Gas Collection System Detailed Design

Project Title	MRL Gas Collection System Design & Construction – Phases 3 to 6
Customer	Cleanaway Waste Management Ltd
Reference	MRLGCS-4-Run
Date	December 2023
Version Number	1

CONTENTS

1. Introduction

Run Energy Pty Ltd (Run) have been engaged by Cleanaway Waste Management Ltd (Cleanaway) to design and construct a gas collection system (GCS) in Phases 3 to 6 at the Melbourne Regional Landfill (MRL), Victoria.

100 vertical gas well locations were proposed by Cleanaway in accordance with the Request for Tender, Statement of Work, Annexure D.

Scope of Work

The scope of work comprises;

- Earthworks and construction access.
  - Cut/fill works required for appropriate falls.
  - Drill pad construction.
- Drill and installation of vertical gas wells
- Gas collection pipework installation
  - Main header lines
  - Lateral header lines
  - Flow lines
- Condensate management
  - Barometric trap installation

2. Basis of Design

The Basis of Design (BoD) serves as the foundation for the design of the gas wells and associated collection pipework. It establishes the key principles, criteria, and considerations that guide the decisions and ensure the successful implementation of the project.

Design Objectives

The primary objectives of the design are:

Safety: The design shall prioritise the safety of personnel, the environment, and the surrounding community throughout all phases of the project, including construction, operation, and maintenance.

Reliability: The gas wells and associated pipework shall be designed to operate reliably under normal and foreseeable abnormal conditions, minimising downtime and ensuring continuous gas collection.

Compliance: The design shall adhere to all relevant regulations, codes, and standards as stated in the applicable Statement of Works.

Environmental Considerations

The design incorporates environmentally sustainable practices, minimising the impact on the ecosystem, water resources, and air quality. Measures to prevent and mitigate potential environmental risks shall be integral to the design.

Operational Efficiency

Efficient operation and maintenance are crucial for the project's long-term success. The design facilitates ease of access for monitoring, inspection, maintenance, and repair activities, minimising downtime and associated costs.

Design Life and Flexibility

The gas wells and associated pipework have been designed to maximise operational life, considering future expansions or modifications. Flexibility in design has been incorporated to accommodate changes in production rates or technology upgrades.

Materials and Construction

Selection of materials is based on durability, corrosion resistance, and compatibility with the transported gas. Construction methods shall adhere to industry best practices to ensure the integrity and longevity of the infrastructure.

Key Attributes

- Well Design: Run Energy's well design prioritises maximum gas collection and long-term durability. The design incorporates larger pipe sizes and thicker walls, ensuring efficient gas flow with minimal restrictions. Additionally, the design incorporates optimal open area to enhance gas collection efficiency. Moreover, the well design serves a dual purpose by enabling the collection of leachate alongside gas, reducing the need for separate systems.
- Wellhead Design: Run Energy's wellhead design is carefully designed to deliver maximum benefits during the operational phase. The design includes features that facilitate ongoing condition assessment, allowing for easy access for tasks such as liquid gauging and pressure monitoring. This ensures continuous monitoring and maintenance of the wellhead system.
- Well Station Manifold Design: Run Energy's well station manifold design offers multiple advantages in the monitoring and control of landfill gas flow. The design enables highly accurate measurement through the incorporation of orifice plates, allowing for precise flow monitoring. Furthermore, the manifolds are positioned vertically, ensuring safe and

convenient access for monitoring and eliminating the need for ground-level monitoring. This design feature enhances operational safety and efficiency.

- Barometric Trap Design: Barometric drains present a cost-effective alternative to knock-out pots while maintaining efficient condensate drainage for maximizing gas flows. This design incorporates a water seal to prevent any oxygen leakage into the Gas Collection System (GCS). Additionally, the depth to which the perforations are engineered ensures that the liquid is not lifted or suspended into the lateral pipe work, optimizing the functionality of the system.

3. Technical Specification and Quality Assurance

The Principal will engage an independent third party to perform Construction Quality Assurance (CQA).

Any deficiency in the construction or installation of the system that deviates from the performance requirements specified in this document will be documented as a non-conformance. The method of recording will depend on the type and nature of the non-conformance, and may include:

- Correspondence through email or other written forms.
- Inclusion in the Construction Quality Assurance (CQA) Report.
- Submission of a Corrective Action Report (CAR).

A CAR that has been duly completed and closed out should encompass, at the very least:

- The assigned CAR Number.
- The type, nature, and date of occurrence of the non-conformance.
- The root cause analysis of the non-conformance, specifying whether it was an isolated incident or is likely to recur.
- Proposed corrective actions for the immediate rectification of the non-conformance.
- Proposed preventive actions to forestall the recurrence of the non-conformance.
- Follow-up and closure procedures, which involve tracking the status of implemented corrective actions and determining whether adjustments to personnel, training, or procedures are necessary.

All non-conformances shall be reported to both the Principal and the Contractor upon the identification of a non-conformance. The Principal bears the responsibility of identifying and notifying relevant parties of non-conformances, contingent on the type and nature of each specific non-conformance. At a minimum, the Principal is obligated to inform the Contractor and the Construction Quality Assurance (CQA) Consultant (or their designated representatives) upon the identification of a non-conformance.

Component	Specification	Reference	Quality Criteria
Main Header Line			
Material/s	• 250mm PN10 – PE100 Polyethylene Pipe	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material/s	• 225mm PN10 – PE100 Polyethylene Pipe	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Installation	• Gradient – Minimum 2% Grade • Secured – Pinned with U-pegs and soil	• 14009-DN-005	• Gradient Check • Visual Inspection
Lateral Header Line			
Material/s	• 200mm PN10 – PE100 Polyethylene Pipe	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material/s	• 160mm PN10 – PE100 Polyethylene Pipe	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Installation	• Gradient – Minimum 2% Grade • Secured – Pinned with U-pegs and soil	• 14009-DN-005	• Gradient Check • Visual Inspection

Flow Line			
Material/s	• 90mm PN10 – PE100 Polyethylene Pipe – 100m Coils	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Installation	• Gradient – Minimum 2% Grade • Secured – Pinned with U-pegs and soil	• 14009-DN-006	• Gradient Check • Visual Inspection
Well Casing			
Material – Plain Pipe	• 200mm PN16 – PE100 Polyethylene Pipe	• 14009-DN-004 • 14009-DN-008	• Material Specification Compliance Inspection • Material Data Sheet

Material - Perforated	• 200mm PN16 – PE100 Polyethylene Pipe
	• Perforation Pattern
	  ○ 12mm (+/- 0.5) drilled perforations at 100mm (+/- 5.0) and 60deg (+/- 5.0) radial displacement alternating every 100mm
	  ○ 6 holes at every 100mm interval
		• 14009-DN-004
		• 14009-DN-008
			• Material Specification Compliance Inspection
			• Material Data Sheet
			• Visual Inspection

Well Completion			
Material - Aggregate	• 40-60mm Gravel – Washed – No Fines	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material - Bentonite	• Granular or Fines • Fully Hydrated – Once Applied	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material – Soils	• Low Permeability – from site stockpiles	• N/A	• Material Specification Compliance Inspection
Installation	• Approved Depth or Less (if saturated/obstructed) • 5m Plain Pipe Below Ground Level • 1m Aggregate Cover Above Perforation • 3m Low Permeability Soil Layer • 1m Hydrated Bentonite Layer • 1m Stick-up Above Ground • Well Cap – 200mm EF End Cap c/w Camlock Fitting and Sample Point • Waste Stream Records	• 14009-DN-004 • 14009-DN-008	• Visual Inspection • As-built Drill Log

Well Station Manifolds			
Material/s	• Polyethylene Fabricated in accordance with Design Drawing	• 14009-DN-009	• Material Specification Compliance Inspection
Installation	• Plumb and Level • Perpendicular with pad • Minimum 500mm Space between Manifolds • Orifice Plate Present (Green – 40m3/hr) • Sample Points Installed • Well ID Applied to Applicable Port	• 14009-DN-009	• Visual Inspection
Condensate Drains			
Material/s - Fabrications	• Polyethylene Fabricated in accordance with Design Drawing	• Barometric Drain - 14009-DN-010 • J-Trap - 14009-DN-011	• Material Specification Compliance Inspection • Material Data Sheet
Material/s - Aggregate	• 40-60mm Gravel – Washed – No Fines	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material/s - Bentonite	• Granular or Fines • Fully Hydrated – Once Applied	• N/A	• Material Specification Compliance Inspection • Material Data Sheet

Installation	• Low Point of Collection Pipework • Installed to Depth in accordance with Design Drawing	• Barometric Drain - 14009-DN-010 • J-Trap - 14009-DN-011	• Visual Inspection
Control Valves			
Material/s	• Cast Iron Casing with Stainless Butterfly and Gear Box • Polyethylene stub flanges	• 14009-DN-012	• Material Specification Compliance Inspection
Installation	• Aligned with Collection Pipework to Gradient • Operate Through Full Range	• 14009-DN-012	• Visual Inspection • Range Test
Road Crossing			
Material/s - Pipe	• 450mm PN10 – PE100 Polyethylene Pipe	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Material/s – Bedding/Cover	• RE-20 Class 2W/M	• N/A	• Material Specification Compliance Inspection • Material Data Sheet
Installation	• Aligned with Collection Pipework to Gradient • Installed to Depth in accordance with Design Drawing	• 14009-DN-007	• Visual Inspection

4. Bill of Quantities

Component	Size	Quantity
Main Header Line	250mm	490m
Main Header Line	225mm	410m
Lateral Header Line	200mm	70m
Lateral Header Line	160mm	480m
Flow Line	90mm	6,000m
Wells	200mm	100
Wellhead Manifolds	125mm	13
Barometric Traps	315mm	7
J-Traps	90mm	9
Road Crossings	450mm	3
Control Valves	Various	9

5. Commissioning

The quality of the construction can be effectively ensured by integrating the new Gas Collection System (GCS) with the existing system while it operates under a vacuum. This process allows for the identification of potential leaks by detecting the presence of oxygen within the system. Furthermore, as the system is surface laid, easy access is provided for remediation in the event of any identified issues. This approach eliminates the need for vacuum or pressure testing, providing a more practical solution for verifying the construction quality of the GCS.

Gas wells will be commissioned in accordance with the Gas Well Commissioning Log (Appendix B).

6. Construction Records

Construction records will be maintained and reported in the Completion Report provided at the completion of the project.

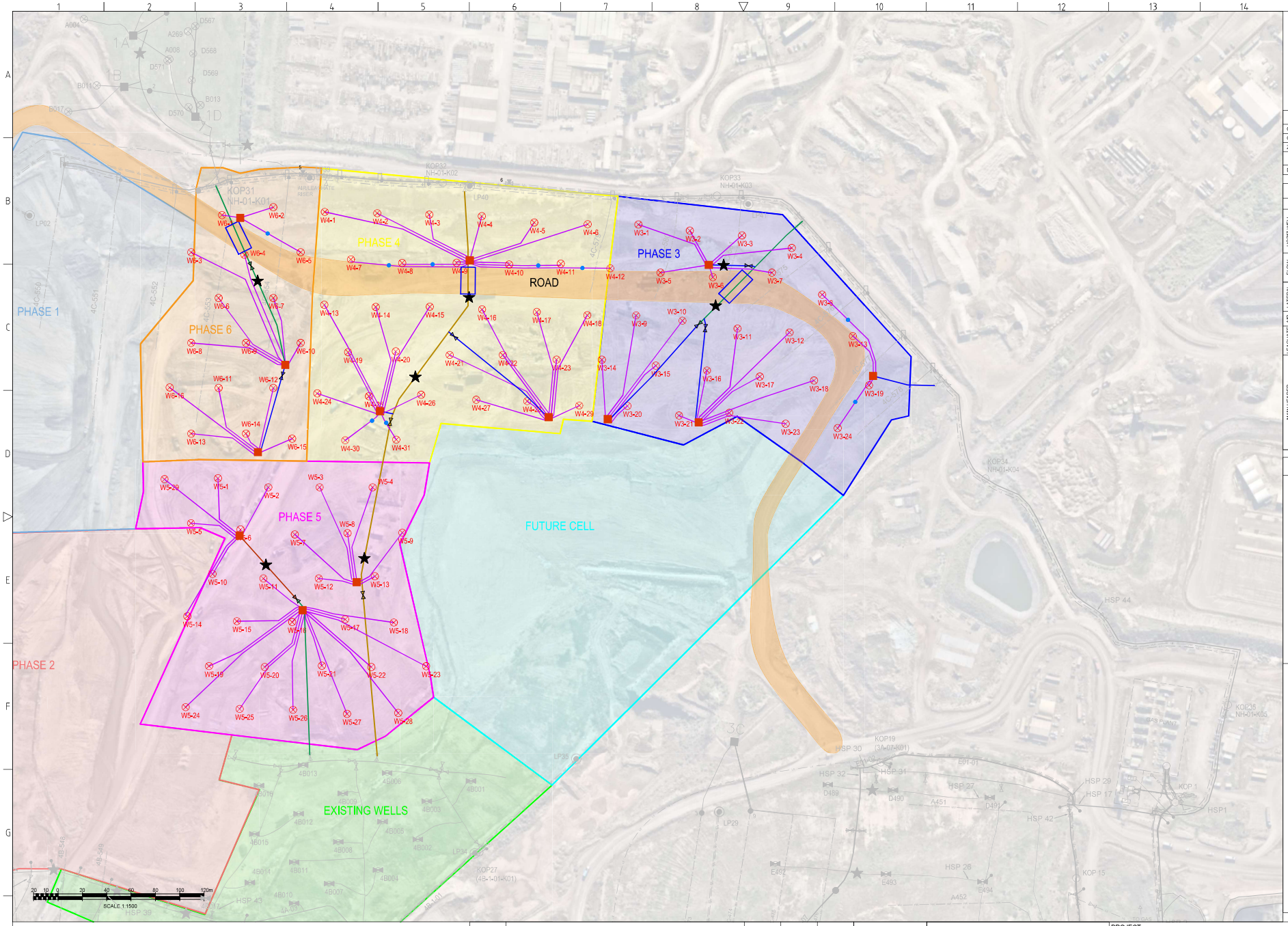
Document Type	Purpose
Drill Location Release Form	Quality assurance to confirm well location accuracy
As-built Drill Log	Record as-constructed well installation detail
Daily Work Logs	Detail Works Undertaken Each Day
Weld Log	Log of each butt-weld completed
As-built Drawing	Record the location of gas collection system
Gas Well Commissioning Log	Record the commissioning details of each gas well

7. Drawing Schedule

Drawing List

Item	Drawing Number	Sheet	Revision	Title
1	14009-DN-001	1	A	MRL Stage 4 – Gas Collection System Installation – All Phases
2	14009-DN-002	2	A	MRL Stage 4 – Gas Collection System Installation – Phases 5 and 6
3	14009-DN-003	3	A	MRL Stage 4 – Gas Collection System Installation – Phases 3 and 4
4	14009-DN-004	1	B	Vertical Well Detail
5	14009-DN-005	1	A	Main/Lateral Header Line Detail
6	14009-DN-006	1	A	Flow Line Detail
7	14009-DN-007	1	A	Road Crossing Detail
8	14009-DN-008	1	A	Wellhead Detail
9	14009-DN-009	1	A	Wellhead Manifold Detail
10	14009-DN-010	1	A	Barometric Trap Detail
11	14009-DN-011	1	A	J-Trap Detail
12	14009-DN-012	1	A	Control Valve Detail

Appendix A - Drawing Set



N

MAPPING INFORMATION	
COORDINATE SYSTEM:	MAP GRID OF AUSTRALIA
COORDINATE UNITS:	METRES
ZONE:	55
NEARMAP INFORMATION	
DATE:	24/04/2023

FIELD SUMMARY

PIPE SIZE	LENGTH	ITEM	TOTAL
HORIZ WELL 63mm	0	WELL	100
HORIZ WELL 90mm	0	MONITORING BORE	0
HORIZ WELL 110mm	0	WELLHEAD STATION - STANDARD	13
HORIZ WELL 125mm	0	J TRAP	9
HORIZ WELL 160mm	0	BAROMETRIC TRAP	7
HORIZ WELL 200mm	0	ISOLATION VALVE	9
FLOW 63mm	0	AIR RELIEF VALVE	0
FLOW 90mm	6000	PIT PUMPOUT	0
FLOW 110mm	0	LEACHATE SUMP / RISER PIPES	0
FLOW 125mm	0	STANDALONE WELL	0
LATERAL 90mm	0	METER RUN	0
LATERAL 125mm	0	KNOCK OUT POT	0
LATERAL 160mm	0	DUAL PURPOSE WELL	0
LATERAL 200mm	0	FLARE / POWER STATION	0
LEACHATE AIR 32mm	0	ROAD CROSSING	3
LEACHATE AIR 63mm	0		
LEACHATE AIR 63mm	0		
LEACHATE AIR 90mm	0		
LEACHATE AIR 125mm	0		
LEACHATE AIR 160mm	0		
MAIN HEADER 90mm	0		
MAIN HEADER 110mm	0		
MAIN HEADER 125mm	0		
MAIN HEADER 160mm	480		
MAIN HEADER 200mm	70		
MAIN HEADER 225mm	410		
MAIN HEADER 250mm	490		
MAIN HEADER 280mm	0		
MAIN HEADER 315mm	0		
MAIN HEADER 355mm	0		
MAIN HEADER 400mm	0		
MAIN HEADER 450mm	0		
MAIN HEADER 500mm	0		

LEGEND

- WELL
- MONITORING BORE
- WELLHEAD STATION - STANDARD
- J TRAP
- BAROMETRIC TRAP
- ISOLATION VALVE
- AIR RELIEF VALVE
- PIT PUMPOUT
- LEACHATE SUMP / RISER PIPES
- STANDALONE WELL
- METER RUN
- KNOCK OUT POT
- DUAL PURPOSE WELL
- FLARE / POWER STATION
- ROAD CROSSING
- WELLHEAD STATION NAME (A)
- WELL NUMBER (A125)
- MAIN GAS PIPE (MP1—1)
- HEADER MARKER
- FENCE LINE
- CELL BOUNDARY
- COMMUNICATION
- POWER
- 32mm AIR LINE
- 63mm AIR LINE
- 63mm LEACHATE LINE
- 90mm LEACHATE LINE
- 110mm LEACHATE LINE
- 125mm LEACHATE LINE
- 160mm LEACHATE LINE
- 200mm LEACHATE LINE
- 90mm HORIZONTAL WELL
- 90mm MAIN/LATERAL HEADER
- 125mm MAIN/LATERAL HEADER
- 140mm MAIN/LATERAL HEADER
- 160mm MAIN/LATERAL HEADER
- 180mm MAIN/LATERAL HEADER
- 200mm MAIN HEADER
- 225mm MAIN HEADER
- 250mm MAIN HEADER
- 280mm MAIN HEADER
- 315mm MAIN HEADER
- 355mm MAIN HEADER
- 400mm MAIN HEADER
- 450mm MAIN HEADER
- 500mm MAIN HEADER

REVISION HISTORY

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW	ZB	RC	RC	24/11/2023

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MELBOURNE REGIONAL LANDFILL

DRAWING TITLE: MRL STAGE 4 GCS INSTALLATION - ALL

DRAWING No: 14009-DN-001

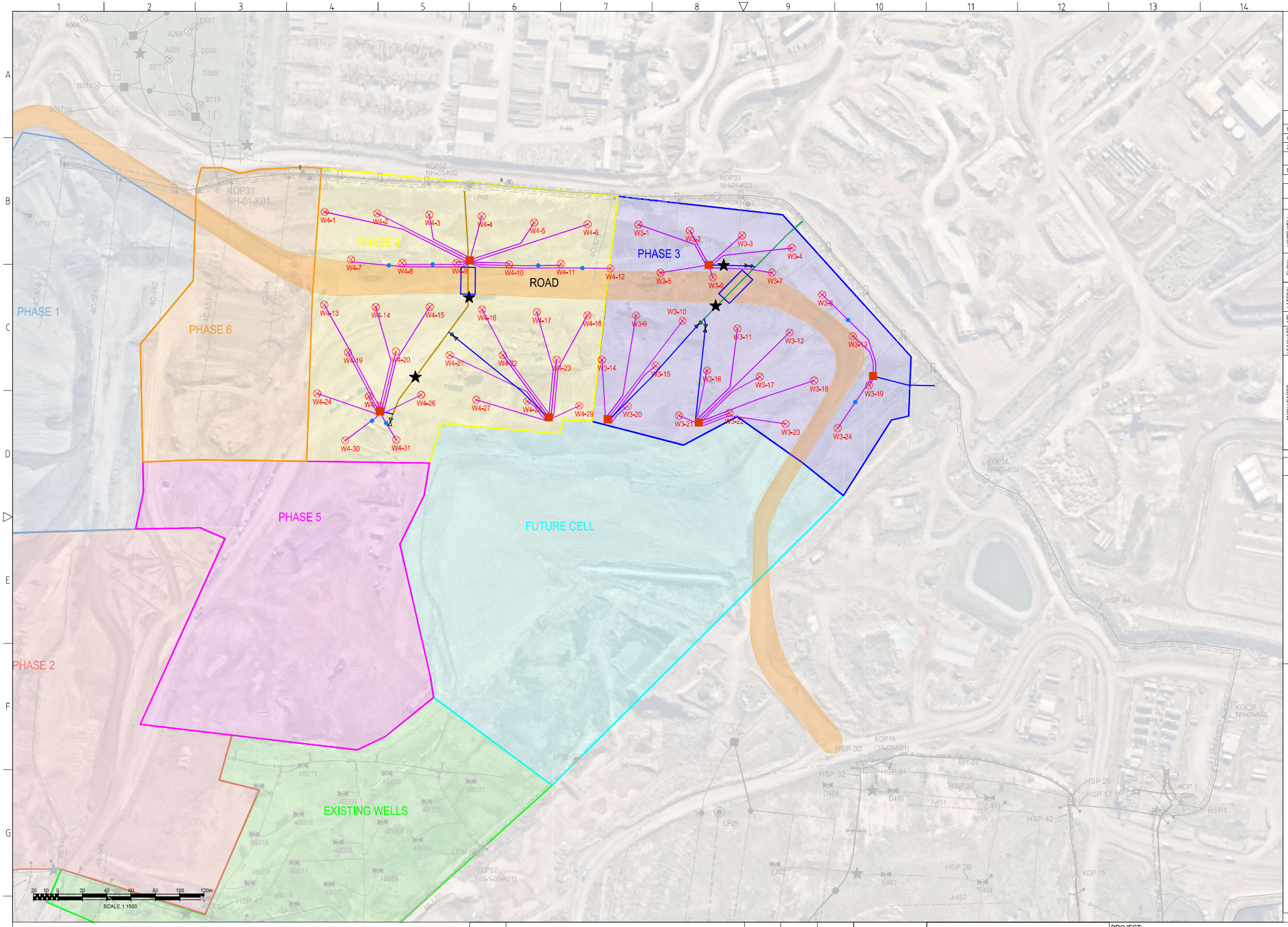
DRAWING TYPE: DESIGN

DRAWN: ZB | CKD: RC

DATE: 24/11/2023 | APP: RC

DESIGNED: RC | APP DATE: 24/11/2023

SCALE: 1:1500 | SHEET: 1 of 3 | REV: A | SIZE: A1



MAPPING INFORMATION	
COORDINATE SYSTEM:	MAP GRID OF AUSTRALIA
COORDINATE UNITS:	METRES
ZONE:	55
NEARMAP INFORMATION	
DATE:	24/04/2023

FIELD SUMMARY

	PIPE SIZE	LENGTH	ITEM	TOTAL
HORIZ WELL	63mm	0		55
	90mm	0		
	110mm	0		0
	125mm	0		
	160mm	0		6
	200mm	0		
FLOW	63mm	0		8
	90mm	3300		4
	110mm	0		5
	125mm	0		
LATERAL	90mm	0		0
	125mm	0		0
	160mm	0		0
	200mm	0		0
AIR	32mm	0	KOP	0
	63mm	0		
LEACHATE	63mm	0		0
	90mm	0		0
	125mm	0		0
	160mm	0		0
MAIN HEADER	90mm	0		2
	110mm	0		
	125mm	0		
	160mm	370		
	200mm	0		
	225mm	120		
	250mm	190		
	280mm	0		
	315mm	0		
	355mm	0		
	400mm	0		
	450mm	0		
	500mm	0		

LEGEND

- WELL
- MONITORING BORE
- WELLHEAD STATION - STANDARD
- J TRAP
- BAROMETRIC TRAP
- ISOLATION VALVE
- AIR RELIEF VALVE
- PIT PUMPOUT
- LEACHATE SUMP / RISER PIPES
- STANDALONE WELL
- METER RUN
- KOP — KNOCK OUT POT
- DUAL PURPOSE WELL
- FLARE / POWER STATION
- ROAD CROSSING
- A — WELLHEAD STATION NAME
- A125 — WELL NUMBER
- MP1—1 — MAIN GAS PIPE
- HEADER MARKER

- FENCE LINE
- CELL BOUNDARY
- COMMUNICATION
- POWER
- 32mm AIR LINE
- 63mm AIR LINE
- 63mm LEACHATE LINE
- 90mm LEACHATE LINE
- 110mm LEACHATE LINE
- 125mm LEACHATE LINE
- 160mm LEACHATE LINE
- 200mm LEACHATE LINE
- 90mm HORIZONTAL WELL
- 90mm MAIN/LATERAL HEADER
- 125mm MAIN/LATERAL HEADER
- 140mm MAIN/LATERAL HEADER
- 160mm MAIN/LATERAL HEADER
- 180mm MAIN/LATERAL HEADER
- 200mm MAIN HEADER
- 225mm MAIN HEADER
- 250mm MAIN HEADER
- 280mm MAIN HEADER
- 315mm MAIN HEADER
- 355mm MAIN HEADER
- 400mm MAIN HEADER
- 450mm MAIN HEADER
- 500mm MAIN HEADER

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW	ZB	RC	RC	24/11/2023

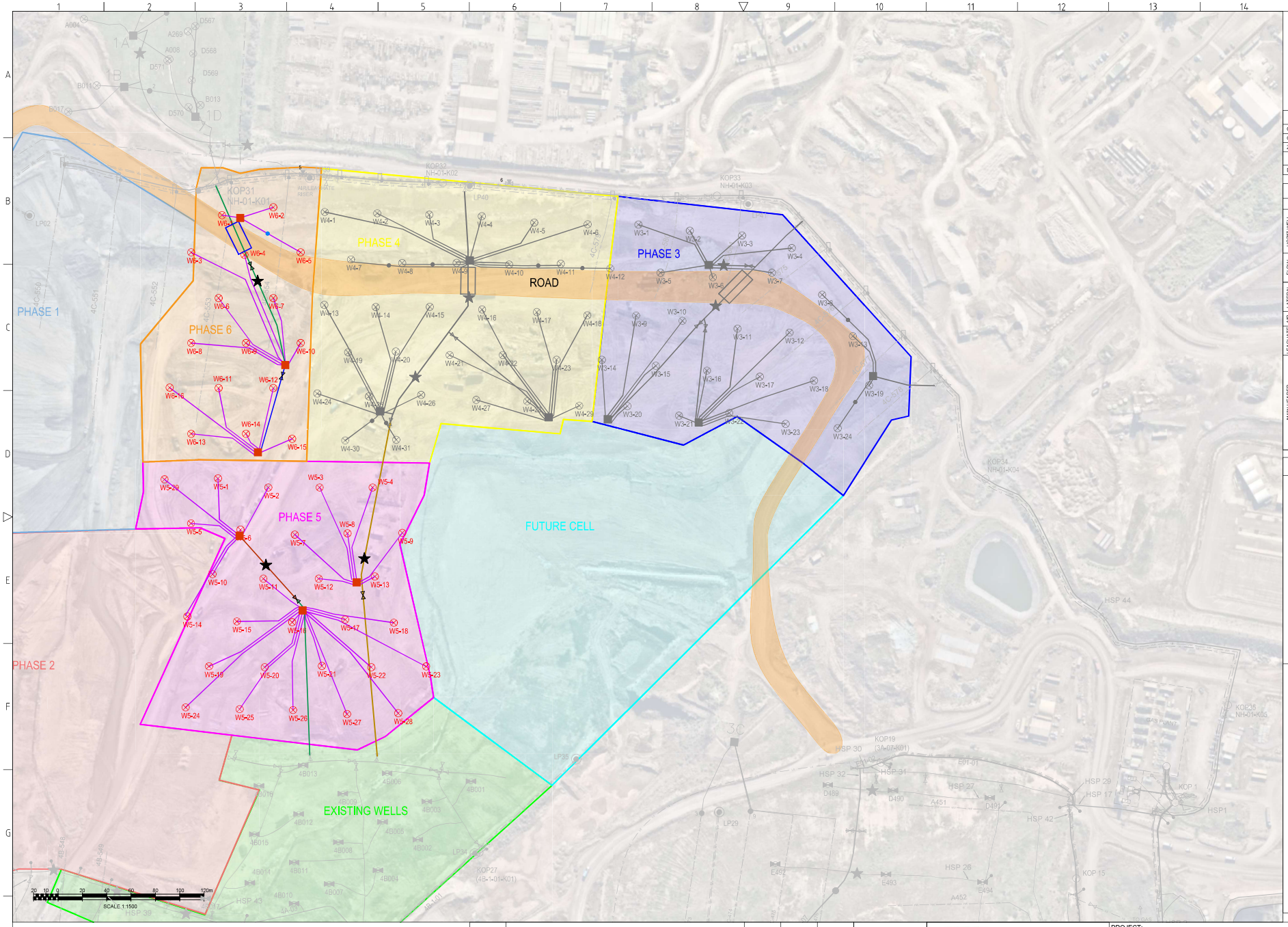
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MELBOURNE REGIONAL LANDFILL

DRAWING TITLE: MRL STAGE 4 GCS INSTALLATION SEPARABLE PORTION 2 PHASE 3 AND PHASE 4

DRAWING No: 14009-DN-002
DRAWING TYPE: DESIGN
DRAWN: ZB | CKD: RC
DATE: 24/11/2023 | APP: RC
DESIGNED: RC | APP DATE: 24/11/2023
SCALE: 1:1500 | SHEET: 2 of 3 | REV: A | SIZE: A1



MAPPING INFORMATION	
COORDINATE SYSTEM:	MAP GRID OF AUSTRALIA
COORDINATE UNITS:	METRES
ZONE:	55
NEARMAP INFORMATION	
DATE:	24/04/2023

FIELD SUMMARY

	PIPE SIZE	LENGTH	ITEM	TOTAL
HORIZ WELL	63mm	0		45
	90mm	0		0
	110mm	0		7
	125mm	0		
	160mm	0		1
	200mm	0		
FLOW	63mm	0		3
	90mm	2700		4
	110mm	0		
	125mm	0		0
LATERAL	90mm	0		0
	125mm	0		0
	160mm	0		0
	200mm	0		
AIR	32mm	0	KOP	0
	63mm	0		0
LEACHATE	63mm	0		0
	90mm	0		0
	125mm	0		0
	160mm	0		
MAIN HEADER	90mm	0		1
	110mm	0		
	125mm	0		
	160mm	110		
	200mm	70		
	225mm	290		
	250mm	300		
	280mm	0		
	315mm	0		
	355mm	0		
	400mm	0		
	450mm	0		
	500mm	0		

LEGEND

- WELL
- MONITORING BORE
- WELLHEAD STATION - STANDARD
- J TRAP
- BAROMETRIC TRAP
- ISOLATION VALVE
- AIR RELIEF VALVE
- PIT PUMPOUT
- LEACHATE SUMP / RISER PIPES
- STANDALONE WELL
- METER RUN
- KNOCK OUT POT
- DUAL PURPOSE WELL
- FLARE / POWER STATION
- ROAD CROSSING
- WELLHEAD STATION NAME
- A125 WELL NUMBER
- MP1–1 MAIN GAS PIPE
- HEADER MARKER

- FENCE LINE
- CELL BOUNDARY
- COMMUNICATION
- POWER
- 32mm AIR LINE
- 63mm AIR LINE
- 63mm LEACHATE LINE
- 90mm LEACHATE LINE
- 110mm LEACHATE LINE
- 125mm LEACHATE LINE
- 160mm LEACHATE LINE
- 200mm LEACHATE LINE
- 90mm HORIZONTAL WELL
- 90mm MAIN/LATERAL HEADER
- 125mm MAIN/LATERAL HEADER
- 140mm MAIN/LATERAL HEADER
- 160mm MAIN/LATERAL HEADER
- 180mm MAIN/LATERAL HEADER
- 200mm MAIN HEADER
- 225mm MAIN HEADER
- 250mm MAIN HEADER
- 280mm MAIN HEADER
- 315mm MAIN HEADER
- 355mm MAIN HEADER
- 400mm MAIN HEADER
- 450mm MAIN HEADER
- 500mm MAIN HEADER

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW	ZB	RC	RC	24/11/2023

REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
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PROJECT: MELBOURNE REGIONAL LANDFILL

DRAWING TITLE: MRL STAGE 4 GCS INSTALLATION SEPARABLE PORTION 1 PHASE 5 AND PHASE 6

DRAWING No:	14009-DN-003
DRAWING TYPE:	DESIGN
DRAWN: ZB	CKD: RC
DATE: 24/11/2023	APP: RC
DESIGNED: RC	APP DATE: 24/11/2023
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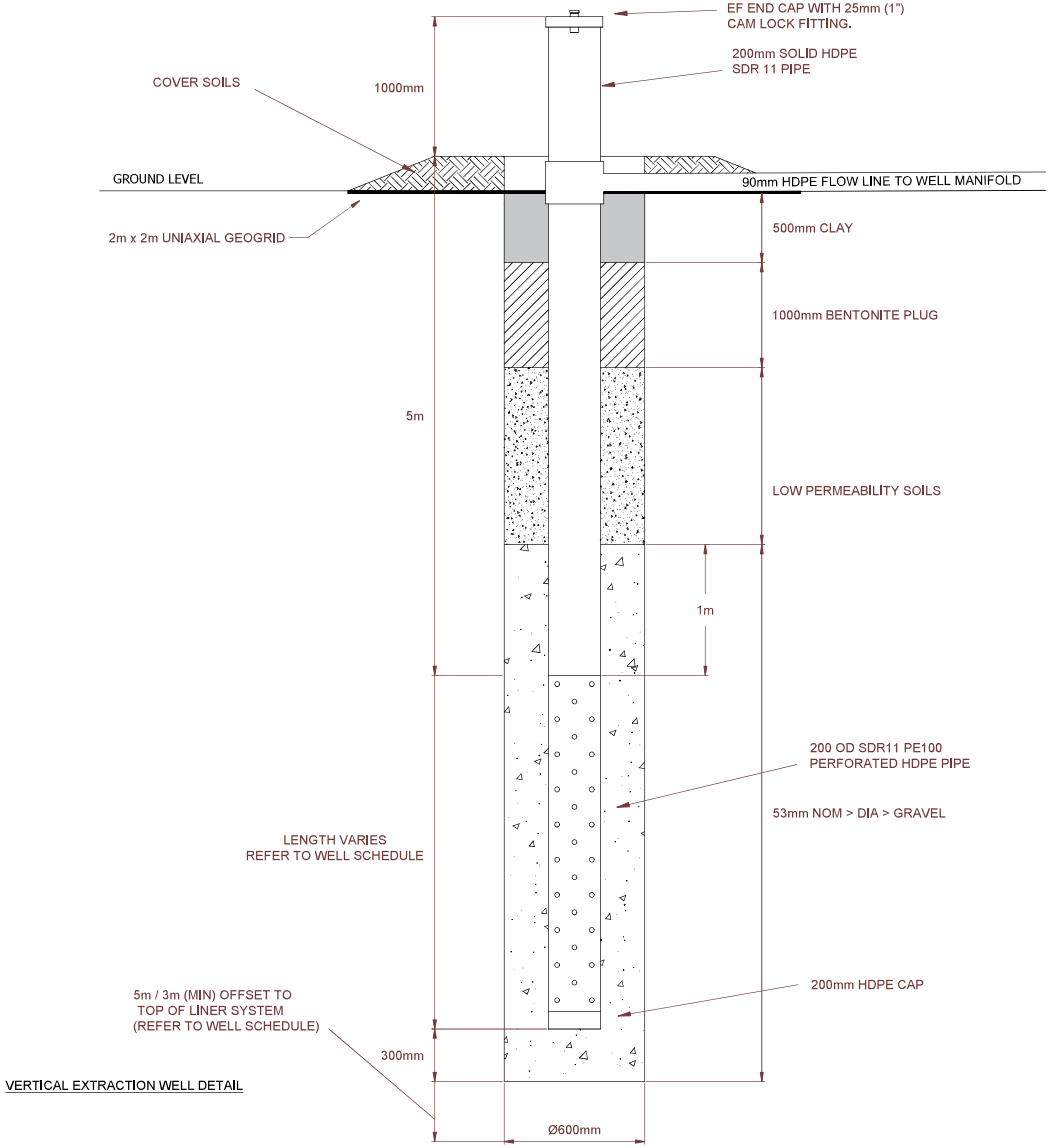
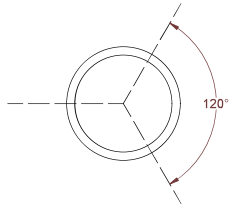
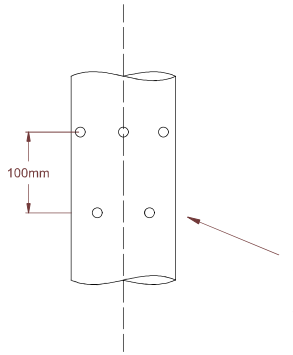
REV: A	SIZE: A1



VERTICAL EXTRACTION WELL DETAIL





Ø12mm (+/- 0.5) DRILLED PERFORATIONS AT 100mm (+/- 5.0) AND 60DEG (+/- 5.0) RADIAL DISPLACEMENT ALTERNATING EVERY 100mm.

THERE ARE 6 HOLES AT EVERY 100mm.

PERFORATION PATTERN

REV	DESCRIPTION	BY	CKD	APP	DATE
B	ADDED 500mm LAYER OF CLAY BELOW GROUND LEVEL				
A	ISSUED FOR REVIEW				

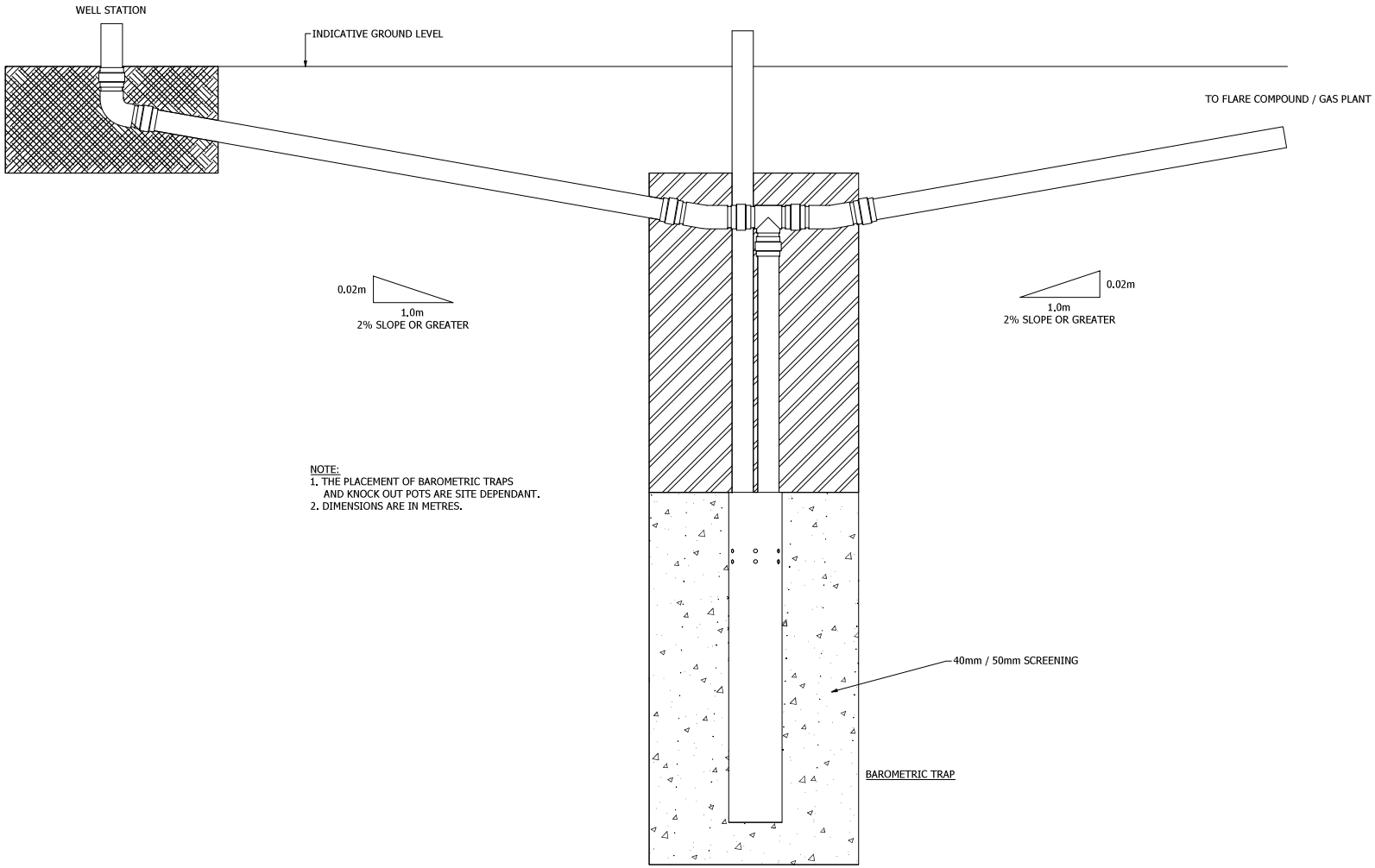
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: VERTICAL WELL DETAIL

DRAWING No:	14009-DN-004
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN:	ZB
CKD:	RC
DATE:	15/12/2023
APP:	RC
DESIGNED:	RC
APP DATE:	15/12/2023
SCALE:	DNS
SHEET:	1 of 1
REV:	B
SIZE:	A1



NOTE:
1. THE PLACEMENT OF BAROMETRIC TRAPS AND KNOCK OUT POTS ARE SITE DEPENDANT.
2. DIMENSIONS ARE IN METRES.

FRONT ELEVATION
SCALE (DNS)

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

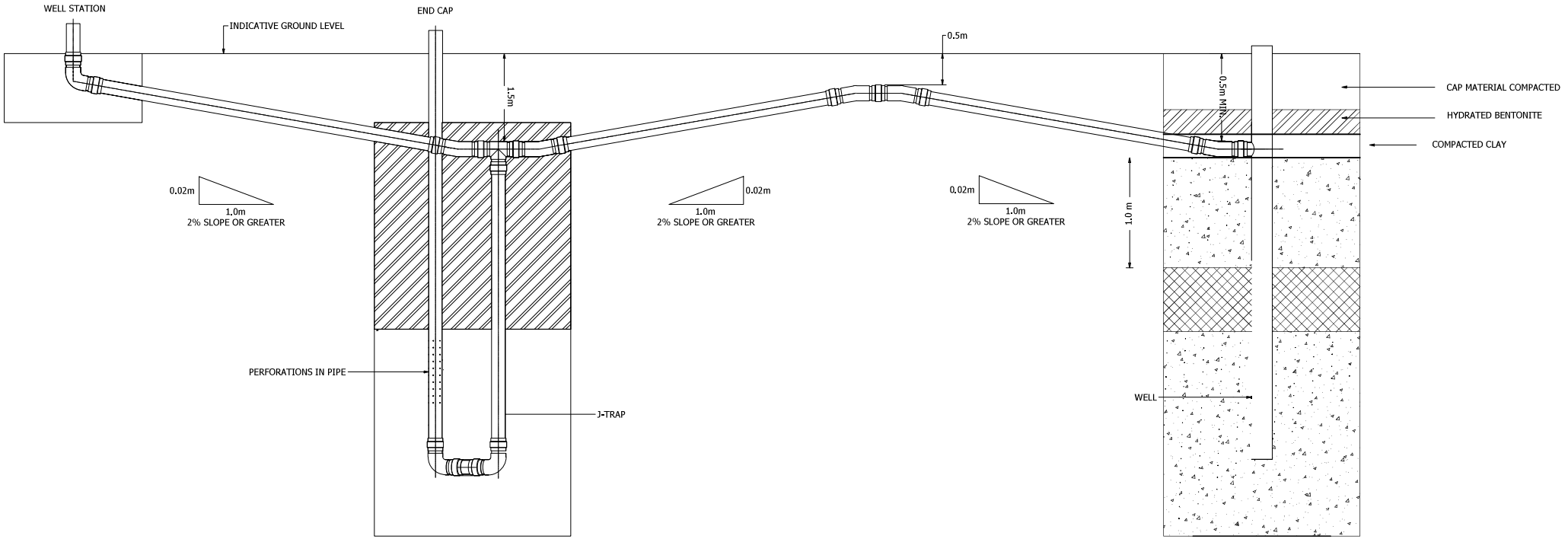
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: MAIN / LATERAL HEADER LINE DETAIL

DRAWING No:	14009-DN-005
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN: ZB	CKD: RC
DATE: 27/11/2023	APP: RC
DESIGNED: RC	APP DATE: 27/11/2023
SCALE: DNS	SHEET: 1 of 1 / REV: A / SIZE: A1



FRONT ELEVATION
SCALE (DNS)

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: FLOW LINE DETAIL

DRAWING No:	14009-DN-006
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN: ZB	CKD: RC
DATE: 27/11/2023	APP: RC
DESIGNED: RC	APP DATE: 27/11/2023
SCALE: DNS	SHEET: 1 of 1 / REV: A / SIZE: A1

ROAD CROSSING

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

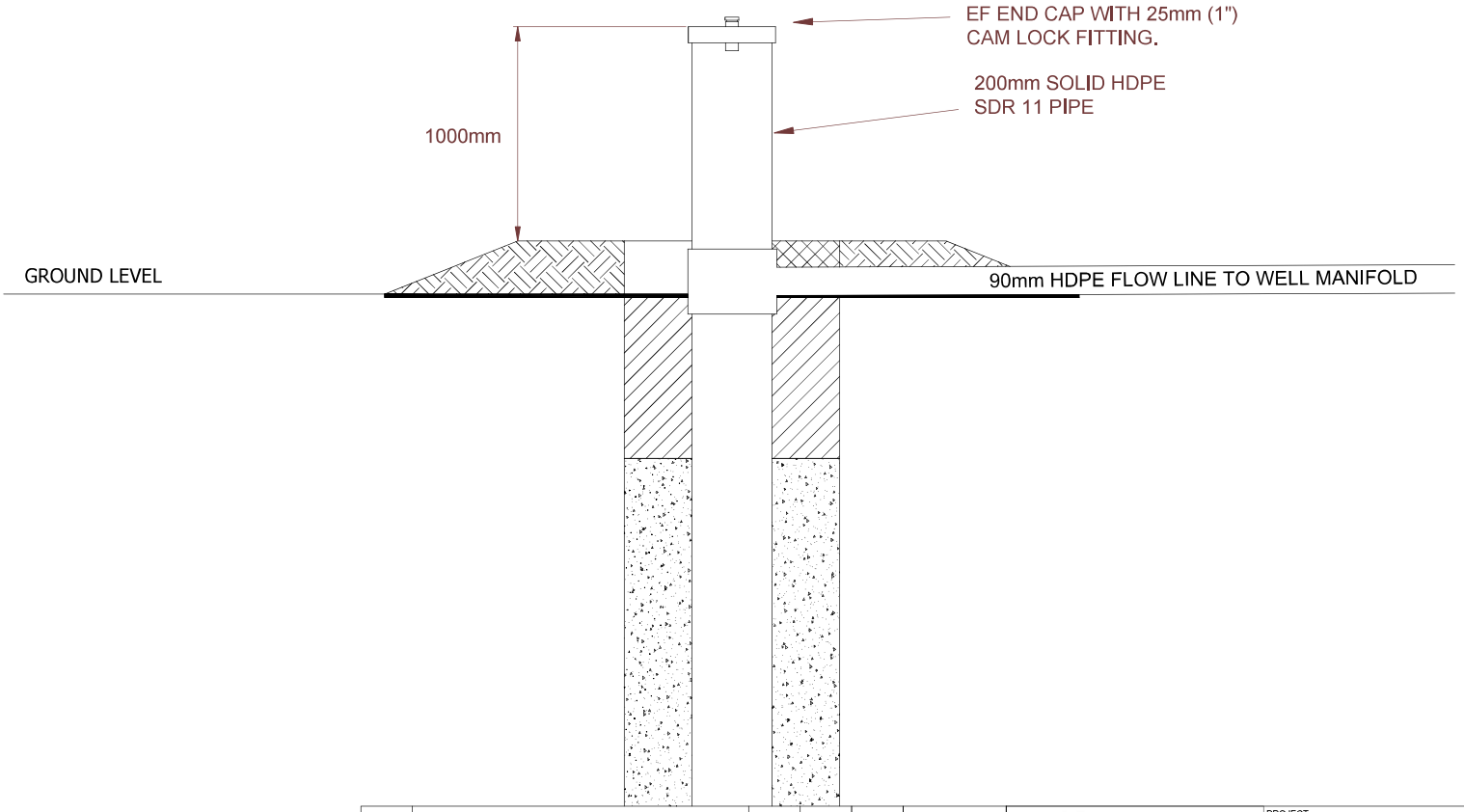
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: ROAD CROSSING DETAIL

DRAWING No:	14009-DN-007
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN:	ZB
CKD:	RC
DATE:	27/11/2023
APP:	RC
DESIGNED:	RC
APP DATE:	27/11/2023
SCALE:	DNS
SHEET:	1 of 1
REV:	A
SIZE:	A1



REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

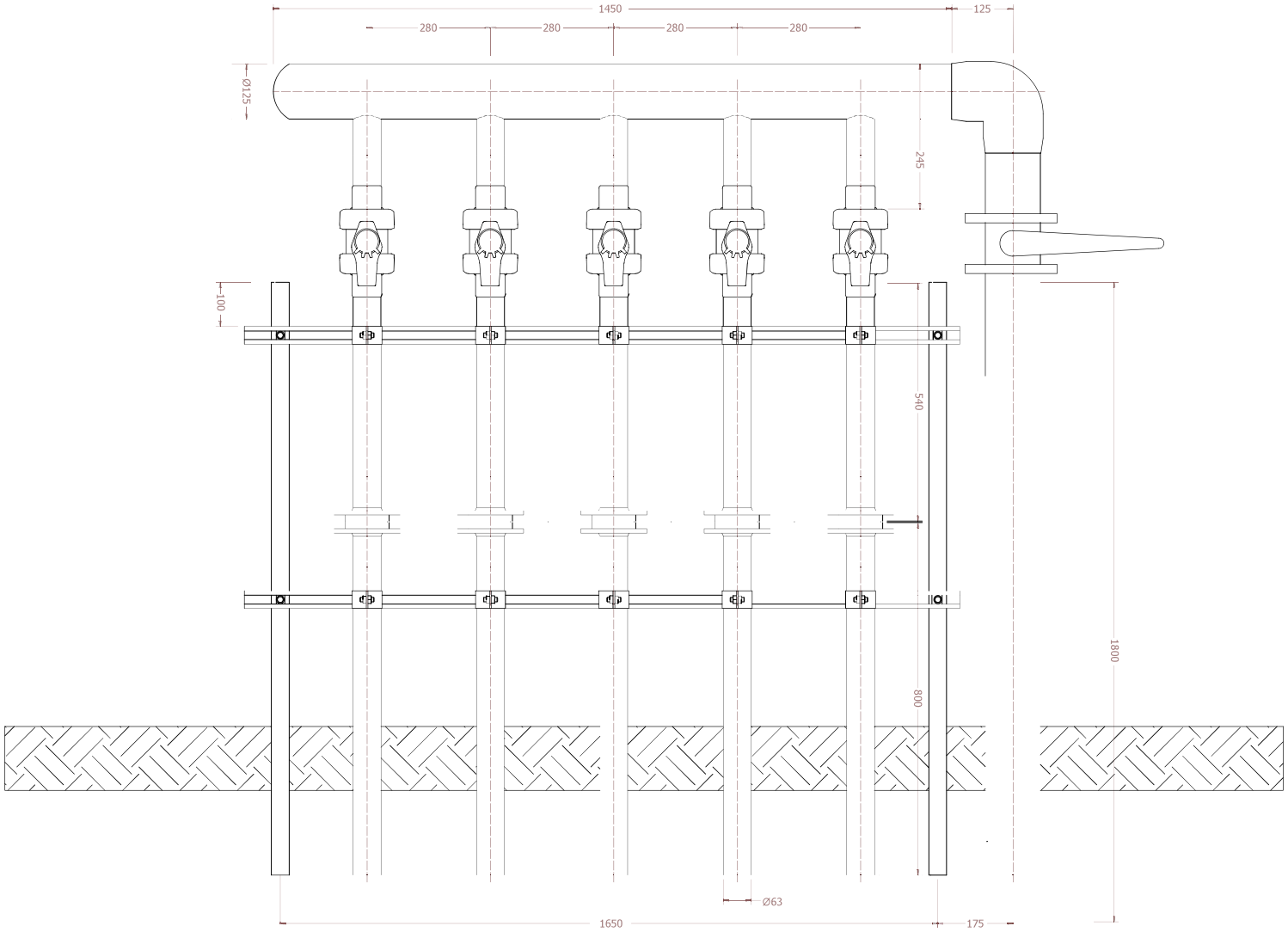
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: WELLHEAD DETAIL

DRAWING No:	14009-DN-008
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN: ZB	CKD: RC
DATE: 27/11/2023	APP: RC
DESIGNED: RC	APP DATE: 27/11/2023
SCALE: DNS	SHEET: 1 of 1 / REV: A / SIZE: A1



FRONT ELEVATION
SCALE (DNS)

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

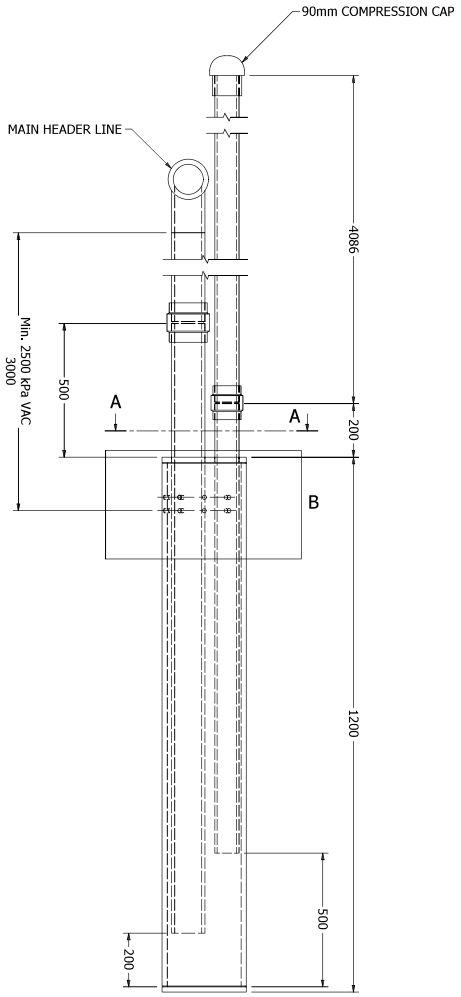
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

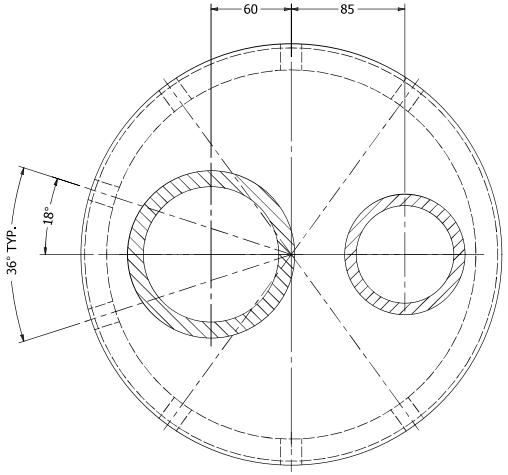
PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: WELLHEAD MANIFOLD DETAIL

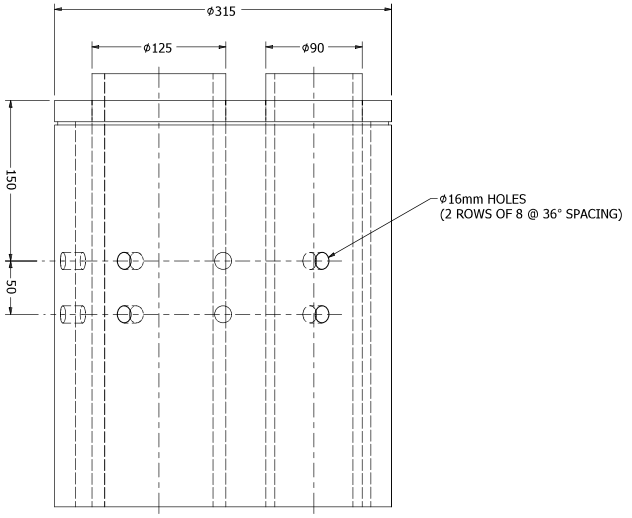
DRAWING No:	14009-DN-009
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN: ZB	CKD: RC
DATE: 27/11/2023	APP: RC
DESIGNED: RC	APP DATE: 27/11/2023
SCALE: DNS	SHEET: 1 of 1 / REV: A / SIZE: A1



FRONT ELEVATION
SCALE (DNS)



SECTION A-A
SCALE (DNS)



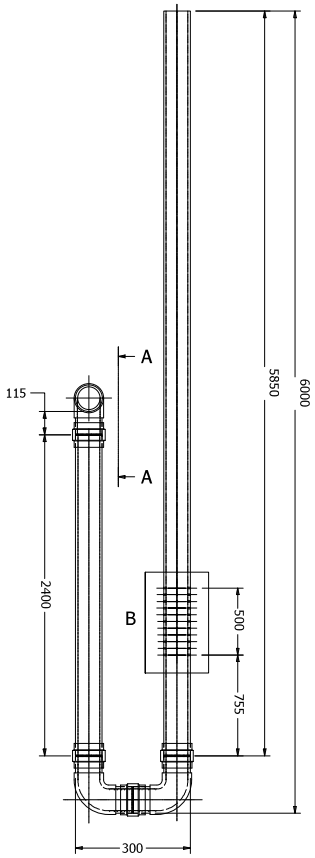
DETAIL B
SCALE (DNS)

REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

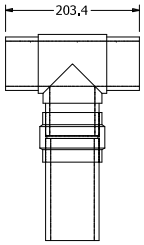
REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

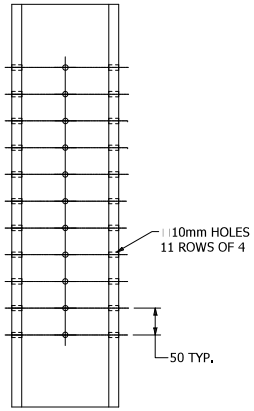
PROJECT:	MRL GCS DESIGN PHASES 3 TO 6
DRAWING TITLE:	BAROMETRIC TRAP DETAIL
DRAWING No:	14009-DN-010
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN:	ZB
CKD:	RC
DATE:	27/11/2023
APP:	RC
DESIGNED:	RC
APP DATE:	27/11/2023
SCALE:	DNS
SHEET:	1 of 1
REV:	A
SIZE:	A1



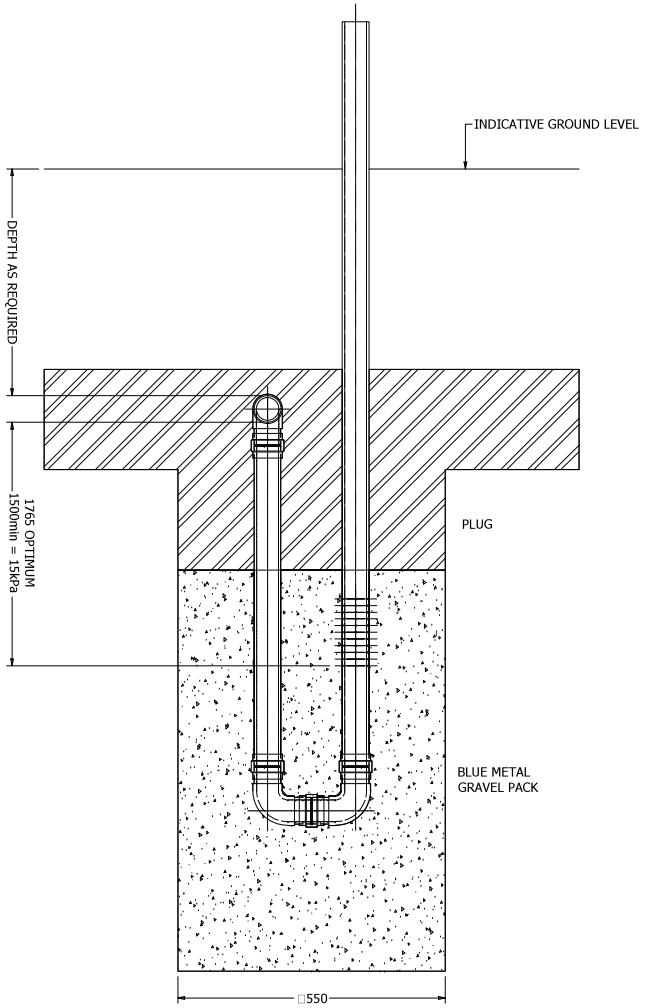
FABRICATION DETAILS
SCALE (DNS)



SECTION A-A
SCALE (DNS)



DETAIL B
SCALE (DNS)



INSTALLATION DETAILS
SCALE (DNS)

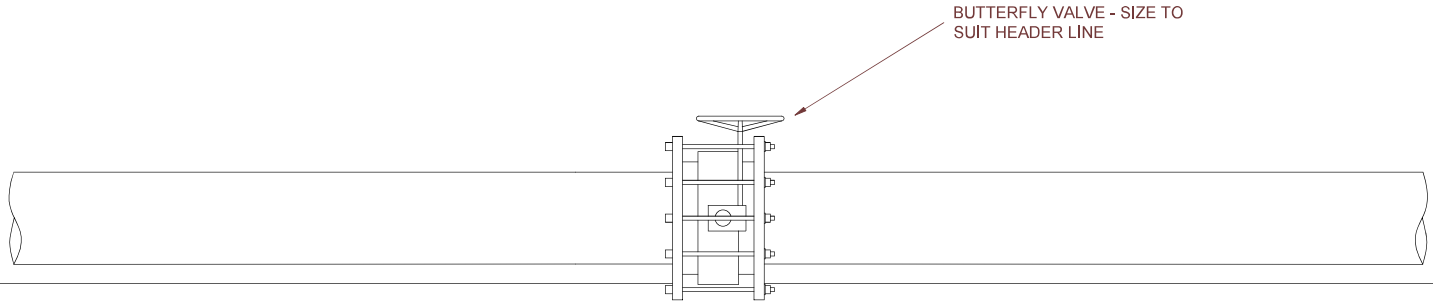
REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6
DRAWING TITLE: J-TRAP DETAIL

DRAWING No: 14009-DN-011
DRAWING TYPE: GENERAL ARRANGEMENT
DRAWN: ZB | CKD: RC
DATE: 27/11/2023 | APP: RC
DESIGNED: RC | APP DATE: 27/11/2023
SCALE: DNS | SHEET: 1 of 1 | REV: A | SIZE: A1



REV	DESCRIPTION	BY	CKD	APP	DATE
A	ISSUED FOR REVIEW				

REVISION HISTORY

runenergy
199C OSBORNE AVE, CLAYTON STH, VIC 3169
PH: (03) 9538 6200
www.runenergy.com

PROJECT: MRL GCS DESIGN PHASES 3 TO 6

DRAWING TITLE: CONTROL VALVE DETAIL

DRAWING No:	14009-DN-012
DRAWING TYPE:	GENERAL ARRANGEMENT
DRAWN:	ZB
CKD:	RC
DATE:	27/11/2023
APP:	RC
DESIGNED:	RC
APP DATE:	27/11/2023
SCALE:	DNS
SHEET:	1 of 1
REV:	A
SIZE:	A1

Appendix B – Gas Well Commissioning Log

Site Name	Melbourne Regional Landfill
Report Type	Well Commissioning Report
Asset ID	TEST1
Date	24-Nov-2023

Asset Information

Asset Type
Gas Well

Asset ID (must be 8 digits)
TEST1

Orifice plate colour
Green

☑ Manifold labelled

☐ Well casing labelled

☐ Pump installed

Flow Line Size (mm)
90

Well Size (mm)
200

Performance Test: Valve < 10%

Methane (%v/v)
60

Oxygen (%v/v)
0

Carbon Dioxide (%v/v)
40

Balance Gas (%v/v)
0

Gas Temperature (%v/v)
37

Static Pressure (mbar)
-20

Differential Pressure (mbar)
10

LFG Flow (SCMH)
20

Valve Position %
10

Performance Test: Valve = 100%

Methane (%v/v): Valve = 100%
60

Oxygen (%v/v): Valve = 100%
0

Carbon Dioxide (%v/v): Valve = 100%
40

Balance Gas (%v/v): Valve = 100%
0

Gas Temperature (%v/v): Valve = 100%
37

Static Pressure (mbar): Valve = 100%
-50

Differential Pressure (mbar): Valve = 100%
20

LFG Flow (SCMH): Valve = 100%
40

Valve Position %: Valve = 100%
100

Flow Line Function Test

Pressure at Well Manifold: Valve = 100%
-50

Pressure at Well Casing: Valve = 100%
-40

Gas Well Commissioning (initial)

Commissioned: Static Pressure (mbar)
-15

Commissioned: Diff. Pressure (mbar)
9

Commissioned: LFG Flow (SMCH)
15

Commissioned: Valve position (%)
30

Notes