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Infinis Energy Services Ltd.

Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Plan

April 2018

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Infinis Energy Services Ltd.

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Construction Quality Assurance Report

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Infinis Energy Services Ltd.

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Construction Quality Assurance Report

April 2018

Prepared for

Infinis Energy Services Ltd.

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Document Review

Version No.	Date of Review	Prepared By	Reviewed By	Approved By
1.0	03/04/2018	Bryn Webb	Richard Furniss	Richard Furniss

1.0 INTRODUCTION

1.1 Egniol Environmental Ltd. (Egniol) of Llys Onnen, Parc Menai, Bangor, Gwynedd have been appointed by Infinis Energy Services Ltd. (Infinis) as Construction Quality Assurance (CQA) Consultants for the Retro Drilling of gas wells at Docks Way Landfill Site.

1.2 The appointment required the professional services of Egniol for the provision of a CQA Inspector. The CQA Inspector was required to monitor the progress and report upon completion of the works, with regard to quality assurance and compliance with the approved CQA Plan for the works (Egniol document: *Docks Way Landfill Site, Retro Drilling of Gas Wells, Construction Quality Assurance Plan, February 2018, v1.0*).

1.3 In accordance with this appointment, Egniol have produced this report which covers the retro drilling of gas wells at Docks Way Landfill Site.

2.0 SITE LOCATION AND ADDRESS

2.1 Site Location

Docks Way Landfill Site is located approximately 2.7km South of the city center of Newport, Gwent.

2.2 Site Address

Docks Way Landfill Site
Maesglas
Newport
Gwent
NP20 2NS

3.0 BRIEF DESCRIPTION AND TIMING OF WORKS

3.1 Description of Works

In accordance with the approved CQA Plan (Egniol document: *Docks Way Landfill Site, Retro Drilling of Gas Wells, Construction Quality Assurance Plan, February 2018, v1.0*), 6no. landfill gas extraction wells were to be installed to the uncapped waste surface of at Docks Way Landfill Site by means of retro drilling.

The Works commenced on 7th March 2018 and were completed on 9th March 2018. Of the 6no. proposed wells, 5no. were installed during these works.

Revised proposed locations and drill depths were supplied by Infinis, following checking and approval by Devon Waste Management (the Site Permit Holder) prior to the Works commencing. These locations were surveyed and marked with the erection of a wooden peg. Each peg was labeled with its own identification number. Once the well was installed, the marker peg was erected next to the well. The proposed locations were confirmed to all parties prior to the commencement of the works.

Table 1 – Well Location and Drill Depth Information

Installed Well ID	Eastings	Northings	Proposed Drill Depth (mBGL)	Actual Drill Depth (mBGL)	Theoretical Stone Installation Volume (m^3)	Actual Stone Installation Volume (m^3)
DWYW1801	330817.417	184893.110	21.0	20.0	1.179	1.18
DWYW1802	330848.020	184887.153	20.0	18.5	1.065	1.07
DWYW1803	330876.718	184876.443	20.0	18.0	1.027	1.03
DWYW1804	330905.066	184867.180	20.0	17.5	0.989	0.99
DWYW1805	330887.748	184909.096	11.0	11.0	0.570	0.57
DWYW1806	Not Drilled		12.0	Not Drilled		

Installed well locations supplied by Infinis via email dated 03.04.18.
All stone installation volumes are based on actual drill depths.

Table 2 – Well Casing Installation Information

Installed Well ID	Plain Casing BGL (m)	Plain Casing AGL (m)	Total Plain Casing (m)	Perforated Casing (m)	Depth of Stone Installed (m)	Depth of Bentonite Installed (m)
DWYW1801	5.0	1.0	6.0	15.0	15.5	4.5
DWYW1802	5.0	1.0	6.0	13.5	14.0	4.5
DWYW1803	5.0	1.0	6.0	13.0	13.5	4.5
DWYW1804	5.0	1.0	6.0	12.5	13.0	4.5
DWYW1805	4.0	1.0	5.0	7.0	7.5	3.5
DWYW1806	Not Drilled					

4.0 CONSTRUCTION QUALITY ASSURANCE

4.1 Specification

The pipework installed consisted of 160mm diameter HDPE SDR11 pipe with a solid upper section and a lower perforated section. The upper section of solid pipework had a minimum of 4.0m installed below ground level and 1.0m above ground level, with exception as discussed further in Section 4.2. Sections of pipework were connected using butt fusion welding methods; the base of the perforated pipework was fitted with a securely fastened push fit end cap on all wells.

The solid pipework was fitted with a push fit air-tight end cap to await installation of the gas well headworks and connection to the landfill gas extraction system.

The annulus between the HDPE pipe and waste was backfilled with 20-40mm non-calcareous smooth gravel to a minimum depth of 4.5m below ground level. The remaining annulus was sealed using a hydrated bentonite seal to ground level following the installation of a dry bentonite blinding layer to the top of the gravel pack; the bentonite remained in an unhydrated state until used. Infinis instructed that the bentonite seal on each well was to be reduced from 5.0m to 4.5m to maintain a stand-off between the base of the bentonite seal and the top of the perforated section of the pipework.

All pipework was measured by the CQA Inspector to verify the length of solid and perforated pipe prior to being installed within the borehole. All materials were checked by the CQA Inspector prior to their use in the works.

4.2 Gas Well Details

The following wells are presented in order of their installation.

Gas Well DWYW1801

Gas Well DWYW1801 was drilled with a target depth of 21.0m Below Ground Level (BGL); drilling reached 20.0m whereupon no further waste arisings could be recovered from the borehole. Infinis were informed and instructed that the well was to be installed to the achieved depth with the pipework being amended by removal of the lower 1.0m of the perforated section.

160mm HDPE pipework was installed to a depth of 20.0m BGL and consisted of 15.0m perforated casing and 6.0m solid casing (including 1.0m Above Ground Level (AGL)). Gravel was installed to a depth of 4.5m BGL; approximately 1.18m^3 was installed. The remaining portion of the annulus was backfilled with a hydrated bentonite which was mixed outside and poured into the annulus to form a seal to ground level following the installation of dry bentonite to the annulus to act as a blinding layer.

Gas Well DWYW1802

Gas Well DWYW1802 was drilled with a target depth of 20.0m BGL; drilling reached 18.5m whereupon no further waste arisings could be recovered from

the borehole. Infinis were informed and instructed that the well was to be installed to the achieved depth with the pipework being amended by removal of the lower 1.5m of the perforated section. A band of clay/waste mix was recorded between 16.0m and 17.0m, with waste recorded below this.

160mm HDPE pipework was installed to a depth of 18.5m BGL and consisted of 13.5m perforated casing and 6.0m solid casing (including 1.0m AGL). Gravel was installed to a depth of 4.5m BGL; approximately 1.07m^3 was installed. The remaining portion of the annulus was backfilled with a hydrated bentonite which was mixed outside and poured into the annulus to form a seal to ground level following the installation of dry bentonite to the annulus to act as a blinding layer.

Gas Well DWYW1803

Gas Well DWYW1803 was drilled with a target depth of 20.0m BGL; drilling reached 18.0m whereupon no further waste arisings could be recovered from the borehole. Infinis were informed and instructed that the well was to be installed to the achieved depth with the pipework being amended by removal of the lower 2.0m of the perforated section. A band of clay was recorded between 15.5m and 17.0m, with waste recorded below this.

160mm HDPE pipework was installed to a depth of 18.0m BGL and consisted of 13.0m perforated casing and 6.0m solid casing (including 1.0m AGL). Gravel was installed to a depth of 4.5m BGL; approximately 1.03m^3 was installed. The remaining portion of the annulus was backfilled with a hydrated bentonite which was mixed outside and poured into the annulus to form a seal to ground level following the installation of dry bentonite to the annulus to act as a blinding layer.

Gas Well DWYW1804

Gas Well DWYW1804 was drilled with a target depth of 20.0m BGL; drilling reached 17.5m whereupon no further waste arisings could be recovered from the borehole. Infinis were informed and instructed that the well was to be installed to the achieved depth with the pipework being amended by removal of the lower 2.5m of the perforated section. A band of clay/waste mixed material was recorded between 16.0m and 17.5m, with the well being installed to 17.5m.

160mm HDPE pipework was installed to a depth of 17.5m BGL and consisted of 12.5m perforated casing and 6.0m solid casing (including 1.0m AGL). Gravel was installed to a depth of 4.5m BGL; approximately 0.99m^3 was installed. The remaining portion of the annulus was backfilled with a hydrated bentonite which was mixed outside and poured into the annulus to form a seal to ground level following the installation of dry bentonite to the annulus to act as a blinding layer.

Gas Well DWYW1805

Gas Well DWYW1805 was drilled to the target depth of 11.0m BGL. 160mm HDPE pipework was installed to a depth of 11.0m BGL and consisted of 7.0m perforated casing and 5.0m solid casing (including 1.0m AGL). Gravel was installed to a depth of 3.5m BGL; approximately 0.57m^3 was installed. The remaining portion of the annulus was backfilled with a hydrated bentonite

which was mixed outside and poured into the annulus to form a seal to ground level following the installation of dry bentonite to the annulus to act as a blinding layer.

4.3 Contract Particulars

During the drilling of the gas extraction wells the verticality of the borehole was regularly checked at approximately 5.0m intervals.

When moving the drilling rig between locations, it was ensured that the route had been walked to establish the most suitable access route and to check for services or penetrations along the way. The area of drilling was also cleared of any obstruction that could prevent the drilling rig from carrying out the Works.

All waste arisings excavated as a result of the drilling works were disposed of to the active tip face of site. Details of the waste arisings can be found in the CQA Inspectors drilling logs enclosed in Appendix 2 of this CQA Report.

The CQA Inspector ensured, by way of liaison with the Main Contractor that all the gas wells local to the vicinity of where the drilling was taking place were switched off.

The CQA Inspector confirmed with the Drilling Sub-Contractor that their documentation was correct and that the proposed plant had suitable and up to date certification. Copies of the Lead Driller's training certification are enclosed in Appendix 4. Prior to commencement of the works the CQA Inspector ensured that the Drilling Sub-Contractor was aware of the proposed drill depths. The CQA Inspector also liaised with the Drilling Sub-Contractor to ensure that drilling commenced at the correct locations.

The CQA Inspector observed the number of extension bars and their respective lengths to ensure that the specified drill depths were achieved. The CQA Inspector was present during the drilling to confirm the achievement of the target drill depths.

5.0 ISSUES ENCOUNTERED

5.1 Well DWYW1801 was installed 1.0m short of target depth due to no recovery of waste at the base of the borehole. Infinis were informed and confirmed installation at 20.0m following removal of the lower 1.0m of the perforated pipework section.

5.2 Well DWYW1802 was installed 1.5m short of target depth due to no recovery of waste at the base of the borehole. Infinis were informed and confirmed installation at 18.5m following removal of the lower 1.5m of the perforated pipework section. A band of clay/waste mix was recorded between 16.0m and 17.0m, with waste recorded below this.

5.3 Well DWYW1803 was installed to a depth of 18.0m, short of the target depth of 20.0m, due to no recovery of waste arisings at the base of the borehole. Infinis were informed and confirmed installation at 18.0m following removal of the lower 2.0m of the perforated pipework section. A band of clay was recorded between 15.5m and 17.0m, with waste recorded below this.

5.4 Well DWYW1804 was installed 2.5m short of target depth due to no recovery of waste at the base of the borehole. Infinis were informed and confirmed installation at 17.5m following removal of the lower 2.5m of the perforated pipework section. A band of clay/waste mixed material was recorded between 16.0m and 17.5m, with the well being installed to 17.5m.

5.5 Well DWYW1806 was not drilled during these works due to access issues.

5.6 No further issues were encountered during the period of these works.

6.0 CONCLUSIONS

6.1 From the observations and measurements made by the CQA Inspector, to the best of our knowledge, 5no. gas extraction wells were installed at Docks Way Landfill Site to a satisfactory standard and in accordance with the previously approved CQA Plan.

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Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Report

1. CQA Inspectors Daily Logs

CQA Inspector's Daily Report

Site Name: Docks Way LFS
Project: Retro Drilling of Gas Wells

Date		Wednesday 7th March 2018
Weather (include Wind Direction & Strength during Drilling Works)	Previous Night	Dry
	a.m	Clear & Dry
	p.m	Clear & Dry
Site Hours:		07.00 – 18.00
Contractors Arrival Time:		08.00
CQA Arrival Time:		08.00
Contractors Departure Time:		17.00
CQA Departure Time:		17.00
Contractors Plant / Resources Utilised		**Dragon Drilling** 1 x Lead driller – K. Rodgerson 1 x Labourer – D. Aspey 1 x Comacchio MC1500 1 x JCB 6T Front Dump truck 1 x JCB T4I Tele handler
Contract Works Undertaken		**Stuart House Constructors (Previous Week)** All well casings have been butt fused the previous week with 160mm HDPE SDR 11 pipework. All lengths of pipework (Inc. plain and perforated) are measured and confirmed to be correct. Joint numbers on well casings are as follows; DWYW1801 – Joints 1, 2 and 3. DWYW1802 – Joints 4, 5 and 6. DWYW1803 – Joints 7, 8 and 9. DWYW1804 – Joints 10, 11 and 12. DWYW1805 – Joints 13 and 14. DWYW1806 – Joints 15 and 16. **Dragon Drilling** Drilling commences after pre-start meeting and drill rig checks have been undertaken. **DWYW1801** Drilling commences at 11.00 on well DWYW1801 to a target depth of 21m BGL. Drilling was undertaken using a 350mm auger, where the auger length (Inc. head bar attachment) and extension bars used in the drilling process were observed to ensure correct drill depth, this is combined with a weighted tape when close to target depth. All waste arisings were removed and taken to the designated area agreed on site and recorded on a separate spreadsheet. Target depth of 21m was unobtainable with 3 x efforts made to retrieve past 20m, therefore casing was adjusted (removed 1m perforated prior to attaching plastic end cap) and pipe was inserted. The casing was installed to 20m BGL and consisted of 15m perforated and 6m of solid pipe work with a 1m stand up. The annulus was then backfilled with roughly 1.18m^3 of 20/40 non-calcareous gravel pack to 4.5m BGL, depth was checked using a weighted dip tape to ensure correct seal depth. 2 x bags of dry bentonite are poured into the annulus to act as a blinding layer. A fully hydrated bentonite mix was then prepared outside the hole and then poured in gradually to form a seal (3 mixes, 2 bags per mix). The gas well was dipped for

For Egniol Environmental Ltd: Nicholas Earlam

CQA Inspector's Daily Report

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Project: Retro Drilling of Gas Wells

	leachate levels after 24 hours and recorded on a separate spreadsheet. Installed and sealed and fitted with flex seal cap at 14:30. **DWYW1802** Drilling commences at 14.30 on well DWYW1802 to a target depth of 20m BGL. Drilling was undertaken using a 350mm auger, where the auger length (Inc. head bar attachment) and extension bars used in the drilling process were observed to ensure correct drill depth, this is combined with a weighted tape when close to target depth. All waste arisings were removed and taken to the designated area agreed on site and recorded on a separate spreadsheet. At 16.30 well is at a depth of 10m BGL, where it is temporarily sealed over night with a mix of hydrated bentonite.
Testing Undertaken	Full time supervision from Egniol Representative. Photographs of all aspects of the works. Verticality checks on the drilling rig. Use of rods during gravel installation to mitigate bridging. Gravel (grading, smoothness and non-calcareous) and bentonite checked to make sure they met the requirements of the CQA Plan. Depth checks on the gravel pack BGL.
Meetings/ Correspondence	Each peg location was walked with CQA and drilling operative prior to moving the drilling rig.
Health and Safety	Facilities Provided by Infinis.
Visitors to Site	G. Augood (Infinis) – Pre-start Meeting
Issues Encountered (and Remedial Actions Taken)	DWYW1801 was drilled to 21m, however no waste recovery was possible past 20m BGL. G. Augood of Infinis was informed and it was instructed to install to 20m BGL.
Comments	None

For Egniol Environmental Ltd: Nicholas Earlam

CQA Inspector's Daily Report

Site Name: Docks Way LFS
Project: Retro Drilling of Gas Wells

Date		Thursday 8th March 2018
Weather (include Wind Direction & Strength during Drilling Works)	Previous Night	Dry
	a.m	Clear & Dry
	p.m	Cloudy & Showers
Site Hours:		07.00 – 18.00
Contractors Arrival Time:		07.00
CQA Arrival Time:		07.00
Contractors Departure Time:		18.00
CQA Departure Time:		18.00
Contractors Plant / Resources Utilised		**Dragon Drilling** 1 x Lead driller – K. Rodgerson 1 x Labourer – D. Aspey 1 x Comacchio MC1500 1 x JCB 6T Front Dump truck 1 x JCB T4I Tele handler
Contract Works Undertaken		**Dragon Drilling** Drilling commences after drill rig checks have been undertaken. **DWYW1802** Drilling continues at 08.00 on well DWYW1802 to a target depth of 20m BGL. Target depth of 20m was unobtainable with 3 x efforts made to retrieve past 18.5m, therefore casing was adjusted (removed 1.5m perforated prior to attaching plastic end cap) and pipe was inserted. The casing was installed to 18.5m BGL and consisted of 13.5m perforated and 6m of solid pipe work with a 1m stand up. The annulus was then backfilled with roughly 1.07m^3 of 20/40 non-calcareous gravel pack to 4.5m BGL, depth was checked using a weighted dip tape to ensure correct seal depth. 2 x bags of dry bentonite are poured into the annulus to act as a blinding layer. A fully hydrated bentonite mix was then prepared outside the hole and then poured in gradually to form a seal (3.5 mixes, 2 bags per mix). The gas well was dipped for leachate levels after 24 hours and recorded on a separate spreadsheet. Installed and sealed and fitted with flex seal cap at 11.00. **DWYW1803** Drilling commences at 11.10 on well DWYW1803 to a target depth of 20m BGL. Drilling was undertaken using a 350mm auger, where the auger length (Inc. head bar attachment) and extension bars used in the drilling process were observed to ensure correct drill depth, this is combined with a weighted tape when close to target depth. All waste arisings were removed and taken to the designated area agreed on site and recorded on a separate spreadsheet. Target depth of 20m was unobtainable with 3 x efforts made to retrieve past 18m, therefore casing was adjusted (removed 2m perforated prior to attaching plastic end cap) and pipe was inserted. The casing was installed to 18m BGL and consisted of 13m perforated and 6m of solid pipe work with a 1m stand up. The annulus was then backfilled with roughly 1.03m^3 of 20/40 non-calcareous gravel pack to 4.5m BGL, depth was checked using a weighted dip tape to ensure correct seal depth.

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CQA Inspector's Daily Report

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	2 x bags of dry bentonite are poured into the annulus to act as a blinding layer. A fully hydrated bentonite mix was then prepared outside the hole and then poured in gradually to form a seal (3 mixes, 2 bags per mix). The gas well was dipped for leachate levels after 24 hours and recorded on a separate spreadsheet. Installed and sealed and fitted with flex seal cap at 17.30. **DWYW1804** Drilling commences at 13.50 on well DWYW1804 to a target depth of 20m BGL. Drilling was undertaken using a 350mm auger, where the auger length (Inc. head bar attachment) and extension bars used in the drilling process were observed to ensure correct drill depth, this is combined with a weighted tape when close to target depth. All waste arisings were removed and taken to the designated area agreed on site and recorded on a separate spreadsheet. At 16.10 well is at a depth of 17.5m BGL, where it is temporarily sealed over night with a mix of hydrated bentonite.
Testing Undertaken	Full time supervision from Egniol Representative. Photographs of all aspects of the works. Verticality checks on the drilling rig. Gravel (grading, smoothness and non-calcareous) and bentonite checked to make sure they met the requirements of the CQA Plan. Use of rods during gravel installation to mitigate bridging. Depth checks on the gravel pack BGL.
Meetings/ Correspondence	Each peg location was walked with CQA and drilling operative prior to moving the drilling rig.
Health and Safety	Facilities Provided by Infinis.
Visitors to Site	N/A
Issues Encountered (and Remedial Actions Taken)	DWYW1802 was drilled to 20m, however no waste recovery was possible past 18.5m BGL. G. Augood of Infinis was informed and it was instructed to install to 18.5m BGL. DWYW1803 was drilled to 20m, however no waste recovery was possible past 18.0m BGL. G. Augood of Infinis was informed and it was instructed to install to 18.0m BGL.
Comments	At 13.45 telehandler receives 2 x punctures, tyre fitters quote 2 hours to repair therefore well DWYW1804 is left to be sealed at end of day. At 16.10 hydraulic hose on drill rig ruptures, Pirtek to arrive 07.00 on 09/03 to repair. (Currently well is temporarily sealed overnight.)

For Egniol Environmental Ltd: Nicholas Earlam

CQA Inspector's Daily Report

Site Name: Docks Way LFS

Project: Retro Drilling of Gas Wells

Date		Friday 9th March 2018
Weather (include Wind Direction & Strength during Drilling Works)	Previous Night	Showers
	a.m	Cloudy & Showers
	p.m	Cloudy & Showers
Site Hours:		07.00 – 18.00
Contractors Arrival Time:		07.00
CQA Arrival Time:		07.00
Contractors Departure Time:		14.00
CQA Departure Time:		14.00
Contractors Plant / Resources Utilised		**Dragon Drilling** 1 x Lead driller – K. Rodgerson 1 x Labourer – D. Aspey 1 x Comacchio MC1500 1 x JCB 6T Front Dump truck 1 x JCB T4I Tele handler
Contract Works Undertaken		**Dragon Drilling** Drilling commences after rig repair and drill rig checks have been undertaken. **DWYW1804** Drilling continues at 08.30 on well DWYW1804 to a target depth of 20m BGL. Target depth of 20m was unobtainable with 3 x efforts made to retrieve past 17.5m, therefore casing was adjusted (removed 2.5m perforated prior to attaching plastic end cap) and pipe was inserted. The casing was installed to 17.5m BGL and consisted of 12.5m perforated and 6m of solid pipe work with a 1m stand up. The annulus was then backfilled with roughly 0.99m^3 of 20/40 non-calcareous gravel pack to 4.5m BGL, depth was checked using a weighted dip tape to ensure correct seal depth. 2 x bags of dry bentonite are poured into the annulus to act as a blinding layer. A fully hydrated bentonite mix was then prepared outside the hole and then poured in gradually to form a seal (3.5 mixes, 2 bags per mix). The gas well was dipped for leachate levels after 24 hours and recorded on a separate spreadsheet. Installed and sealed and fitted with flex seal cap at 10.45. **DWYW1805** Drilling commences at 10.00 on well DWYW1805 to a target depth of 11m BGL. Drilling was undertaken using a 350mm auger, where the auger length (Inc. head bar attachment) and extension bars used in the drilling process were observed to ensure correct drill depth, this is combined with a weighted tape when close to target depth. All waste arisings were removed and taken to the designated area agreed on site and recorded on a separate spreadsheet. Target depth of 11m is achieved and the well casing is installed. The casing was installed to 11m BGL and consisted of 7m perforated and 5m of solid pipe work with a 1m stand up. The annulus was then backfilled with roughly 0.57m^3 of 20/40 non-calcareous gravel pack to 4.5m BGL, depth was checked using a weighted dip tape to ensure correct seal depth. 2 x bags of dry bentonite are poured into the annulus to act as a blinding layer. A

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	fully hydrated bentonite mix was then prepared outside the hole and then poured in gradually to form a seal (2 mixes, 2 bags per mix). The gas well was dipped for leachate levels and recorded on a separate spreadsheet. Installed and sealed and fitted with flex seal cap at 12.45.
Testing Undertaken	Full time supervision from Egniol Representative. Photographs of all aspects of the works. Verticality checks on the drilling rig. Gravel (grading, smoothness and non-calcareous) and bentonite checked to make sure they met the requirements of the CQA Plan. Use of rods during gravel installation to mitigate bridging. Depth checks on the gravel pack BGL.
Meetings/ Correspondence	Each peg location was walked with CQA and drilling operative prior to moving the drilling rig.
Health and Safety	Facilities Provided by Infinis.
Visitors to Site	G. Augood (Infinis)
Issues Encountered (and Remedial Actions Taken)	DWYW1804 was drilled to 20m, however no waste recovery was possible past 17.5m BGL. G. Augood of Infinis was informed and it was instructed to install to 17.5m BGL. Drill rig was unable to access DWYW1806 due to the profile. G. Augood of Infinis was contacted and it was agreed to abandon this well installation.
Comments	None.

For Egniol Environmental Ltd: Nicholas Earlam

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Docks Way Landfill Site

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Construction Quality Assurance Report

2. CQA Inspectors Drill Logs

DRILLING REPORT				Well Number:	**DWYW1801**
CQA INSPECTOR:-	**N.Earlam**			Site:	Docks Way LFS
CLIENT:	**Infinis**			Peg Level (mAOD):	**30.914**
Date:	**07/03/2018**	Installation Details		Target Depth (m):	**21.00**
Drilling Rig type:	**Commachio MC1500**	Solid AGL (m):	**1.00**	Actual Depth (m):	**20.00**
Extruder Dimensions:		Solid BGL (m):	**5.00**	Dip Level (mBGL):	**9.50**
Auger Dimensions:	**350mm**	Perforated BGL (m):	**15.00**	Dip Level (mBGL) after 24hrs:	**9.50**
Casing Dimensions:		Bentonite (m):	**4.50**	HDPE Casing Dimensions:	**160mm**
		Gravel (m):	**15.50**		

Depth From (m)	Depth To (m)	Interval (m)	DESCRIPTION	STRATA
		m	m	
Peg Level (mAOD)	+1.0	1	+0.5	GL
	0.0	0		
0.0		0	Wet Soils & Waste	
	1.0		Wet Soils & Waste 0.5	Soils & Wet Waste
1.0		1	Dry Consolidated Waste	
	2.0		Dry Consolidated Waste 1.5	
2.0		2	Dry Consolidated Waste	Bentonite seal
	3.0		Dry Consolidated Waste 2.5	
3.0		3	Dry Consolidated Waste	
	4.0		Dry Consolidated Waste 3.5	
4.0		4	Dry Consolidated Waste	
	5.0		Dry Consolidated Waste 4.5	J1
5.0		5	Dry Consolidated Waste	
	6.0		Dry Consolidated Waste 5.5	
6.0		6	Dry Consolidated Waste	
	7.0		Dry Consolidated Waste 6.5	
7.0		7	Dry Consolidated Waste	
	8.0		Dry Consolidated Waste 7.5	
8.0		8	Dry Consolidated Waste	
	9.0		Dry Consolidated Waste 8.5	
9.0		9	Dry Consolidated Waste	
	10.0		Dry Consolidated Waste 9.5	Dry Waste
10.0		10	Dry Consolidated Waste	
	11.0		Dry Consolidated Waste 10.5	J2
11.0		11	Dry Consolidated Waste	
	12.0		Dry Consolidated Waste 11.5	
12.0		12	Dry Consolidated Waste	
	13.0		Dry Consolidated Waste 12.5	
13.0		13	Dry Consolidated Waste	
	14.0		Dry Consolidated Waste 13.5	
14.0		14	Dry Consolidated Waste	
	15.0		Dry Consolidated Waste 14.5	
15.0		15	Dry Consolidated Waste	
	16.0		Dry Consolidated Waste 15.5	
16.0		16	Dry Consolidated Waste	
	17.0		Dry Consolidated Waste 16.5	J3
17.0		17	Dry Consolidated Waste	
	18.0		Dry Consolidated Waste 17.5	
18.0		18	Dry Consolidated Waste	
	19.0		Dry Consolidated Waste 18.5	
19.0		19	Dry Consolidated Waste	Gravel Volume 1.18m3
	20.0		Dry Consolidated Waste 19.5	Dry Waste
20.0		20		
	21.0		20.5	
21.0		21		
	22.0		21.5	
22.0		22		
	23.0		22.5	
23.0		23		
	24.0		23.5	
24.0		24		
	25.0		24.5	
25.0		25		
	26.0		25.5	
26.0		26		
	27.0		26.5	
27.0		27		
	28.0		27.5	
28.0		28		
	29.0		28.5	
29.0		29		
	30.0		29.5	
30.0		30		
	31.0		30.5	
31.0		31		
	32↓		31.5	

DRILLING REPORT				Well Number:	**DWYW1802**
CQA INSPECTOR:-	**N.Earlam**			Site:	Docks Way LFS
CLIENT:	**Infinis**			Peg Level (mAOD):	**30.876**
Date:	**08/03/2018**	Installation Details		Target Depth (m):	**20.00**
Drilling Rig type:	**Commachio MC1500**	Solid AGL (m):	**1.00**	Actual Depth (m):	**18.50**
Extruder Dimensions:		Solid BGL (m):	**5.00**	Dip Level (mBGL):	**13.50**
Auger Dimensions:	**350mm**	Perforated BGL (m):	**13.50**	Dip Level (mBGL) after 24hrs:	**13.50**
Casing Dimensions:		Bentonite (m):	**4.50**	HDPE Casing Dimensions:	**160mm**
		Gravel (m):	**14.00**		

Depth From (m)	Depth To (m)	Interval (m)		DESCRIPTION		STRATA
			m		m	
Peg Level (mAOD)	+1.0	1	+1		+0.5	GL
	0.0	0	0			GL
0.0			0	Wet Soils & Waste		
	1.0			Wet Soils & Waste	0.5	Soils & Wet Waste
1.0		1	1	Dry Consolidated Waste		
	2.0			Dry Consolidated Waste	1.5	
2.0		1	2	Dry Consolidated Waste		
	3.0			Dry Consolidated Waste	2.5	
3.0		1	3	Dry Consolidated Waste		
	4.0			Dry Consolidated Waste	3.5	
4.0		1	4	Dry Consolidated Waste		
	5.0			Dry Consolidated Waste	4.5	J4
5.0		1	5	Dry Consolidated Waste		
	6.0			Dry Consolidated Waste	5.5	
6.0		1	6	Dry Consolidated Waste		
	7.0			Dry Consolidated Waste	6.5	
7.0		1	7	Dry Consolidated Waste		
	8.0			Dry Consolidated Waste	7.5	
8.0		1	8	Dry Consolidated Waste		
	9.0			Dry Consolidated Waste	8.5	
9.0		1	9	Dry Consolidated Waste		
	10.0			Dry Consolidated Waste	9.5	Dry Waste
10.0		1	10	Dry Consolidated Waste		
	11.0			Dry Consolidated Waste	10.5	J5
11.0		1	11	Dry Consolidated Waste		
	12.0			Dry Consolidated Waste	11.5	
12.0		1	12	Dry Consolidated Waste		
	13.0			Dry Consolidated Waste	12.5	
13.0		1	13	Dry Consolidated Waste		
	14.0			Dry Consolidated Waste	13.5	
14.0		1	14	Dry Consolidated Waste		
	15.0			Dry Consolidated Waste	14.5	
15.0		1	15	Dry Consolidated Waste		
	16.0			Dry Consolidated Waste	15.5	
16.0		1	16	Perched Clay/Soils		Perched Clay/Soils
	17.0			Perched Clay/Soils	16.5	J6
17.0		1	17	Dry Consolidated Waste		
	18.0			Dry Consolidated Waste	17.5	Gravel Volume 1.07m3
18.0		1	18	Dry Consolidated Waste		Dry Waste
	19.0				18.5	
19.0		1	19			
	20.0				19.5	
20.0		1	20			
	21.0				20.5	
21.0		1	21			
	22.0				21.5	
22.0		1	22			
	23.0				22.5	
23.0		1	23			
	24.0				23.5	
24.0		1	24			
	25.0				24.5	
25.0		1	25			
	26.0				25.5	
26.0		1	26			
	27.0				26.5	
27.0		1	27			
	28.0				27.5	
28.0		1	28			
	29.0				28.5	
29.0		1	29			
	30.0				29.5	
30.0		1	30			
	31.0				30.5	
31.0		1	31			
	32↓				31.5	

DRILLING REPORT				Well Number:	**DWYW1803**
CQA INSPECTOR:-	**N.Earlam**			Site:	Docks Way LFS
CLIENT:	**Infinis**			Peg Level (mAOD):	**30.809**
Date:	**08/03/2018**	Installation Details		Target Depth (m):	**20.00**
Drilling Rig type:	**Commachio MC1500**	Solid AGL (m):	**1.00**	Actual Depth (m):	**18.00**
Extruder Dimensions:		Solid BGL (m):	**5.00**	Dip Level (mBGL):	**12.00**
Auger Dimensions:	**350mm**	Perforated BGL (m):	**13.00**	Dip Level (mBGL) after 24hrs:	**12.00**
Casing Dimensions:		Bentonite (m):	**4.50**	HDPE Casing Dimensions:	**160mm**
		Gravel (m):	**13.50**		

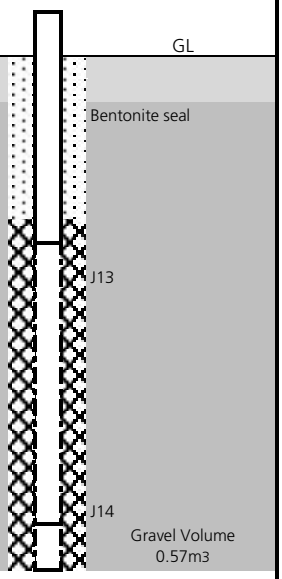
Depth From (m)	Depth To (m)	Interval (m)		DESCRIPTION		STRATA
			m		m	
Peg Level (mAOD)	+1.0	1	+1		+0.5	GL
	0.0	0	0			GL
0.0			0	Wet Soils & Waste		
	1.0			Wet Soils & Waste	0.5	Soils & Wet Waste
1.0		1	1	Dry Consolidated Waste		
	2.0			Dry Consolidated Waste	1.5	
2.0		1	2	Dry Consolidated Waste		
	3.0			Dry Consolidated Waste	2.5	Bentonite seal
3.0		1	3	Dry Consolidated Waste		
	4.0			Dry Consolidated Waste	3.5	
4.0		1	4	Dry Consolidated Waste		
	5.0			Dry Consolidated Waste	4.5	J7
5.0		1	5	Dry Consolidated Waste		
	6.0			Dry Consolidated Waste	5.5	
6.0		1	6	Dry Consolidated Waste		
	7.0			Dry Consolidated Waste	6.5	
7.0		1	7	Dry Consolidated Waste		
	8.0			Dry Consolidated Waste	7.5	
8.0		1	8	Dry Consolidated Waste		
	9.0			Dry Consolidated Waste	8.5	
9.0		1	9	Dry Consolidated Waste		
	10.0			Dry Consolidated Waste	9.5	Dry Waste
10.0		1	10	Dry Consolidated Waste		
	11.0			Dry Consolidated Waste	10.5	J8
11.0		1	11	Dry Consolidated Waste		
	12.0			Dry Consolidated Waste	11.5	
12.0		1	12	Dry Consolidated Waste		
	13.0			Dry Consolidated Waste	12.5	
13.0		1	13	Dry Consolidated Waste		
	14.0			Dry Consolidated Waste	13.5	
14.0		1	14	Dry Consolidated Waste		
	15.0			Dry Consolidated Waste	14.5	
15.0		1	15	Dry Consolidated Waste		
	16.0			Perched Clay/Soils	15.5	
16.0		1	16	Perched Clay/Soils		Perched Clay/Soils
	17.0			Perched Clay/Soils	16.5	J9
17.0		1	17	Dry Consolidated Waste		Gravel Volume 1.03m3
	18.0			Dry Consolidated Waste	17.5	Dry Waste
18.0		1	18			
	19.0				18.5	
19.0		1	19			
	20.0				19.5	
20.0		1	20			
	21.0				20.5	
21.0		1	21			
	22.0				21.5	
22.0		1	22			
	23.0				22.5	
23.0		1	23			
	24.0				23.5	
24.0		1	24			
	25.0				24.5	
25.0		1	25			
	26.0				25.5	
26.0		1	26			
	27.0				26.5	
27.0		1	27			
	28.0				27.5	
28.0		1	28			
	29.0				28.5	
29.0		1	29			
	30.0				29.5	
30.0		1	30			
	31.0				30.5	
31.0		1	31			
	32↓				31.5	

DRILLING REPORT				Well Number:	**DWYW1804**
CQA INSPECTOR:-	**N.Earlam**			Site:	Docks Way LFS
CLIENT:	**Infinis**			Peg Level (mAOD):	**30.45**
Date:	**09/03/2018**	Installation Details		Target Depth (m):	**20.00**
Drilling Rig type:	**Commachio MC1500**	Solid AGL (m):	**1.00**	Actual Depth (m):	**17.50**
Extruder Dimensions:		Solid BGL (m):	**5.00**	Dip Level (mBGL):	**12.50**
Auger Dimensions:	**350mm**	Perforated BGL (m):	**12.50**	Dip Level (mBGL) after 24hrs:	**12.50**
Casing Dimensions:		Bentonite (m):	**4.50**	HDPE Casing Dimensions:	**160mm**
		Gravel (m):	**13.00**		

Depth From (m)	Depth To (m)	Interval (m)		DESCRIPTION		STRATA
			m		m	
Peg Level (mAOD)	+1.0	1	+1		+0.5	GL GL
	0.0	0	0			
0.0			0	Wet Soils & Waste		
	1.0			Wet Soils & Waste	0.5	Soils & Wet Waste
1.0		1	1	Dry Consolidated Waste		
	2.0			Dry Consolidated Waste	1.5	Bentonite seal
2.0		1	2	Dry Consolidated Waste		
	3.0			Dry Consolidated Waste	2.5	
3.0		1	3	Dry Consolidated Waste		
	4.0			Dry Consolidated Waste	3.5	
4.0		1	4	Dry Consolidated Waste		
	5.0			Dry Consolidated Waste	4.5	J10
5.0		1	5	Dry Consolidated Waste		
	6.0			Dry Consolidated Waste	5.5	
6.0		1	6	Dry Consolidated Waste		
	7.0			Dry Consolidated Waste	6.5	
7.0		1	7	Dry Consolidated Waste		
	8.0			Dry Consolidated Waste	7.5	
8.0		1	8	Dry Consolidated Waste		
	9.0			Dry Consolidated Waste	8.5	
9.0		1	9	Dry Consolidated Waste		
	10.0			Dry Consolidated Waste	9.5	Dry Waste
10.0		1	10	Dry Consolidated Waste		
	11.0			Dry Consolidated Waste	10.5	J11
11.0		1	11	Dry Consolidated Waste		
	12.0			Dry Consolidated Waste	11.5	
12.0		1	12	Dry Consolidated Waste		
	13.0			Dry Consolidated Waste	12.5	
13.0		1	13	Dry Consolidated Waste		
	14.0			Dry Consolidated Waste	13.5	
14.0		1	14	Dry Consolidated Waste		
	15.0			Dry Consolidated Waste	14.5	
15.0		1	15	Wet Consolidated Waste		
	16.0			Wet Consolidated Waste	15.5	Wet Waste
16.0		1	16	Perched Clay/Soils/Waste		
	17.0			Perched Clay/Soils/Waste	16.5	Perched Clay/Waste J12 Gravel Volume 0.99m3
17.0		1	17	Perched Clay/Soils/Waste		
	18.0				17.5	
18.0		1	18			
	19.0				18.5	
19.0		1	19			
	20.0				19.5	
20.0		1	20			
	21.0				20.5	
21.0		1	21			
	22.0				21.5	
22.0		1	22			
	23.0				22.5	
23.0		1	23			
	24.0				23.5	
24.0		1	24			
	25.0				24.5	
25.0		1	25			
	26.0				25.5	
26.0		1	26			
	27.0				26.5	
27.0		1	27			
	28.0				27.5	
28.0		1	28			
	29.0				28.5	
29.0		1	29			
	30.0				29.5	
30.0		1	30			
	31.0				30.5	
31.0		1	31			
	32↓				31.5	

DRILLING REPORT				Well Number:	**DWYW1805**
CQA INSPECTOR:-	**N.Earlam**			Site:	Docks Way LFS
CLIENT:	**Infinis**			Peg Level (mAOD):	**21.95**
Date:	**09/03/2018**	Installation Details		Target Depth (m):	**11.00**
Drilling Rig type:	**Commachio MC1500**	Solid AGL (m):	**1.00**	Actual Depth (m):	**11.00**
Extruder Dimensions:		Solid BGL (m):	**4.00**	Dip Level (mBGL):	**5.00**
Auger Dimensions:	**350mm**	Perforated BGL (m):	**7.00**	Dip Level (mBGL) after 24hrs:	**5.00**
Casing Dimensions:		Bentonite (m):	**3.50**	HDPE Casing Dimensions:	**160mm**
		Gravel (m):	**7.50**		

Depth From (m)	Depth To (m)	Interval (m)	DESCRIPTION	STRATA
			m	m
Peg Level (mAOD)	+1.0	1	+1	+0.5
	0.0	0	0	GL
0.0			0	Wet Soils & Waste
	1.0		Wet Soils & Waste	0.5
1.0		1	1	Dry Consolidated Waste
	2.0		Dry Consolidated Waste	1.5
2.0		1	2	Dry Consolidated Waste
	3.0		Dry Consolidated Waste	2.5
3.0		1	3	Dry Consolidated Waste
	4.0		Dry Consolidated Waste	3.5
4.0		1	4	Dry Consolidated Waste
	5.0		Dry Consolidated Waste	4.5
5.0		1	5	Dry Consolidated Waste
	6.0		Dry Consolidated Waste	5.5
6.0		1	6	Dry Consolidated Waste
	7.0		Dry Consolidated Waste	6.5
7.0		1	7	Dry Consolidated Waste
	8.0		Dry Consolidated Waste	7.5
8.0		1	8	Dry Consolidated Waste
	9.0		Dry Consolidated Waste	8.5
9.0		1	9	Dry Consolidated Waste
	10.0		Dry Consolidated Waste	9.5
10.0		1	10	Dry Consolidated Waste
	11.0		Dry Consolidated Waste	10.5
11.0		1	11	11.5
	12.0			
12.0		1	12	12.5
	13.0			
13.0		1	13	13.5
	14.0			
14.0		1	14	14.5
	15.0			
15.0		1	15	15.5
	16.0			
16.0		1	16	16.5
	17.0			
17.0		1	17	17.5
	18.0			
18.0		1	18	18.5
	19.0			
19.0		1	19	19.5
	20.0			
20.0		1	20	20.5
	21.0			
21.0		1	21	21.5
	22.0			
22.0		1	22	22.5
	23.0			
23.0		1	23	23.5
	24.0			
24.0		1	24	24.5
	25.0			
25.0		1	25	25.5
	26.0			
26.0		1	26	26.5
	27.0			
27.0		1	27	27.5
	28.0			
28.0		1	28	28.5
	29.0			
29.0		1	29	29.5
	30.0			
30.0		1	30	30.5
	31.0			
31.0		1	31	31.5
	32↓			



ENGINEERING
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Infinis Energy Services Ltd.

Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Report

3. Welding Records

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	1
Reference	12881919
Created	20/02/2018 09:36:07
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	10.2 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	19.2 (bar)
	Dynamic Drag	19.2 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.7
Bead Pressure (bar)	[19.2]+17.0	36.2
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.2]+17.0	36.4
Cool Time (s)	230.0	230.0

Final Bead OK	Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	2
Reference	12881918
Created	20/02/2018 09:50:54
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	11.3 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	18.4 (bar)
	Dynamic Drag	18.4 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	232.0
Bead Pressure (bar)	[18.4]+17.0	35.2
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[18.4]+17.0	35.6
Cool Time (s)	230.0	230.0

Final Bead OK	Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	3
Reference	12881917
Created	20/02/2018 10:05:16
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	12.3 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	19.1 (bar)
	Dynamic Drag	19.1 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.8
Bead Pressure (bar)	[19.1]+17.0	35.7
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.1]+17.0	36.2
Cool Time (s)	230.0	230.0

Final Bead OK	Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 4
Reference 12881916
Created 20/02/2018 10:18:32
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 12.9 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 19.5 (bar)
Dynamic Drag 19.5 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.5
Bead Pressure (bar)	[19.5]+17.0	36.3
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.5]+17.0	36.3
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 5
Reference 12881915
Created 20/02/2018 10:31:46
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 13.8 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 21.9 (bar)
Dynamic Drag 21.9 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	1.0
Heater Temp (°C)	233.0	231.5
Bead Pressure (bar)	[21.9]+17.0	38.8
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[21.9]+17.0	38.8
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 6
Reference 12881914
Created 20/02/2018 10:44:31
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 15.1 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 10.7 (bar)
Dynamic Drag 10.7 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.0
Bead Pressure (bar)	[10.7]+17.0	27.6
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[10.7]+17.0	27.6
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	7
Reference	12881913
Created	20/02/2018 10:59:27
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	15.8 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	19.8 (bar)
	Dynamic Drag	19.8 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	230.7
Bead Pressure (bar)	[19.8]+17.0	36.5
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.8]+17.0	36.7
Cool Time (s)	230.0	230.0
Final Bead OK	Yes	

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	8
Reference	12881912
Created	20/02/2018 11:59:12
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	13.4 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	16.5 (bar)
	Dynamic Drag	16.5 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.3
Bead Pressure (bar)	[16.5]+17.0	33.4
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[16.5]+17.0	33.4
Cool Time (s)	230.0	230.0
Final Bead OK	Yes	

Joint Record

https://www.jointmanager.com

Status **COMPLETE**

Account	_SHELFMCA
Uploaded	08/03/2018 14:38:16
Uploader	scox

Joint Identification

Joint	9
Reference	12881911
Created	20/02/2018 12:11:20
Operator	S.HOUSE

Location & Environment

Location	DOCKS WAY

Project Details

Machine

Model	Gator2
Serial Number	GTR200974
Plant Number	G250/114
Owner	MCA FUSION HIRE
Software version	2.0
Operating Voltage	110V
Ambient Temp	14.2 °C

Pipe Selected

PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters

Standard	Fusion FW Landfill [05/1999]	
Drag Parameters	Peak Drag	13.2 (bar)
	Dynamic Drag	13.2 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.6
Bead Pressure (bar)	[13.2]+17.0	30.4
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[13.2]+17.0	30.1
Cool Time (s)	230.0	230.0
Final Bead OK	Yes	

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 10
Reference 12881910
Created 20/02/2018 12:23:43
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 15.4 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 21.4 (bar)
Dynamic Drag 21.4 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.6
Bead Pressure (bar)	[21.4]+17.0	38.2
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[21.4]+17.0	38.3
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 11
Reference 12881909
Created 20/02/2018 12:35:36
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 16.7 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 19.2 (bar)
Dynamic Drag 19.2 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.4
Bead Pressure (bar)	[19.2]+17.0	36.0
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.2]+17.0	36.0
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 12
Reference 12881908
Created 20/02/2018 12:48:30
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 17.1 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 12.8 (bar)
Dynamic Drag 12.8 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.3
Bead Pressure (bar)	[12.8]+17.0	29.9
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[12.8]+17.0	29.8
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 13
Reference 12881907
Created 20/02/2018 13:04:49
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 17.9 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 21.2 (bar)
Dynamic Drag 21.2 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	232.0
Bead Pressure (bar)	[21.2]+17.0	38.2
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[21.2]+17.0	38.0
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 14
Reference 12881906
Created 20/02/2018 13:17:49
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 18.7 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 7.7 (bar)
Dynamic Drag 7.7 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.5
Bead Pressure (bar)	[7.7]+17.0	24.8
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[7.7]+17.0	24.6
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 15
Reference 12881905
Created 20/02/2018 13:30:27
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 19.3 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 19.4 (bar)
Dynamic Drag 19.4 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.4
Bead Pressure (bar)	[19.4]+17.0	36.3
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[19.4]+17.0	36.2
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 16
Reference 12881904
Created 20/02/2018 13:41:55
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 20.8 °C

Pipe Selected
PE80 160mm SDR 11.0 Black
<----> 160mm SDR 11.0 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 9.7 (bar)
Dynamic Drag 9.7 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.5
Bead Pressure (bar)	[9.7]+17.0	26.8
Bead Distance (µm)	300.0	300.0
Soak Pressure (bar)	0	0
Soak Time (s)	30.0	30.0
Fusion Pressure (bar)	[9.7]+17.0	26.7
Cool Time (s)	230.0	230.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 17
Reference 12881903
Created 20/02/2018 14:18:56
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 17.6 °C

Pipe Selected
PE80 160mm SDR 17.6 Black
<----> 160mm SDR 17.6 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 12.7 (bar)
Dynamic Drag 12.7 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.7
Bead Pressure (bar)	[12.7]+11.0	23.6
Bead Distance (µm)	500.0	500.0
Soak Pressure (bar)	0	0
Soak Time (s)	20.0	20.0
Fusion Pressure (bar)	[12.7]+11.0	23.7
Cool Time (s)	170.0	170.0

Final Bead OK Yes

Joint Record

https://www.jointmanager.com

Status **COMPLETE**
Account _SHELFMCA
Uploaded 08/03/2018 14:38:16
Uploader scox

Joint Identification
Joint 18
Reference 12881902
Created 20/02/2018 14:32:23
Operator S.HOUSE

Location & Environment
Location DOCKS WAY

Project Details

Machine
Model Gator2
Serial Number GTR200974
Plant Number G250/114
Owner MCA FUSION HIRE
Software version 2.0
Operating Voltage 110V
Ambient Temp 18.4 °C

Pipe Selected
PE80 160mm SDR 17.6 Black
<----> 160mm SDR 17.6 <---->

Pipe/Fitting Details

Welding Parameters
Standard Fusion FW Landfill [05/1999]
Drag Parameters Peak Drag 14.2 (bar)
Dynamic Drag 14.2 (bar)

	TARGET	ACTUAL
Energy (kJ)	-	
Voltage (V)		-
Dwell Time (s)	4.0	2.0
Heater Temp (°C)	233.0	231.6
Bead Pressure (bar)	[14.2]+11.0	25.3
Bead Distance (µm)	500.0	500.0
Soak Pressure (bar)	0	0
Soak Time (s)	20.0	20.0
Fusion Pressure (bar)	[14.2]+11.0	25.0
Cool Time (s)	170.0	170.0

Final Bead OK Yes

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ENVIRONMENTAL
HEALTH & SAFETY

egniol

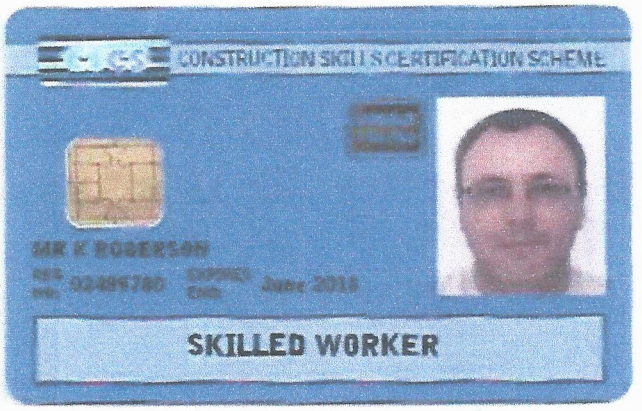
Infinis Energy Services Ltd.

Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Report

4. Drillers Certificates



CSCS Tel: 0844 576 8777 www.cscs.uk.com

Registration No: 02489780

Land Drilling - Driller NVQ Level 2

The card holder has met the Health and Safety requirements as laid out in the CSCS Scheme Booklet

The authenticity of this card can be checked by telephoning. 0844 9157274

Registration No: 03509602

PLANT OPERATOR

CATEGORIES

Forward Tipping Dumper - Wheeled

Telescopic Handler - All sizes exc. 360 Slew

This card is issued in accordance with the terms laid out in the CPCS Booklet

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ENVIRONMENTAL
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Infinis Energy Services Ltd.

Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Report

5. Photographic Log

PHOTO LOG

Plate No.	Description
1	Previously welded Butt Fusion welded joint for gas wells
2	Drilling rig at well location
3	Installation of HDPE Pipework
4	Checking depth/agitation of installed gravel using measuring tape
5	Dry Bentonite Blinding Layer installation
6	Hydrated Bentonite poured into annulus
7	Completed Gas Well

Plate 1

Plate 2

Plate 3

Plate 4

Plate 5

Plate 6

Plate 7

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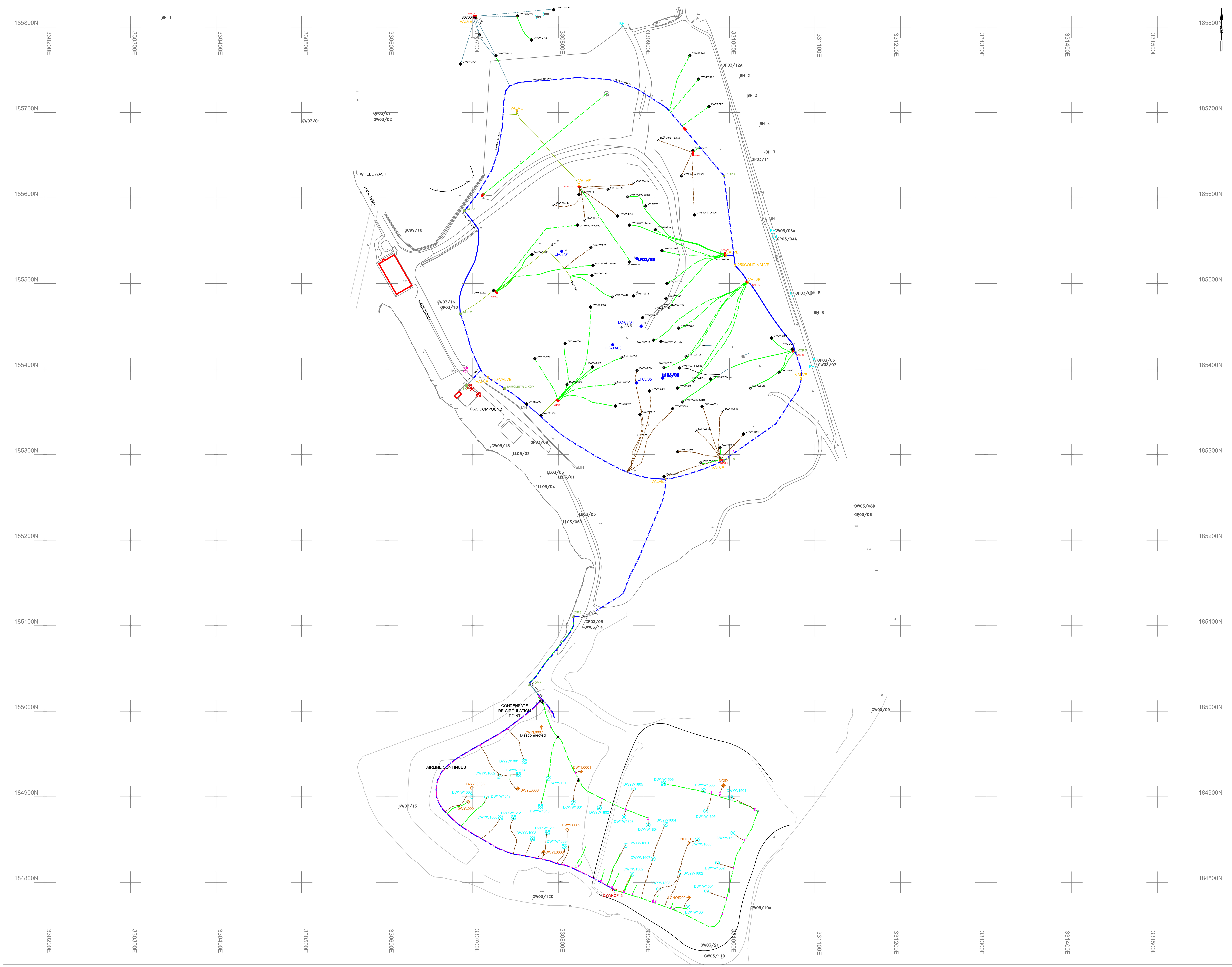
Infinis Energy Services Ltd.

Docks Way Landfill Site

Retro Drilling of Gas Wells

Construction Quality Assurance Report

6. Updated Site Layout Plan



LEGEND

Monitoring Points

- Landfill Gas Monitoring Borehole
- Landfill Gas Surface Monitoring Point
- Combined Gas/ Groundwater Monitoring Point
- Gas Flare Stack
- Landfill Gas Extraction/ Leachate Monitoring Point
- Condensate Unit (Knock-out Pot)
- Groundwater Monitoring Borehole
- Groundwater Pumping Point
- Surface Water Monitoring Point
- Leachate Collection Point
- Leachate Monitoring Point
- Leachate Recirculation Point
- Valve
- Strategic Monitoring Point
- KOP
- PEG
- Manifold
- Finn Drains
- Pinwell

Gas Wells

- Gas Well 63Ø
- Gas Well 90Ø
- Gas Well 110Ø
- Gas Well 120Ø
- Gas Well 160Ø
- Gas Well 180Ø
- Gas Well 225Ø
- Gas Well 250Ø >
- Proposed Gas Well
- Underground / Assumed Gas Well

Infrastructure Pipework

Above ground Pipe / Underground Pipe

- 32mm Gas Pipe
- 55mm Gas Pipe
- 63mm Gas Pipe
- 90mm Gas Pipe
- 110mm Gas Pipe
- 120mm Gas Pipe
- 125mm Gas Pipe
- 160mm Gas Pipe
- 180mm Gas Pipe
- 200mm Gas Pipe
- 250mm Gas Pipe
- 280mm Gas Pipe
- 315mm Gas Pipe
- 355mm Gas Pipe
- 400mm Gas Pipe
- 450mm Gas Pipe
- 500mm Gas Pipe
- 650mm Gas Pipe
- Leachate Pipe
- Airline Pipe
- Air and Discharge Pipe
- Discharge Pipe
- Condensate Pipe
- Leachate Recirculation Pipe
- Assumed Pipe

Notes:

1. All dimensions are in metres unless otherwise stated.
2. All survey co-ordinates related to local site co-ordinate system - positions and levels checked against site control.
3. For co-ordinates and ground levels of proposed well locations please refer to spreadsheet: '6372_PW07 - Dockway - Proposed Wells List - March 2018.xls'.
4. For ground levels and tops of as-built well levels please refer to spreadsheet: '6372_GI04 - Dockway - Gas Well Co-ordinates and levels - March 2018.xls'.
5. Background mapping copied from plan: 'INF-DOCKSWAY-GS-02B.dwg'

Disclaimer

THIS INFORMATION SHOULD NOT BE REGARDED AS ACCURATE AND SHOULD BE USED FOR GUIDANCE PURPOSES ONLY.

UTEC STARNET

GARD ID Prefix: DWY

Files/ information used: INF-DOCKSWAY-GS-02B

REVISIONS

No	Description	By	Chk'd	Date

Project:

DOCKSWAY
LANDFILL SITE

Title:

Gas Infrastructure Plan

Drawn By T.R. Date 23/03/2018

Chk'd By J.M. Date 23/03/2018

Scale 1: 2000 Sheet Size A1

Infinis Limited
First Floor
500 Pavilion Drive
Northampton Business Park
Northampton
NN4 7YJ

infinis

Drawing No 6372_GI04

ENGINEERING
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