

Giants Grave – Closure Report

C&P Environmental Ltd

The Environmental Permitting (England and Wales) Regulations 2010

Permit EAWML 34060
Giants Grave Closed Landfill Site

Landfill Closure Report

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CP4259

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EXECUTIVE SUMMARY

In 2003, on the cessation of waste disposal activities at Giants Grave, the operational phase of the landfill ended and the site entered Closure.

In November 2005 the regulator, as required under the Landfill (England and Wales) Regulations 2002, served a Closure Notice on Neath Port Talbot Waste Management Company Limited (“NPTWM”). The notice formally required NPTWM to: cease accepting waste; continue to maintain and monitor the site; and prepare certain plans and reports.

During the closure phase NPTWM has undertaken closure works and prepared aftercare plans in readiness for the aftercare phase.

NPTWM now wish to progress Giants Grave from Closure to Aftercare.

The closure phase will end and the aftercare phase will begin once Natural Resources Wales (“NRW”) accepts a report on the closure phase, the Closure Report. As such the Closure Report is being submitted to NRW in order to ensure that the site can move into Aftercare.

This Closure Report presents the information required in the Closure Notice and describes the site in terms of environmental setting and installation design and makes reference to the aftercare plans which will be in place for the aftercare phase.

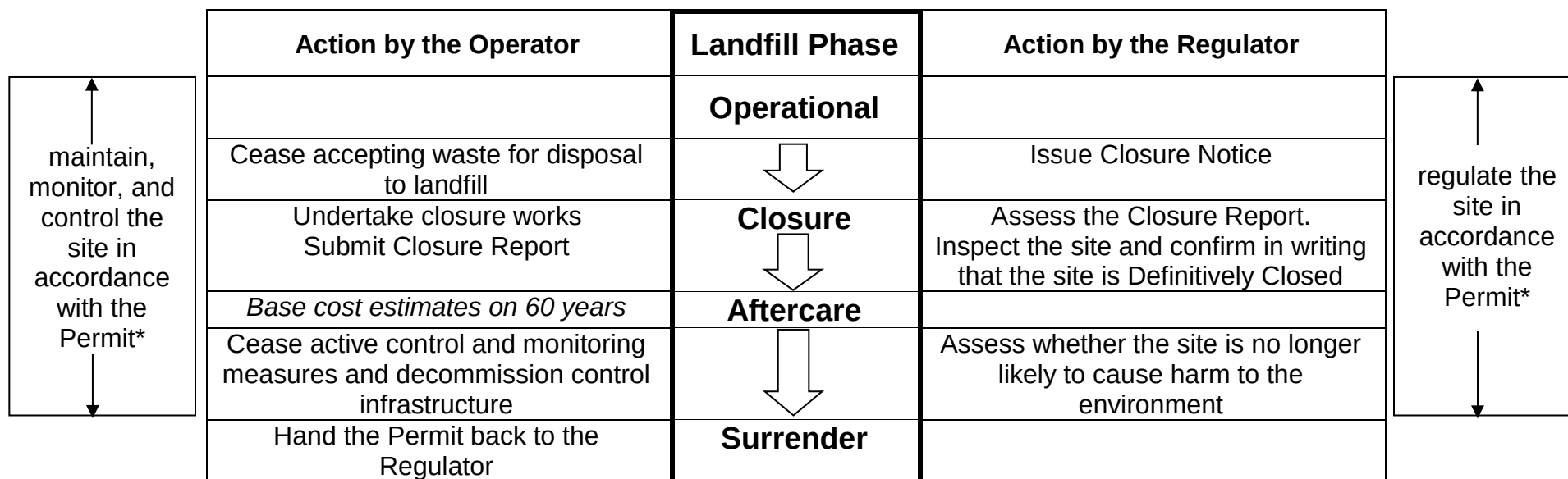
Once the regulator is satisfied that adequate measures are in place it will inspect the site and confirm in writing that the site is Definitively Closed and Giants Grave will move into Aftercare.

During the aftercare phase the site at Giants Grave will remain subject to regulatory control under Environmental Permit EAWML 34060 and NPTWM will remain responsible for the maintenance, monitoring, and control of the site. It is recognised that elements of the Permit may need to be regularised once the site is Definitively Closed.

The aftercare phase will last until NRW is satisfied that the site is no longer likely to cause a hazard to the environment, at which point NPTWM may apply to surrender the Environmental Permit. There is no prescribed period to the aftercare phase, but NRW consider it appropriate to base cost estimates on a 60 year period.

The long-term objective of NPTWM is the surrender of Environmental Permit EAWML 34060.

Schematic of Landfill Phases and Associated Actions



*The landfill site will be regulated by the Regulator, and maintained, monitored and controlled by the Operator in accordance with the Environmental Permit during the life of the landfill until the surrender of the Permit. However, it is recognised that the regulation and operation of the site will decrease during Aftercare.

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A3	Landfill Gas Collection and Utilisation Management Plan. Viridis Energy (Norgen). September 2013
A4	Giants Grave Closed Landfill Site Landfill Aftercare Plan. C&P Environmental. Version 3.1 September 2013. Report No. CP4259-1
A5	Giants Grave Landfill Site - Leachate Well Investigation. January 2013
A6	Planning Approval. Reference No. P2013/0479. August 2013

1 Introduction

1.1 Giants Grave Closure

The landfill site at Giants Grave ceased accepting waste for disposal in June 2003. From that date the site has been considered Closed and the Closure process began.

As part of the Closure process at Giants Grave, NPTWM have undertaken restoration and closure works and prepared aftercare plans in readiness for the aftercare phase. The closure works included the installation and implementation of control measures, for example the gas extraction and utilisation infrastructure, together with engineering and restoration works, for example the restoration cover on the western and southern flanks. The closure works were by agreement with the regulator and were informed by risk assessments, the Environmental Permit and with the Working Plan. The aftercare plans include: monitoring plans, contingency action plans, and reporting procedures in respect of landfill gas, leachate, groundwater, and surface water.

NPTWM now wish to progress Giants Grave from Closure to Aftercare. This Closure Report has been prepared to ensure that NRW can consider the site Definitively Closed and Giants Grave can move into Aftercare.

This Closure Report:

- i. describes the site (post closure works) in terms of environmental setting and installation design, with reference to risk assessments which formed the basis of the closure works; and
- ii. makes reference to the aftercare plans which will be in place for the Aftercare Phase.

The primary objective of this report is to present the information required under the Closure Notice to ensure that NRW can consider the site Definitively Closed. The table below makes specific reference to the information set out in the Closure Notice.

A further objective of this report is to provide any outstanding information as detailed in the HRA and Closure Report section of the compliance assessment report (CAR) form (reference 03755 and dated 7/10/10 to 19/01/11). This additional information is detailed in the table below.

Item 3, Schedule 1 of the Closure Notice	Reference
Area of the site to be considered definitively closed	Section 2.1 Drawing 1552/5/001
Evidence that the waste mass is stable	Section 2.6.4 Appendix A2 - Giants Grave Landfill Stability Risk Assessment. TerraConsult. March 2013. Report No. 1552/R/001-3
Procedures for the management and control of landfill gas, leachate, groundwater and surface water	Section 2.6 Appendix A1. Hydrogeological Risk Assessment. Jacobs Engineering UK. September 2010. 1404900 Appendix A3. Landfill Gas Collection and Utilisation Management Plan. Viridis Energy (Norgen). September 2013 Appendix A4. Landfill Aftercare Plan. C&P Environmental. Version 3.1 September 2013. CP4259-1
Procedures for monitoring; landfill gas, leachate, groundwater and stability / settlement during the aftercare phase	Section 3 Appendix A3. Landfill Gas Collection and Utilisation Management Plan. Viridis Energy (Norgen). September 2013 Appendix A4. Landfill Aftercare Plan. C&P Environmental. Version 3.1 September 2013. CP4259-1
Procedure for reporting any significant environmental effects during the aftercare phase	Section 3 Appendix A4. Landfill Aftercare Plan. C&P Environmental. Version 3.1 September 2013. CP4259-1

Compliance Assessment Report (CAR1) form – 03755 (closure report comments)	Reference and comments
Closure report section item 5 – Revised restoration levels	Item 5 was concerned with whether the restoration levels are in accordance with the planning approved by the Planning Department in December 2005 (ref 2/3/95/0593/12 drawing number 2.115/17). At 2005 the approved final contours described a smooth dome formed over the entire landfill site from the River Neath on the west to the Neath Canal on the east. As a result of changes in the waste market, these contours were not achieved and no landfilling took place in either the southern or western extensions. Planning Approval has now been gained to reflect this position (i.e. the southern and western extensions remain unfilled). Appendix A6. Planning Approval. Reference No. P2013/0479. August 2013
Closure report section item 11 – Leachate heights	Item 11 was concerned with leachate head levels and with accuracy of the data from leachate wells which may be subject to high rates of siltation. NPTWM organised the jetting of leachate wells within the Former Operational Area of Giants Grave Landfill Site during 2011. The report for this work is provided in Appendix A5. (Giants Grave Landfill Site – Leachate Well Investigation. January 2013)

Compliance Assessment Report (CAR1) form – 03755 (HRA comments)	Reference and comments
Hydrogeological Risk Assessment (HRA) section	A formal reply in respect to comments made by EAW in the CAR form 03755 concerning the HRA. Appendix A1.1. Addendum to the Hydrogeological Risk Assessment. NPTWM. September 2013

1.2 Legislative Context

In February 2003 pursuant to the Landfill (England and Wales) Regulation 2002, Schedule 4 paragraph 1(9), the Environment Agency (the regulator at the time of the Notice) served notice on NPTWM requiring the company to apply for a PPC Permit in order to continue landfill operations at Giants Grave.

In April 2004 NPTWM applied for, and was subsequently granted, a PPC Permit for the as yet undeveloped western and southern extensions only.

In respect of the completed landfill area at Giants Grave no application was made. Subsequently, as no application was made for this area of the site, the Environment Agency, as required under Schedule 4, paragraph (9A)b of the above regulations, served a Closure Notice on NPTWM and required the company to initiate the closure of part of the landfill site at Giants Grave.

1.3 Definitions of Closure, Aftercare and Surrender

The term landfill ‘closure’ relates to a site that stops operating and no longer receives controlled wastes. The ‘closure process’ therefore establishes the measures that need to be in place, following the cessation of activities, in order to ensure the appropriate level of control and monitoring of the potential hazards and risks associated with a site. In summary:

Closure report -> Definite closure -> Aftercare phase -> Permit Surrender

“Closed”	when the site ceases accepting waste for disposal it is considered closed.
“Closure”	is an ongoing process between the time when the site is ‘closed’, i.e. has ceased accepting waste for disposal and ‘definitive closure’, i.e. when we [the regulator] agree that the site may enter the aftercare phase.
“Closure Report”	the landfill operator must provide the Environment Agency with reports (a Closure Report) to describe how the site will be managed and monitored in the aftercare phase to ensure that it does not cause pollution or harm.

“Definitively Closed”

once the Environment Agency is satisfied that such measures are in place and adequate it will inspect the site and confirm in writing that the site is ‘definitively closed’. The site will then enter the aftercare phase.

“Aftercare Phase”

once the Environment Agency has confirmed in writing that the site is ‘definitively closed’ the site will then enter the aftercare phase. The site remains subject to regulatory control. The aftercare phase will last until the Environment Agency is satisfied that the site is no longer likely to cause a hazard to the environment at which point the operator may apply to surrender the Permit.

“Surrender” / “Completion”

Surrender of the [Permit may take place when] the Environment Agency consider the landfill no longer poses any pollution risk.

For further reference please refer to Section 4.3 of Guidance for the Landfill Sector Environment Agency April 2007.

The information provided to the Natural Resources Wales to demonstrate definite closure must be in a report (‘closure report’) and must be sufficient to confirm that:

1. the area of the site to which closure application relates;
2. that the waste mass is stable;
3. that the infrastructure and procedures are in place for management and monitoring (for example, landfill gas, leachate, groundwater and stability/settlement) during the aftercare phase;
4. that procedures are in place for reporting any significant environmental effects during the aftercare phase.

This was included in Schedule 1 of the Closure Notice issued on 28th November 2005 by the Environment Agency Wales.

2 Environmental Setting and Installation Design

2.1 Area of the site to which the closure report relates

This section provides the required information to comply with Bullet Point 1 of Schedule 1 of the Closure Notice issued on 28th November 2005 by the Environment Agency Wales.

The area of the site which is to be considered definitively closed is shown in Drawing 1552/5/001.

The site encompasses a total of 60 hectares and can be described as consisting of four main elements:

- i. the “Cut” - the leachate treatment lagoon installed in the former navigational cut running approximately north south through the site
- ii. the completed landfill cells to the east of the Cut (28 hectares)
- iii. the Western Extension - the reclaimed salt marshes to the west of the Cut
- iv. the Southern Extension - the reclaimed salt marshes to the east of the Cut south of the completed cells

The area of the site which is to be considered definitively closed is the 28 hectares of the completed landfill. The other areas of the site were covered by a PPC application submitted in April 2004 and are now covered by Environmental Permit HP3535PS.

2.2 Location

Giants Grave Landfill Site is situated approximately 2.5km to the southwest of Neath, at National Grid Reference (NGR) SS 733 957. It is located in the valley of the River Neath, 3.5km upstream of its confluence with the sea, and within the influence of the tide. The site is bounded by the Neath Canal to the east, by the River Neath to the west and South, and by a railway embankment to the north.

The location of the site is shown in two drawings:

1. Drawing reference 1552/3/001 which shows the location of the site within the Neath and Port Talbot area;
2. Drawing reference 003/P1 which shows a more detailed plan showing the location with respect to the River Neath and the Neath Canal.

2.3 Designated sites

Giants Grave is situated within 2km of two Sites of Special Scientific Interest (SSSI), a Special Area of Conservation (SAC) and a Ramsar Site, with a further two SSSI's within 5 km:

The Crymlyn Bog is approximately 1.9km to the south west of the landfill site and is designated as a SAC and a Ramsar site. The area comprises of the Crymlyn Bog

SSSI and the Pant-y-Sais SSSI. It contains habitats that are rare or threatened within the European context. This is an extensive area with the extremity of the bog being over 4km from the landfill site.

Earlswood Road Cutting and Ferryboat Inn Quarries SSSI (a UK Geological Conservation Review (GCR) site of the Westphalian block) lies approximately 1km south of the landfill site. This site is not currently covered by any European designations.

Crymlyn Burrows SSSI is approximately 2.5km to the south of the landfill site and is a sand dune habitat. This site is not currently covered by any European designations.

2.4 Geology

The geology underlying the site consists of marine or estuarine alluvium overlying Carboniferous (Westphalian) Upper Pennant Measures; the Swansea Beds. The uppermost Swansea Beds, which were not intercepted by any investigation, are characteristically fine grained sandstone, siltstone and mudstone flood plain facies, with occasional fluvial channel deposits.

The superficial deposits at the site are at least 12.5 m thick (BH49W), although the full thickness was not proved during ground investigations. The general sequence of alluvium sediment encountered by the ground investigations is summarised as follows:

- Silty sandy clay and clay: inferred to be present near the original ground surface beneath much of the landfill, with a maximum thickness of 5.3m (BH40B), although this horizon becomes thinner or absent towards the west within the proposed development area;
- Sandy and clayey silt and silt: generally present at shallow depths near the ground surface with thicknesses of up to 4m (BH49W), interbedded with the clay deposits and less prevalent towards the west;
- Silty clayey sand: present beneath the clay and silt deposits across the whole site, at shallower depths and thinner towards the west. The full thickness of these deposits has not been proved;
- Sand: commonly present below the silty clayey sand, at shallower depths and greater thicknesses towards the west near the River Neath. The full thickness of these deposits was not proved.

A limited deposit of made ground was encountered at the eastern and northern boundaries of the landfill, comprising sandy silt, silty clay, and silty clayey gravel with occasional angular brick and sandstone fragments. The made ground at the eastern boundary may be associated with the construction of the Neath Canal, while the made ground on the northern boundary may be associated with the railway.

2.5 Hydrogeology

The waste mass at Giants Grave generally sits on former tidal mud flats and estuarine alluvial deposits. The alluvial deposits are believed to provide a lower permeability matrix for groundwater flow and a barrier to downward migration of contaminants.

The groundwater on-site is in hydraulic continuity with the River Neath to the west and south of the site, with both showing a tidal influence. Because of the saline nature of local groundwater and the lack of local abstraction, the River Neath, rather than the groundwater itself, is viewed as the primary receptor of any contaminants leaching from the waste mass.

The landfill was permitted on the basis that there would be some dilution and dispersion within the local groundwater. With groundwater flow to the west and the River Neath, this is what is occurring. An infilled tidal channel beneath the waste mass may provide a preferential groundwater flow pathway in the south of the landfill. Travel times for ammoniacal nitrogen to reach the perimeter boreholes from the waste mass are in the order of 20 years, with considerable attenuation likely along the flow path.

The HRA concluded that “...modelling has indicated that, in its present state, without further restoration, the closed and restored landfill does not pose a risk to the River Neath...”.

Refer also to the Hydrogeological Risk Assessment, Jacobs 2010, included at Appendix A1 and the addendum to the Hydrogeological Risk Assessment, NPTWM 2013, included at Appendix A1.1.

2.6 Installation Design

This section provides the required information to comply with Bullet Point 3 of Schedule 1 of the Closure Notice issued on 28th November 2005 by the Environment Agency Wales.

This section of the Report sets out the infrastructure in place for management of landfill gas, leachate, groundwater, surface water and stability/settlement during the aftercare phase.

2.6.1 Basal Containment / Groundwater Infrastructure

When Giants Grave Landfill site was designed and constructed it was considered that the permeability of the in-situ material underlying the site was sufficient to act as a containment seal. Therefore this landfill was considered as a ‘dilute and disperse’ site and considered to be environmentally acceptable by the regulating bodies at the time of permitting.

The HRA identified the River Neath as the main receptor and considered the groundwater as the main pathway to the River Neath. The HRA concluded that “...modelling has indicated that, in its present state, without further restoration, the closed and restored landfill does not pose a risk to the River Neath...”

Refer also to the Hydrogeological Risk Assessment, Jacobs 2010, included at Appendix A1.

2.6.2 Waste Inputs

Giants Grave Landfill site was the primary landfill for Neath Port Talbot from 1972 to 2002. The landfill site is classified as a non-hazardous landfill under the Landfill Regulations and accepted a range of non-hazardous household, commercial and industrial wastes until its closure in July 2003.

The amount of waste landfilled at Giants Grave Landfill is estimated to be approximately 2.5Mm³. The area of the landfilled waste is 30ha and the compaction rate is estimated to be 1tonne/m³, resulting in an estimated 2.5 million tonnes of landfilled waste

There are no clear pre-deposit surveys for the site but it is thought that the base of the site is approximately 3mAOD and the surface of the cap is between 7.5 and 23mAOD.

2.6.3 Landfill cap and flanks

The landfill cap was installed in 3 phases to minimise both gas emissions and surface water ingress. A clay cap was installed in two phases beginning Summer 1999 and a Linear Low Density Polyethylene (LLDPE) membrane cap was laid in the third and final capping phase in Autumn 2003. The cap was graded to a smooth self-draining profile to ensure no ponding. A soil protection layer was placed on top of the cap to an average depth of 320mm over 820mm of clay and 600mm over the LLDPE.

A scheme to address differential settlement was undertaken during Autumn 2010. Bentonite sheets were used to reinstate the seal around the leachate wells and the cap. Also, soils taken from the stockpile in the Southern Extension were used to re-grade the cap to a smooth self-draining profile to ensure no ponding.

Details of the restoration works undertaken at the southern and western flanks during winter 2012-13 were accepted by the EAW on 17 May 2012. The completed landfill flanks were graded to 1(v) 3(h). An enhanced soil layer was placed to achieve a minimum thickness of 300mm over both the south west area (the area of most recent waste deposits), and areas where an FID survey identified gaseous emissions. A restoration soil layer was placed to achieve a minimum thickness of 300mm on the whole of the southern and western flanks.

2.6.4 Stability and Settlement

This section provides the required information to comply with Bullet Point 2 of Schedule 1 of the Closure Notice issued on 28th November 2005 by the Environment Agency Wales.

The SRA concluded that there was no sign of stability failure across the whole site other than at the southern and western flank.

In line with the recommendations of the SRA the waste sub-grade at the western and southern flanks is graded to 1(v) to 3(h) with drainage materials placed where there was evidence of leachate breakout.

TerraConsult Report No. 1552/R/001-3 dated 19 March 2013, provides the evidence that 'Once the western and southern flanks are capped and stabilised, it is considered that the whole landfill will be stable.' The southern and western flanks have now been remediated in line with the recommendations.

This Landfill Stability Risk Assessment is included at Appendix A2.

2.6.5 Gas management infrastructure

Neath Port Talbot Waste Management Company Limited entered a contractual arrangement with Natural Power Limited involving the control, monitoring, and utilisation of landfill gas produced at the site. The original contract, entitled 'Agreement for utilisation of gas and the installation maintenance and use of processing equipment at Giant's Grave Road, Briton Ferry, Neath' was dated 29th August 2003.

Natural Power Limited sold its interest in the site to Viridis Energy (Norgen) Ltd in 2006. From then until 30th November 2012, EnerG Natural Power were contracted to operate and manage the gas-field and generation compound. In July 2011, the assets of Viridis Energy (Norgen) Ltd were sold to Red Rose Infrastructure Limited and, with effect from 1st December 2012, Arevon Services Ltd is responsible for operation and maintenance of the gas-field and generation compound.

Under the Agreement, an active gas extraction system was installed at Giants Grave Landfill in June 2004. Prior to this the landfill gas was passively vented.

A network of gas extraction wells were installed into the waste mass and a number of existing leachate wells were also converted for gas extraction. Collection pipelines connected each well to the gas engine via a series of manifolds.

A 1000m³/hr modular ground gas flare is installed (details in Appendix B of the Gas Management Plan (GMP)), with a dedicated pump capable of supplying enough gas to sustain the flare and up to 2 No 1MW engines. When the engine is not operational gas will be directed to the flare (see Section 5.3 of the GMP, Generation Compound).

A Caterpillar 3516, 1150kW engine was installed in July 2004. This engine was replaced by a Perkins 4008, 400kW unit in January 2011, in response to falling gas availability, based on running the Caterpillar engine at reduced capacity over an extended period. The 400kW Perkins engine/generator set is capable of utilising approx. 240m³/hr of landfill gas.

The generating engine has a 24-hour telemetry link that will be activated in the case of failure of the engine. In the event of the failure of the engine any landfill gases would be directed to the flare. The flare unit is equipped with an auto slam-shut valve that will prevent landfill gas venting to atmosphere in the event of ignition loss (an auto re-ignition is also available).

Works undertaken in 2013 to install five additional gas wells and remediate a number of failed wells have extended the scope and effectiveness of the system.

Refer also to the Gas Collection and Utilisation Management Plan, Viridis Energy (Norgen) September 2013, included at Appendix A3.

2.6.6 Leachate management infrastructure

The detail and location of the leachate management system is shown on Drawing 003/P3.

When Giants Grave Landfill site was designed and constructed it was considered that the permeability of the in-situ material underlying the site was sufficient to act as a containment seal. Therefore this landfill would be considered as a dilute and disperse site that was considered to be environmentally acceptable by the regulatory bodies at the time of permitting.

A clay bund at the northern boundary of the landfilled area was constructed to prevent the ingress of tidal waters from the northern drainage channel and from the flood plain to the north. A stone drain was installed at the toe of the inside edge of the clay bund. This stone drain is no longer working and, for the purpose of transferring the leachate from the eastern leachate drain to the leachate treatment reed bed, this function is now served by the northern by-pass drain installed in 2011.

Along the eastern boundary a trench was excavated to the base of the waste plus 0.5m into the underlying clays. The excavation was back-filled with clay and incorporates a trammel drain constructed with a LLDPE membrane and a 150mm perforated pipe laid at approx 3m BGL. The drain flows from south to north driven by the head of leachate within the landfill. Leachate is transferred to the Leachate Treatment Reed Bed via the northern by-pass drain.

Leachate cut-off drains at the south of the landfilled area drain directly to the leachate treatment reed bed as shown on plan 003/P3. The first drain was installed in 1995 with a second drain installed in 1999.

As set out above the cap was installed to limit surface water ingress and therefore minimise the creation of leachate.

A navigational "cut" running through the site was stopped off with earth bunds at both ends. The north-most 100m of the cut was engineered as treatment beds in the 1990's. Reeds have subsequently self-seeded throughout the length of the cut. Simple earth bunds have been constructed within the reed bed to increase the residence time of the leachate through the additional reeds and improve treatment.

A Vee Notch Weir is installed in the southern section of the leachate treatment reed bed in order to monitor flow.

Treated Leachate is discharged to the River Neath via a flap valve in the southern bund across the "cut" in accordance with Discharge Consent BP0236201.

There is no active leachate extraction system installed at Giants Grave Landfill. Leachate management relies on an adequate leachate head within the central areas of the site to allow leachate to move by gravity through the waste to the perimeter drains and feeds into the northern end of the leachate treatment reed bed.

2.6.7 Surface water

The detail and location of the surface water management system including collection ditches and ponds are shown on Drawing 003/P3.

As set out above, the cap was installed to limit surface water ingress. The graded contours have been designed to allow lateral shedding of surface water.

Surface water ditches along the toe of the northern, eastern, and southern flanks collect surface water run-off. Surface water can flow directly off the western flank into the leachate treatment reed bed. The northern and southern surface water collection ditches drain directly to the leachate treatment reed bed.

The surface water collection ditch at the east drains to settlement ponds both north and south. At the north the surface water drains to the Leachate Treatment Reed Bed via the northern by-pass drain. At the south surface water may be discharged to an unnamed tributary of the River Neath via Discharge Consent BP0278801. This discharge point is currently closed and surface water is managed via a pump to the north of the eastern ditch.

The surface water, like the leachate, passes through the leachate treatment reed bed system installed in the “cut” and is discharged to the River Neath via a flap valve in the southern bund across the “cut” in accordance with Discharge Consent BP0236201.

Works planned for Autumn 2013 (subject to weather conditions) to alter the surface water management system will ensure that all of the surface water in the eastern surface water ditch drains to the north and thereby enable the surrender of Discharge Consent BP0278801.

2.6.8 Monitoring Infrastructure

The detail and location of the site environmental monitoring infrastructure is shown on Drawing B1404900/CAP/2010/01.

Access points for in-waste landfill gas monitoring are integrated within the gas extraction and utilisation infrastructure.

Ex-waste landfill gas and groundwater is monitored via perimeter boreholes.

Wells installed within the waste mass enable in-waste leachate monitoring. Access points are constructed to enable samples to be collected from open bodies of leachate within the leachate management system.

Surface water is monitored at open bodies of water.

Site roads, which are variously constructed as green routes; compacted stone on earth; and compacted stone on geo-grid, enable access to monitoring locations across the site.

3 Aftercare Plans

This section provides the required information to comply with Bullet Point 4 and 5 of Schedule 1 of the Closure Notice issued on 28th November 2005 by the Environment Agency Wales.

Procedures for monitoring: perimeter gas, leachate, groundwater, surface water and stability / settlement during Aftercare are set out in the Landfill Aftercare Plan included in Appendix A4.

Procedures for monitoring: in-waste landfill gas during Aftercare are set out in the Landfill Gas Collection and Utilisation Management Plan included in Appendix A3.

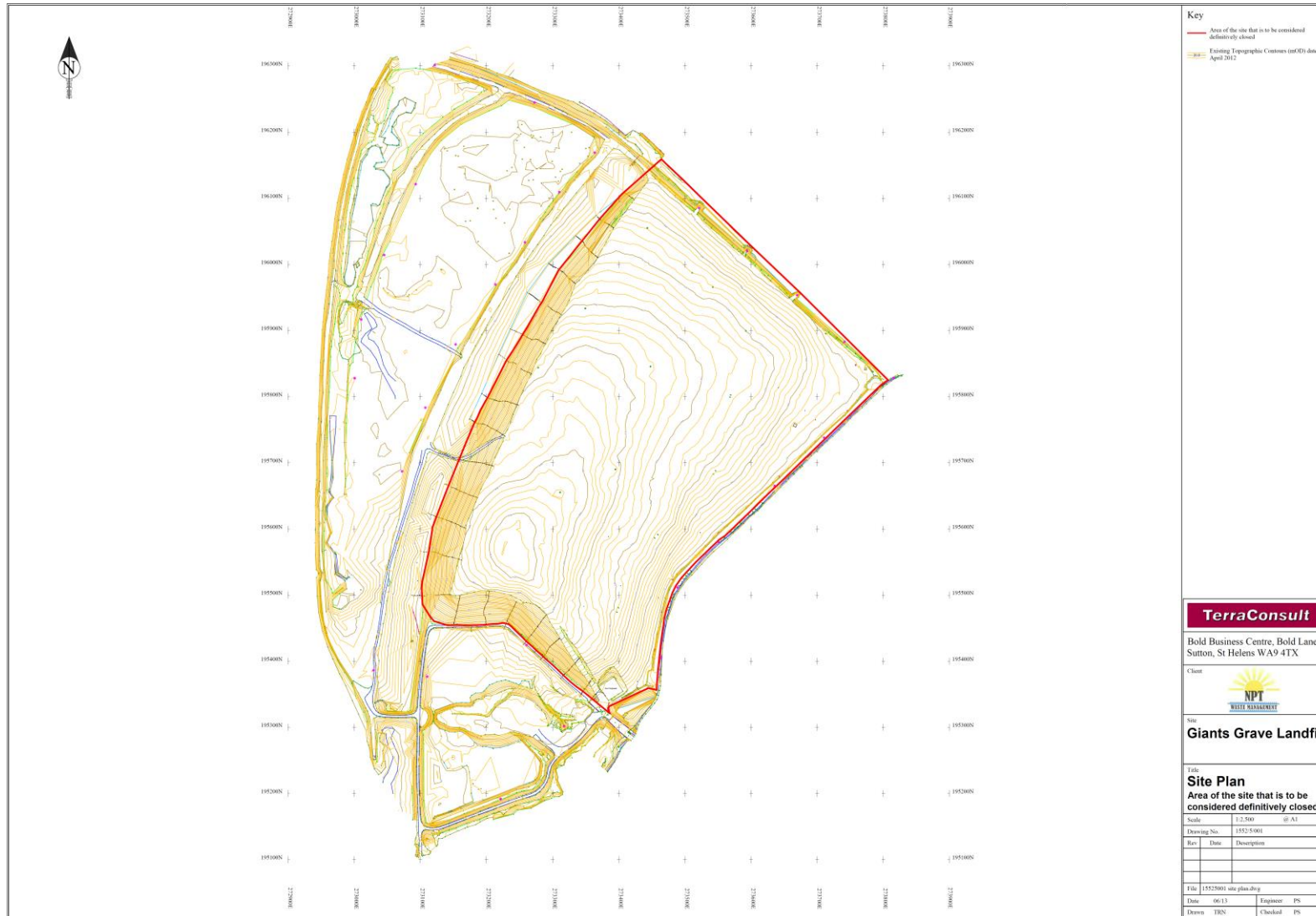
Procedures for reporting any significant environmental effects during Aftercare are set out in the Landfill Aftercare Plan included in Appendix A4.

Drawings

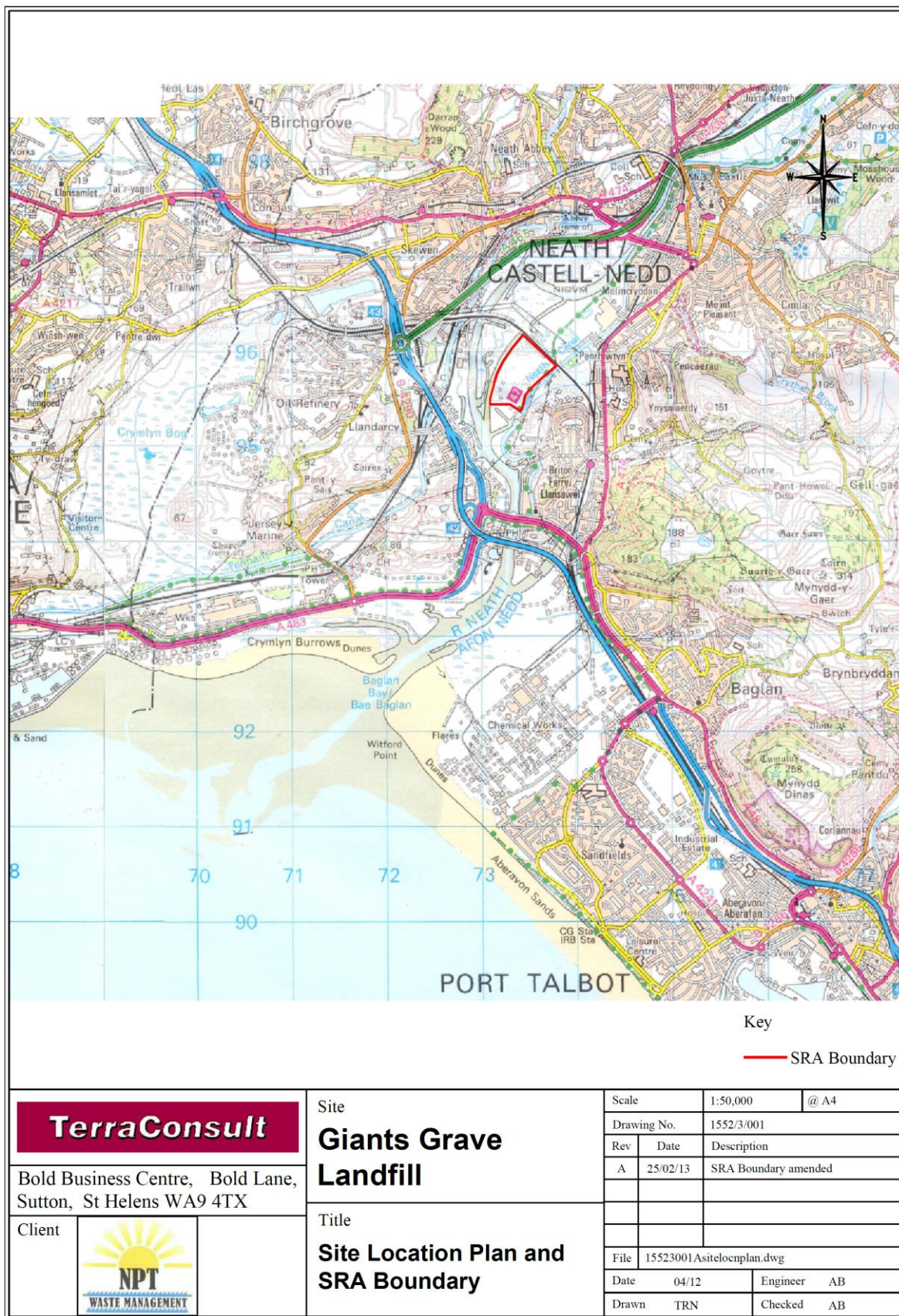
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B1404900/CAP/2010/01	Environmental Monitoring Plan	22

Drawing 1552/5/001 - Area of the site which is to be considered definitively closed



Drawing 1552/3/001 - Site Location Plan and SRA Boundary

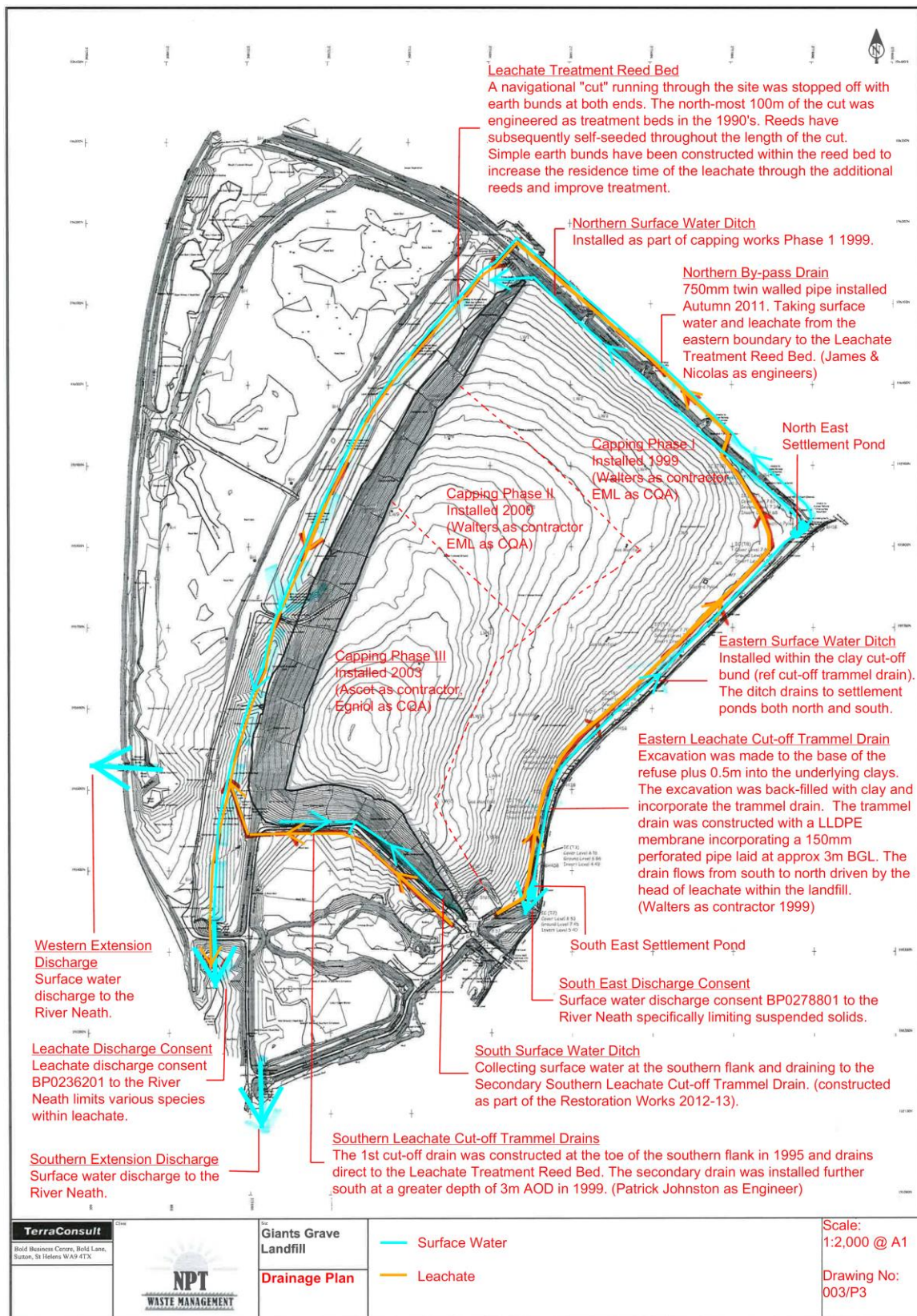


Drawing 003/P1 - Giants Grave Landfill Site Location Plan



The area marked in red indicates the Giants Grave Landfill Site. Refer to Site Plan drawing no. 1552/5/001 for area of the site which is to be definitively closed."

Drawing 003/P3 - Giants Grave Landfill Drainage Plan (location and details of surface water and leachate engineering)



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Drawing B1404900/CAP/2010/01 - Environmental Monitoring Plan

