

BLUE SKY RESOURCE RECOVERY LTD.

LISBANE LANDFILL SITE – GAS EXTRACTION
BOREHOLES
CQA REPORT



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) Report 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 comprised the installation of six new gas extraction boreholes

A drawing showing the proposed location of the new boreholes is 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 Description of the Works

3.1 Parties/Responsibilities

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

3.2 Scope of Drilling Works

6 No. gas extraction boreholes will be installed at Lisbane Landfill Site with their locations shown on the drawings in Appendix A. The gas boreholes drilled at various depths and aim to extract landfill gas from areas of the site currently not fully availed of.

Each gas extraction borehole was drilled with a bore diameter of 450mm to a maximum depth of 42.5m, ensuring the underlying engineered liner of the landfill is not breached. The standpipe installations comprise of a HDPE standpipe, with a slotted section, solid section, bentonite seal and gravel pack surround.

A bentonite seal was 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 consist of angle seated valves allowing adjustment and balancing of the gas field and include push lock sample points for monitoring purposes.

The ground was inspected before drilling commences to minimise impact on site infrastructure. The drilling contractor ensured the proposed drill rig is serviced as per the manufacturer's requirements. Upon completion of the gas extraction boreholes, all joints and seals were checked to ensure the integrity of the installation.

Health and safety considerations were incorporated into a health and safety plan by the contractor, which was read by all site workers and site visitors.

The Contractor provided suitably experienced and qualified person who were responsible for the general supervision of drilling. The responsible person ensured that all works carried out are in accordance with the CQA Plan and to the satisfaction of the Engineer. This person also ensured logging of boreholes was in accordance with regular standards for engineering purposes. Borehole logs from the works are available in Appendix B.

The results of the new gas boreholes 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.

4 Summary

This CQA Validation Report outlines the constructions quality assurance procedures in place throughout the gas extraction borehole works at Lisbane Landfill Site.

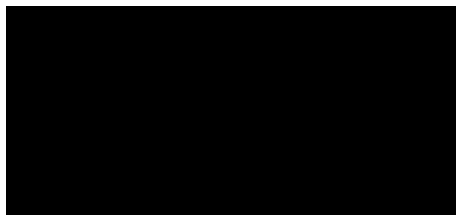
Taggarts were appointed as CQA Supervisors for the works and observed and monitored all works undertaken. The works were completed in accordance with the CQA Plan and completed to the satisfactions of the CQA Supervisor.

CQA Certificate

On the basis of supervising and monitoring the works carried out at Lisbane Landfill Site, borehole logs and on-site testing, we hereby certify that:

Gas extraction borehole works involved the drilling and connection of four new boreholes to the landfill gas extraction network at Lisbane Landfill Site. Taggarts can confirm that the above works were carried out in accordance with the approved CQA Plan.

Signed:

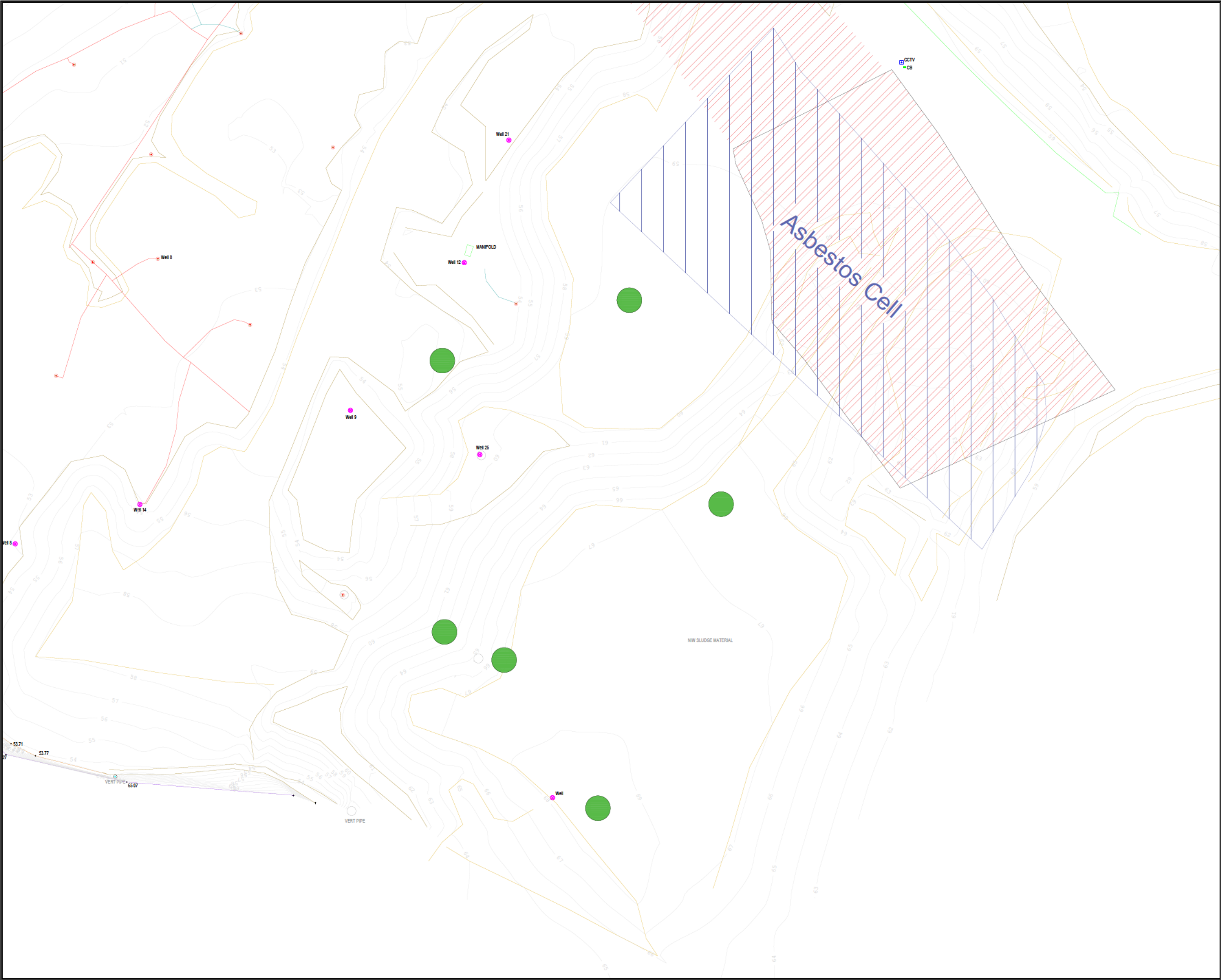


Date: 17.10.2022

CQA Supervisor (for and on behalf of Taggarts)

Appendix A

Drawings



New Well

REV DATE	DESCRIPTION	DRN	CKD
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CQA REPORT

Taggarts

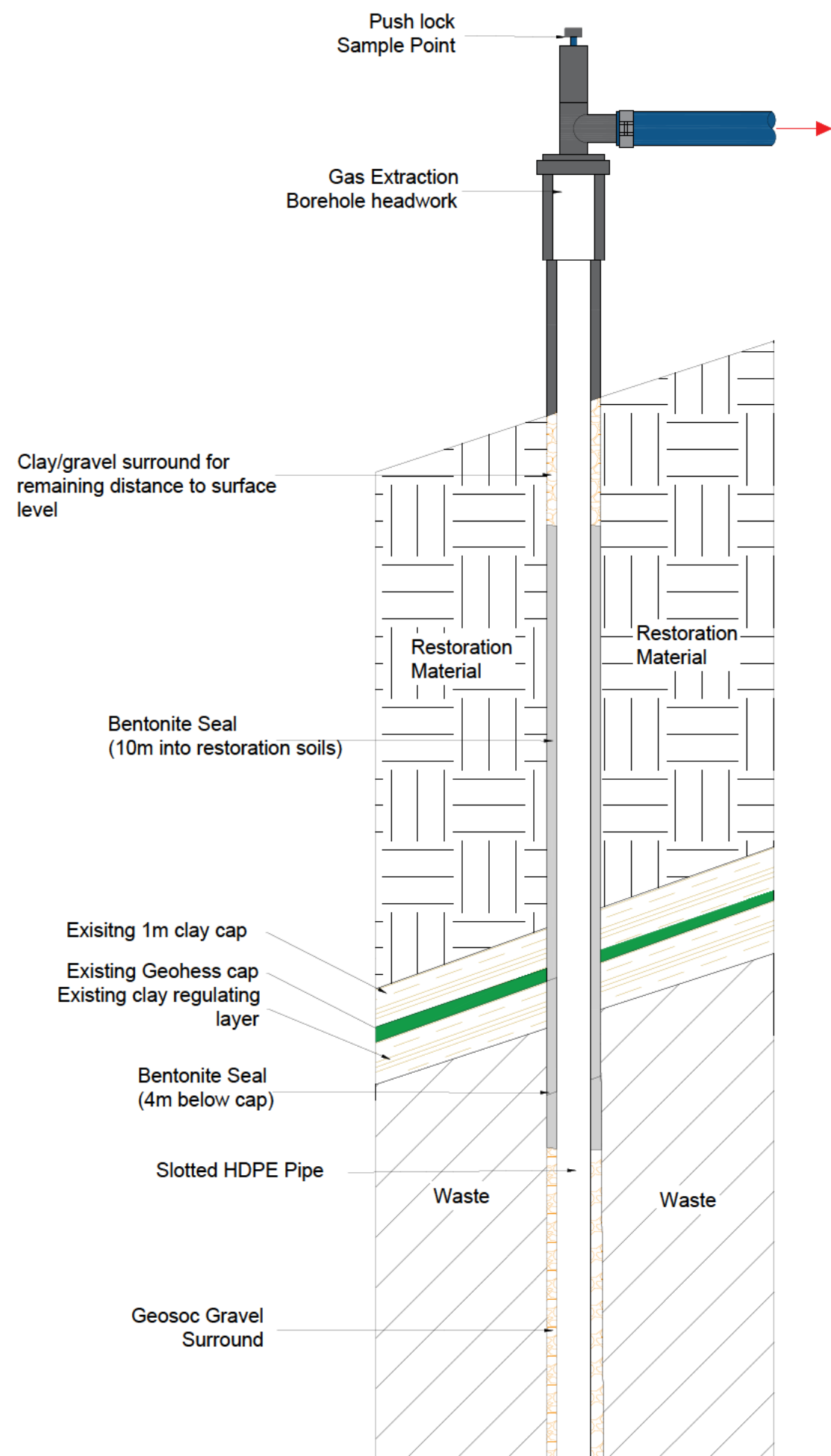
CLIENT BLUE SKY RESOURCE RECOVERY TLD.

CONTRACT LISBANE LANDFILL

DRAWING NEW GAS WELLS (2022)

SCALE	1:500	DATE	09.08.2022
DRAWN		CHECKED	
DRG No.	15047-900-101	REVISION	A

Architects Civil Engineers Waste & Energy Project Managers	23 Bedford Street Bedford, BD2 7EJ t: 028 9066 2121 e: info@taggarts.uk w: www.taggarts.uk
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Notes

REV DATE DESCRIPTION DRN CKD

CQA REPORT

Taggarts

CLIENT BLUE SKY RESOURCE RECOVERY TLD.

CONTRACT LISBANE LANDFILL

DRAWING NEW GAS WELL DETAILS (2022)

SCALE N.T.S. DATE 03.08.2022

DRAWN [] CHECKED []

DRG No. 15047-900-102 REVISION

Architects 23 Bedford Street
Bedford, BT2 7EJ

Waste & Energy t: 028 9066 2121
e: info@taggarts.uk
Project Managers w: www.taggarts.uk

Appendix B

Borehole Logs

DRILL LOG: 65765

SITE LISBANE LANDFILL

B/H No

DATE 08/08/2022

RIG NO STD 7

CREW

VEHICLE

MOBILISED DRILLING RIG AND EQUIPMENT TO
LISBANE LANDFILL

South Tyne Drilling Limited
11 Westmorland Gardens
Low Fell
Gateshead
Tyne & Wear
NE9 6HP
Tel: (0191) 4872588
Fax: (0191) 4872588
www.southtynedrilling.co.uk
E-mail: enquiries@southtynedrilling.co.uk



SOUTH TYNE drilling

The Landfill Drilling Specialists

DRILL LOG

65766

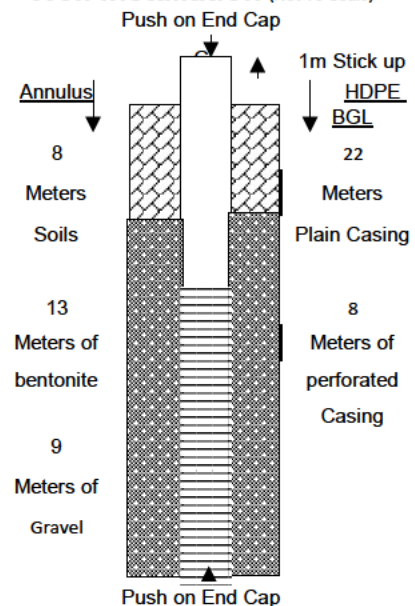
SITE LISBANE LANDFILL
B/H No 31
DATE 16/08/2022
RIG NO STD 7
CREW

VEHICLE

	SIZE (mm)	FROM (M)	TO (M)	LENGTH (M)	DESCRIPTION
MOVE & SET UP AT BOREHOLE				31	
DRILLING	450	0	19	19	Fliter Cake
		19	31	12	Dry Waste
		31			No recovery
BOREHOLE COMPLETE					

INSTALLED	160	(+)1	22	23	Plain Pipe
	160	22	30	8	Perforated Pipe
		0	8	8	Soils
		8	21	13	Bentonite
		21	30	9	Gravel
Push on Top Cap					
Push on Bottom Cap					

Well Installation (Not To Scale)



INSTALLATION DETAILS

1 M OF PIPE STICKING UP

SUMMARY

MOVE AND SET UP	1	NO.
DRILLING	31	METRES
INSTALLATION	31	METRES
BENTONITE	13	METRES
GRAVEL	9	METRES
STANDING TIME	0	HOURS

CLIENT: BLUE SKY RESOURCE RECOVERY

SOUTH TYNE DRILLING LTD'S PROJECT MANAGER:

South Tyne Drilling Limited
11 Westmorland Gardens
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DRILL LOG

65767

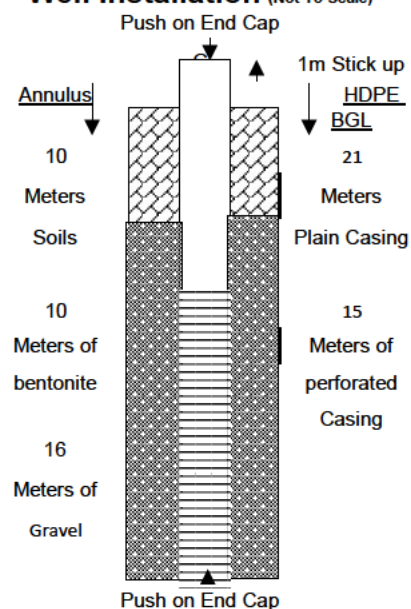
SITE LISBANE LANDFILL
B/H No Redrill 1
DATE 18/08/2022 to 24/08/2022
RIG NO STD 7
CREW

VEHICLE

	SIZE (mm)	FROM (M)	TO (M)	LENGTH (M)	DESCRIPTION
MOVE & SET UP AT BOREHOLE Redrill 1					
DRILLING	450	0	18	18	Fliter Cake
		18	40	22	Dry Waste
BOREHOLE COMPLETE					

INSTALLED	160	(+)1	21	22	Plain Pipe
	160	21	36	15	Perforated Pipe
		0	10	10	Soils
		10	20	10	Bentonite
		20	36	16	Gravel
Push on Top Cap					
Push on Bottom Cap					

Well Installation (Not To Scale)



INSTALLATION DETAILS

1 M OF PIPE STICKING UP

SUMMARY

MOVE AND SET UP	1	NO.
DRILLING	40	METRES
INSTALLATION	37	METRES
BENTONITE	10	METRES
GRAVEL	16	METRES
STANDING TIME	0	HOURS

CLIENT: BLUE SKY RESOURCE RECOVERY

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DRILL LOG

65768

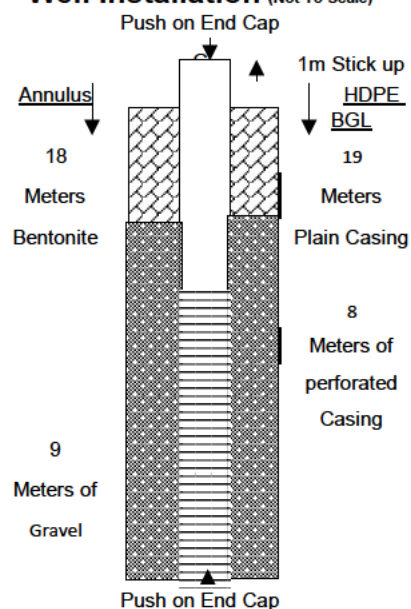
SITE LISBANE LANDFILL
B/H No Redrill 2
DATE 24/08/2022
RIG NO STD 7
CREW

VEHICLE

	SIZE (mm)	FROM (M)	TO (M)	LENGTH (M)	DESCRIPTION
MOVE & SET UP AT BOREHOLE				Redrill 2	
DRILLING	450	0	17	17	Fliter Cake
		17	29	12	Dry Waste
BOREHOLE COMPLETE					

INSTALLED	160	(+)2	19	21	Plain Pipe
	160	19	27	8	Perforated Pipe
		0	0	0	Soils
		0	18	18	Bentonite
		18	27	9	Gravel
Push on Top Cap					
Push on Bottom Cap					

Well Installation (Not To Scale)



INSTALLATION DETAILS

1 M OF PIPE STICKING UP

SUMMARY

MOVE AND SET UP	1	NO.
DRILLING	29	METRES
INSTALLATION	29	METRES
BENTONITE	18	METRES
GRAVEL	9	METRES
STANDING TIME	0	HOURS

CLIENT: BLUE SKY RESOURCE RECOVERY

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DRILL LOG

65769

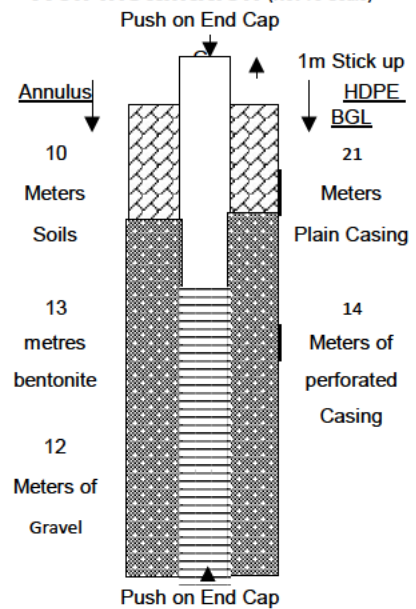
SITE LISBANE LANDFILL
B/H No 30
DATE 29/08/2022 to 31/08/2022
RIG NO STD 7
CREW

VEHICLE

	SIZE (mm)	FROM (M)	TO (M)	LENGTH (M)	DESCRIPTION
MOVE & SET UP AT BOREHOLE				30	
DRILLING	450	0	17	17	Fliter Cake
		17	28	11	Dry Waste
		28	35	7	Damp Waste
BOREHOLE COMPLETE					

INSTALLED	160	(+)1	21	22	Plain Pipe
	160	21	35	14	Perforated Pipe
		0	10	10	Soils
		10	23	13	Bentonite
		23	35	12	Gravel
Push on Top Cap					
Push on Bottom Cap					

Well Installation (Not To Scale)



INSTALLATION DETAILS

1 M OF PIPE STICKING UP

Temporary casing used
to keep borehole open
through filter cake

SUMMARY

MOVE AND SET UP	1	NO.
DRILLING	35	METRES
INSTALLATION	36	METRES
BENTONITE	13	METRES
GRAVEL	12	METRES
STANDING TIME	0	HOURS

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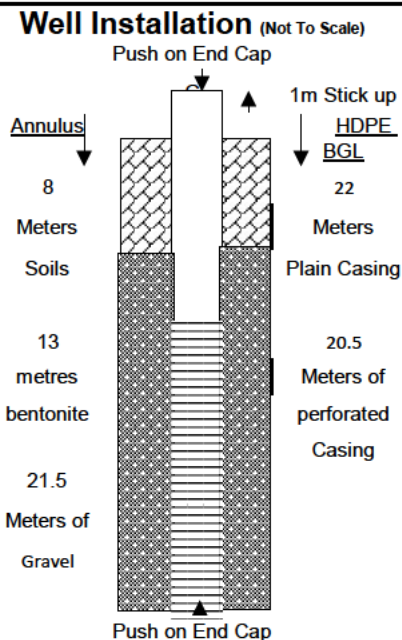


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SITE	LISBANE LANDFILL
B/H No	Redrill 1A
DATE	01/09/2022 to 09/09/2022
RIG NO	STD 7
CREW	

VEHICLE

INSTALLED	160	(+) ¹	22	23	Plain Pipe
	160	22	42.5	20.5	Perforated Pipe
		0	8	8	Soils
		8	21	13	Bentonite
		21	42.5	21.5	Gravel
	Push on Top Cap				
	Push on Bottom Cap				



Temporary casing used
to keep borehole open
through filter cake

MOVE AND SET UP	1	NO.
DRILLING	42.5	METRES
INSTALLATION	43.5	METRES
BENTONITE	13	METRES
GRAVEL	21.5	METRES
STANDING TIME	0	HOURS

CLIENT: BLUE SKY RESOURCE RECOVERY
SOUTH TYNE DRILLING LTD'S PROJECT MANAGER: [REDACTED]

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SOUTH TYNE drilling

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DRILL LOG

65771

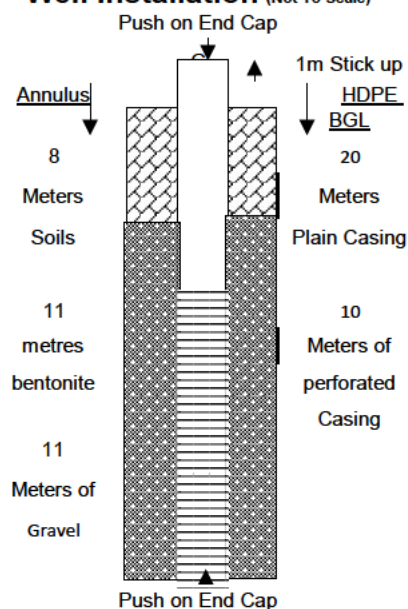
SITE LISBANE LANDFILL
B/H No Extra Well 4
DATE 13/09/2022
RIG NO STD 7
CREW

VEHICLE

	SIZE (mm)	FROM (M)	TO (M)	LENGTH (M)	DESCRIPTION
MOVE & SET UP AT BOREHOLE					Extra Well 4
DRILLING	450	0	17	17	Fliter Cake
		17	28	11	Dry Waste
		28	30	2	Damp Waste
		30	32	2	Wet Waste
	BOREHOLE COMPLETE				

INSTALLED	160	(+)1	20	21	Plain Pipe
	160	20	30	10	Perforated Pipe
		0	8	8	Soils
		8	19	11	Bentonite
		19	30	11	Gravel
Push on Top Cap					
Push on Bottom Cap					

Well Installation (Not To Scale)



INSTALLATION DETAILS

1 M OF PIPE STICKING UP

SUMMARY

MOVE AND SET UP	1	NO.
DRILLING	32	METRES
INSTALLATION	31	METRES
BENTONITE	11	METRES
GRAVEL	11	METRES
STANDING TIME	0	HOURS

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