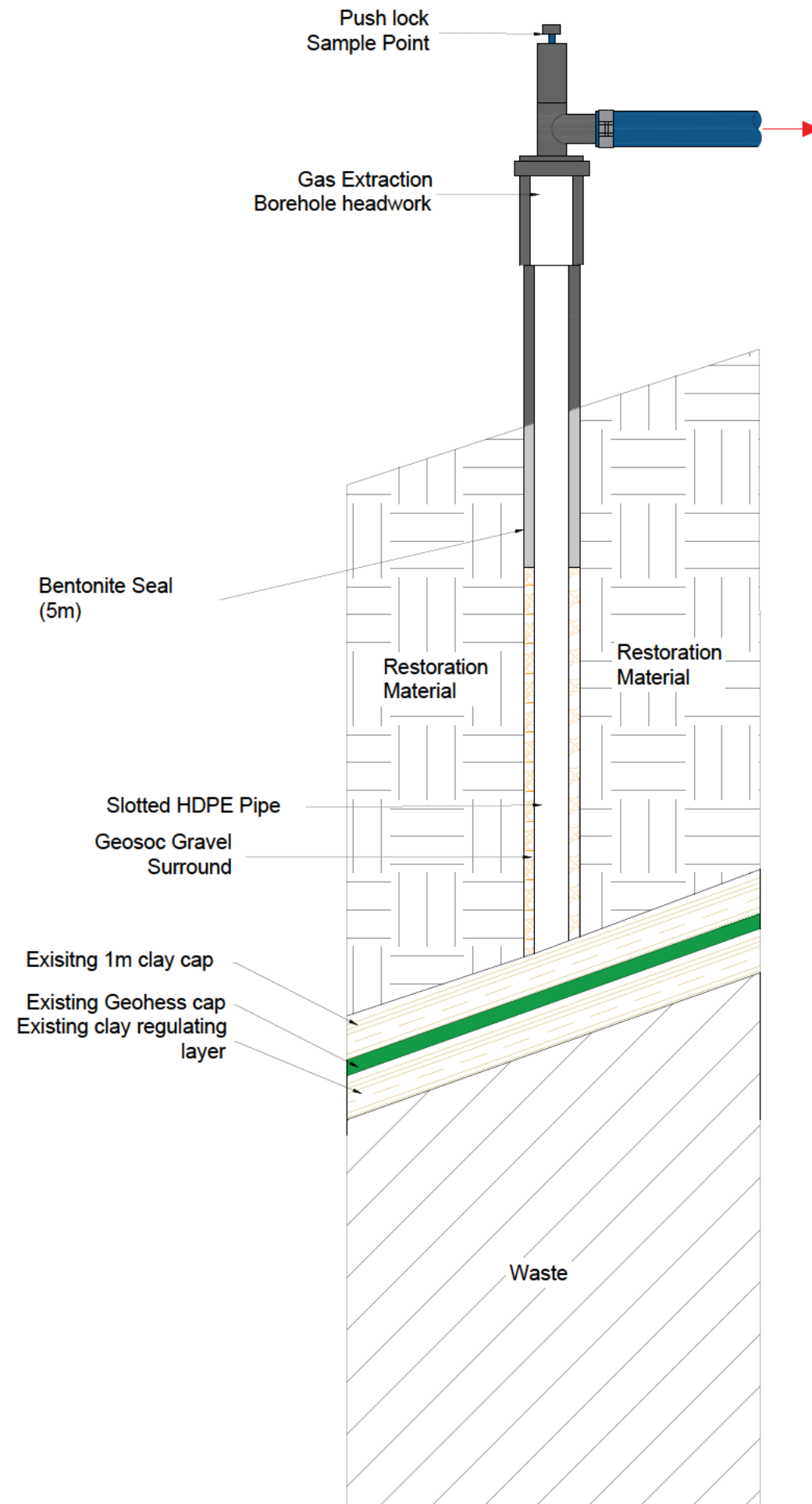
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Architects
Civil Engineers

23 Bedford Street
Bedford,
BD2 7EJ

Waste & Energy
Project Managers

t: 028 9066 2121
e: info@taggarts.uk
w: www.taggarts.uk



REV	DATE	DESCRIPTION	DRN	CKD
CQA REPORT				
Taggarts				
CLIENT		BLUE SKY RESOURCE RECOVERY TLD.		
CONTRACT		LISBANE LANDFILL		
DRAWING		NEW GAS WELL DETAILS (DEC 2022)		
SCALE	N.T.S.	DATE	01.12.22	
DRAWN		CHECKED		
DRG No.	15047-900-202	REVISION		
Architects	23 Bedford Street Bristol, BS1 2EJ			
Civil Engineers				
Waste & Energy	t: 028 9066 2121 e: info@taggarts.uk w: www.taggarts.uk			
Project Managers				