

Landfill Closure Report

Dow Silicones UK Limited

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Quality information

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Executive Summary

AECOM Limited (AECOM) has been commissioned to undertake a Landfill Closure Report for the landfill area at the Dow Silicones UK Limited (Dow) site on Cardiff Road, Barry, South Glamorgan. Dow's long-term objective is to surrender the Waste Management Licence for the landfill area and to remove the landfill from the site Environmental Permit.

This report aims to provide the evidence required to agree the strategy of landfill restoration capping and to support a future application for the surrender of the Waste Management Licence and vary the Installation Boundary for the Environmental Permit.

The landfill area is subject to the following relevant licenses and Permits:

- Waste Disposal Licence No. 22, issued under the Control of Pollution Act 1974 (COPA), with an extension to the licensed disposal area agreed in 1986.
- Waste Management Licence (WML) No. 38, issued in 1991 for infilling of the former Timber Pond with silicone gel, spent silicone, calcium sulphate filter cake, limestone and carbon filter / molecular sieve kieselguhr. Waste deposition ceased in 2002.
- Landfill area within the Installation Boundary incorporated into the Environmental Permit issued as an IPPC Permit in 2006 as Zone E: Landfill. Inclusion of the landfill area within the Permit was to allow for the regulation of waste stockpiling and off-site shipment activities that were being undertaken – no waste deposition was authorised under the conditions of the Environmental Permit.

To accept an application to surrender Waste Management Licence No. 38, Natural Resources Wales (NRW) must be satisfied that:

- The site has ceased accepting waste [COMPLETED];
- Relevant closure procedures have been complied with [COMPLETED / MONITORING ONGOING];
- An appropriate period of aftercare has passed to allow the waste to stabilise and to gather evidence to demonstrate that the pollution control measures are no longer necessary [RESTORATION CAPPING PROPOSED]; and
- The deposits of waste are in a satisfactory state that, if left undisturbed, will not cause pollution of the environment [RESTORATION CAPPING PROPOSED].

The specific objectives for the Landfill Closure Report include:

- Request of a variation of the Waste Management Licence to rationalise the previously agreed licence area boundary, removing an area that has been redeveloped as part of the chemical process area;
- Demonstrate the existing environmental conditions for the landfill and surrounding area; and
- Seek approval in principal for the proposed landfill capping concept and post-capping Environmental Monitoring Plan.

AECOM has completed a review of environmental monitoring data and the Conceptual Site Model (CSM) for the landfill area. This is based on the latest round of site investigation and CSM development (2015 and 2016), with the addition of three rounds of groundwater and surface water monitoring data collected by Dow during 2016 and 2017.

The environmental data review demonstrates that there are only minor revisions to the 2015/16 CSM, which broadly states that rainfall recharge to the waste mass results in the potential for leaching of contaminants of potential concern (COPC, including copper, trimethylsilanol) from the waste mass and vertical migration to shallow groundwater within alluvial sand strata beneath the site.

Rainfall recharge to the flat, uncapped landfill surface is interpreted as the cause of a localised groundwater "high", approximately located towards the southern end of the landfill. The CSM includes lateral migration pathways away from the landfill, consistent with the presence of the localised higher

groundwater elevations in the area of the waste mass. Southerly migration towards the South Pond and Cadoxton River is possible, but this is considered to be a minor component of the conceptual model. The primary groundwater pathway included within the CSM is north-westwards towards the two ponds within the Cadoxton Ponds nature reserve area.

These ponds are on the historical alignment of the Cadoxton River, which would have provided the natural area for the discharge of groundwater baseflow to the river. Historical diversion of the Cadoxton River to the south, along with the development of the Barry Docks Complex, Barry Chemical Complex and associated infilling of low-lying surrounding ground, has left the ponds area isolated in a topographical low point, surrounded by higher ground. To prevent flooding of the low-lying nature reserve area and to maintain the pond water levels at a constant elevation, Dow pumps water from a sump close to the south western pond, to the Barry Docks basin. This artificially lowered surface water elevation within the Cadoxton Ponds is interpreted as increasing the gradient on the northern groundwater flow pathway.

The Cadoxton Ponds are therefore identified as the primary receptor of concern, based on their use as a nature reserve and fishing lake(s), along with the artificially enhanced viability of the groundwater migration pathway between the landfill waste mass and the ponds.

Installation of a low permeability cap has been selected as the most appropriate remediation option for the landfill area. Combined with a slightly re-profiled surface topography and provision of enhanced drainage, capping is expected to substantially reduce rainfall recharge to the landfill. At present, there is no means of surface water drainage away from the landfill surface and almost all incident rainfall is interpreted as providing recharge to the waste mass, with only evaporation losses expected to reduce the amount available for infiltration. A reduction in rainfall recharge will reduce the leaching potential for contaminants still present within the waste mass, reduce the driving head for groundwater migration and reduce the total groundwater flux along the northern migration pathway to the Cadoxton Ponds.

The existing condition of the landfill has been modelled within a Detailed Quantitative Risk Assessment (DQRA) based on the Environment Agency's Remedial Targets Methodology. The potential contaminants of concern modelled are based on those where exceedance of generic assessment criteria (GAC) have been recorded in groundwater monitoring, and soil and leachate data suggests that the contaminants are associated with the landfill waste mass.

The DQRA model is based on the following CSM components:

- Sources:
 - Investigation, sampling and analysis of the landfilled wastes indicates they represent a viable source of contamination;
 - Leachable metals were recorded for landfill waste mass samples, with copper being the primary contaminant of concern, along with leachable organic compounds; and
 - Groundwater is present within the waste mass, where it is regarded as a leachate containing the leachable components of the solid waste materials.
- Pathways:
 - Rainfall infiltration, followed by infiltration leaching of the waste mass and vertical migration to underlying groundwater / leachate within the Made Ground / landfill waste deposits;
 - Lateral and vertical migration of groundwater within the Made Ground to adjacent / underlying natural strata, principally the natural sand layer identified within the alluvial strata;
 - Lateral contaminant migration within alluvial strata, followed by groundwater discharge into identified surface water receptors (principally Cadoxton Ponds, but also possibly the South Pond);
 - Potential recharge of Timber Pond water to the landfill (increasing leaching potential) and / or migration of contaminated groundwater / leachate from the Made Ground fill to the Timber Pond;
- Receptors:

- The most environmentally sensitive receptor is considered to be the Cadoxton Ponds to the north of the site, reflecting the closeness of the receptor, identified groundwater gradient between the landfill and the ponds and the ecological sensitivity of the wildlife area / recreational fishing facility developed around the ponds;
- A southern migration pathway, from the groundwater high in the south of the landfill to the South Pond is also considered plausible, based on groundwater level data and chemical data, although groundwater level data suggest that flow directions could be reversible;
- Hydraulic connectivity between the Timber Pond and the base of Made Ground / shallow sand on the western edge of the landfill is also considered likely. Groundwater elevation data suggests that there may be limited flow across this boundary, or that flow directions may be reversible dependent on respective seasonal head differences between the pond water level and the groundwater head within the Made Ground.

Based on the known history of waste deposition, the magnitude of the hazard indices and their detection at multiple points along the potential migratory pathway; copper, trimethylsilanol, mercury, lead and cadmium may pose a greater hazard than the other substances detected. These contaminants of concern have been modelled within the DQRA.

The DQRA model indicates that simulated steady state concentrations of copper, trimethylsilanol, cadmium, lead and mercury within groundwater discharging to the Cadoxton Ponds would exceed relevant assessment criteria by over an order of magnitude. However, the breakthrough time for the existing uncapped landfill is estimated to be 6,000 years for copper (the lowest breakthrough time for any of the metals modelled).

The model has also been run with the provision of a low permeability landfill cap, using assumptions of 80% and 90% reduction in rainfall recharge / groundwater flux. The post capping models simulate the same steady state contaminants concentrations, but with copper breakthrough times extended to 30,000 – 60,000 years.

Cadmium, lead and mercury are hazardous substances whose entry into groundwater is to be prevented. All three have already been detected in groundwater in the Made Ground and Natural Sands around the periphery of the landfill and are therefore regarded as having entered groundwater historically. The assessment has considered their potential impact through migration in the Natural Sands and migration of chemicals in leachate emanating from an uncapped or capped landfill in the future.

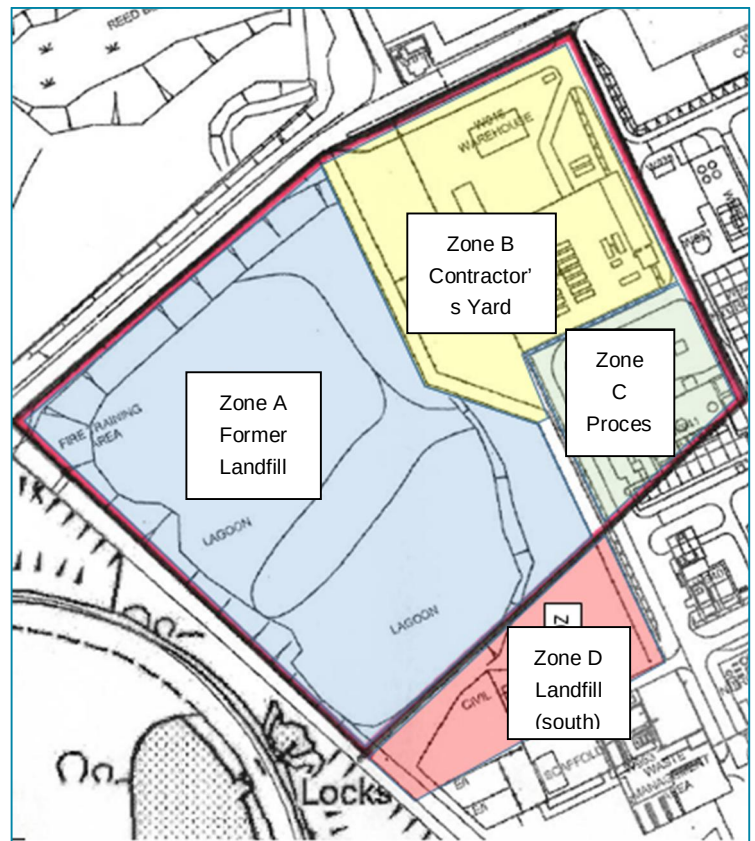
The simulated effect of the capping of the landfill indicates that this proposed strategy should have a notable effect on the potential flux of chemicals in groundwater. The reduction in risk, based on the capping, reflects the reduced infiltration and driving hydraulic head, the resulting reduced groundwater flux and the extensive disruption and near severing of this source-pathway-receptor linkage. Additionally, the reduced rainfall recharge to the waste mass would also be expected to reduce the potential for the leaching and mobilisation of contaminants.

Dow therefore proposes to install low permeability restoration capping on the landfill, to secure and re-vegetate the exposed landfill surface, to provide segregated clean water drainage, reduce infiltration and reduce the identified risks to groundwater and surface water receptors.

The proposed capping comprises:

- Zone A – approx. 40,200m². Main area of the operationally landfill site and within the boundary of Waste Management Licence No. 38. This area will be capped and restored prior to licence surrender.
- Zone B – Contractor's Yard – approx. 14,500m². This area is outside of the landfill fence line, but within the licence boundary. This area will be surfaced with a dense asphaltic concrete (DAC) or similar bituminous hard surface, with segregated drainage. The area will be spilt to provide a car park on the current equipment lay down area, with retention of the Contractor's Yard and existing steel portal framed buildings.
- Zone D – Southern landfill area – approx. 4,500m². This area was part of the operational landfill, but was not included within the licensed area. Zone D will be capped and restored as part of Zone A.

Zone C, the W941 Distillation Process area and apron was included within the WML No. 38 boundary, but is not included within capping project.



Landfill Area Site Zoning Plan
WML No. 38 Boundary shown in red

For the open area of unrestored landfill (Zones A and D), the low permeability cap is proposed to be formed from a geosynthetic clay liner (GCL), which would be deployed over a re-shaped and prepared formation and prepared sub-base layer. Restoration cover would include a suitable liner protection layer and restoration soils to provide a growing medium for planting. Clean water drainage will be discharge to the wetlands adjacent to the Cadoxton Ponds.

The Contractor's Yard which is also within the areas covered by Waste Management licence No. 38, will be surfaced with a low permeability bitumen or Dense Asphaltic Concrete (DAC). Drainage will be to the Cadoxton Ponds wetland, via a three stage interceptor and isolation valve.

All works will be undertaken under an approved Construction Quality Assurance (CQA) Plan and Environmental Monitoring Plan (EMP). CQA validation and environmental data will be submitted to NRW on completion of the contract.

Post closure monitoring will continue for an agreed period after cap installation. The data from post-closure monitoring will be used to prepare and submit a revised Hydrogeological Risk Assessment for the landfill, with a view to agreement of the surrender of Waste Management Licence No. 38.

1. Introduction

1.1 Terms of Reference

AECOM Limited (AECOM) has been commissioned to undertake a Landfill Closure Report for the landfill area at the Dow Silicones UK Limited (Dow) site on Cardiff Road, Barry, South Glamorgan. Dow Silicones UK Limited is a wholly owned business of The Dow Chemical Company¹.

AECOM prepared a proposal which set out the proposed scope of works to enable progress towards the surrender of the Waste Management Licence for the landfill area, and for the landfill to be removed from the Site's Environmental Permit.

1.2 Objectives

AECOM understands that Dow's long-term objective is to surrender the Waste Management Licence for the landfill area and remove the landfill from the site Environmental Permit. The report aims to agree the strategy of landfill restoration capping, provide the evidence required to support a future application for the surrender of the Waste Management Licence and vary the Installation Boundary for the Environmental Permit.

To accept an application to surrender the Waste Management Licence, Natural Resources Wales (NRW) must be satisfied that:

- The site has ceased accepting waste;
- Relevant closure procedures have been complied with;
- An appropriate period of aftercare has passed to allow the waste to stabilise and to gather evidence to demonstrate that the pollution control measures are no longer necessary; and
- The deposits of waste are in a satisfactory state that, if left undisturbed, will not cause pollution of the environment.

The specific objectives for the Landfill Closure Report include:

- Request of a variation of the Waste Management Licence to rationalise the previously agreed licence area boundary, removing an area that has been redeveloped as part of the chemical process area;
- Demonstrate the existing environmental conditions for the landfill and surrounding area; and
- Seek approval in principal for the proposed landfill capping concept and post-capping Environmental Monitoring Plan.

1.3 Scope of Works

To achieve the project objectives presented above, this report will contain the following content as discussed previously with Dow and taking into account NRW's additional scope request(s):

- General site and regulatory / licence area background;
- Update / review of environmental monitoring data – Dow groundwater data, surface water quality data (including);
- Revised Conceptual Site Model (CSM) – to include most recent site investigation (2015) and environmental monitoring data (2017);

¹ Dow Corning Limited became Dow Silicones UK limited on 1st February 2018. Historical references to Dow Corning and Dow Corning Limited are included where the reference relates to licences, permits, regulatory correspondence or references within historical reports.

- Updated groundwater detailed quantitative risk assessment (DQRA) – the previous Landfill Closure Report (2004) and Conceptual Site Model / DQRA (2007) have been updated to include the most recent site investigation / monitoring data and refined CSM;
- Proposed areas to be capped and conceptual design proposals for landfill capping / drainage; and
- Proposed environmental monitoring programme (post closure monitoring) and aftercare plan (maintenance / inspection) of the capping.

2. Site Setting and Regulatory Context

2.1 Landfill Site Setting and Regulatory Background

Dow currently manufactures a range of silicone based products and intermediates at its Barry facility. The site is understood to have been involved in the manufacture of silicone based products since the 1950s, although the site was not acquired by Dow Corning until 1971.

Aerial photographs inspected in Dow offices show that a Timber Pond historically occupied the western part of the site area. The photographs, along with historical mapping, indicate that the Timber Pond was progressively in-filled from east to west, allowing the westerly expansion of the process plant area. Since acquisition of the site in 1971, it is understood that the remaining area of the former timber pond has been infilled with waste process materials (direct process residue, or "DPR" gel and filter bed material). The most westerly section of the former pond was formally licensed as a landfill for the disposal of process waste from the plant.

Waste Disposal Licence No. 22 was issued to Dow Corning by Vale of Glamorgan Borough Council, under the Control of Pollution Act 1974 (COPA). This licence formally defined the area regarded as the "landfill", although historical information and site investigation data indicates that similar materials have also been deposited within the previously infilled sections of the former Timber Pond, to the east of the defined landfill area: i.e. within the area previously reclaimed prior to the construction of the current Genesis Plant.

An extension to the licensed disposal area was agreed in 1986, and in 1991 Waste Management Licence No. 38 was issued to Dow Corning, with infilling of the former Timber Pond continuing until closure of the landfill in 2002. The licence permitted landfilling with five specific process wastes (silicone gel, spent silicone, calcium sulphate filter cake, limestone and carbon filter / molecular sieve kieselguhr). The landfill area is understood to have been incorporated into the site Environmental Permit (EP) in 2006, as Zone E: Landfill. The landfill area was included within the Environmental Permit to allow for the regulation of waste stockpiling and off-site shipment activities that were being undertaken – no waste deposition was authorised under the conditions of the Environmental Permit. Waste Management Licence No. 38 has remained in force since the cessation of waste deposition activities in 2002 and throughout the period covered by the Environmental Permit.

AECOM understands that Dow originally intended to negotiate closure of the landfill with Environment Agency Wales (EAW, now Natural Resources Wales, NRW) and move to a period of post-closure monitoring. A landfill closure report was prepared by AECOM legacy company, URS, in 2004. This set out the site conditions at the time and presented a Conceptual Site Model (CSM) and environmental monitoring plan to support the closure process.

EAW requested further data to address areas of uncertainty in the 2004 CSM. Further intrusive investigation was completed during 2006 / 2007 as part of the First Phase Site Protection and Monitoring Programme (SPMP), as required by the newly issued Pollution Prevention and Control (PPC) Permit (subsequently Environmental Permit, under the Environmental Permitting Regulations 2010, "EPR 2010"). Additional groundwater monitoring wells were installed around the perimeter of the landfill area as part of the 2006/07 investigation, and a revised CSM for the landfill site area was prepared on the basis of the additional SPMP site investigation data.

This additional data was reported to EAW in URS report: Dow Corning Landfill CSM Update 49310733/BRRP0001, along with a quantitative Controlled Waters Risk Assessment (CWRA) to support the proposed surrender of the Waste Management Licence. The updated CSM and DQRA included a potential groundwater migration pathway between the landfill and the Cadoxton Ponds within the site nature area. The DQRA modelled risks associated with copper and trimethylsilanol, with copper being the contaminant of potential concern (CoPC) for the landfill waste mass and trimethylsilanol being identified as a characteristic contaminant, albeit with no Environmental Quality Standard (EQS) and limited toxicological data to derive risk based screening values. A theoretical risk to the Cadoxton Ponds was modelled for copper but with a breakthrough time of >5000 years. On the basis of the updated 2007 CSM and 2008 DQRA, EAW requested a further period of environmental monitoring to demonstrate that there were no upward trends for copper and trimethylsilanol.

During operation, the landfill was dewatered via a pumped leachate sump located to the southern side of the landfill. Following cessation of pumping, in 2003, it is understood that groundwater / leachate levels within the landfill and groundwater levels in the surrounding area have risen. In 2012, Dow commissioned URS to undertake hydrogeological monitoring of the landfill area, as the landfill surface and adjacent contractors' compound were subject to frequent flooding. The primary objective of the hydrogeological study was to investigate whether the observed flooding could be linked to the rebound in standing groundwater levels following the cessation of leachate pumping in 2003.

URS reported the hydrogeological data within a Landfill Groundwater Data Assessment, submitted in November 2013. This report identified that the observed flooding was most likely to be related to high rainfall and the lack of a dedicated surface water drainage system for the landfill and Contractors' compound surfaces. Recharge to groundwater occurs through the landfill surface and via the adjacent Timber Pond. The additional groundwater data collected during 2012-13 provided further support to the previous CSM, which identified potential groundwater flow pathways from the landfill to the surface water bodies to the north (Cadoxton Pond) and to the south of the site (South Pond)

Based on the results of previous investigations and Dow's SPMP monitoring, the principal sources of groundwater contaminants associated with the deposited waste were identified as copper and trimethylsilanol (TMS). Concentrations of copper and TMS have been identified in groundwater / leachate samples from wells inside the landfill area. These contaminants have also been identified in monitoring wells along the boundaries of the landfill area.

Since the operational closure of the landfill (i.e. cessation of waste deposition), there has been a requirement to stock pile waste materials on the landfill surface to await disposal. The Landfill Groundwater Data Report highlighted a risk that observed contaminant concentration increases (Cu, TMS) within the perimeter monitoring wells might be linked to leaching from the stockpiled material on the landfill surface, rather than solely from the underlying waste deposit. Any such additional contaminant contribution from the stockpiles was considered likely to obscure underlying copper and TMS concentration trends associated with the waste mass, and could therefore hinder attempts to demonstrate a declining level of risk posed to groundwater and surface water receptors by the licensed / permitted landfill area.

URS completed an optioneering study during 2014, to identify data gaps for the landfill closure, permit surrender and future remediation / liability reduction for the landfill area. The results of the optioneering study were presented to Dow and issued in the Landfill Optioneering Report, AECOM, April 2015².

As background information for the optioneering study, Dow provided URS with groundwater and surface water monitoring records for 2007 to 2014, for the landfill and surrounding area. The records were entered into the URS ESdat database system and a subsequent data gap analysis was undertaken, reported as part of the Landfill Optioneering Report.

In addition to analysis of the available monitoring data, it was apparent that some spatial data gaps existed, as a result of the historical loss of some groundwater monitoring wells, in particular those along the western perimeter of the landfill adjacent to the Timber Pond (E2, LF4, LF5 and BH211). This is understood to relate in part to the changing nature of the landfill surface, through materials and surface water management and in part due to the submersion of part of the landfill western boundary, given the reported rising surface water levels within the Timber Pond. It is possible that maintenance and upgrading of the landfill perimeter bunds has resulted in the perimeter monitoring wells being buried beneath the landfill perimeter bund.

The previous Landfill Groundwater Data Assessment³ identified that groundwater level variation within the permeable alluvial strata beneath the landfill may be linked to recharge via the standing water body in the Timber Pond. The assessment also identified that standing surface water flooding and shallow groundwater / leachate recharge within the landfill are most likely to be influenced by rainfall recharge events and surface water drainage / management on the landfill area – rather than as a result of groundwater flooding or rising water levels in the Timber Pond.

² Landfill Optioneering Report. Ref.: 47065177/CRRP0002, AECOM, April 2015

³ Landfill Groundwater Data Assessment, 47065177, CRRP0001, URS, August 2013

Spatial data gaps between the available wells suggested that the CSM for the hydrogeological regime presented in the assessment could be refined through the replacement of some perimeter wells and could be further supported through additional site investigation to characterise the waste mass within the landfill. The installation of groundwater monitoring wells within the landfill mass itself was not considered practicable by Dow due to the frequent movement of surface materials within the area.

Additional site investigation works were undertaken in 2015 to enable Dow to continue the required monitoring of the landfill and surrounding area and to maintain compliance with the site Environmental Permit. An additional, longer-term, objective was to obtain, and allow ongoing collection of, additional data to support the Waste Management Licence surrender and remediation / liability reduction process. The site investigation included replacement groundwater monitoring wells for compliance monitoring and additional monitoring wells and landfill waste mass investigation to address the identified data gaps, refinement of the CSM and improved decision making for future remediation / liability management, including remedial objectives for the site and progression towards surrender of the Waste Management Licence.

The works included the installation of four replacement landfill perimeter groundwater monitoring wells; the installation of three additional wells at selected down hydraulic gradient locations, and a subsequent round of groundwater and surface water monitoring. 3-Channel continuous multichannel tubing (CMT) wells were selected in order to target the groundwater sampling of three depths within each well, allowing for characterisation of groundwater contaminant concentrations within individual strata / layers to enable clearer interpretation of contaminant pathways / migration.

The investigation also included a series of ten trial pits across the landfill surface to enable analysis of historical waste constituents and where possible to conduct a survey of the near surface groundwater levels and conditions within the waste mass. The trial pits proved waste materials to a depth of at least 4.2m bgl. Data from the perimeter boreholes suggests that the full thickness of the fill is likely to be between 6.5m and 7.0m. The landfill surface elevation is at 7.5 to 8.0m above Ordnance Datum (AOD), giving an estimated basal elevation of approximately 1.0 to 1.6m AOD. Extrapolated over the measured landfill site area (40,735m², based on the perimeter fence-line on aerial photographs), this provides an estimated waste deposit volume of 265,000 – 285,000m³.

The 2015 site investigation and monitoring indicated that both the landfill waste mass and the then stockpiled waste materials were viable sources of copper and selected organic compounds (the stockpiled materials which were awaiting shipment off-site have subsequently been removed).

These contaminants are mobilised by leaching and are present within the landfill leachate and the underlying / surrounding aquifer units. Despite the presence of contaminants within groundwater around the landfill perimeter, there was evidence of impact at the identified receptors in 2015. Pathway monitoring boreholes showed marginally elevated concentrations of metals, but in general, the identified groundwater contamination appeared to be limited to the area immediately adjacent to the landfill.

During 2017, all remaining stockpiled process waste materials were removed from the landfill area. This has removed any secondary / additional source for contaminant leaching and has provided a cleared area for future landfill restoration works. Dow have provided updated (up to 2017) environmental monitoring data for the landfill area and down gradient pathway wells. This recent data is reviewed in Section 3 and has been used to develop the DQRA.

2.2 Waste Licensing History and Landfill Areas

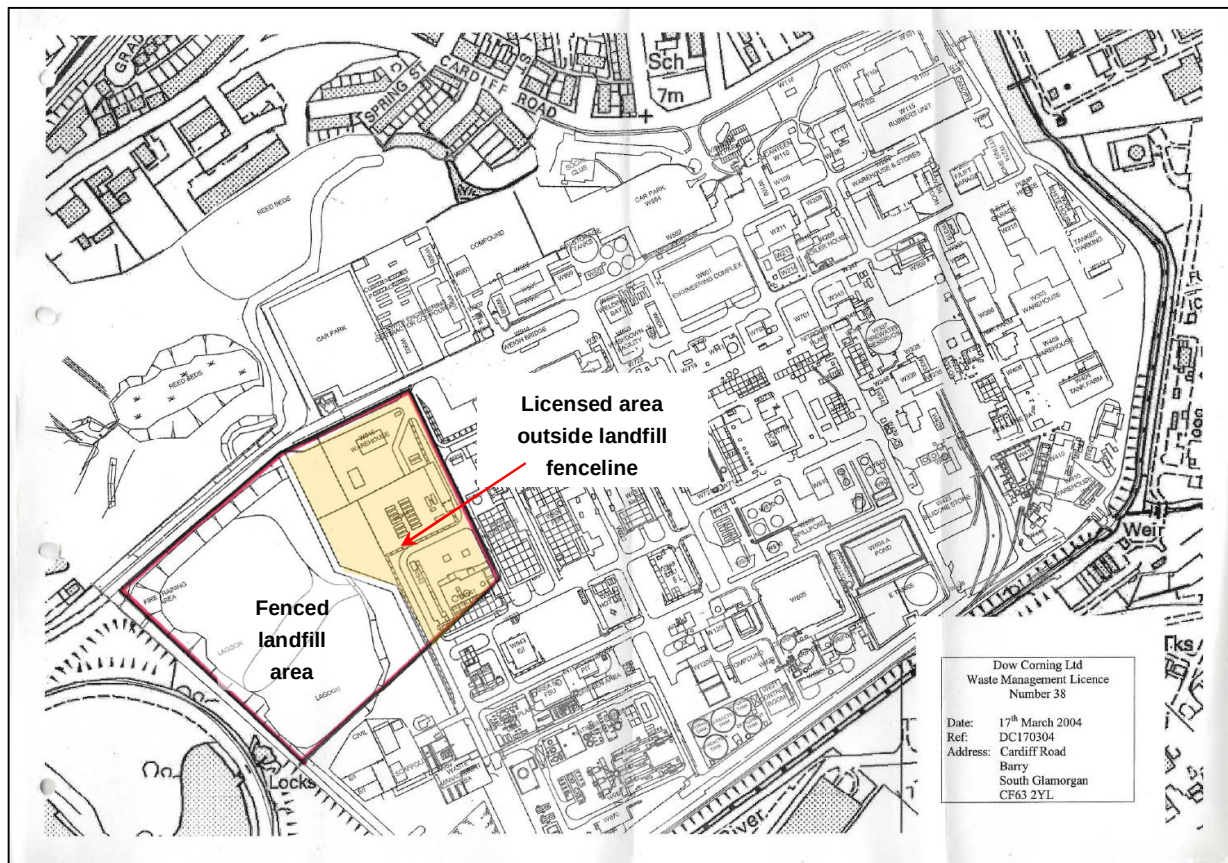
As noted in Section 2.1, the landfill has been regulated under two previous waste licences; COPA era Waste Disposal Licence No. 22 and the later Waste Management Licence No.38 (1991). Both were issued by Vale of Glamorgan Council as the appropriate Waste Regulation Authority (WRA) at the time of licence issue.

In 1995, the Environment Agency (EA) assumed the role of waste regulator, and since then the waste licensing regime(s) have been implemented by the EA and its successors in Wales (Environment Agency Wales, EAW, and Natural Resources Wales, NRW).

March 2004 correspondence between Dow and the EA indicates that although the landfill area was licensed for waste disposal activities, no plan showing the licensed area boundaries was held on record by the Regulator, stating:

"Please find enclosed 3 copies of a licence informative relating to the licensed area. This is necessary to regularise the licence, as it appears that either no drawing was attached originally to the licence or that in transfer from Vale of Glamorgan BC to the Agency the drawing became detached."

Dow plan, Ref. DC170304, was formally attached to Waste Management Licence No. 38 to regularise the position and status of the licensed site boundary, as shown in the insert below.



Agreed boundary of Waste Management Licence No. 38, 19th March 2004

(shaded area represents land outside of the fenced landfill boundary but within the licence red line boundary)

This boundary was agreed and added to Waste Management Licence No. 38 retrospectively but does not accurately represent the fenced boundary of the landfill on the ground.

In particular, land to the east of the landfill is shown as being within the licensed area. By 2004 the landfill was no longer receiving waste, and the land within the eastern part of the licensed area had been previously developed – with the south eastern section in use as part of the Genesis process plant and the north eastern area in use as a contractor's compound. Date-stamped online aerial imagery indicates that these land-uses were already established by at least December 2001, two years before the landfill stopped receiving waste and the formal agreement of the licensed area boundary for Waste Management Licence No. 38.

Additionally, the southern area of the landfill is outside of the agreed Waste Management Licence boundary. This area is within the landfill fenceline and was used operationally as part of the landfill.

The apparent discrepancies between the licensed area and the actual area of the landfill are relevant to the proposed landfill capping and restoration works, and subsequent Waste Management Licence surrender. Capping of the part of the formally licensed area which is now part of the Genesis production plant is not considered to be feasible without considerable disruption to production facilities. Equally, capping the southern landfill area, which is outside of the licence boundary, is

considered to be desirable for environmental protection and for future continuity of surface water drainage.

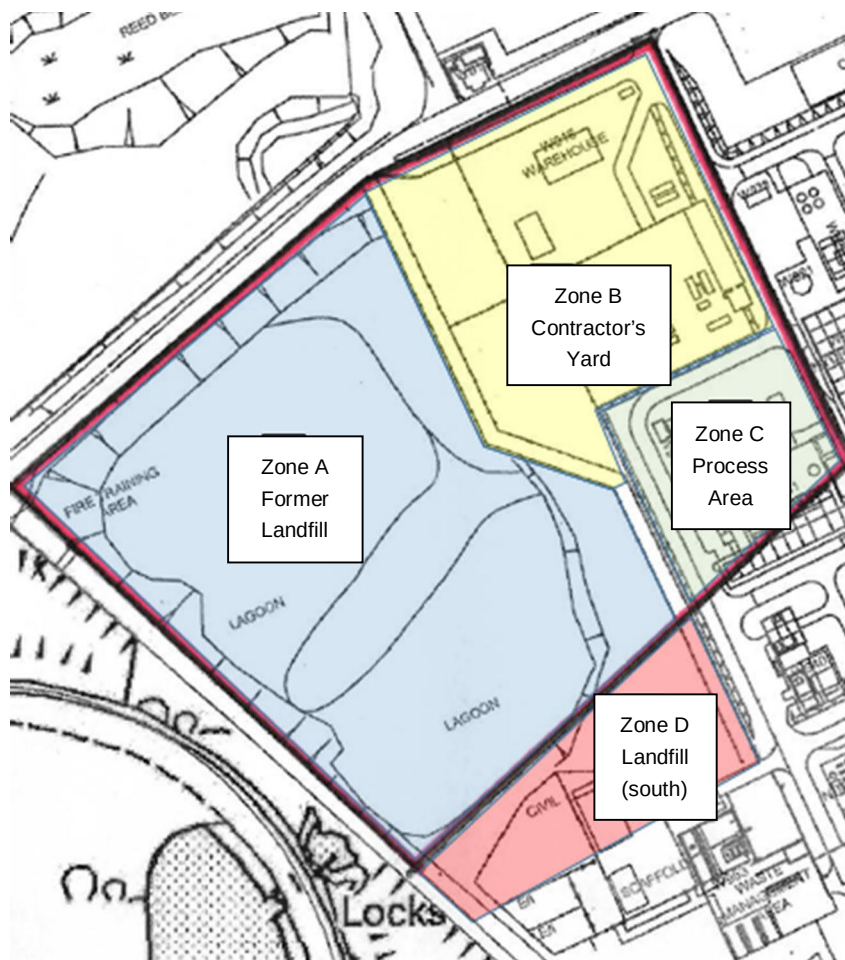
2.3 Recent Regulatory Meetings and Negotiated Approach

Dow has held a number of meetings with NRW to discuss the context for restoration / remediation works on the landfill area, and to agree the requirements that would allow the Waste Management Licence to be surrendered following completion of agreed restoration / remediation works.

The licensed landfill area was originally the remnants of the once extensive Timber Pond which was progressively infilled to reclaim the land for development of the process plant. Within the formally licensed area, the void space was not provided with any engineered low permeability containment (basal / bottom liner and side liner) and therefore does not comply with current EU Landfill Directive requirements for landfill permitting, receipt of waste and subsequent closure / Permit surrender. Dow and NRW have agreed that a pragmatic approach is required to agree the Waste Management Licence surrender conditions, and that these should include an element of risk based assessment, as typically used for land contamination sites.

Both parties have agreed that the construction of a low permeability cap and provision of segregated clean surface water drainage will reduce rainfall infiltration, and therefore reduce the potential for contaminant leaching from the waste mass. Installation of a low permeability should also reduce the groundwater head within the landfill and reduce the gradient on the groundwater flow pathway between the landfill and identified down gradient receptor(s).

On 13th September 2017, NRW agreed with the principle that it would not be possible to provide a low permeability capping layer across the entire area covered by Waste Management Licence No. 38. The areas relevant to the waste management licence and proposed capping are shown on the inset figure below:



Landfill Area Site Zoning Plan

- Zone A – Main area of the operational landfill site and within the boundary of Waste Management Licence No. 38. This area will be capped and restored prior to licence surrender.
- Zone B – Contractor's Yard. This area is outside of the landfill fence line, but within the licence boundary. Like many areas of the Dow Barry site, Zone B is underlain by fill materials. As this area is infilled and within the licence boundary, NRW requires that a low permeability surface is installed. Dow has agreed that this area will be surfaced with dense asphaltic concrete (DAC) or similar bituminous hard surface, with segregated surface water drainage.
- Zone C – W941 Distillation Process area and apron. This area is within the current Waste Management Licence area, but has previously been developed as a production area. No capping is proposed for this area. Dow and NRW have discussed a variation to the Waste Management Licence to remove this area from the licence boundary. To allow for continued regulatory oversight, the Environmental Permit boundary would require minor amendment to include areas that are removed from the WML but are not currently included under EPR.
- Zone D – Southern landfill area. This area was part of the operational landfill, but was not included within the licensed area. Zone D will be capped and restored as part of Zone A.

This Landfill Closure Report formally requests that the boundary for Waste Management Licence No. 38 is amended to remove "Zone C", shaded green on the Landfill Area Site Zoning Plan, above.

2.4 Groundwater Hazardous Substances Review

A pragmatic, risk based approach to capping the landfill and surrendering the Waste Management Licence has been agreed with NRW, but as an unlined landfill, i.e. with no engineered containment of the waste mass and any leachate, NRW has asked that the presence of hazardous substances and their potential to enter groundwater is assessed. The EU Water Framework Directive (2000/60/EC) (WFD) and Groundwater Daughter Directive (2006/118/EC) (GDD) require Member States to prevent inputs of hazardous substances into groundwater and to limit the input of non-hazardous pollutants.

The previous 2004 Landfill Closure Report was followed up by the 2007 Dow Corning Landfill CSM Update 49310733/BRRP0001, which included a DQRA for the northern groundwater flow pathway between the landfill area and the down gradient surface water receptors at Cadoxton Ponds.

The DQRA modelled copper and trimethylsilanol as the contaminants of concern and concluded that although there was a theoretical risk of future copper contamination at the ponds, the very long predicted travel times mitigated the potential risks.

Copper is classified as a non-hazardous pollutant. Trimethylsilanol (TMS) was used as a marker for silanols – both within the post-2007 SPMP environmental monitoring and within the DQRA model. No UK or EU based Environmental Quality Standards (EQS) or generic assessment criteria (GAC) were available for TMS as an aquatic contaminant.

Previous groundwater studies and the existing conceptual site model has focused on TMS (trimethylsilanol) as this substance was readily identifiable and has been monitored and tracked for over 10 years now. In 2017 the analytical capability was improved and site effluent and borehole testing indicated that there are other silanol species present in addition to TMS, namely DMSD (dimethylsilanediol) and MST (methylsilanetriol).

Work has continued with identification of sources, potential control measures and impacts of DMSD and MST in the waste water discharge to the Cadoxton River and in site boreholes, including ones local to the on-site landfill area.

Dow is currently assessing whether selected silanols, including TMS, DMSD and MST, are likely to be classified as hazardous substances in the context of the WFD and GDD, using the approach outlined by JAGDAG⁴. The Water Framework Directive defines a hazardous substance as one which is toxic, persistent and liable to bioaccumulate, so a substance must meet all three criteria to be determined as hazardous. Alternatively, a substance must be very persistent and very bio-accumulative to be considered hazardous in groundwater.

⁴ Joint Agencies Groundwater Directive Advisory Group

Dow and NRW have previously discussed the data emerging from the ongoing hazardous substances assessment. DMSD is specifically referenced in NRW Compliance Assessment Report (CAR) Ref.: CAR_NRW0032494, dated 18/10/2017:

So far testing has established that DMSD is not acutely toxic, not bio-accumulative, but is very persistent. The outcome of the chronic toxicity testing is awaited. It is noted that chronic toxicity using Tisbe only is being tested. This is not thought to be a problem.

The Water Framework Directive defines a hazardous substance as one which is toxic, persistent and liable to bioaccumulate, so a substance must meet all three criteria to be determined as hazardous. Alternatively, a substance must be very persistent and very bio-accumulative to be considered hazardous in groundwater.

On this basis DMSD is considered to be a non-hazardous pollutant.

At the time of report preparation, the hazardous substances assessment for silanol species is ongoing. No information has been reviewed to suggest that these silanol species are likely to be classified as hazardous substances. At the time of report preparation, the silanol species detected in groundwater are regarded as non-hazardous pollutants.

The 2015 site investigation report collected soil samples from the waste mass, for soil and leachate analysis, and groundwater samples from the landfill perimeter and down gradient pathway. This data has been used with 2017 groundwater and surface water monitoring data, to update the DQRA presented in this report and to review the potential for future release of hazardous substances from the waste mass to groundwater.

Hazardous substances have been detected within the alluvial sand strata unit around the perimeter of the landfill, although it is not clear whether they will have entered groundwater as a result of leaching from the waste mass or from other potential sources.

In terms of the proposed capping and WML surrender, the hazardous compounds that have been detected are regarded as having entered groundwater historically. The potential for leaching and future entry of hazardous substances into groundwater will be significantly reduced by the installation of a low permeability cap, as proposed within this Landfill Closure Report.

2.5 Waste Management Licence Surrender Process

Dow has agreed with NRW that this Landfill Closure Report will present the current status of the landfill and the potential impact on the groundwater regime.

This Landfill Closure Report also presents the proposed conceptual design for the capping works and requests the minor change to the Waste Management Licence area boundary and Environmental Permit boundary in the vicinity of the W941 Distillation Process area and apron (Zone C).

Following agreement and approval of the proposed approach, Dow will develop the outline and detailed capping and restoration design and obtain the necessary regulatory permits to undertake the construction work (Planning Consent). The construction works will be undertaken under an agreed Construction Quality Assurance (CQA) Plan and Environmental Monitoring Plan.

Following installation of the low permeability cap, Dow will continue post-closure environmental monitoring (as presented within this report) and will prepare a full Hydrogeological Risk Assessment (HRA). The CQA / Verification Report and Hydrogeological Risk Assessment will be submitted to NRW to support the licence surrender application.

3. Monitoring Infrastructure

Table 3.1 presents the response zones and construction details of all monitoring points present in the landfill and surrounding area along with a description of the strata. Borehole logs are presented in **Appendix D. Table 2** presented the surface water sampling locations.

Table 3.1 - Boreholes and Target Strata

Borehole	Top of screen (m bgl)	Base of screen (m bgl)	Screen length (m)	Target Strata description	Locations
CP1s	2.6	2.85	0.25	Silty clay with pockets of coarse sand (Made Ground)	Downgradient wells
CP1m	3.6	5	1.4	Very soft sandy clayey SILT	Downgradient wells
CP1d	6.9	10	3.1	Highly weathered silty MUDSTONE	Downgradient wells
CP2s	1.2	2.2	1	Silty clay with pockets of coarse sand (Made Ground)	Downgradient wells
CP2m	3.8	6.1	2.3	Silty fine to coarse SAND	Downgradient wells
CP2d	7.5	10	2.5	Highly weathered silty MUDSTONE	Downgradient wells
E1	-	-	-	Log not available	-
E4	-	-	-	Log not available	-
E5s	4.85	5.15	0.3	Soft silty sandy clay with medium cobble content (Made Ground)	Landfill wells – MG
E5s2	2.05	2.35	0.3	Ashy very sandy gravelly fine to coarse silt (Made Ground)	Landfill wells – MG
E5m	5.95	6.25	0.3	Sandstone gravel band within soft to firm slightly gravelly silty clay (Made Ground)	Landfill wells – MG
E5d	8.55	8.85	0.3	Fine to coarse SAND with silt laminations and shell fragments	Landfill wells – NS
E6s	2.7	3	0.3	Sandy clayey gravelly silt with pockets of coarse sand (Made Ground)	Landfill wells – MG
E6m	6.2	6.5	0.3	Sandy silty fine to coarse gravel of mudstone (Made Ground)	Landfill wells – MG
E6d	7.1	7.4	0.3	Fine to coarse SAND with rare shells/fragments	Landfill wells – NS
E7s	2.1	2.35	0.25	Slightly sandy fine to coarse gravel of hardcore (Made Ground)	Landfill wells – MG
E7m	4.85	5.15	0.3	Slightly silty sandy fine to coarse gravel of sandstone with frequent rootlets (Made Ground)	Landfill wells – MG
E7d	7.7	8	0.3	Slightly silty fine to coarse SAND.	Landfill wells – NS
E8s	2.65	2.95	0.3	Slightly clayey slightly silty sandy gravel/gravelly sand (Made Ground)	Landfill wells – MG
E8m	5.3	5.6	0.3	Clayey slightly gravelly to gravelly coarse sand grading into clayey gravel and cobbles (Made Ground)	Landfill wells – MG
E8d	7.9	8.2	0.3	Silty fine to medium SAND	Landfill wells – NS
E9s	5.5	5.8	0.3	Slightly gravelly clay with occasional pockets of ash (Made Ground)	Landfill wells – MG
E9m	6.15	6.45	0.3	Laminated fine to coarse SAND	Landfill wells – NS
E9d	7.55	7.85	0.3	Laminated fine to coarse SAND	Landfill wells – NS
LF1	1.0	5.5	4.5	Silty sand with direct process residue (DPR) and cobbles of sandstone and mudstone (Made Ground)	Lost - not currently sampled
LF2	1.5	6.0	4.5	Silty clay / silty sandy gravel with sandstone and mudstone cobbles (Made Ground)	Lost - not currently sampled

Table 3.1 - Boreholes and Target Strata

Borehole	Top of screen (m bgl)	Base of screen (m bgl)	Screen length (m)	Target Strata description	Locations
LF3	1.0	6.0	5.0	Sandy silt with gravel and cobbles of sandstone and mudstone (Made Ground)	Lost - not currently sampled
LF4	1.0	4.0	3.0	Sandy SILT with gravel and cobbles	Landfill wells – MG
LF5	1.0	3.5	2.5	Sandy SILT / Silty sandy GRAVEL	Not currently sampled
LF6	1.0	3.5	2.5	Silty sandy gravel cobble fill (Made Ground) / SILT	Not currently sampled
LF7	1.0	5.0	4.0	Hardcore ballast (Made Ground) / sandy SILT / Silty GRAVEL / GRAVEL	Downgradient wells
LF8	1.0	6.0	5.0	Hardcore ballast (Made Ground) / sandy SILT / sandy silty GRAVEL / GRAVEL	Not currently sampled
BH210	13.0	19.0	6.0	Silty CLAY with mudstone and sandstone gravel / MUDSTONE	Downgradient wells
BH211	20.0	25.0	5.0	MUDSTONE	Not currently sampled
BH212	20.0	25.0	5.0	MUDSTONE	Not currently sampled
A2	-	-	-	Log not available	Upgradient / Potential Source Area wells
BH312	-	-	-	Log not available	Upgradient / Potential Source Area wells
BH412	-	-	-	Log not available	Upgradient / Potential Source Area wells

Notes:

MG – Made Ground

NS – Natural sand

Table 3.2 – Surface water monitoring locations

Sampling Location	Alternative Name	Position
Cadoxton North Pond	Pond 1 / Lake Carol	North of Landfill - Downgradient
Cadoxton South Pond	Pond 2 / Lake Sue	North of Landfill - Downgradient
Timber Pond	-	West boundary of Landfill
South Pond	South Pond	South of landfill – potentially downgradient
SW2	Cadoxton River	Southern site boundary - upstream
SW3	Cadoxton River	Southern site boundary - downstream

4. Data Review and Interpretation

4.1 Landfill Zones

The following landfill zone areas are used in describing groundwater trends and quality data:

- Upgradient / Potential Source Area wells (A2, BH312, BH412);
- Landfill wells – Made Ground (MG) (LF4, E1s, E5s, E5m, E6s, E6m, E7s, E7m, E8s, E8m and E9s);
- Landfill wells – Natural sand (NS) (E1m, E5d, E6d, E7d, E8d and E9m, E9d); and
- Downgradient wells (LF7, BH210, E4d, CP1m, CP1d, CP2s, CP2m and CP2d).

4.2 Groundwater Level Data

Dow has been undertaking groundwater level monitoring at up to nine locations on a six monthly basis across the landfill site since 2015 (see Figure 2 of 2016 Site Investigation report for borehole locations, **Appendix A**).

The groundwater levels were entered into the AECOM ESdat database and converted to meters above Ordnance Datum (mAOD) for all locations where a survey elevation for top of well pipe was available.

In summarising the groundwater levels, the latter three monitoring rounds 2016-Q3, 2017-Q1 and 2017-Q3 have been assessed due to the wider spatial coverage (inclusive of locations E5 to E9) and the greater number of available measurements than in previous rounds. Tables **B1** and **B2** in **Appendix B** present a summary of the groundwater levels for rounds 2016-Q3, 2017-Q1 and 2017-Q3 for Made Ground and the underlying natural sand strata respectively. Full groundwater level results are also presented in **Appendix B**.

4.3 Groundwater level trends

Groundwater level trends have been assessed for the monitoring rounds 2016-Q3, 2017-Q1 and 2017-Q3 with reference to water levels previously recorded between 2012 to 2015 and reported by AECOM in the 2016 site investigation report. **Table B3 in Appendix B** presents a summary of the well screens and piezometric levels (converted to mAOD). Graphs illustrating the levels for Made Ground and Sand (2016-Q3 to 2017-Q3) are also presented in **Appendix B**.

Overall, the piezometric head data indicate variable vertical and lateral gradients during each monitoring event and over the monitoring programme.

An overall downward gradient is observed at many locations around the landfill in each event, but in some places an upward gradient is evident (e.g. E1, 2016-Q3 and 2017-Q3). At other wells, there is an upward gradient between the shallow and deeper part of the landfill (e.g. E8s-E8m, 2016-Q3 and 2017-Q1) which could reflect localised interaction with surface water bodies e.g. the Timber Pond.

Data for wells on the northern edge of the landfill (E9 and LF7) to pathway wells (CP1 and CP2) indicate a downward lateral gradient to the north of the landfill in the Made Ground (s wells) and in the Natural Sands (m wells) towards the Cadoxton Ponds.

Charts 1 to 4 below illustrate the time series groundwater level data for CMT wells on each of the four perimeters of the landfill area. The well screen depths for each CMT port (s, m and d) are shown at mAOD. Detailed analysis of each well is provided below:

Chart 1 Piezometric Head – Western Landfill Perimeter 2016-Q3 to 2017-Q3

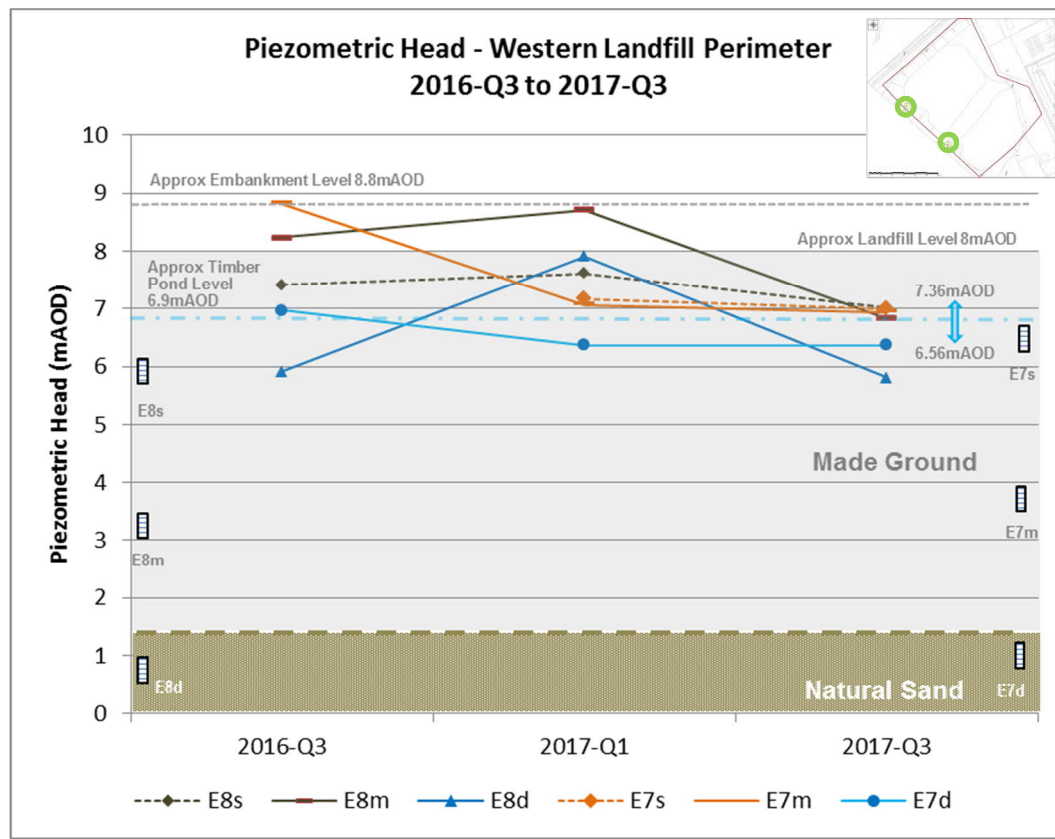


Chart 2 Piezometric Head – Northern Landfill Perimeter 2016-Q3 to 2017-Q3

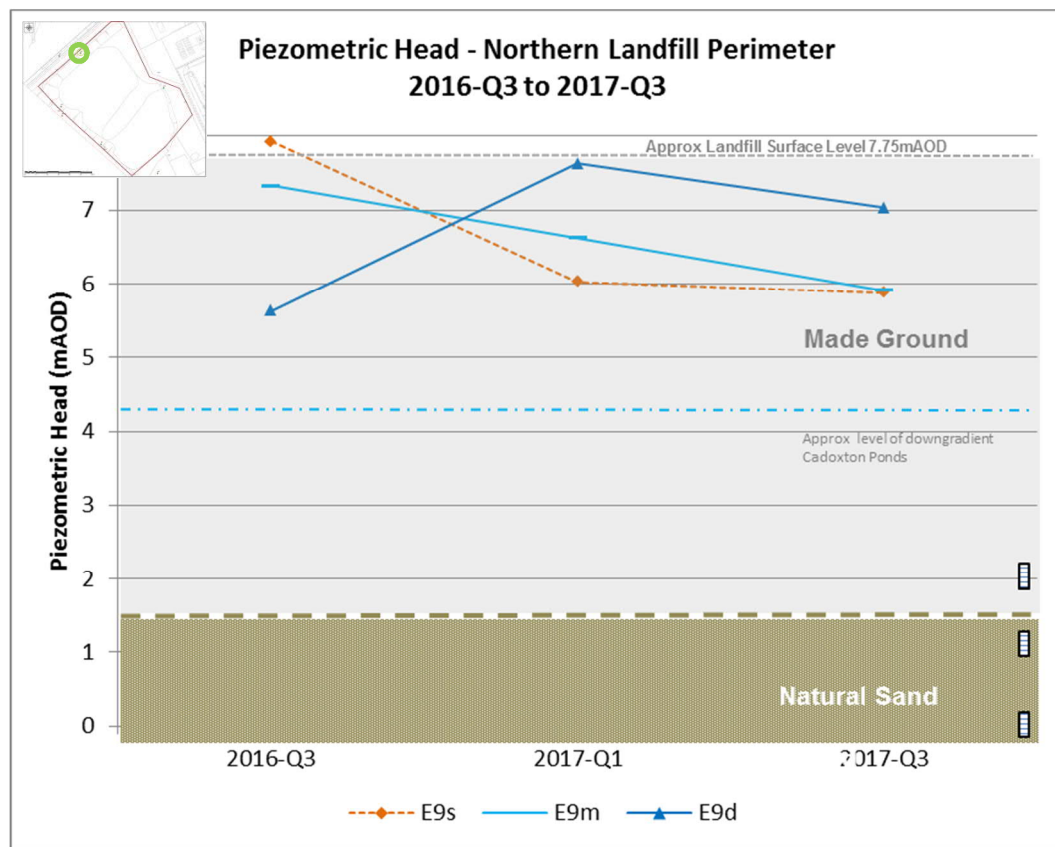


Chart 3 Piezometric Head – Southern Landfill Perimeter 2016-Q3 to 2017-Q3

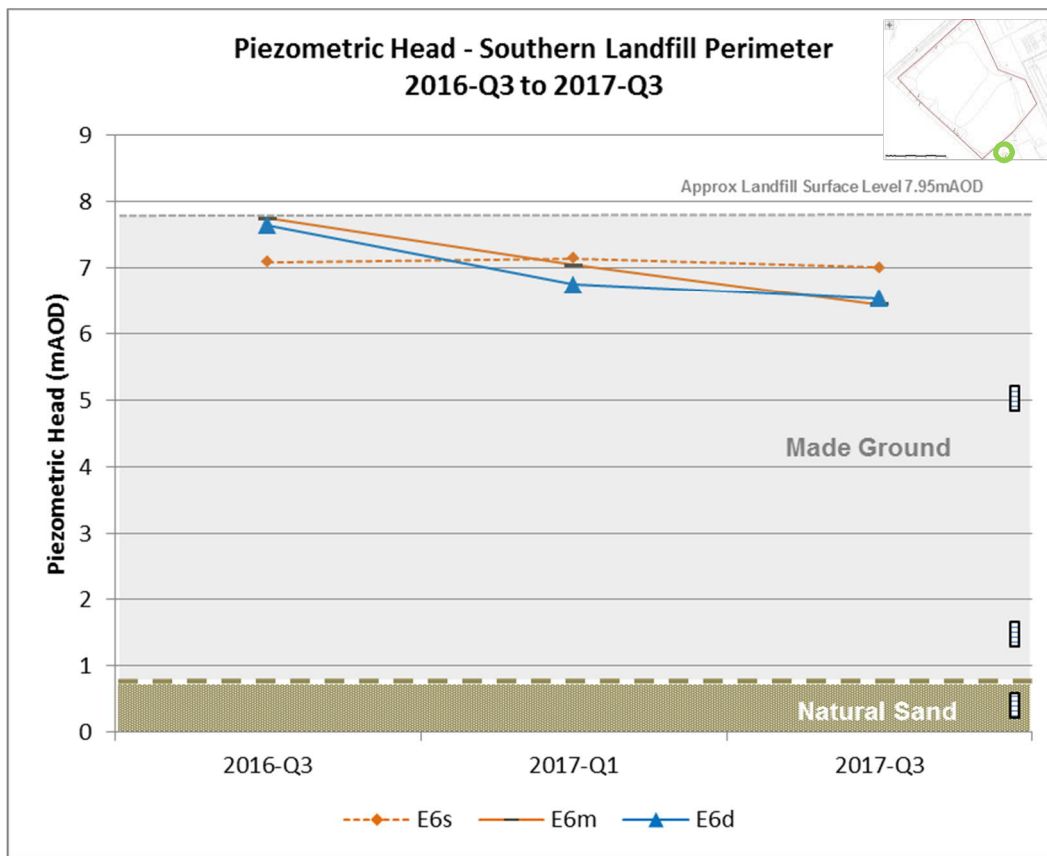
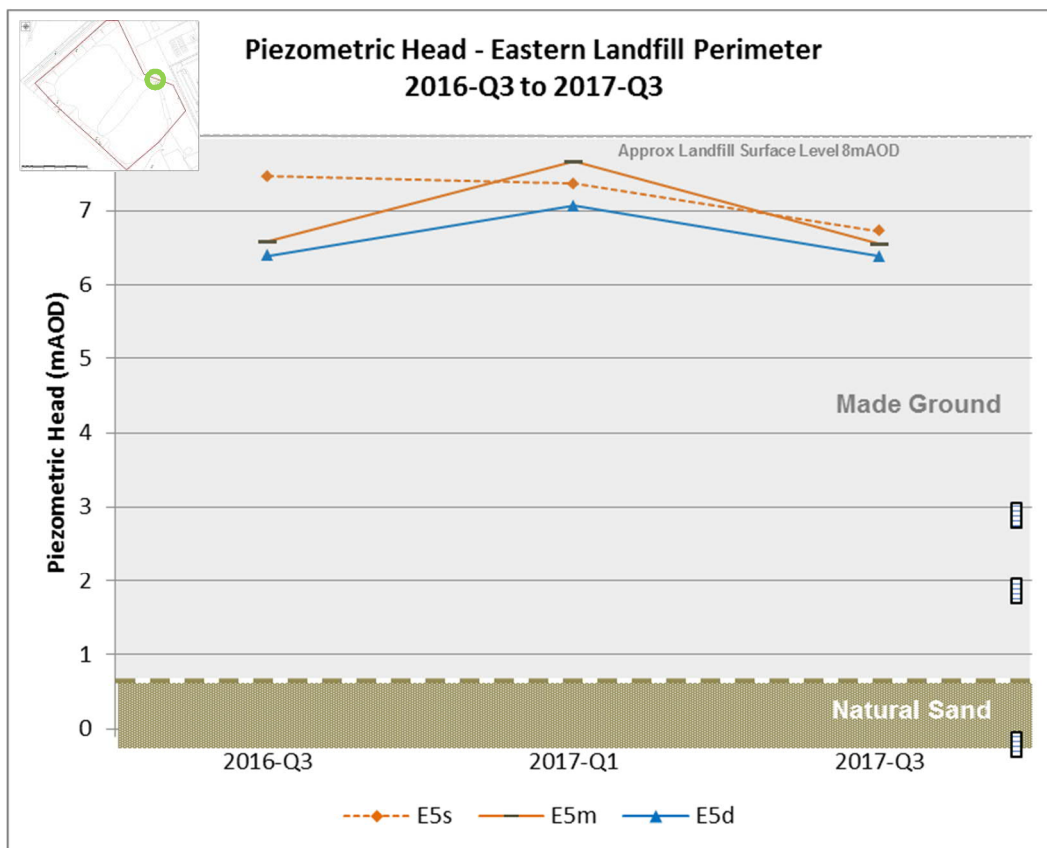


Chart 4 Piezometric Head – Eastern Landfill Perimeter 2016-Q3 to 2017-Q3



Made Ground

- The observed groundwater levels and level fluctuations are broadly consistent with previously reported data. The highest recorded change in groundwater levels / piezometric head within Made Ground were recorded in the following locations:
 - E5s (eastern boundary - installed mid-depth in Made Ground); 7.46mAOD in 2016-Q3 compared to a previous range of 6.71 to 6.76m AOD. Water levels in E5 wells for the three periods show a downwards reduction in piezometer levels (with the exception of a highpoint for E5m in 2017-Q1), suggesting a vertical migration of surface water to deeper Made Ground.
 - E6m (southern boundary - installed at the base of Made Ground); 7.75mAOD in 2016-Q3 compared to a previous range of 6.65 to 6.75mAOD and 6.45mAOD in 2017-Q3. Various stockpiles of demolition rubble have been created at different periods in the immediate vicinity of this location and standing water pools created by localised bunding have been noted on some occasions. In 2016-Q3 the piezometer level is higher in E6m than in E6s, whilst E6d (Sand) is only slightly lower, suggesting possible direct lateral recharge from the Timber Pond. A shallow layer of clay was proven between the base of Made Ground and the top of the sand at this location. The presence of a clay layer above the sand would suggest lateral recharge from the Timber Pond toe is more likely, however, indirect recharge via the upper sand cannot be ruled out. In the 2017 rounds the shallow Made Ground piezometer levels are higher than the medium which may indicate that surface water infiltration was prevalent during these monitoring rounds.
 - E7m (western boundary - installed near the base of Made Ground); 8.816mAOD in 2016-Q3 compared to a previous level of 7.17mAOD and 6.93mAOD in 2017-Q3. This location has previously been considered as being in potential groundwater connection with the adjacent Timber Pond at the base of Made Ground/top of the underlying natural Sand unit. Timber Pond levels were not available for the 2016-Q3 period for direct comparison. The piezometer levels in E7s and E7m for the monitoring periods are similar and on a slight downward reduction. They are consistently higher in E7m (screened in the lower half of the made ground) compared to E7d, installed in the top of the sand unit. This downwards reduction within Made Ground suggests that vertical surface water infiltration plays a part in groundwater levels at this location. A shallow layer of clay underlying Made Ground was encountered during the installation of this well which suggests a degree of separation between water within Made Ground and underlying groundwater within the sand. In addition, E7 is located immediately west of demolition stockpiles and associated ponded surface water maintained by the higher western perimeter embankment and the demolition spoil bunds. These factors may have influenced the higher recorded levels in Made Ground, in particular the highest piezometer levels recorded for E7s installed in shallow Made Ground.
 - E8m (western boundary - installed near the base of Made Ground); 8.24mAOD (2016-Q3) and 8.71m AOD (2017-Q1) compared to a previous level of 6.13mAOD and 6.83mAOD in 2017-Q3. As for location E7, E8 has previously been considered in potential groundwater connection with the adjacent Timber Pond. Similarly, the reinforced western landfill perimeter bund is likely to be ponding surface water on the landfill surface, potentially introducing more hydraulic head for infiltration into underlying Made Ground. The piezometer levels in E8s and E8m are similar and on a slight downward reduction for 2017-Q3, suggesting surface water infiltration. However, the piezometer levels are higher in E8m (installed the base of Made Ground) in 2016-Q3 and 2017-Q1 than in E8s, suggesting possible indirect recharge from the Timber Pond. Levels in the underlying sand are lower than in Made Ground in 2016-Q3 and 2017-Q3 and suggest a distinction between water within the base of Made Ground and the underlying sand. In 2017-Q1 however, the levels are higher in E8m (deep Made Ground) than in E8d (Sand), both higher than the shallow Made Ground in E8s which suggests a source of recharge other than vertical surface water infiltration. This could be interpreted as lateral recharge from the Timber Pond with the possible influence of upwards vertical recharge from the sand.
 - E9s (northern boundary - installed in the base of Made Ground); 7.93mAOD compared to a previous range of 6.05 to 6.08mAOD and 5.88mAOD in 2017-Q3. This high level is noted as close to the top of the monitoring well installation at 8.03mAOD. It is possible that this

location was influenced by the infiltration of localised standing water during this monitoring period. In 2016-Q1 E9s has the highest piezometer level of the three CMT wells and a downwards reduction suggests that vertical surface water infiltration may be migrating through Made Ground and influencing groundwater within the top of the sand. However, the 2017 rounds show piezometer levels increasing with depth within the sand. In 2017-Q1 the level within Made Ground is aligned with that of the shallow sand, suggesting potential groundwater recharge to Made Ground, whilst a higher level recorded within the deeper sand suggests that upwards recharge from the deeper sand is possible.

The landfill perimeter wells within Made Ground are all considered to be subject to the possible influence of standing surface water infiltration. In addition, during and after periods of rain it is possible that the Made Ground could receive recharge from the rising head of water in the Timber Pond combined with increased surface water ponding and a longer term infiltration. Levels recorded in shallow and medium wells at E6, E7 and E8 (in the western area of the landfill) demonstrate generally higher water levels than E5 in the east and E9 in the north (with the exceptions outlined above).

Sand

- Groundwater level fluctuations and levels are broadly consistent with previously reported levels. The following exceptions were noted:
 - E1m (south of landfill boundary) - Levels in 2016-Q3 (7.08mAOD) and 2017-Q3 (7.01mAOD) were more than 0.5m higher than the average level of 6.47mAOD reported by AECOM for 2015. In 2016-Q3 and 2017-Q3 the level within the sand is higher than that of Made Ground and suggests the potential for upwards recharge to the Made Ground. Previous groundwater monitoring has indicated that a high point for groundwater within the sand exists in the area of E1. However, the 2017-Q1 level is higher within Made Ground and distinct from the sand, suggesting that infiltration is likely to have been a source of recharge to Made Ground at that time.
 - E5d (eastern boundary) - Levels were marginally lower than the previously reported level of 6.56mAOD with the exception of 2017-Q1 at 7.06mAOD. In 2016-Q3 and 2017-Q3 the levels recorded in E5d have been only marginally lower than within Made Ground suggesting the possibility of downwards vertical migration to the sand from above. The level was highest within E5m at the base of Made Ground in 2017-Q1, but lower in the underlying sand and upper Made Ground suggesting a degree of lateral groundwater recharge to E5m. E5 is located on the eastern perimeter of the current landfill area and is not considered subject to recharge from the surface waters but from up-gradient groundwater within the sand.
 - E6d (southern boundary) - Levels were consistent with previously reported levels of 6.65 to 6.75mAOD with the exception of 7.65mAOD in 2016-Q3. The sand may be recharging the base of the Made Ground, supported by the levels recorded in 2017-Q3 where the piezometer level in sand is marginally higher than in the base of Made Ground.
 - E7d (western boundary) Levels within the sand are generally distinct and lower than those recorded within Made Ground in each of the three rounds. As noted above a downwards reduction in levels from shallow Made Ground to the sand and the presence of a shallow layer of clay between the two suggests that groundwater within the sand is distinct from Made Ground.
 - E8d (western boundary) - Levels were consistent with, though marginally lower than, the previously reported level of 6.13mAOD with the exception of 7.91mAOD in 2017-Q1. Levels within the sand are generally distinct and lower than those recorded within Made Ground (2016-Q3 and 2017-Q3). In 2016-Q3 the level is higher in deeper Made Ground than shallow and indicates potential lateral recharge from the Timber Pond. However, in 2017-Q1 the piezometer level within the sand is higher than for shallow Made Ground but lower than deep Made Ground as discussed above.
 - E9m (northern boundary - installed in the top of the sand unit) Levels ranged from a low level of 5.91mAOD in 2017-Q3 to a high level of 7.33mAOD in 2016-Q3.

- E9d (northern boundary installed in the base of the sand unit) Levels in 2017 were higher than the previously reported 5.83mAOD at 7.63mAOD (2017-Q1) and 7.03mAOD (2017-Q3).
- The recorded levels within the sand for E9m and E9d do not present a clear relationship to Made Ground. In 2016-Q3 a downwards reduction in levels suggests the influence of surface water infiltration and a distinct groundwater within the sand. In 2017-Q1 a rising piezometer level from Made Ground to deep sand suggests the inverse, with the potential for groundwater within sand to vertically recharge Made Ground. In 2017-Q3 the level in E9m within the top of the sand is marginally higher than in E9s in the base of Made Ground suggesting the potential for direct recharge of Made Ground from the underlying sand, supported by a head of water from the deeper sand indicated by the higher level recorded in E9d.

4.4 Inferred Groundwater Flow Directions

Made Ground

The available data is inconclusive with regard to shallow or perched groundwater flow direction. Factors including the heterogeneity of the landfill mass, stockpiled surface materials, banded and ephemeral surface water and the potential for recharge from the Timber Pond complicate the assessment.

The data for 2016-Q3 broadly suggests that the western area and boundary (E7 and E8) is influenced by recharge from the Timber Pond, and by standing surface water infiltration. During this round the water level in E9s was recorded as almost at the top of the pipe which suggests a large degree of surface water infiltration.

The 2017-Q3 data suggests that shallow water within the northern half of the landfill flows in a north/north-westerly direction towards the Cadoxton ponds. The levels during this round in E5m on the eastern perimeter and E6m on the southern perimeter are very similar, whilst in the shallow wells the water level is higher at E6s. However, this shallow level at E6s of 7.01mAOD is replicated in E8s in the north west, and almost as high in E7s at 6.996mAOD, supporting the case for continuity in shallow water along the western boundary.

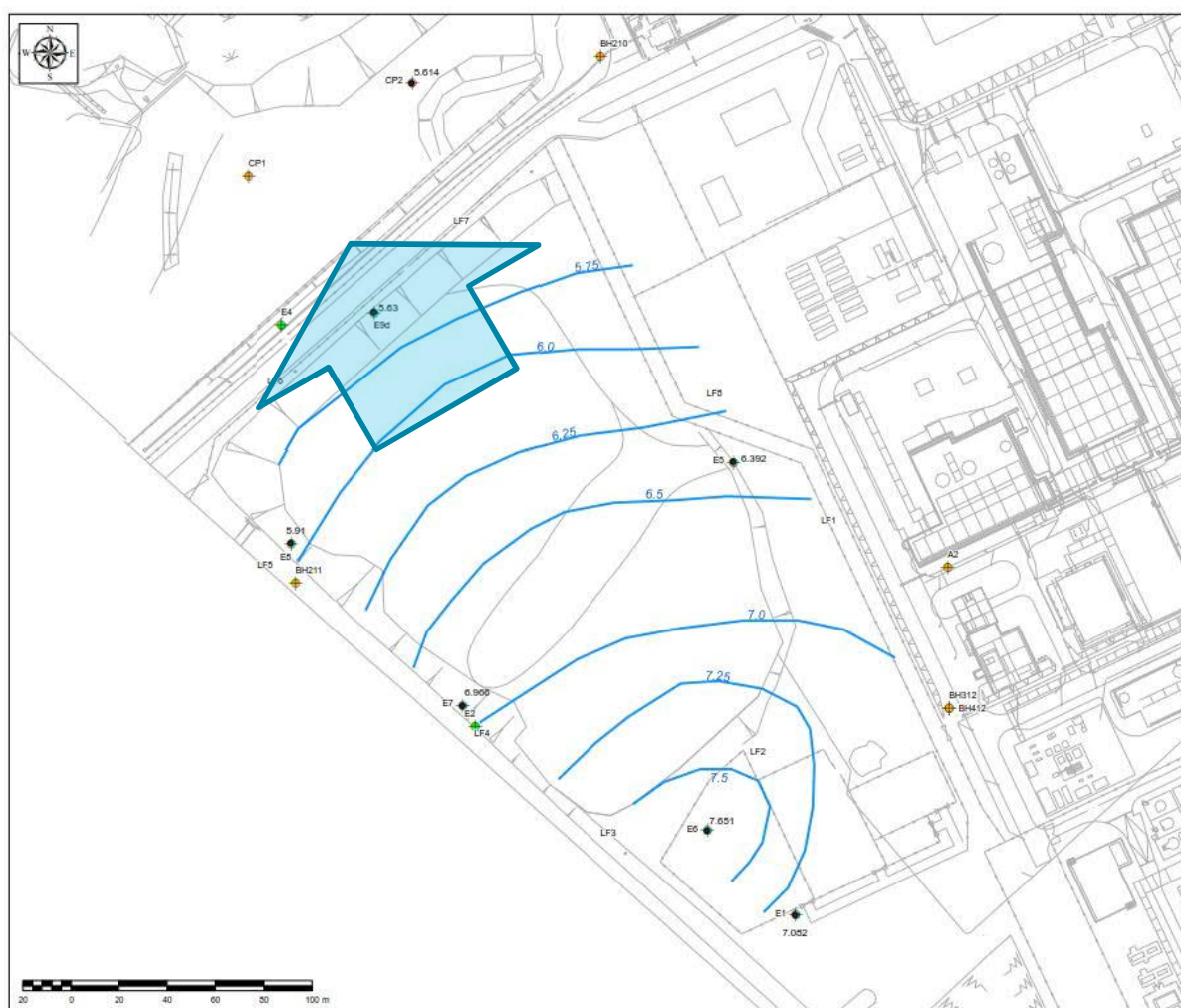
Sand

The groundwater level data broadly supports the previously inferred flow direction within the alluvial sand unit beneath the landfill to the north-west and the Cadoxton Ponds. This is most clearly demonstrated in the levels recorded in 2016-Q3 and 2017-Q3.

In addition, the levels recorded in 2016-Q3 and 2017-Q1 suggest a high point in the vicinity of E6 with groundwater flow to both the north west towards the Cadoxton Ponds and to the south east towards the South pond (as indicated by levels recorded in E1). In 2017-Q3 the groundwater highpoint was recorded in E1m. The data for this round supports a groundwater flow to the north-west towards the Cadoxton Ponds. The possibility of flow towards the South pond remains, though there are no wells to the south east of E1 to confirm this.

Groundwater contour plots for 2016-Q3 to 2017-Q3 are presented in **Appendix B. Figure 4.1** below presents the 2016-Q3 piezometric levels within the sand unit and the associated groundwater contours. The figure confirms the previously stated general groundwater flow direction towards the north west and the Cadoxton Ponds. Some seasonal variation in levels is noted within certain wells, as presented in Charts 1 to 4 and the above summary discussion.

Figure 4.1 – Piezometric head contours in the underlying sand - 2016-Q3



Ethylbenzene was less frequently reported, and was not reported above the MDL in 2016-Q1. Ethylbenzene was reported at a maximum concentration of 36µg/l in the sample from BH312 in 2016-Q3 with levels reducing to 12.91µg/l in 2017-Q3.

Toluene was reported at a maximum concentration of 100µg/l in the sample from BH312 in 2017-Q1, though similar concentrations were reported in 2015-Q1 (98µg/l) and 2017-Q3 (96µg/l). Toluene was not reported above the MDL for samples from BH412.

Maximum concentrations of the remaining BTEX compounds were all reported in samples from BH312. M, o and p-xylene concentrations were highest in 2015-Q1, with a maximum concentration of 82µg/l reported for p-xylene, though other detections in 2015-Q1 were within the same order of magnitude.

Landfill wells – Made Ground (LF4, E5s, E5m, E6s, E6m, E7s, E7m, E8s, E8m and E9s) – Table C2 in Appendix C

In 2015-Q1 o-xylene (1.31µg/l) and p-xylene (3.36µg/l) were reported in the sample from LF4. In 2015-Q3 only LF4 was sampled with no detections reported.

BTEX compounds have been reported above the Method Detection Limit (MDL) in rounds 2016-Q3, 2017-Q1 and 2017-Q3 in Made Ground wells E5s, E5m, E6s (2016-Q3 only), E6m, E7m, E8s and E8m in the landfill perimeter area, with the exception of m-xylene in 2016-Q3.

Benzene was reported at a maximum concentration of 4.22µg/l for the sample from E5s in 2017-Q1. Benzene was reported above the MDL at E5m in the latter three rounds and at E8s (2017-Q3) and E8m (2017 rounds only).

Ethylbenzene was reported most frequently in 2016-Q3 at a maximum concentration of 11.84µg/l at E5s and was not reported above the MDL at E5m. In 2017-Q1 and Q3 ethylbenzene was reported above the MDL at E5s only.

Toluene was reported at a maximum concentration of 10.09µg/l in the sample from E5s in 2017-Q3. The four remaining detections were from E5s (2017-Q1) and E5m (2016-Q3, 2017-Q1 and Q3).

Xylene was the most frequently reported BTEX compound, in particular for the 2017 monitoring rounds. Concentrations were generally highest in 2017-Q3, with a maximum concentration of 21.47µg/l reported for p-xylene.

Results from AECOM 2015 Investigation

Soil results from 2015 Investigation

BTEX compounds were reported above the MDL in three borehole soil samples only, E5 at 2.2m and 5.5m and E8 at 2.75m bgl. The maximum laboratory reported BTEX concentration for an individual analyte in soil was 5.12mg/kg of toluene from E8 at a depth of 2.6m bgl within Made Ground. E8 is located on the western perimeter bund of the landfill. The detections were concurrent with observations of a strong odour during drilling and soil headspace PID readings of 1,282ppm at 2.2m and 105ppm at 2.85m bgl.

Benzene was reported in the three samples at a maximum of 1.03mg/kg in the sample from E8 at 2.6m bgl. Ethylbenzene was reported in the same two samples; E5 at 5m bgl (0.424mg/kg) and E8 at 2.6m bgl (0.395mg/kg).

O-Xylene was reported in the sample from E8 at 2.6m bgl at a concentration of 0.556mg/kg. Xylene (m&p) were reported in two samples; E5 at 5m bgl (1.26mg/kg) and E8 at 2.6m bgl (1.61mg/kg).

Leachate results for 2015 Trial Pits

BTEX compounds were reported above the MDL for leachates derived from four of eleven trial pit samples; TP01 at 0.5m, TP08 at 1.75m, TP09 at 1.5m and TP09 at 2.5m bgl. The maximum reported leachate concentration for an individual analyte from the trial pit samples was 167µg/l of m/p xylene in the sample from TP09 at 1.5m bgl (m/p xylene was reported above the MDL in four samples). In the soil sample the maximum was reported at 2.5m bgl.

O-xylene was also reported in the same four leachate samples at a maximum concentration of 132µg/l in the sample from TP09 at 1.5m bgl.

Benzene was reported above the MDL in only the sample from TP09 at 2.5m bgl at a concentration of 10.6µg/l. Ethylbenzene was not reported above the MDL. Toluene was reported in three samples at a maximum concentration of 32µg/l in the samples from TP08 at 1.5 to 2m bgl.

AECOM Groundwater results 2015

BTEX was reported above the MDL in five groundwater samples; for each of the four depth screens at E5 and also at E8m. The maximum reported concentration in groundwater for an individual analyte was 13µg/l of toluene in the sample from E5m. Toluene at a concentration of 7µg/l in the sample from E5d was the only BTEX analyte reported for a well installed within the natural sand.

Landfill Wells – Natural sand (E5d, E6d, E7d, E8d and E9d) – Table C3 in Appendix C

Benzene, toluene and m-xylene were not reported above the MDL in samples from wells screened in natural sand on the landfill perimeter.

Ethylbenzene was reported in 2016-Q3 only in samples from wells E5d, E7, E8d and E9d at a maximum concentration of 12.93µg/l in the sample from E5d.

Xylenes (o & p) were reported above the MDL in each of the three rounds in which the CMT wells were sampled. The maximums for both o-xylene and p-xylene were reported from E5d in 2017-Q1 at concentrations of 5.39µg/l and 16.05µg/l respectively.

Table 4.1 – Xylene 2017 concentrations in groundwater and the potential for downwards migration from landfill mass to underlying groundwater within sand

Monitoring Round	Location	Well	Xylene (m)	Xylene (o)	Xylene (p)	Piezometric level (mAOD)	Potential for downward migration?
2017-Q1	E5	s	3.393	2.39	19.58	7.362	Yes – based on xylene data
		m	<MDL	2.13	16.40	7.662	
		d	<MDL	5.39	16.05	7.062	
	E6	s	<MDL	<MDL	<MDL	7.151	Yes – from deeper MG to sand
		m	<MDL	<MDL	6.92	7.051	
		d	<MDL	<MDL	7.23	6.751	
	E7	s	<MDL	<MDL	<MDL	7.166	Yes – though sand groundwater level lower
		m	<MDL	1.23	11.15	7.066	
		d	<MDL	1.79	10.97	6.366	
	E8	s	<MDL	<MDL	8.17	7.61	Unclear – potential for interaction at basal Made Ground and top of sand. xylene data suggests not.
		m	<MDL	1.01	5.80	8.71	
		d	<MDL	<MDL	<MDL	7.91	
	E9	s	<MDL	<MDL	<MDL	6.03	No – potential recharge from sand to Made Ground. Data suggests xylene migration within sand.
		m	<MDL	<MDL	<MDL	6.63	
		d	<MDL	<MDL	3.79	7.63	
2017-Q3	E5	s	3.861	21.47	17.90	6.722	Yes – based on piezometer levels and xylene data
		m	2.17	19.80	16.12	6.552	
		d	<MDL	4.87	14.35	6.382	
	E6	s	<MDL	<MDL	<MDL	7.011	Yes – potential from deep Made Ground to sand based on piezometer levels and xylene data, though could represent recharge to base of Made Ground from sand
		m	<MDL	1.39	5.16	6.451	
		d	<MDL	1.64	5.54	6.541	
	E7	s	<MDL	<MDL	<MDL	6.996	Yes – potential from deep Made Ground to sand based on piezometer levels and xylene
		m	<MDL	4.01	9.30	6.936	

Table 4.1 – Xylene 2017 concentrations in groundwater and the potential for downwards migration from landfill mass to underlying groundwater within sand

Monitoring Round	Location	Well	Xylene (m)	Xylene (o)	Xylene (p)	Piezometric level (mAOD)	Potential for downward migration?
		d	<MDL	4.32	9.16	6.366	data.
		s	<MDL	4.46	8.21	7.01	Yes – potential from shallow to deep Made Ground to sand based on piezometer levels and xylene data.
	E8	m	<MDL	2.29	4.83	6.83	
		d	<MDL	2.57	5.20	5.81	
		s	<MDL	<MDL	<MDL	5.88	
	E9	m	<MDL	<MDL	<MDL	5.91	No – potential recharge from Sand to Made Ground. Data suggests xylene migration within sand.
		d	<MDL	1.19	5.02	7.03	

Downgradient wells (LF7, CP1m, CP1d, CP2s, CP2m, CP2d and BH210) – Table C4 in Appendix C

In 2015-Q3 and 2016-Q1 LF7 (screened over Made Ground and dense sandy gravels) was sampled with no detections reported.

Benzene and toluene were not reported above the MDL in samples from downgradient wells screened in natural sand/silty and or underlying mudstone.

Ethylbenzene was reported in 2016-Q3 for each of the CMT wells at CP2 at a maximum concentration of 4.79µg/l in the sample from CP2d (screened in weathered mudstone)

M-xylene was reported above the MDL in 2016-Q3 in one sample from BH210 (installed in weathered mudstone) at a concentration of 7.31µg/l

Xylenes (o & p) were reported above the MDL in 2017-Q3 for each of the CMT wells at CP2 at a maximum concentration for p-xylene of 5.24µg/l in the sample from CP2s (screened in Made Ground).

4.5.2 Volatile Organic Compounds (VOCs) and Site Specific Compounds (SSC)

Analysis results were provided for the following analytes:

- Methanol;
- D4 (octamethyl-cyclotetrasiloxane);
- D5 (decamethylcyclopentasiloxane);
- D6 (dodecamethylcyclohexasiloxane);
- TMS (Trimethylsilanol);
- HMDS (Hexamethyldisilazane or Bis(trimethylsilyl)amine);
- MST (Methylsilanetriol) (2017 rounds only);
- DMSD (Dimethylsilanediol) (2017 rounds only); and
- Silicic Acid (2017 rounds only).

Note: HMDS was not reported above the MDL in any of the samples.

Upgradient / Potential Source Area wells (A2, BH312, BH412)

Methanol was reported on two occasions, in samples from A2 in 2015-Q1 (4.93µg/l) and from BH312 in 2015-Q3 (3.48µg/l). Methanol has not been reported above the MDL since.

D4 was reported on one occasion at a concentration of 0.02µg/l in a sample from A2 in 2015-Q3. D4 has not been reported above the MDL since.

D5 was reported in 2015-Q3 only in samples from A2, BH312 and BH412 at concentrations of 0.07, 0.06 and 0.08µg/l respectively.

D6 was not reported above the MDL for the 2015-Q1 to 2017-Q3 monitoring rounds.

Trimethylsilanol (TMS) was reported in each of the monitoring rounds at locations A2, BH312 and BH412, with the exception of A2 in 2015-Q1 (<MDL). The maximum reported concentration was 7.86mg/l in the sample from BH312 in 2016-Q1. The lowest reported concentration was 1.87mg/l in the sample from BH412 in 2017-Q3. The average concentrations across the monitoring period are: 5.2mg/l for A2, 6.6mg/l for BH312 and 4.24mg/l for BH412.

Landfill Area - Made Ground (LF4, E5s, E5m, E6s, E6m, E7s, E7m, E8s, E8m and E9s) – Table C5 in Appendix C

Methanol, HMDS, D4, D5 and D6 were not reported in samples from these wells.

TMS was detected in each of the monitoring rounds with the exception of 2015-Q1. The lowest reported concentration (>MDL) was 80µg/l in the sample from E1s in 2015-Q3. The maximum reported concentration is 5,920µg/l in the sample from E5m. Samples from E5s and E5m are consistently the highest concentrations in Made Ground, with a minimum of 4,020µg/l at E5m in 2016-Q3. E5 is located on the east perimeter of the current landfill area and is in relative close proximity to the Genesis plant and wells A2, BH312 and BH412 (potential up-hydraulic gradient sources).

The average concentration of TMS between Q3 2015 and Q3 2017 in samples from Made Ground within the landfill area is 1,694µg/l.

MST was reported in the Q3 2017 round only at wells E5s, E5m, E6s, E7m and E8m. The maximum reported concentration was 169.6ppm in the sample from E7m, and a minimum of 0.4ppm in the sample from E6s. The average for landfill perimeter Made Ground is 80.64ppm.

DMSD was reported in the 2017 rounds only in the same wells as MST. The maximum reported concentration was 165.7ppm in the sample from E5m, and a minimum of 8.9ppm in the sample from E6s. The average for landfill perimeter Made Ground is 100.92ppm.

Silicic acid was reported for the same rounds and locations as MST at a maximum concentration of 16.9ppm in the sample from E7m and a minimum of 6.9ppm in the sample from E6s.

Landfill Area - Natural Ground (E5d, E6d, E7d, E8d, E9m and E9d) – Table C6 in Appendix C

Methanol, HMDS, D4, D5 and D6 were not reported in samples from these wells.

TMS was reported above the MDL in monitoring rounds 2015-Q3, 2016-Q3, 2017-Q1 and 2017-Q3. The average concentration of TMS in samples from natural ground within the landfill area is 1,210µg/l (excluding E1d, installed in underlying weathered mudstone). The lowest reported concentration (>MDL) was 100µg/l in the samples from E1m in 2015-Q3 and E1d in 2016-Q3. The maximum reported concentration is 2,450µg/l in the sample from E5d. As for the Made Ground samples the highest concentrations within the sand unit of the landfill area are consistently reported in samples from E5.

MST was reported in the 2017 rounds only at wells E5m, E5d, E6d, E7d, E8d, E9m and E9d. The maximum reported concentration was 150.8ppm in the sample from E8d, and a minimum of 0.6ppm in the sample from E9m. The average for landfill perimeter Made Ground is 40.15ppm.

DMSD was reported in the 2017 rounds only in the same wells as MST. The maximum reported concentration was 106.1ppm in the sample from E7d, and a minimum of 7.6ppm in the sample from E9d. The average for landfill perimeter Made Ground is 62.75ppm.

Silicic acid was reported for the same rounds and locations as MST at a maximum concentration of 45.1ppm in the sample from E9d and a minimum of 14.9ppm in the sample from E5m.

Downgradient Wells (LF7, BH201, CP1m, CP1d, CP2s, CP2m and CP2d) – Table C7 in Appendix C

Methanol, HMDS, D5 and D6 were not reported in samples from these wells.

D4 was reported on one occasion at a concentration of 1.76µg/l in a sample from CP2d in 2016-Q3 (installed in weathered mudstone bedrock). D4 has not been reported above the MDL since.

TMS was reported above the MDL in all monitoring rounds with the exception of 2015-Q1. TMS was reported above the MDL in three samples from Made Ground (CP1s, CP2s and LF7). Samples from LF7 ranged in concentration from 90 to 200µg/l. In 2016-Q3 the concentration in the sample from CP1s was reported at 1,650µg/l and in 2017-Q3 the concentration in the sample from CP2s was reported at 1850µg/l.

In natural sandy/silty ground TMS was reported in samples from downgradient wells LF7 and CP2m, at concentrations of between 90 to 200µg/l and 1,890 to 2,140µg/l respectively. This latter result of 2,140µg/l for the sample from CP2m in 2017-Q3 (the most recent monitoring round) was the maximum reported concentration from a downgradient well.

Samples from BH210, installed in the underlying weathered mudstone, ranged in concentration from 110 to 380µg/l. Higher concentrations were reported for two samples from CP2d, also installed in mudstone, at concentrations of 2,000µg/l (2016-Q3) and 1,830µg/l (2017-Q3).

Average concentrations of TMS are higher in 2017 than for previous rounds. Averages across the monitoring rounds are 1,750µg/l for the two Made Ground wells, 896µg/l within sandy natural ground and 728µg/l for the wells screened in underlying mudstone.

MST was reported in the 2017 rounds only at wells BH210, CP1m, CP1d, CP2s, CP2m and CP2d. In Made Ground MST was reported in two samples from CP2s at concentrations of 2.6ppm and 4ppm. In natural sand concentrations in two samples from CP2m ranged from 3ppm to 4.3ppm (<MDL for one sample from CP1m). In samples from underlying mudstone (BH210, CP1d and CP2d) concentrations ranged from <MDL (CP1d on two occasions) to 2.3ppm in a sample from CP2d in 2017-Q1.

Silicic acid was reported for the same rounds and locations as MST. In two samples from CP2s in Made Ground the reported concentrations were 12.3ppm (2017-Q1) and 29.6ppm (2017-Q3). In natural sand three detections were reported; 3.1ppm (CP1m 2017-Q1), 21ppm (CP2m 2017-Q1) and 31.1ppm (CP2m 2017-Q3). In underlying mudstone (BH210, CP1d and CP2d) concentrations ranged from <MDL (BH210 2017-Q1) to 21.1ppm in a sample from CP2d in 2017-Q3.

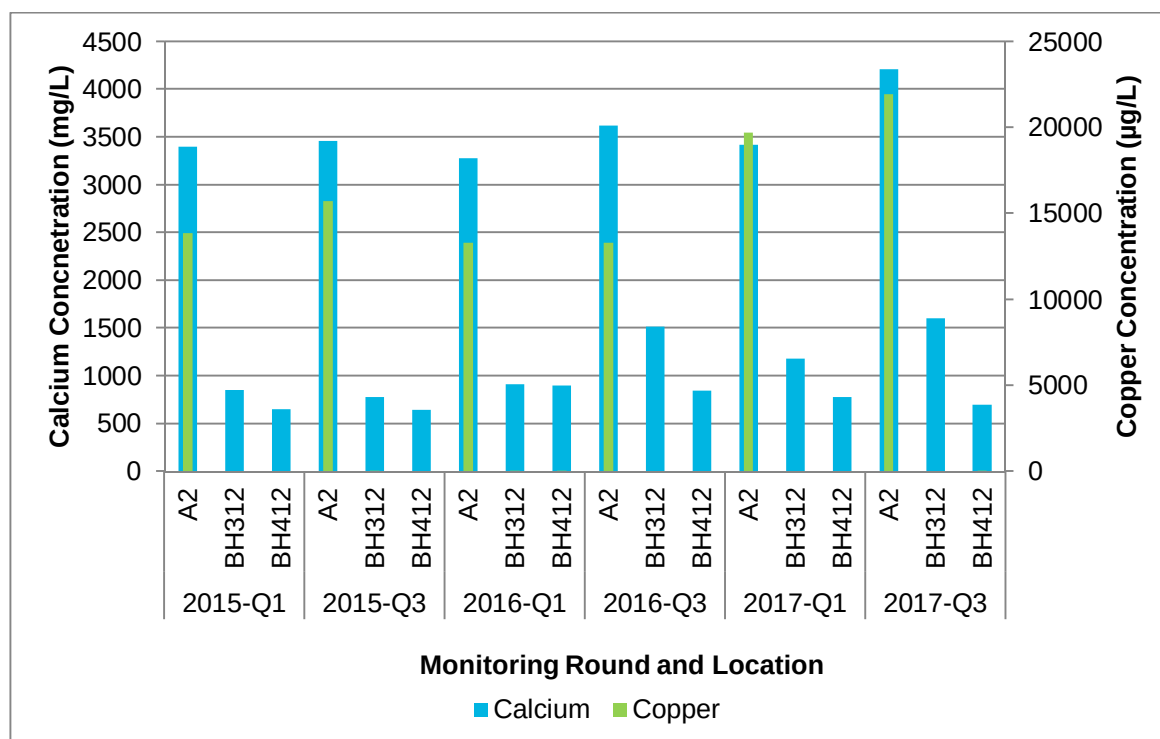
4.5.3 Metals

Upgradient / Potential Source Area wells (A2, BH312, BH412) – Table C8 in Appendix C

Table C8 presents detections of metals in groundwater samples collected from upgradient (potential source area wells).

Copper

The primary metal contaminant of concern, copper, was reported at a maximum concentration of 21.95mg/l in the sample from A2d in 2017-Q3. Copper was reported in samples from A2 in each round and are elevated compared to BH312 and BH412, with a lowest recorded concentration (for those >MDL) of 13.29mg/l. Copper was reported above the MDL in samples from BH312 in two of six rounds at a maximum concentration of 9.63µg/l, and in two samples of six from BH412 at a maximum concentration of 8.51µg/l. Concentrations of copper in samples from BH312 and BH412 are lower than in samples from A2 by three orders of magnitude. Higher concentrations of calcium (generally an order of magnitude higher than in BH312 and BH412) correlate with the elevated copper concentrations in A2 as demonstrated in Chart 5.

Chart 5 Calcium and copper in potential source area wells

Landfill wells – Made Ground (LF4, E5s, E5m, E6s, E6m, E7s, E7m, E8s, E8m and E9s) – **Table C9** in **Appendix C**

Table C9 presents detections of metals in groundwater samples collected from wells installed in Made Ground in the Landfill Area.

Copper

Copper was reported in Made Ground at a maximum concentration of 30.93µg/l in the sample from LF4 in 2015-Q3. As previously noted, it is possible that this sample is actually from location E2 (both located very close to one another beyond the west embankment of the landfill, and previously submerged within the edge of the Timber Pond during AECOM groundwater sampling in 2015).

Copper was reported above the MDL in six samples from Made Ground locations on the landfill perimeter (LF4 – two samples, E1s, E5s, E5m and E7m). The second highest concentration was 11.63µg/l in the sample from E7m in 2017-Q3. E7m is located in the west embankment in close proximity to E2 and LF4. Copper was not reported for E7m in previous rounds.

During the AECOM 2015 sampling the maximum reported copper concentration reported in Made Ground was 142µg/l in the sample from LF6 on the northern perimeter of the landfill. The second highest concentration was reported for E7s at 23.8µg/l. Copper was reported above an MDL of 0.85µg/L in all samples with the exception of E1s.

Other Metals

The 2015 AECOM site investigation included the excavation of ten trial pits across the surface of the landfill in order to characterise the waste mass. Leachate analysis was conducted on soil samples and detections were compared to the Freshwater EQS (applicable only at the downgradient surface water receptor - Cadoxton Ponds) in order to illustrate possible contaminants of concern at a potential upgradient source.

Leachable metal concentrations from soil samples identified elevated levels of nickel in all but one sample in comparison to the EQS of 4µg/l, at a maximum concentration of 18.6µg/l. Three samples were elevated for vanadium when compared to the EQS of 20µg/l at a maximum of 257µg/l. Hexavalent chromium was identified in two samples at a maximum of 82.4µg/l against an EQS of

3.4µg/l. One detection of cadmium at 0.205µg/l exceeded the EQS of 0.08µg/l. Mercury was reported marginally above the MDL of 0.01µg/l in two trial pit samples, TP06 at 0.5m bgl and TP09 at 1.5m bgl at concentrations of 0.0101µg/l and 0.0156µg/l respectively.

Analysis of groundwater samples collected from Made Ground in the landfill perimeter in the same period identified lower levels of nickel as well as copper. Vanadium was not reported above the EQS in groundwater; however, one detection of arsenic was reported marginally in excess of the EQS of 50µg/l at 55.7µg/l. Cadmium was reported above the EQS of 0.08µg/l in one sample from LF6 at a concentration of 0.273µg/l. Zinc, which had not been reported above the EQS of 10.9µg/l in leachate samples was reported in three samples in excess of the EQS at a maximum concentration of 43.6µg/l in the sample from LF6. Mercury was not reported above the MDL.

The groundwater results for 2016-Q3 to 2017-Q3 for the Made Ground perimeter wells indicate fluctuations in metal concentrations across the period generally within the same order of magnitude compared to previous rounds. Iron and manganese are consistently elevated and the majority of metals have marginally increased in concentration in samples from at least one or more locations.

In the most recent round recorded in 2017-Q3 aluminium (EQS 15µg/l) is reported above the MDL on four occasions at a maximum concentration of 36µg/l at E6s. Lead is most elevated in E5s and E5m at a maximum of 50.25µg/l at E5s. Nickel (EQS 4µg/l) was reported at a maximum of 20.62µg/l at E8m and Zinc (EQS 10.9µg/l) at a maximum of 5.94µg/l at E7m. LF7 on the southern perimeter exhibits five maximum detections in 2017-Q3 for arsenic, cadmium, chromium, iron and mercury. Of those, three EQS are exceeded; arsenic (EQS 50µg/l) at 68.5µg/l, iron (EQS 1000µg/l) at 30,161µg/l and mercury (EQS 0.07µg/l) at 16.39µg/l.

Landfill Wells – Natural sand (E5d, E6d, E7d, E8d and E9d) – Table C10 in Appendix C

Table C10 presents detections of metals in groundwater samples collected from wells installed in natural sand in the Landfill Area.

The primary metal contaminant of concern, copper, was reported in sand at a maximum concentration of 66.18µg/L in 2016-Q1 in the sample from E1m. This well is located marginally beyond the southern edge of the landfill. Copper was reported on three other occasions, the second highest detection again from E1m in the preceding quarter 2015-Q3. The remaining two detections were an order of magnitude lower in E9m in 2017-Q1 (6.41µg/L) and E8d in 2017-Q3 (1.27µg/L). The majority of samples collected from natural sand CMT wells E5 to E9 on the landfill perimeter were reported as <MDL.

During the 2015 AECOM groundwater monitoring copper was reported in all samples at a maximum concentration of 21µg/L in a sample from E7d. In natural sand nickel was widely reported above the EQS of 4µg/l but at an average concentration of 21.58µg/l compared to an average of 19.77µg/l for groundwater in Made Ground. Zinc was reported in excess of the EQS of 10.9µg/l in four samples at a maximum of 21.1µg/l, though the average concentration in sand of 7.82µg/l was marginally lower than that of Made Ground at 10.67µg/l.

In the most recent round recorded in 2017-Q3 aluminium (EQS 15µg/l) is reported above the MDL on one occasion at a concentration of 4µg/l at E1m. Arsenic was not reported above the EQS of 50µg/l. Lead is most elevated in the sample from E7d at a maximum of 42.93µg/l, in excess of the EQS of 1.2µg/l. Mercury was reported above the EQS of 0.07µg/l in the sample from E5d at a concentration of 10.81µg/l. Nickel (EQS 4µg/l) was reported at a maximum of 25.5µg/l in the sample from E7d, marginally higher than the concentration reported for Made Ground. Zinc was not reported the EQS of 10.9µg/l and concentrations are comparable to Made Ground at a maximum of 6.81µg/l in the sample from E8d.

Downgradient Wells (E4, BH201, CP1 and CP2) – Tables C11 to C13 in Appendix C

Copper was not reported in Made Ground well CP2s or in downgradient natural sand strata.

One detection of copper was reported for wells installed in underlying mudstone, in a sample from BH210 in 2016-Q1 at a concentration of 9.08µg/L.

4.5.4 Inorganics

The following tables in **Appendix C** present the Inorganic results by site area.

- Upgradient / Potential Source Area wells (A2, BH312, BH412) – **Table C14** in **Appendix C**
- Landfill Perimeter - Made Ground (LF4, E1s, E5s, E5m, E6s, E6m, E7s, E7m, E8s, E8m, E9s) – **Table C15** in **Appendix C**
- Landfill Perimeter – Natural Ground (E1m, E1d, E5d, E6d, E7d, E8d, E9m, E9d) – **Table C16** in **Appendix C**
- Downgradient wells (E4s, E4d, LF7, CP1m, CP1d, CP2s, CP2m, CP2d) – **Table C17** in **Appendix C**

4.5.5 Major Anions and Cations in the Alluvial Sand

The following three charts 6 to 8 illustrate the concentrations in groundwater within the natural sand between major cations (calcium and magnesium) and anions (chloride and sulphate), plus the parameters Chemical Oxygen Demand (COD), Hardness (as CaCO_3) and Total Alkalinity for the 2016-Q3, 2017-Q1 and 2017-Q3 monitoring periods.

Chart 6 Inorganics & Major Anions and Cations in Sand - 2016-Q3

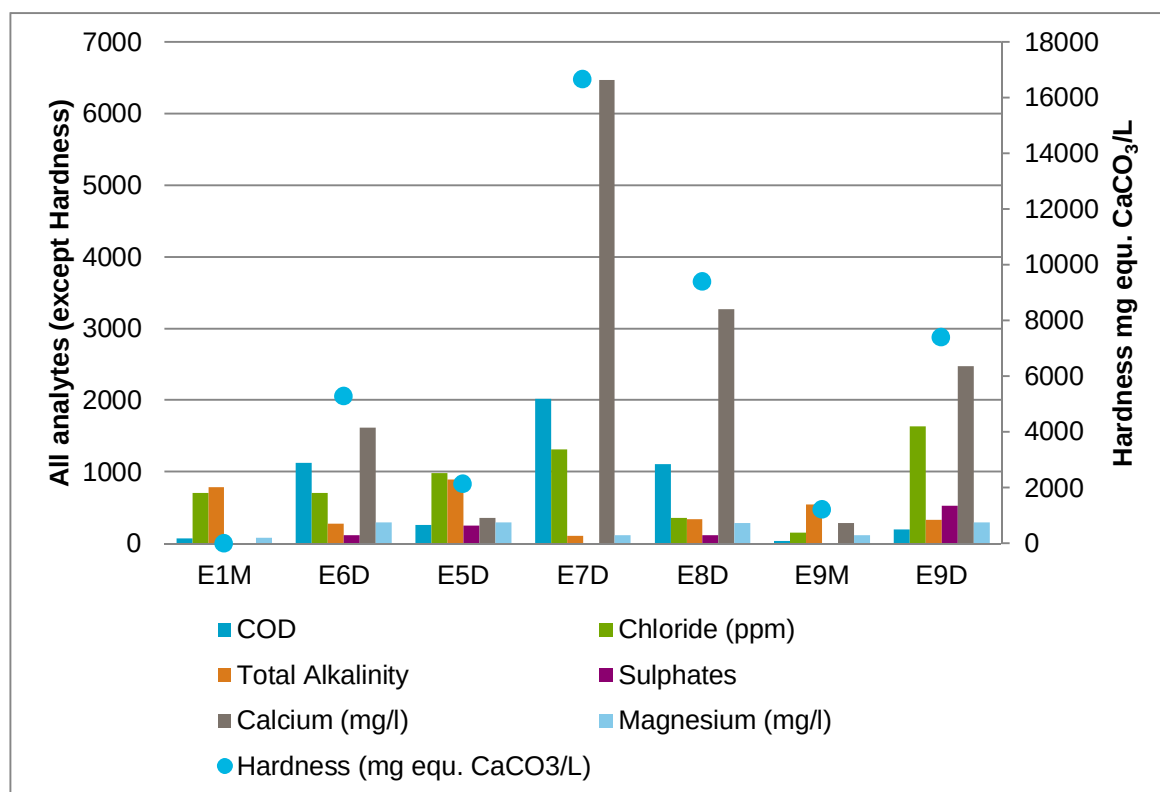


Chart 7 Inorganics & Major Anions and Cations in Sand - 2017-Q1

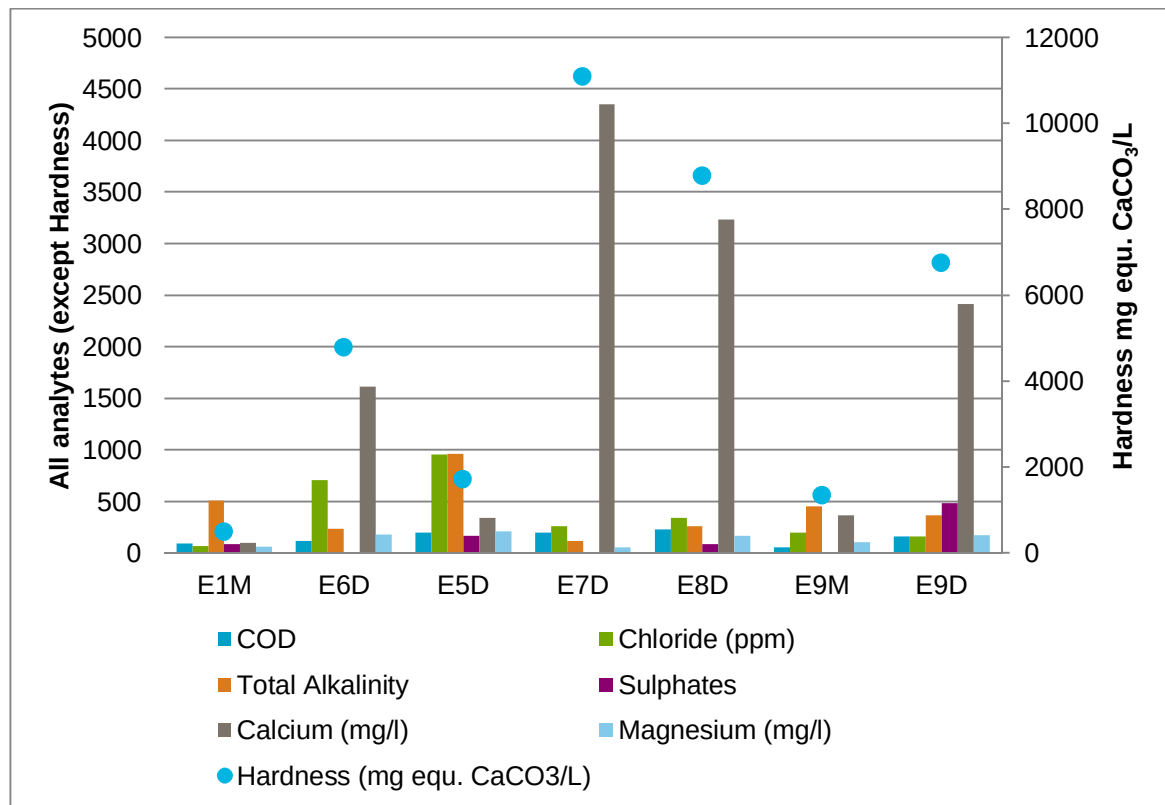
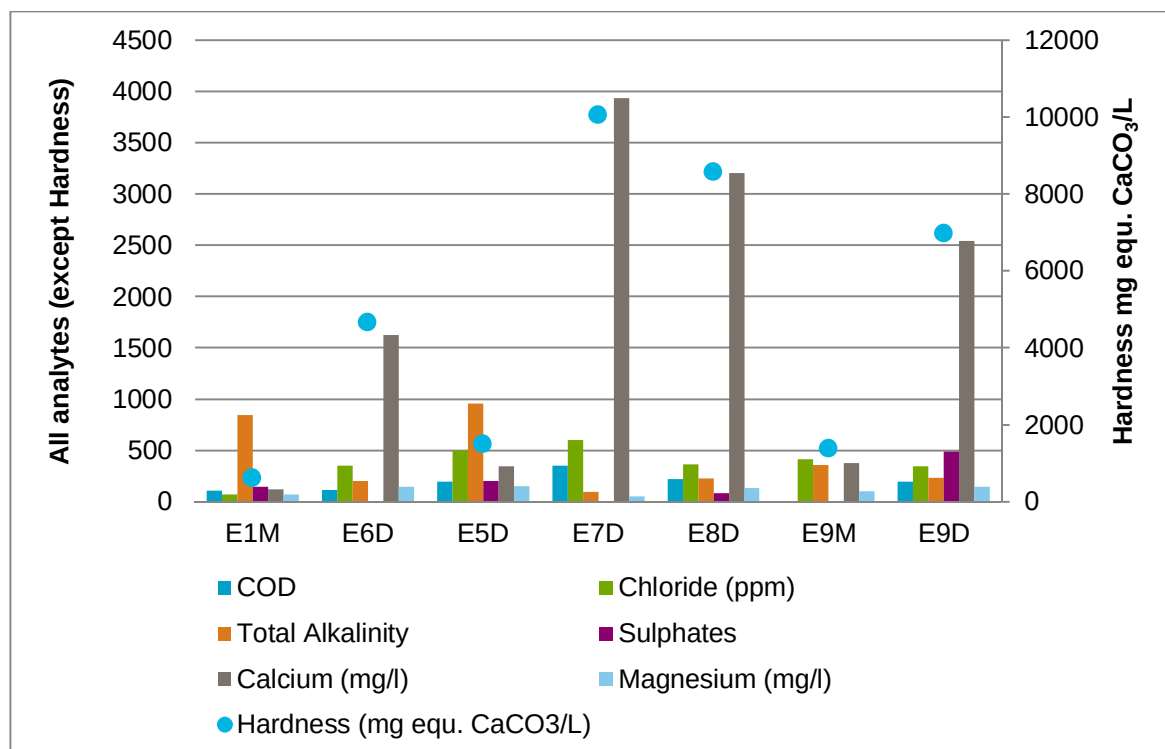


Chart 8 Inorganics & Major Anions and Cations in Sand - 2017-Q3



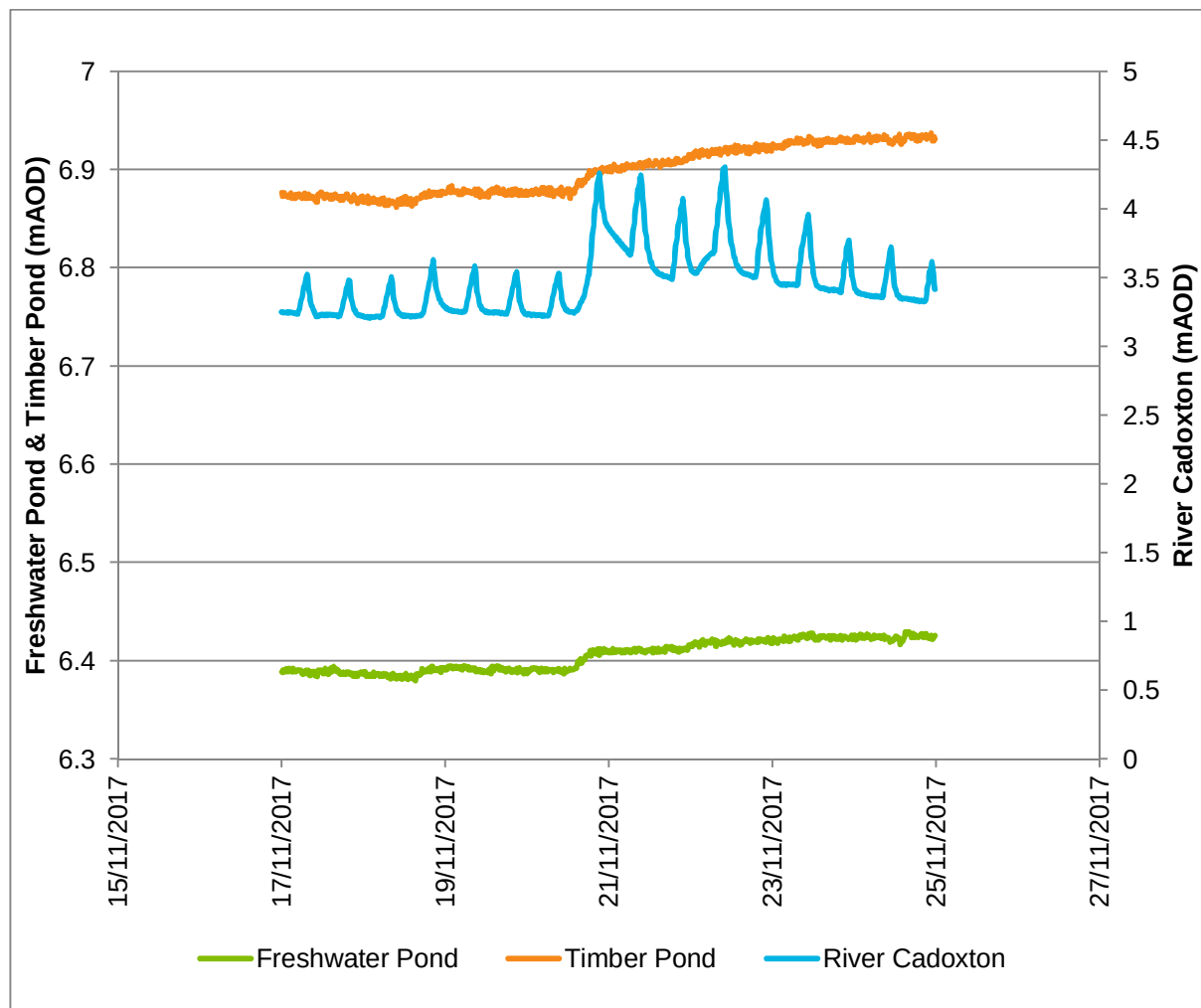
There are some apparent relationships such as that higher calcium, COD and chloride generally equate to lower alkalinity and a lower concentration of magnesium and sulphates (except in the case of E9d for sulphates).

4.6 Surface water levels

There is no surface water level data from the 2015-Q1 to 2017-Q3 monitoring periods against which to compare groundwater levels. However, AECOM installed pressure transducers in the Timber Pond, South Pond and the River Cadoxton on 8th August 2017 (which are still present at time of this report issue), in order to assess water level changes within these surface water bodies. AECOM has assessed a snapshot period to illustrate relative changes in levels for the surface water bodies.

Chart 9 presents surface water elevation data recorded between the 17th November and 24th November 2017.

Chart 9 Snapshot of Surface Water Elevations



The surface water levels (converted to mAO from pressure transducer data) for the three water bodies for the start of the snapshot period are:

- Timber Pond – 6.88mAO
- South Pond - 6.39mAO
- River Cadoxton – 3.25mAO

The chart illustrates the response of the three water bodies to an assumed rainfall event that occurred on the 20th / 21st November 2017. Both the South Pond and the Timber Pond follow a similar trend with a short, sharp increase in surface water elevation (of approximately 0.018m and 0.024m respectively) between 13:45 and 21:15 on the 20th November, continuing with a gradual rise over the following five days to 6.43mAO for the South Pond and 6.94mAO for the Timber Pond.

The Timber Pond surface water elevation increased by approximately 0.06m over the event, whilst the South Pond increased by approximately 0.04m. These responses are interpreted as an almost immediate rise due to direct rainfall and any surrounding surface water run-off.

The data for the River Cadoxton for the 17th to the 20th November appears to indicate some form of tidal influence with a daily elevation range. The data seems to indicate some form of water level influence at the top of each tide. We understand that there is some form of sluice / flap valve on the end of the artificial Cadoxton channel. It appears that this is closed at the top of each tide and the river water behind the control structure backs up after it is closed and is rapidly released when re-opened. Tidal curves are sinusoidal, with very little change in height / amplitude over the half hour either side of high / low tide however what has been recorded here is the opposite – the greatest rate of change is at the peak (when the valve / sluice opens), followed by a rapid discharge then gradual decay in the head of water as the system approaches back to its natural equilibrium.

4.7 Surface water quality

4.7.1 Benzene, Toluene, Ethylbenzene & Xylenes (BTEX)

All results for the period Q1-2015 to Q3-2017 were reported as less than the Method Detection Limit (<MDL).

4.7.2 Volatile Organic Compounds (VOCs) and Site Specific compounds

Methanol, HMDS and D4 to D6 were not reported above the MDL in the surface water samples.

TMS only was reported in two samples from the River Cadoxton (SW3) in monitoring rounds 2016-Q1 and 2016-Q3 at concentrations of 130µg/l, and 260µg/l respectively. It is not considered that the VOC concentrations identified in the river are associated with the landfill. They are more likely to be associated with Dow ETP discharge.

Table C18 in **Appendix C** presents detections of MST and silicic acid in surface waters.

MST was reported in the 2017 rounds for two River Cadoxton locations SW2 and SW3, the Timber Pond, South Pond (2017-Q3 only) and Cadoxton North Pond (2017-Q3 only). The maximum reported concentration was 38.3ppm in the sample from the Timber Pond in 2017-Q1 (36ppm in 2017-Q3). Concentrations in the Timber Pond are elevated compared to other locations. The minimum reported concentration was 0.1ppm in both samples from SW2.

Silicic acid was reported at a maximum concentration of 12.9ppm in the sample from SW2 in 2017-Q1 and a minimum of 3ppm in the sample from the South Pond in 2017-Q3.

4.7.3 Metals

Table C19 in **Appendix C** presents the detections of metals in surface water samples for the six monitoring rounds 2016-Q1 to 2017-Q3.

Copper - The primary metal contaminant of potential concern was reported at a maximum surface water concentration of 19µg/l in the samples from the Timber Pond and the Cadoxton River SW3 location in 2017-Q3. This concentration is higher than the maximum reported concentration of 3.31µg/l from the Timber Pond, sampled during the previous AECOM monitoring round in 2015.

4.7.4 Inorganics

Table C20 in **Appendix C** presents a summary of results for surface waters.

5. Revised Conceptual Site Model

The assessment of the data provided by Dow indicates that the Conceptual Site Model (CSM) for the landfill and surrounding area remains broadly unchanged since 2015. The revised CSM as reported by AECOM in 2016 is included in **Appendix A**.

The following sections assess the results of the 2015-2017 groundwater monitoring data with regard to contaminant migration in the CSM, focusing on any siloxanes, silanols and copper (based on the previously identified COPC trimethylsilanol and copper).

5.1 Groundwater and surface water data summary

- The highest concentration for a BTEX compounds in the potential upgradient source wells was 31.19µg/l of o-xylene in BH312 in 2015-Q1. Detections of BTEX in Made Ground in landfill perimeter wells are consistent with previous detections of BTEX in soils at E5s2, E5s, E5m in 2015 (E5 is nearest the process plant area) and E8s and E8m. Ethylbenzene and Xylenes were more widely reported in Made Ground above the MDL in samples from E5, E6, E7 and E8 at a maximum concentration of 19.58µg/l p-xylene at E5s in 2017-Q1. Ethylbenzene was reported in 2016-Q3 for wells screened in the underlying natural sand strata (E5, E7, E8 and E9), whilst xylenes were reported on at least one occasion for each of the perimeter wells (E5, E6, E7, E8 and E9) with a maximum concentration of 16.05 µg/l of p-xylene at E5d in 2017-Q1. Detections of BTEX in downgradient wells were lower in concentration and less frequent, with a maximum of 7.31µg/l of m-xylene at BH201 from within underlying mudstone. BTEX was not reported above the MDL in surface water samples.
- Methanol was reported on two occasions, in samples from A2 in 2015-Q1 (4.93µg/l) and from BH312 in 2015-Q3 (3.48µg/l). Methanol was not reported in any samples from landfill perimeter wells, downgradient wells or surface water samples.
- D4 (octamethylcyclotetrasiloxane) was reported on one occasion at a concentration of 0.02µg/l in a sample from A2 (plant area) in 2015-Q3. D4 was reported on one occasion at a concentration of 1.76µg/l in a sample from CP2d (downgradient) in 2016-Q3 (installed in weathered mudstone bedrock). D4 was not reported in samples from landfill perimeter wells or surface water samples.
- D5 (decamethylcyclopentasiloxane) was reported in 2015-Q3 only in samples from A2, BH312 and BH412 at concentrations of 0.07, 0.06 and 0.08µg/l respectively. D5 was not reported in samples from landfill perimeter wells, downgradient wells or surface water samples.
- D6 (dodecamethylcyclohexasiloxane) was not reported above the MDL for the 2015-Q1 to 2017-Q3 monitoring rounds.

5.2 Trimethylsilanol (TMS) within groundwater and surface water

TMS was reported in each of the monitoring rounds at locations A2, BH312 and BH412, with the exception of A2 in 2015-Q1 (<MDL). The maximum reported concentration was 7.86mg/l in the sample from BH312 in 2016-Q1. In Made Ground wells on the landfill perimeter TMS was detected in each of the monitoring rounds with the exception of 2015-Q1. The maximum reported concentration is 5,920µg/l in the sample from E5m. Samples from E5s and E5m are consistently the highest concentrations in Made Ground, with a minimum of 4,020µg/l at E5m in 2016-Q3. E5 is located on the east perimeter of the current landfill area and is in relative close proximity to the Genesis plant and wells A2, BH312 and BH412 (potential up-hydraulic gradient sources). In natural sand at the landfill perimeter TMS was reported above the MDL in monitoring rounds 2015-Q3, 2016-Q3, 2017-Q1 and 2017-Q3. The maximum reported concentration is 2,450µg/l in a sample from E5d.

In downgradient wells TMS was reported above the MDL in all monitoring rounds with the exception of 2015-Q1. TMS was reported above the MDL in three samples from Made Ground (CP1s, CP2s and LF7). Samples from LF7 ranged in concentration from 90 to 200µg/l. In 2016-Q3 the concentration in the sample from CP1s was reported at 1,650µg/l and in 2017-Q3 the concentration in the sample from CP2s was reported at 1850µg/l. In natural sandy/silty ground TMS was reported in samples from downgradient wells LF7 and CP2m, at concentrations of between 90 to 200µg/l and 1,890 to 2,140µg/l respectively. This latter result of 2,140µg/l for the sample from CP2m in 2017-Q3 (the most

recent monitoring round) was the maximum reported concentration from a downgradient well. Samples from BH210, installed in the underlying weathered mudstone, ranged in concentration from 110 to 380µg/l. Higher concentrations were reported for two samples from CP2d, also installed in mudstone, at concentrations of 2,000µg/l (2016-Q3) and 1,830µg/l (2017-Q3).

Average concentrations of TMS are higher in 2017 than for previous rounds. Averages across the monitoring rounds are 1,750µg/l for the two Made Ground wells, 896µg/l within sandy natural ground and 728µg/l for the wells screened in underlying mudstone.

TMS was reported in two samples from the River Cadoxton (SW3) in monitoring rounds 2016-Q1 and 2016-Q3 at concentrations of 130µg/l, and 260µg/l respectively.

5.3 Methylsilanetriol (MST) and silicic acid within groundwater and surface water

Within Made Ground in the landfill area MST was reported in the 2017 rounds only at wells E5s, E6s, E7m and E8m. The maximum reported concentration was 169.6ppm in the sample from E7m, and a minimum of 0.4ppm in the sample from E6s. The average for landfill perimeter Made Ground is 78.45ppm. Within Made Ground in the landfill area silicic acid was reported for the same rounds and locations as MST at a maximum concentration of 16.9ppm in the sample from E7m and a minimum of 6.9ppm in the sample from E6s.

Within natural sand in the landfill area MST was reported in the 2017 rounds only at wells E5m, E5d, E6d, E7d, E8d, E9m and E9d. The maximum reported concentration was 150.8ppm in the sample from E8d, and a minimum of 0.6ppm in the sample from E9m. The average for landfill perimeter Made Ground is 40.15ppm. Silicic Acid was reported for the same rounds and locations as MST at a maximum concentration of 45.1ppm in the sample from E9d and a minimum of 14.9ppm in the sample from E5m.

At downgradient locations MST was reported in the 2017 rounds only at wells BH210, CP1m, CP1d, CP2s, CP2m and CP2d. In Made Ground MST was reported in two samples from CP2s at concentrations of 2.6ppm and 4ppm. In natural sand concentrations in two samples from CP2m ranged from 3ppm to 4.3ppm (<MDL for one sample from CP1m). In samples from underlying mudstone (BH210, CP1d and CP2d) concentrations ranged from <MDL (CP1d on two occasions) to 2.3ppm in a sample from CP2d in 2017-Q1. Silicic Acid was reported for the same rounds and locations as MST. In two samples from CP2s in Made Ground the reported concentrations were 12.3ppm (2017-Q1) and 29.6ppm (2017-Q3). In natural sand three detections were reported; 3.1ppm (CP1m 2017-Q1), 21ppm (CP2m 2017-Q1) and 31.1ppm (CP2m 2017-Q3). In underlying mudstone (BH210, CP1d and CP2d) concentrations ranged from <MDL (BH210 2017-Q1) to 21.1ppm in a sample from CP2d in 2017-Q3.

MST was reported in the 2017 rounds for two River Cadoxton locations SW2 and SW3, the Timber Pond, South Pond (2017-Q3 only) and Cadoxton North Pond (2017-Q3 only). The maximum reported concentration was 38.3ppm in the sample from the Timber Pond in 2017-Q1 (36ppm in 2017-Q3). Concentrations in the Timber Pond are elevated compared to other locations. The minimum reported concentration was 0.1ppm in both samples from SW2. Silicic Acid was reported at a maximum concentration in surface water of 12.9ppm in the sample from SW2 in 2017-Q1 and a minimum of 3ppm in the sample from the South Pond in 2017-Q3.

5.4 Copper

In plant area wells the primary metal contaminant of concern, copper, was reported at a maximum concentration of 21.95 µg/l in the sample from A2d in 2017-Q3. Copper was reported in samples from A2 in each round and are elevated compared to BH312 and BH412, with a lowest recorded concentration (for those >MDL) of 13.29 µg/l. Concentrations of copper in samples from BH312 and BH412 are lower than in samples from A2 by three orders of magnitude.

In Made Ground at the landfill perimeter copper was reported at a maximum concentration of 30.93µg/l in the sample from LF4 in 2015-Q3. Copper was reported above the MDL in six samples (LF4 – two samples, E1s, E5s, E5m and E7m). The second highest concentration was 11.63µg/l in the sample from E7m in 2017-Q3.

In natural sand at the landfill perimeter copper, was reported at a maximum concentration of 66.18µg/L in 2016-Q1 in the sample from E1m. This well is located marginally beyond the southern

edge of the landfill. Copper was reported on three other occasions, the second highest detection again from E1m in the preceding quarter 2015-Q3. The remaining two detections were an order of magnitude lower in E9m in 2017-Q1 (6.41µg/L) and E8d in 2017-Q3 (1.27µg/L). The majority of samples collected from natural sand CMT wells E5 to E9 on the landfill perimeter were reported as <MDL.

Copper was not reported in Made Ground well CP2s or in downgradient natural sand strata. One detection of copper was reported for wells installed in underlying mudstone, in a sample from BH210 in 2016-Q1 at a concentration of 9.08µg/L.

The copper concentrations reported above the MDL in the above groundwater samples are higher than the published bioavailable EQS of 1µg/l (EQS applicable only to downgradient surface water receptors).

5.5 Summary of groundwater gradient and potential pathways

The recorded groundwater levels within the Made Ground support the previously stated groundwater gradient from approximately south east (E6m 7.715m AOD, 2016-Q3) to north-north-west towards the Cadoxton ponds (5.594mAOD at CP2s, 2016-Q3). Based on the levels recorded within the landfill perimeter wells the degree of connectivity between shallow and deeper Made ground remains unclear, though levels within E5, E6 and E7 in 2017-Q1 are broadly similar.

Groundwater within deeper Made Ground may be in connectivity with the underlying sand in the eastern and southern boundaries of the landfill area based on the recorded levels at E5, E6 and E9, whilst the laboratory results, for example BTEX, suggest potential contaminant pathways may exist at each of the landfill perimeter wells E5 to E9.

The previously assumed groundwater gradient in underlying sand from south east (E1) to north-north-west towards the Cadoxton ponds is supported by the water levels recorded in the groundwater monitoring rounds.

5.6 Summary of potentially complete Source-Pathway-Receptor linkages

Figures 3, 4 and 5 of the 2016 AECOM report present conceptual cross sections for the landfill area (A-A', B-B' and C-C'), illustrating the refined geological model, hydrogeology, water level ranges and potential receptors. These are presented in **Appendix A**. The lines of the sections are presented on the Site Features Plan, Figure 1.

5.6.1 Sources

Review of the current data set supports the previous assessment, in that the primary source of contamination remains the landfill itself. Based on the variations in fill material previously encountered in both trial pits and boreholes, infill is considered as heterogeneous. The elevated contaminant concentrations recorded in the monitoring wells around the perimeter of the landfill are most likely to be from sources within the landfilled waste materials. However, it is noted that the area of infilling extends beyond the current licensed landfill boundary and as such, source contributions may also originate from outside of the current landfill boundary (as indicated by results from A2, BH312 and BH412), in particular, some hydrocarbons identified in E5 to the east of the current landfill and E6 to the south of the current landfill, though both of these wells are installed in historically infilled areas. Previous SPMP monitoring has indicated some elevated concentrations of contaminants (including copper and TMS) within the larger adjacent plant area. The previous conclusion that the landfill may be the primary contributor to any elevated contaminant levels observed in the area, but unlikely to be the sole source, is supported by the Dow groundwater data.

Previous assessment of the stockpiled materials on the landfill surface indicated that this material did have the potential to be a source of leachable contaminants, in particular copper, which through infiltration and subsequent migration from shallow to deeper Made Ground may impact on the underlying alluvial groundwater body. However, since the 2015 investigation the bulk of this material has been removed and disposed of off-site. The open and exposed nature of the previously stockpiled materials is likely to have contributed to the generation of dissolved copper that has been leached from the stockpiled material. At the time of the 2015 assessment, the stockpile materials were judged as being likely to result in an additional copper loading to the groundwater system and may have represented a proportion of the copper that had been recorded within the groundwater

monitoring wells. Although the stockpiled materials have been removed from site, any resulting additional dissolved copper loading from this source would be expected to still be present within the landfill or within the groundwater pathway.

5.6.2 Pathways

- Rainfall infiltration through the landfill surface, followed by leaching of contaminants from the waste mass and vertical migration to underlying groundwater / leachate within the made ground / landfill waste deposit. Infiltration of water into the landfill deposits and vertical migration through the fill may be exacerbated by the ponding of water on the landfill surface (copper was identified as the most significant contaminant of potential concern in the 2007 CSM / DQRA, but the 2015-2017 environmental monitoring data has reported a wider suite of COPC)
- Potential recharge of Timber Pond water to the landfill (increasing leaching potential) and / or migration of contaminated groundwater / leachate from the made ground fill to the Timber Pond. The flow direction(s) across the western boundary remain unclear, but could potentially vary according to season / water level changes within the Timber Pond and landfill waste mass. (Timber Pond water level data should be collected as part of every groundwater and surface water monitoring event)
- Lateral migration of contaminated groundwater within the made ground to adjacent / underlying natural strata, principally the natural sand layer identified within the alluvial strata sequence.
- Lateral contaminant migration within alluvial strata, followed by groundwater discharge into identified surface water receptors (principally Cadoxton Ponds, but also potentially the South Pond).

Since completion of the 2013 water level assessment, the western bund of the landfill was raised and widened with site derived demolition materials. It is therefore less likely that direct runoff from the landfill surface to the Timber Pond will occur and this pathway is not currently considered active. Since the 2015 site investigation lower water levels within the Timber Pond have been observed during site walkovers, supporting the case for the reduction of this pathway. However, the ponding of surface water along the western edge of the landfill between the western bund and demolition material stockpiles does provide hydraulic head for infiltration and potential vertical and / or lateral mobilisation of contaminants within the heterogeneous fill.

Contaminant migration from the landfill area is considered to most likely occur through groundwater flow through the alluvial deposits into which the original Timber Pond was constructed. The CSM originally considered the alluvium to comprise sands and fine grained silts, with sporadic coarser granular bands. Whilst these soils are all present, the refined 2015 CSM identified a defined alluvial sand strata underlying Made Ground as the primary groundwater carrier. This sand was identified in all CMT wells installed around the perimeter of the landfill and it is assumed that this sand, though varying in thickness, extends beneath the extent of the landfill. This was a refinement to the previous CSM, which was based on the pond having been largely excavated into the clayey silt alluvium only, with the more permeable alluvial sand being slightly deeper than the base of the pond / base of the infilled wastes.

5.6.3 Receptors

The most environmentally sensitive receptor is still considered to be the Cadoxton Ponds to the north of the site, reflecting the closeness of the receptor, identified groundwater gradient between the landfill and the ponds and the ecological sensitivity of the wildlife area / recreational fishing facility developed around the ponds. Groundwater flow within the shallow sand aquifer is predominately in the direction of the ponds, consistent with the observed reduction in groundwater head along the migration pathway between the landfill and the ponds.

A southern migration pathway, from the groundwater high in the south of the landfill to the South Pond and the Cadoxton River is also considered plausible, based on the available groundwater level data.

Hydraulic connectivity between the Timber Pond and the base of Made Ground / shallow sand on the western edge of the landfill is also considered likely. Groundwater elevation data suggests that there may be limited flow across this boundary, or that flow directions may be reversible dependent on the respective head differences between the pond water level and the groundwater head within the made ground.

6. Groundwater Risk Assessment

6.1 Objective

A pragmatic, risk based approach to capping the landfill and surrendering the Waste Management Licence has been agreed with NRW, but as an unlined landfill, i.e. with no engineered containment of the waste mass and any leachate, NRW has asked that the presence of hazardous substances and their potential to enter groundwater is assessed. It was also agreed that this pragmatic approach should include an element of risk based assessment, as typically used for land contamination sites (as described in **Section 2.3**). This section presents the methodology and results of the risk assessment.

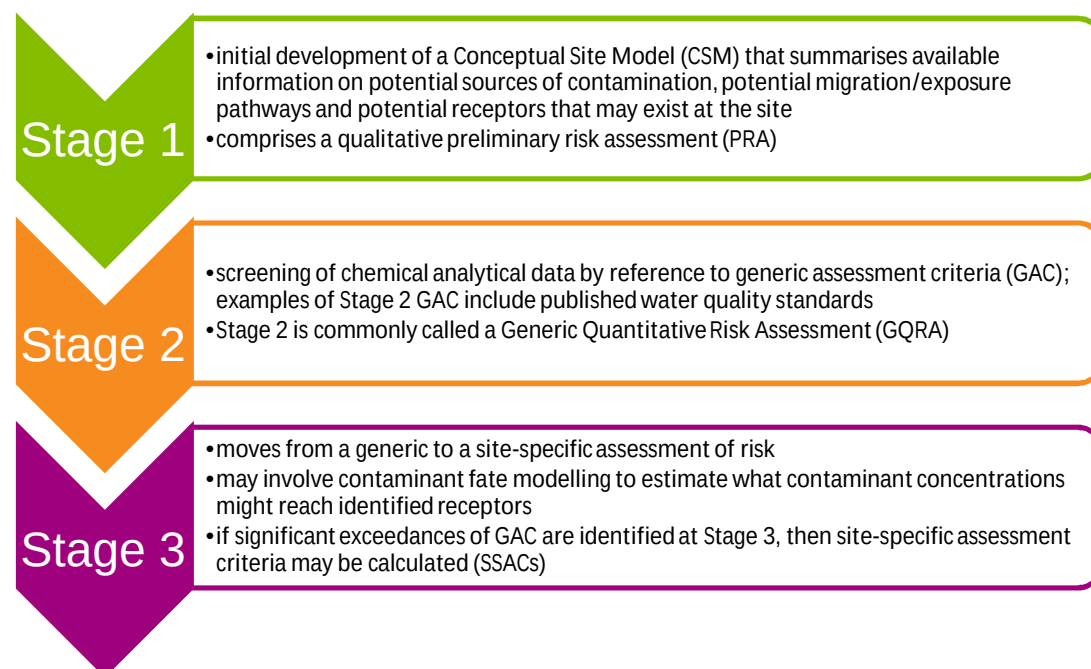
6.2 Methodology

A risk assessment was completed for site in 2007⁵ for the northern groundwater flow pathway between the landfill area and the down-hydraulic gradient surface water receptors at Cadoxton Ponds.

The 2015 site investigation⁶ collected soil samples from the waste mass, for soil and leachate analysis and groundwater samples from the landfill perimeter and down-gradient pathway. This data has been used to update the existing DQRA and to review the potential for future release of hazardous substances from the waste mass to groundwater.

Potentially contaminated land is assessed through the identification and assessment of pollutant linkages (i.e. source-pathway-target relationships) as defined in various guidance, including notably the Environment Agency's Contaminated Land Report no 11 (CLR 11) Model Procedures for the Management of Land Contamination (Environment Agency, 2004)⁷. Implicit in the guidance is the application of risk assessment, which aims to assess the significance of identified pollutant linkages i.e. whether they are likely to give rise to a significant risk. In broad outline, the adopted approach is illustrated in **Figure 6.1**.

Figure 6.1: Staged Assessment Approach, after CLR11



⁵ Dow Corning Landfill CSM Update, ref. 49310733/BRRP0001, URS Corporation Limited, 3rd October 2008

⁶ Dow Corning Barry Landfill Site Investigation Report, ref. 60469588 (47065177), AECOM Infrastructure & Environment UK Limited, dated May 2016

⁷ Model Procedures for the Management of Land Contamination, Contaminated Land Report 11, Environment Agency, 2004

The risk assessment presented here has been undertaken in general accordance with the methodology and principals set out the Environment Agency's Remedial Target Methodology⁸ and Groundwater Protection guidance⁹.

6.3 Stage 1: Preliminary Risk Assessment

6.3.1 Conceptual Site Model

The current CSM for the site in its current format (i.e. before capping of the landfill) is presented in **Section 5** and is illustrated in the figures presented in **Appendix A**. In summary, this comprises:

- Sources:
 - Investigation, sampling and analysis of the landfilled wastes indicates they represent a viable source of contamination;
 - Leachable metals were recorded for landfill waste mass samples, with copper being the primary contaminant of concern, along with leachable organic compounds;
 - Groundwater is present within the waste mass, where it is regarded as a leachate containing the leachable components of the solid waste materials;
 - Stockpiles previously held on the surface of the landfill are no longer present. Prior to removal in 2017, the stockpiles also represented viable contaminant sources of leachable copper and organic compounds;
 - Whilst adjacent areas of the infilled former Timber Pond are likely to contain similar materials, they were not infilled under the WML regime(s);
- Pathways:
 - Rainfall infiltration, followed by infiltration leaching of the waste mass and vertical migration to underlying groundwater / leachate within the Made Ground / landfill waste deposits;
 - Lateral and vertical migration of groundwater within the Made Ground to adjacent / underlying natural strata, principally the natural sand layer identified within the alluvial strata;
 - Lateral contaminant migration within alluvial strata, followed by groundwater discharge into identified surface water receptors (principally Cadoxton Ponds, but also possibly the South Pond);
 - Potential recharge of Timber Pond water to the landfill (increasing leaching potential) and / or migration of contaminated groundwater / leachate from the Made Ground fill to the Timber Pond;
- Receptors:
 - The most environmentally sensitive receptor is considered to be the Cadoxton Ponds to the north of the site, reflecting the closeness of the receptor, identified groundwater gradient between the landfill and the ponds and the ecological sensitivity of the wildlife area / recreational fishing facility developed around the ponds;
 - A southern migration pathway, from the groundwater high in the south of the landfill to the South Pond is also considered plausible, based on groundwater level data and chemical data, although groundwater level data suggest that flow directions could be reversible;
 - Hydraulic connectivity between the Timber Pond and the base of Made Ground / shallow sand on the western edge of the landfill is also considered likely. Groundwater elevation data suggests that there may be limited flow across this boundary, or that flow directions may be reversible dependent on the respective head differences between the pond water level and the groundwater head within the Made Ground.

⁸ Remedial Targets Methodology, Environment Agency, 2006

⁹ <https://www.gov.uk/government/collections/groundwater-protection>, accessed January 2018

6.3.2 Risk Evaluation

The presence of viable linkages by which substances of concern within the waste mass could reach surface water bodies (Controlled Waters), indicates a risk to these receptors. In accordance with the methodology outlined above, the assessment has progressed to Stage 2, a Generic Quantitative Risk Assessment (GQRA) to assess the identified risks in more detail.

Stage 2: Generic Risk Assessment

6.3.3 Screening Criteria Selection

A Stage 2 Generic Quantitative Risk Assessment (GQRA) has been completed for the substances identified in soil leachate and groundwater samples. Detected concentrations have been compared to Generic Assessment Criteria (GAC) protective of the identified surface water receptors. If concentrations fall below these criteria, the substance is not considered to pose an unacceptable risk to the receptor.

For Controlled Waters (CW), Stage 2 GAC based on Environmental Quality Standards (EQS) for fresh waters have been selected according to the following hierarchy:

- The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 - AA-EQS Inland;
- The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 - MAC-EQS Inland;
- The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 - Freshwater Standards;
- The Water Environment (River Basin Management Planning etc.) (Miscellaneous Amendments) (Scotland) Regulations 2015. Scottish SI 2015 No. 211. AA-EQS Inland;
- SEPA - Supporting Guidance (WAT-SG-53) Environmental Quality Standards for Discharges to Surface Waters. v6. Dec 2015. Fresh EQS – AA;
- SEPA - Supporting Guidance (WAT-SG-53) Environmental Quality Standards for Discharges to Surface Waters. v6. Dec 2015. Fresh EQS – MAC;
- PNEC derived for EU REACH registration dossiers - Freshwater.

In addition, the PNEC value derived for trimethylsilanol (124 µg/l) during the 2007 QRA has been adopted for the current assessment.

Whilst there is not a comprehensive set of freshwater EQS screening criteria values for all compounds and some substances may not have been screened, or may have been screened against values based on non-UK environmental standards. Where non-UK based values have been used, they are cited in order to provide some context to the magnitude of the recorded concentrations for those respective contaminants and do not represent regulatory standards.

For the purpose of this assessment, trimethylsilanol and the other silanols are assumed to be non-hazardous pollutants as discussed in **Section 2**.

6.3.4 Data Screen

Data collected during the 2015 investigation¹⁰ and monitoring conducted at the site between 2015 and 2017 has been reviewed and screened against the selected assessment criteria to identify substances of concern for more detailed risk assessment.

6.3.5 Landfill Area / Source Area

The leachate data collected from waste materials within the landfill area has been used to assess potential input of hazardous substances and non-hazardous pollutants from the waste mass.

¹⁰ AECOM Infrastructure & Environment UK Limited, Dow Corning Barry Landfill Site Investigation Report, ref. 60469588 (47065177), dated May 2016

The use of leachate data, supported by the groundwater data collected from wells screened in the Made Ground around the landfill's periphery over the soil data is considered a reasonable indication of potential leaching and mobility, and thus the input to groundwater. This preference for soil leachate and shallow groundwater data over results from soils is as described in published risk assessment guidance¹¹.

The following substances were identified in the waste leachate samples collected from the trial pits and detected at concentrations above available assessment criteria are summarised in **Table 6.1**, below. Full results are presented in **Table E1** in **Appendix E**.

Table 6.1 - Substances Detected in excess of Assessment Criteria in Waste Leachate Samples Collected within the Landfill

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
2,4-dichlorophenol	µg/l	1	4.20	57.00	13.57
Benzene	µg/l	1	10.00	10.60	1.06
<i>Bis(2-ethylhexyl) phthalate</i>	µg/l	1	1.30	4.66	3.59
Cadmium	µg/l	2	0.08	0.21	2.56
<i>Chloride</i>	mg/l	11	250	3,580	14.32
Chromium (hexavalent)	µg/l	2	3.40	82.40	24.24
<i>Copper</i>	µg/l	11	1.00	638	638
<i>Nickel</i>	µg/l	10	4.00	18.60	4.65
<i>Phenol</i>	µg/l	3	7.70	65.30	8.48
<i>Vanadium</i>	µg/l	3	20.00	257	12.85
Total Xylene	µg/l	1	30.00	299	9.97

Hazardous substance

Non-hazardous pollutant

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

The hazardous substances arsenic, lead and mercury were also detected in these samples but concentrations did not exceed the relevant assessment criteria (arsenic: 50 µg/l; lead: 1.2 µg/l; mercury: 0.07 µg/l).

Background

The wells located outside the licensed landfill boundary and former landfill area (A2d, BH312, BH412) have been taken as being representative of background, or up-gradient concentrations, along with data from the Cadoxton River, upstream of the site (location SW2). The substances identified in the samples from these locations at concentrations above available assessment criteria are summarised in **Table 6.2**, and **Table 6.3**. Full results are presented in **Table E2** in **Appendix E**.

Table 6.2 - Substances Detected in excess of Assessment Criteria in Groundwater Samples Collected from Active Plant Wells (potential up-gradient / background)

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Benzene	µg/L	3	10.00	11.47	1.15
Cadmium	µg/l	9	0.08	2.26	28.00
<i>Copper</i>	µg/l	10	1.00	21,950	21,950

¹¹ Remedial Targets Methodology, Environment Agency, 2006

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Ethylbenzene	µg/l	3	20.00	35.74	1.79
<i>Iron</i>	µg/l	8	1,000	6,550	6.55
Lead	µg/l	17	1.20	120	100
<i>Manganese</i>	µg/l	14	123	1,003	8.15
Mercury	µg/l	3	0.07	25	362
<i>Nickel</i>	µg/l	8	4.00	115	28.80
Toluene	µg/l	3	74.00	100	1.35
<i>Zinc</i>	µg/l	7	10.90	146	13.40
Total Xylene	µg/l	11	30	152	5.07
<i>Trimethylsilanol</i>	µg/l	17	124	7,860	63.39

Hazardous substance*Non-hazardous pollutant*

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

Table 3.3 - Substances Detected in Surface Water Samples Collected from the Cadoxton River Upstream of the Site

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
<i>Aluminium</i>	µg/l	5	15.00	437	29.16
Cadmium	µg/l	1	0.08	1.46	18.25
<i>Copper</i>	µg/l	5	1.00	7.01	7.01
Lead	µg/l	1	1.20	3.88	3.23
Mercury	µg/l	1	0.07	53.19	760
<i>Zinc</i>	µg/l	1	10.90	11.78	1.08

Hazardous substance*Non-hazardous pollutant*

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

Made Ground around the Landfill Perimeter

The wells located around the licensed landfill boundary and screened within the Made Ground¹² provide information on concentrations in leachate and groundwater within the source area. The substances identified in the samples from these locations at concentrations above available assessment criteria are summarised in **Table 6.4**. Full results are presented in **Table E2** in **Appendix E**.

¹² Locations: E1s, E5m, E5s, E5s2, E6m, E6s, E7m, E7s, E8m, E8s, E9s, LF4, LF6, LF7

Table 6.4 - Substances Detected in excess of Assessment Criteria in Groundwater Samples Collected from Peripheral Wells screened in the Made Ground

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Aluminium	µg/l	4	15.00	36.04	2.40
Arsenic	µg/l	5	50.00	68.50	1.37
Bis(2-ethylhexyl) phthalate	µg/l	1	1.30	3.75	2.89
Cadmium	µg/l	14	0.08	4.46	55.81
Chloride	mg/l	13	250	12,100	48.40
Copper	µg/l	18	1.00	142	142
Iron	µg/l	38	1,000	51,300	51.30
Lead	µg/l	24	1.20	59.04	49.20
Manganese	µg/l	36	123	10,090	82.03
Mercury	µg/l	18	0.07	55.48	793
Nickel	µg/l	18	4.00	60.10	15.03
Phenol	µg/l	2	7.70	16.90	2.20
Zinc	µg/l	8	10.90	43.60	4.00
Total Xylene	µg/l	2	30	43.24	1.44
Trimethylsilanol	µg/l	29	124	5,920	63.39

Hazardous substance*Non-hazardous pollutant*

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

The results show the presence of both hazardous substances and non-hazardous pollutants at concentrations in excess of GAC. However, comparison to the data for the up-gradient wells (**Table 5**) shows that many of these substances are also present at similar levels outside of the permitted landfill area. This includes trimethylsilanol. Copper was detected at higher levels in the up-gradient samples than in peripheral wells.

Natural Sand around the Landfill Perimeter and Pathway to Cadoxton Ponds

The wells¹³ located around the licensed landfill boundary and screened within the Natural Sands, plus those within this groundwater body down-hydraulic gradient towards Cadoxton Ponds (CP1m and CP2m), provide information on concentrations in groundwater within the potential migratory pathway. The substances identified in the samples from these locations at concentrations above available assessment criteria are summarised in **Table 6.5**. Full results are presented in **Table E2** in **Appendix E**.

¹³ Locations: E1m, E4s, E5d, E6d, E7d, E8d, E9d, E9m

Table 6.5 - Substances Detected in excess of Assessment Criteria in Groundwater Samples Collected from Peripheral and Pathway Wells screened in the Natural Sands

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Aluminium	µg/l	2	15.00	271.25	18.08
Arsenic	µg/l	2	50.00	55.70	1.11
Boron	µg/l	3	2000	2089	1.05
Cadmium	µg/l	6	0.08	1.62	20.29
Chloride	mg/l	9	250	18,100	72.40
Copper	µg/l	12	1.00	66.18	66.18
Iron	µg/l	30	1,000	29,500	29.50
Lead	µg/l	20	1.20	51.34	42.79
Manganese	µg/l	27	123	10,212	83.02
Mercury	µg/l	13	0.07	10.81	154
Nickel	µg/l	17	4.00	59.20	14.80
Zinc	µg/l	6	10.90	34.89	3.20
Trimethylsilanol	µg/l	20	124	2,450	47.74

Hazardous substance

Non-hazardous pollutant

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

The results for the groundwater sampled in the natural sands show a similar range of substances and level of exceedance to those for the peripheral wells screened in the Made Ground. However the results are also similar to those for the up-gradient wells. This makes it difficult to distinguish background contributions to those from the permitted landfill.

Potential Surface Water Receptors

Samples collected from Cadoxton Ponds could reflect the potential discharge of substances migrating from the landfill to this receptor. In addition, the South Pond, Timber Pond and the Cadoxton River southeast of the landfill (location SW3) could also form potential receptors or provide additional information on surface water conditions in this area. The substances identified in the samples from these locations at concentrations above available assessment criteria are summarised in **Table 6.6**. Full results are presented in **Table E2** in **Appendix E**.

Table 6.6 - Substances Detected in excess of Assessment Criteria in Surface Water Samples from Potential Receptors

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Aluminium	µg/l	18	15.00	432	28.78
Cadmium	µg/l	5	0.08	22.19	277
Chloride	mg/l	4	250	950	3.80
Copper	µg/l	27	1.00	18.68	18.68
Iron	µg/l	1	1,000	1,630	1.63
Lead	µg/l	11	1.20	24.72	20.60
Manganese	µg/l	15	123	731	5.94

Substance	Units	Number of Results Exceeding	Assessment Criteria	Maximum Detected Concentration	Exceedance Factor
Mercury	µg/l	10	0.07	143	2,041
<i>Nickel</i>	µg/l	2	4.00	4.83	1.21
<i>Zinc</i>	µg/l	10	10.90	28.20	2.59
<i>Trimethylsilanol</i>	µg/l	2	124	260	2.10

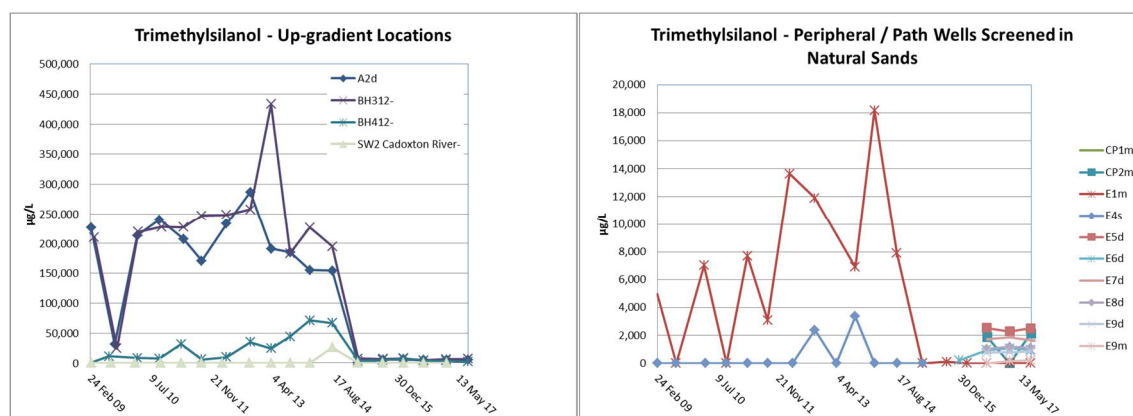
Hazardous substance*Non-hazardous pollutant*

*: Exceedance factor calculated for maximum detected concentration of that substance and is the ratio of maximum reported concentration over the assessment criteria

Whilst some of the detected concentrations and exceedance factors equal to or greater than those for groundwater in the Made Ground or sand, the samples giving these results were generally taken from the South Pond, SW3 on the Cadoxton River or the Timber Pond, rather than the Cadoxton Ponds. In addition, the data from SW2 (Table 6.3) indicates the presence of some of these chemicals, including mercury upstream of the site.

6.3.6 Time-series Data

Time series data for the five key chemicals has been plotted for each set of monitoring locations (e.g. peripheral wells, surface waters). These plots are presented on Figure E1 to Figure E5 in Appendix E. Examples are provided below in Figure 6.1, below.

Figure 6.1: Trimethylsilanol Concentrations Detected during monitoring 2007-2017

Review of the plots presented in Appendix E provides further evidence of the levels of substances of concern up-gradient / up-stream of the landfill, particularly for copper and trimethylsilanol. In particular, a notable decrease is seen when comparing results from up-gradient or peripheral wells screened in the Made Ground to data from the wells screened in the Natural Sands.

Data for metals including cadmium, lead and mercury was only available for 2014 to 2017. The time series plots for these also show differences in concentrations detected between the different parts of the migratory pathway. However, some corresponding trends are notable at each stage in the pathway.

6.3.7 Risk Evaluation

The data summarised in **Table 6.1** to **Table 6.6** provides evidence of the level of risk posed to Controlled Waters in the Cadoxton Ponds. Substances of concern have been detected at concentrations above assessment criteria, and the resulting exceedance factors give an indication of the magnitude of the potential hazard. This assumes migration from the landfill to the surface water bodies, which is considered a viable pathway based on the current CSM, i.e. prior to capping of the landfill. Further details are as follows:

- Based on the known history of waste deposition, the magnitude of the hazard indices and their detection at multiple points along the potential migratory pathway, copper, trimethylsilanol, mercury, lead and cadmium may pose a greater hazard than the other substances detected, with exceedance factors of two to three orders of magnitude. It is noted that only the latter three are classified as hazardous substances with respect to groundwater¹⁴;
- Although some organic compounds were detected at concentrations above GAC in the waste leachate samples (benzene, xylene and 2,4-dichlorophenol) these were either not recorded above analytical detection limits, or not detected in excess of the GAC in the groundwater samples collected from peripheral wells screened in the Made Ground. A fourth substance detected in excess of GAC in the leachate, hexavalent chromium, was not analysed in the perimeter groundwater samples;
- Whilst hazardous substances have been detected within the alluvial sand strata around the perimeter of the landfill, it is not clear whether they entered groundwater as a result of leaching from the waste mass or from other potential sources in the surrounding area, as indicated by the data from up-gradient wells (e.g. maximum detected copper concentration 2015-2017: up-gradient - 21,950 µg/l; periphery - 142 µg/l).

6.4 Stage 3: Detailed Quantitative Risk Assessment

6.4.1 Assessment Approach

With a number of substances detected in excess of GAC, the assessment progressed to a more detailed, site-specific appraisal of the risk. This was carried out for copper and trimethylsilanol, the key chemicals considered in the previous QRA. In addition, the hazardous substances cadmium, lead and mercury have also been considered further, given the frequency and magnitude of detection. However, it is noted that they were also detected in up-gradient background wells at comparable levels.

The assessment has been carried out using the Environment Agency's Remedial Targets Worksheet¹⁵. Input parameters and assumptions are presented in **Table 6.7** and **Table 6.8**, below. Model print outs are presented in **Appendix E**.

Table 6.7 - Stage 3 Model Input - Pathway Parameters

Parameter	Symbol	Value	Units	Source
Width of plume in aquifer at source (perpendicular to flow)	Sz	190	m	Width of landfill, closest to the receptor, perpendicular to groundwater flow
Plume thickness at source	Sy	4	m	Based on review of updated 2016 CSM
Saturated aquifer thickness	da	4	m	Assume same as plume thickness
Bulk density of aquifer materials	r	1.7	g/cm ³	From URS QRA ¹⁶ (Fill material, literature value)

¹⁴ <http://www.wfduk.org/resources/groundwater-hazardous-substances-standards>, accessed January 2018.

¹⁵ <https://www.gov.uk/government/publications/remedial-targets-worksheet-v22a-user-manual>, accessed January 2018

¹⁶ URS QRA: Phase II Soil and Groundwater Investigation, URS (formerly Dames & Moore), 9 June 1999

Parameter	Symbol	Value	Units	Source
Effective porosity of aquifer	n	0.2	fraction	From URS QRA
Hydraulic gradient	i	0.08	fraction	Estimated using 2015 to 2017 data
Hydraulic conductivity of aquifer	K	0.47	m/day	From URS QRA
Distance to compliance point	x	90	m	Shortest distance in direction of groundwater flow from landfill to Cadoxton Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0	m	Compliance point assumed to be along flow path
Distance (depth) to compliance point perpendicular to flow direction	y	0	m	Flow assumed to be horizontal
Fraction of organic carbon in aquifer	foc	0.0118	fraction	From URS QRA

Table 6.8 - Stage 3 Model Input - Chemical Parameters

Chemical	Parameter	Symbol	Value	Units	Source
Copper	Initial contaminant concentration in groundwater at plume core	C0	0.066	mg/l	Maximum detected in Natural Sands, 2015 to 2017
	Half-life for degradation of contaminant in water	t1/2	9E+99	days	Default for no degradation in Remedial Targets model
	Partition coefficient	Kd	540	l/kg	From URS QRA
Trimethylsilanol	Initial contaminant concentration in groundwater at plume core	C0	2.45	mg/l	Maximum detected in Natural Sands, 2015 to 2017
	Half-life for degradation of contaminant in water	t1/2	9E+99	days	Default for no degradation in Remedial Targets model
	Organic carbon partition coefficient	Koc	48.6	l/kg	Derived for 2008 QRA
Cadmium	Initial contaminant concentration in groundwater at plume core	C0	0.002	mg/l	Maximum detected in Natural Sands, 2015 to 2017
	Half-life for degradation of contaminant in water	t1/2	9E+99	days	Default for no degradation in Remedial Targets model
	Partition coefficient	Kd	2,560	l/kg	CLEA UK
Lead	Initial contaminant concentration in groundwater at plume core	C0	0.051	mg/l	Maximum detected in Natural Sands, 2015 to 2017
	Half-life for degradation of contaminant in water	t1/2	9E+99	days	Default for no degradation in Remedial Targets model
	Partition coefficient	Kd	36,000	l/kg	From URS QRA

Chemical	Parameter	Symbol	Value	Units	Source
Mercury	Initial contaminant concentration in groundwater at plume core	C0	0.01	mg/l	Maximum detected in Natural Sands, 2015 to 2017
	Half-life for degradation of contaminant in water	t1/2	9E+99	days	Default for no degradation in Remedial Targets model
	Partition coefficient	Kd	7,500	l/kg	CLEA UK

The model has been run for migration in groundwater in the Natural Sands from the landfill's north-western periphery to the Cadoxton Ponds. This is considered to be the principal pathway, given the groundwater elevations and changes in hydraulic head along the pathway.

The model has been run for the following scenarios for each chemical of concern:

- Base case – current situation;
- Post cap installation – assuming a 80% reduction in groundwater flux; and
- Post cap installation – assuming a 90% reduction in groundwater flux.

The estimated reduction in groundwater flux after installation of the landfill cap is based on the discussion presented in **Section 7.1**. To simulate this reduction, the hydraulic gradient has been reduced in the model to achieve the specified decrease in flux. For the base case, the gradient was 0.08; for the 80% reduction, 0.016; and for the 90% reduction, 0.008. This also provides an assessment of the sensitivity of the model to input parameters.

6.4.2 Model Results

Travel Times

The model calculated the following un-retarded groundwater travel times in the Natural Sands from the northern edge of the landfill to Cadoxton Ponds (assuming a 90 m travel distance):

- Base case – current situation: 1.3 years;
- Post cap installation – 80% reduction in flux: 6.6 years; and
- Post cap installation – 90% reduction in flux: 13 years.

The simulated retarded travel times in groundwater in the Natural Sands from the northern boundary of the landfill to the Cadoxton Ponds are presented in **Table 6.9**, below.

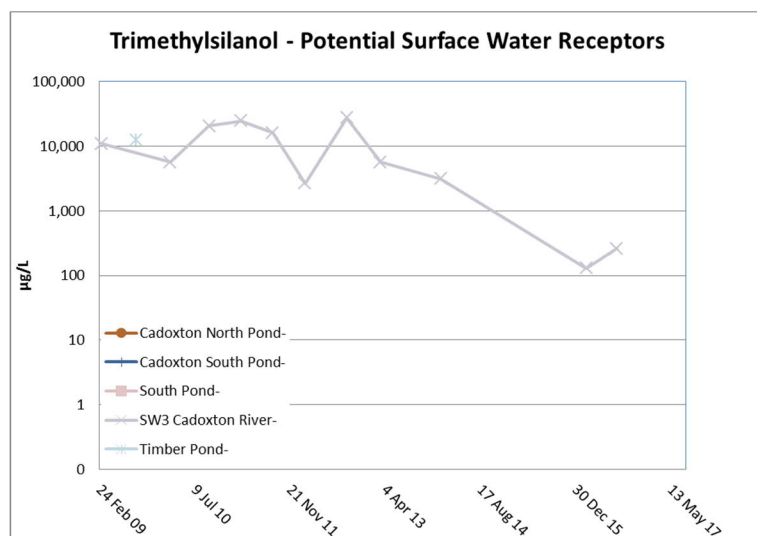
Table 4 - Estimated Retarded Travel Times

Chemical	Estimated Retarded Travel Times (years)		
	Base Case - Current Situation	80% reduction in flux	90% reduction in flux
Copper	6,000	30,100	60,200
Trimethylsilanol	7.7	39	77
Cadmium	28,500	142,700	285,400
Lead	401,300	2,006,700	4,013,400
Mercury	83,600	418,100	836,100

These are steady state travel times that assume breakthrough of the chemical at the pond at a single point in time and do not take into account dispersion in the groundwater body. They also assume a constant source term over time, which is a conservative assumption. Even without the installation of the landfill cap there is a considerable delay before the metals are calculated to reach the pond. The cap is shown to then increase the travel times by up to an order of magnitude.

For trimethylsilanol, the travel times are considerably lower and indicate it could have already reached the Cadoxton Ponds. However review of monitoring data collected to date shows that it has not been detected in either the north or south pond at concentrations above analytical detection limits (see **Figure 6.2**, below and **Figure E1** in **Appendix E**).

Figure 6.2: Trimethylsilanol in Surface Waters – 2007 to 2017



Note: non-detects reported as zero are not plotted

The travel times presented in **Table 5.9** for copper and trimethylsilanol are comparable to the travel times estimated during the previous risk assessment in 2008. These were 5,550 to 37,450 years for copper and 9 to 48 years for trimethylsilanol. The differences between the current and previous results are due to changes in modelled pathway properties (e.g. aquifer saturated thickness) due to update and revision of the CSM to incorporate new data.

Review of data for CP1m and CP2m, screened in the natural sands on the pathway, down-hydraulic gradient of the landfill towards the Cadoxton Ponds provides some evidence of possible migration of trimethylsilanol with periodic detection at CP2 in 2016 and 2017. However, data for metals is less conclusive as detected concentrations in these two wells are similar to those observed around the landfill and also in up-gradient / background wells.

Based on the current DQRA results, the likelihood of these substances migrating from the landfill to the Cadoxton Ponds is considered low over a practical time scale (decades to centuries). This likelihood, and associated risk, is anticipated to reduce after installation of the landfill cap, reflecting the reduced infiltration and groundwater flux.

Simulated Concentrations

The concentrations simulated in groundwater in the Natural Sands at the point immediately prior to discharge into the Cadoxton Ponds, are presented in **Table 6.10**, below. These do not allow for any dilution in the receiving water body, and also assume a constant source mass and steady state (i.e. the concentration ultimately achieved at the receptor based on the constant source term).

Table 6.105 - Simulated Concentrations of Chemicals Concern in Natural Sands Groundwater Discharging to the Cadoxton Ponds

Chemical	EQS (µg/l)	Estimated Concentration at Receptor (µg/l) Assumed Steady State		
		Base Case - Current Situation	80% reduction in flux	90% reduction in flux
Copper	1	45	45	45
Trimethylsilanol	124	1,665	1,665	1,665
Cadmium	0.08	1	1	1
Lead	1.2	35	35	35
Mercury	0.07	7	7	7

As the results assume steady state conditions, the simulated concentrations of each chemical at the receptor are the same regardless of flux. However, as shown in Table 6.9, the anticipated reduction in rainfall recharge and groundwater flux which is provided by the installation of a low permeability cap, increases the breakthrough time for these contaminants by an order of magnitude.

Exceedance factors (the ratio of the simulated concentration over the assessment criteria (EQS/GAC)) have been calculated for the simulated concentrations and are presented in **Table 6.11**, below.

Table 6.11 - Exceedance Factors for Chemicals Concern in Natural Sands Groundwater Simulated to be Discharging to the Cadoxton Ponds

Chemical	Exceedance Factor		
	Base Case - Current Situation	80% reduction in flux	90% reduction in flux
Copper	45	45	45
Trimethylsilanol	13	13	13
Cadmium	17	17	17
Lead	29	29	29
Mercury	97	97	97

The exceedance factors indicate that simulated concentrations in groundwater entering the Cadoxton Ponds would, in the long term, exceed the relevant assessment criteria by over an order of magnitude. However, the time for this to occur could be in the order of 10,000s to 100,000s of years or more, as shown in **Table 6.9**.

6.4.3 Risk Evaluation

The exceedance factors indicate that simulated concentrations in groundwater in the Natural Sands discharging into the Cadoxton Ponds would exceed the relevant assessment criteria by over an order of magnitude. However, the likelihood of this hazard being realised, and thus the overall level of risk, is considered to be low. This reflects the long travel times to reach the receptor plus the conservative assumptions underlying these estimates¹⁷.

Whilst it is noted that cadmium, lead and mercury are hazardous substances whose entry into groundwater is to be prevented, all three have already been detected in groundwater in the Made

¹⁷ Conservative assumptions: constant source, steady state, no dilution at the receptor, and no consideration of the averaging effects of time against EQS given as annual averages (cadmium and lead).

Ground and Natural Sands around the periphery of the landfill and are therefore regarded as having entered groundwater historically. The assessment has considered their potential impact through migration in the Natural Sands and migration of chemicals in leachate emanating from a uncapped or capped landfill in the future.

There is evidence of the chemicals of concern considered in the Stage 3 assessment in groundwater samples collected from the Made Ground up-hydraulic gradient / outside of the permitted boundary of the landfill and in the Cadoxton River upstream of the site. The detection of the chemicals of concern in groundwater in the Natural Sands, or surface water in the Cadoxton Ponds could, therefore, result from inputs from these sources, rather than the permitted landfill area.

The simulated effect of the capping of the landfill indicates that this proposed strategy should have a notable effect on the potential flux of chemicals in groundwater. The reduction in risk based on the capping reflects the reduced infiltration and driving hydraulic head, the resulting reduced groundwater flux and the extensive disruption and near severing of this source-pathway-receptor linkage.

7. Conceptual Landfill Capping Design

7.1 Rationale for Proposed Landfill Capping

Environmental monitoring has historically detected copper and TMS within groundwater around the perimeter of the landfill. Copper is a characteristic contaminant associated with the process waste deposited within the landfill and is considered to be the key risk driver for contaminant migration to the down gradient surface water receptors.

The landfill was closed (for receipt of wastes) in 2003, but the surface has not been restored to any approved restoration scheme. The original Planning Consent required that waste was infilled into the former Timber Pond area to a maximum of 1' (0.3m) below the prevailing surrounding ground level.

This planning condition prevented the ground levels being raised and shaped to a profile that would assist rainfall run-off and minimise water infiltration into the waste mass. Infiltration of water into the waste mass promotes the leaching of contaminants and the generation of leachate. With an unlined void space, rainfall infiltration also provides a driving hydraulic head for downward migration of leachate / contaminants into the underlying and surrounding groundwater system.

The current extent of rainfall infiltration into the waste is not known. The waste materials include hydrophobic silicone crumb residues and the site often exhibits surface water flooding, indicating poor drainage and potentially low rates of infiltration into the wastes. However, the existing flat surface and lack of engineered drainage or natural decant outlet also suggests that rainwater accumulates on the landfill surface until it either soaks into the waste mass or evaporates. No vegetation is present, suggesting that the only losses will be via infiltration to the waste mass or evaporation.

Water level data from the CMT wells installed in the edge of the fill reveal a downward hydraulic gradient, adding to evidence of rain water infiltration. The chemical profile from the CMT well samples also suggests downward migration of water and progressive leaching of contaminants.

The nearest weather monitoring station, at St Athan, approximately 7km west of Barry, records a long term average (LTA) rainfall of 998.9 mm/annum¹⁸. In the absence of any run-off or engineered drainage, infiltration could be assumed to be as high as 80% of LTA, giving an infiltration / effective rainfall figure of circa 790 mm/annum. For the approximately 45,000m² of exposed planar waste surface that constitutes landfill Zones A and D, this potentially amounts to an annual recharge rate / groundwater flux of 35,640 m³/annum.

Providing a better gradient profile and capping the landfill with a low permeability barrier, such as a geosynthetic clay liner (GCL) or flexible membrane liner (FML), would be expected to reduce infiltration to 50-100 mm/annum, equivalent to recharge of 2,250 – 4,500 m³/annum (potentially representing a circa 90% reduction in rain water infiltration to the waste mass).

This reduction in infiltration, recharge and potential groundwater flux is expected to reduce contaminant leaching and mobility to groundwater. Reducing infiltration will reduce the standing leachate head within the waste and potentially reduce the head driving leachate migration from the waste mass to the underlying / surrounding alluvial strata. The one caveat is that a reduced internal leachate level may induce cross boundary flux from the standing head of water within the Timber Pond. Ongoing groundwater and surface water monitoring will establish whether this is occurring.

7.2 Proposed Capping Areas

The proposed capping areas are:

- Zone A – approx. 40,200m². Main area of the operationally landfill site and within the boundary of Waste Management Licence No. 38. This area will be capped and restored prior to licence surrender.
- Zone B – Contractor's Yard – approx. 14,500m². This area is outside of the landfill fence line, but within the licence boundary. This area will be surfaced with a dense asphaltic concrete (DAC)

¹⁸ St Athan LTA rainfall 1981-2010 (<https://www.metoffice.gov.uk/public/weather/climate/gcjs3tzpf>)

or similar bituminous hard surface, with segregated drainage. The area will be spilt to provide a car park on the current equipment lay down area, with retention of the Contractor's Yard and existing steel portal framed buildings.

- Zone C – W941 Distillation Process area and apron. Not included within capping project.
- Zone D – Southern landfill area – approx. 4,500m². This area was part of the operational landfill, but was not included within the licensed area. Zone D will be capped and restored as part of Zone A.

7.3 Conceptual Design

Outline and detailed designs will be developed as NRW and Vale of Glamorgan Council regulatory approvals are sought and obtained. The intention is to obtain NRW approval in principle on the basis of the conceptual design presented in this Landfill Closure Report. This will be followed by outline design to support the application for Planning Consent, followed by detailed design work to support contract preparation and contractor procurement.

The conceptual design is based on:

- **Preparation works** – The existing waste surface will be re-graded to provide a minimum 1:200 gradient from east to west. The western extent will be set at an elevation just above the Timber Pond water level, with the waterside edge detail bench to be developed during the design process. The edge bench level will allow surface water drainage from above the cap to directly run off to the Timber Pond. The gently sloping new landform will help to promote run-off to the west, whilst minimising the volume of fill materials required to establish a gradient on the landfill cap. A 3-D model and materials balance has not yet been developed, but the re-grading of the existing surface should minimise the cost and sustainability issues and cost of importing large quantities of soil or other fill from off-site sources.
- **Capping works.** The prepared formation will be trimmed and proof rolled prior to laying a liner base layer. This will comprise 300mm of <20mm ("20mm to dust") material. A thinner layer may be possible, again to minimise soil import, but the 300mm basal layer thickness should prevent GCL (if used) making contact with and contaminated soil materials that may impair the swelling and hydraulic performance of the bentonite. The basal layer will be trimmed and rolled to prevent rutting during capping layer deployment.
- Cap materials will be deployed directly onto the prepared basal layer, according to the manufacturer's specification and will be covered with a liner protection layer of 300mm <20mm ("20mm to dust").
- Impermeable surfacing to the Contractors Yard will be formed from 100mm DAC over a suitable sub-base.
- All soil, preparation layer and lining materials will be selected and approved in advance.
- **Restoration works.** A soil-forming layer of minimum 300mm thickness will be placed over the liner protection layer. The final soil thickness will be agreed based on planting and vegetation requirements. The cap will be hydroseeded with an agreed seed mix (to the approval of the local planning authority), to provide rapid establishment of vegetation cover. This will help reduce run-off erosion after soil placement and help in the rapid "re-greening" of the site. Restoration soils will be imported from a selected and approved off-site source.
- **Drainage works.** The landfill cap will drain directly to the Timber Pond. The Timber Pond has no known outlet to surface waters. To reduce flood risk associated with Timber Pond water levels, a new outlet pipe will be extended beneath the south access road, discharging to the area between the south access road's embankment and the Cadoxton Ponds. This low-lying area is currently vegetated with grass and scrub and forms part of the site nature area. To mitigate storm induced rapid run-off from the reinstated cap area, the run-off will be discharged via the Timber Pond, to the existing wetland area(s) within the low-lying ground between the south access road and the Cadoxton Ponds. The wetland will also help to provide some phyto-remediation capacity for contaminants entrained within the shallow groundwater flow pathway.
- Drainage from the Contractor's Yard area will be via a three stage interceptor with isolation valve, discharging to the engineered wetland via a new pipeline beneath the south access road.

- Water flows from the wetland will enter the Cadoxton Pond system, finally being pumped from the nature area to Barry Docks, via the existing Dow pump station.

All works will be undertaken under an approved Construction Quality Assurance (CQA) Plan and Environmental Monitoring Plan (EMP). CQA verification activities will be undertaken by a CQA Supervisor who is independent from any appointed Contractor.

CQA validation and environmental data will be submitted to NRW on completion of the contract.

8. Post Closure Monitoring Programme

Closure is a distinct stage within the regulatory 'life-cycle' of a landfill which occurs after the site has ceased accepting waste, but before it is placed into definitive closure and can enter the aftercare phase.

The landfill at Dow ceased accepting waste some time during the early 2000s and before dewatering of the landfill ceased in 2003. An Environmental Monitoring Plan was proposed as part of the 2004 Landfill Closure Report, and following issue of the site IPPC / EP Permit in 2006 has been incorporated into the Site Protection Monitoring Programme (SPMP). All monitoring of the landfill area since 2004 could therefore be classed as post closure monitoring.

This monitoring programme will continue until the final capping and drainage is complete and the landfill can enter the aftercare phase, having entered definitive closure. However, the existing monitoring plan should be updated to include changes in the analytical suite such as increased capabilities to analyse silanols and the addition of specific hazardous substances (e.g. metals). Changes to the monitoring well network should also be documented in the revised plan. This update to the plan would be implemented as part of the agreement of the closure strategy with the regulator

9. Proposed Aftercare Plan

The aftercare period is defined as the period after [definite] closure of the site but prior to surrender during which maintenance and monitoring work is needed to ensure the restored landfill does not cause pollution of the environment.

The aftercare phase continues for a suitable period of time to demonstrate that no unacceptable discharge or impact on the environment has occurred.

9.1 Stability Survey

A topographical survey will be undertaken of the pre-capped surface and the post capped final landform once capping and drainage works are complete, in case the act of capping induces settlement. It is recommended that an annual topographical survey should be undertaken to assess settlement of the landfill body.

Surveying of the finished landform should continue until there is evidence that negligible waste settlement is taking place.

9.2 Maintenance and Inspection of the Capping System

A walkover of the landfill should be undertaken twice yearly during which any signs of instability, cracking, depressions or any other signs of movement should be recorded. The cap should be inspected for any damage and if any noted remedial works should be undertaken as soon as practicably possible.

9.3 Borehole Maintenance

As part of the monitoring programme an inspection of the condition of monitoring points will be undertaken during each monitoring event and recorded. Any remedial works required to the boreholes will be carried out as soon as practicably possible.

9.4 Water Level Monitoring

Groundwater levels should be monitored monthly for the six months following capping then quarterly following that period for two years. The frequency could then be reviewed following data assessment. Monitoring of the levels will continue until they have returned to a level consistent with the local water table. Surface water levels in each potential water body should also be recorded during each monitoring event to aid assessment of potential hydraulic gradients, groundwater flow vectors and potential flux.

It is acknowledged that there are specific risks to the health and safety of staff carrying out surface water monitoring. The existing gauge board in the Cadoxton Ponds should therefore be used by staff to read levels from a safe distance. The installation of similar gauge boards, surveyed into datum, is recommended for the other surface water bodies.

9.5 Groundwater Quality Monitoring

It is recommended that all groundwater monitoring wells are sampled on a six monthly basis for two years. The frequency could then be reviewed following data assessment.

Monitoring data should be reviewed for evidence of increasing concentration trends in perimeter and pathway wells. Detected concentrations should be reviewed against site-specific assessment criteria (SSAC) derived from the DQRA results, rather directly to EQS. If an increasing trend exceeds the SSAC, then more frequent monitoring and reporting may be necessary to provide more detailed assessment.

The suite of analysis should include:

- **Total Petroleum Hydrocarbons** (TPH CWG – aliphatic/aromatic and hydrocarbon chain length split);

- Volatile Organic Compounds (VOC) including **benzene**, **toluene**, **ethylbenzene** and **xylene** (BTEX) and *methyl tert-butyl ether* (MTBE) including TICs (tentatively identified compounds);
- Semivolatile Organic Compounds (SVOC) including speciated Polycyclic Aromatic Hydrocarbons (PAHs) (*naphthalene*, acenaphthylene, **acenaphthene**, fluorene, phenanthrene, **anthracene**, **fluoranthene**, pyrene, benzo(a)anthracene, chrysene, **benzo(bk)fluoranthene**, **benzo(a)pyrene**, **indeno(123cd)pyrene**, dibenzo(ah)anthracene and **benzo(ghi)perylene**), *phenol*, **chlorinated phenols** and phthalates including TICs;
- metals (*aluminium*, **arsenic**, **cadmium**, chromium, *copper*, **lead**, **mercury**, *manganese*, *nickel*, selenium, *zinc*, vanadium, beryllium, *boron*, **chromium VI** and chromium III);
- Biological Oxygen Demand (BOD);
- Chemical Oxygen Demand (COD);
- Ionic Balance suite (ammoniacal nitrogen, bicarbonate alkalinity, total alkalinity, *chloride*, sulphate, nitrate as NO₃, nitrite as NO₂, calcium, iron, magnesium, potassium, sodium and ionic balance calculation);
- Acidity, bromide, phosphate, sulphide, pH and dissolved organic carbon; and
- Silanols (DMSD, *Trimethylsilanol*, MST and silicic acid)

(Note: text format indicates: **Hazardous substances** and *Non-hazardous pollutants*¹⁹)

9.6 Surface Water Quality Monitoring

A risk to surface water receptors has been identified; in particular, to, the Cadoxton pond and the Timber Pond. Significantly elevated concentrations contaminants relating to the source term have not been realised to date, but it is recommended that semi-annual monitoring of surface water level and composition is undertaken. This should include the Cadoxton pond and the Timber Pond, subject to safe access to sample collection locations.

Monitoring data should be reviewed for evidence of increasing concentration trends in each water body. Detected concentrations should be reviewed against EQS, taking into account whether these are for an annual average concentration or a maximum value. If an increasing trend exceeds the EQS, then more frequent monitoring and reporting may be necessary to provide more detailed assessment.

The suite of analysis should include:

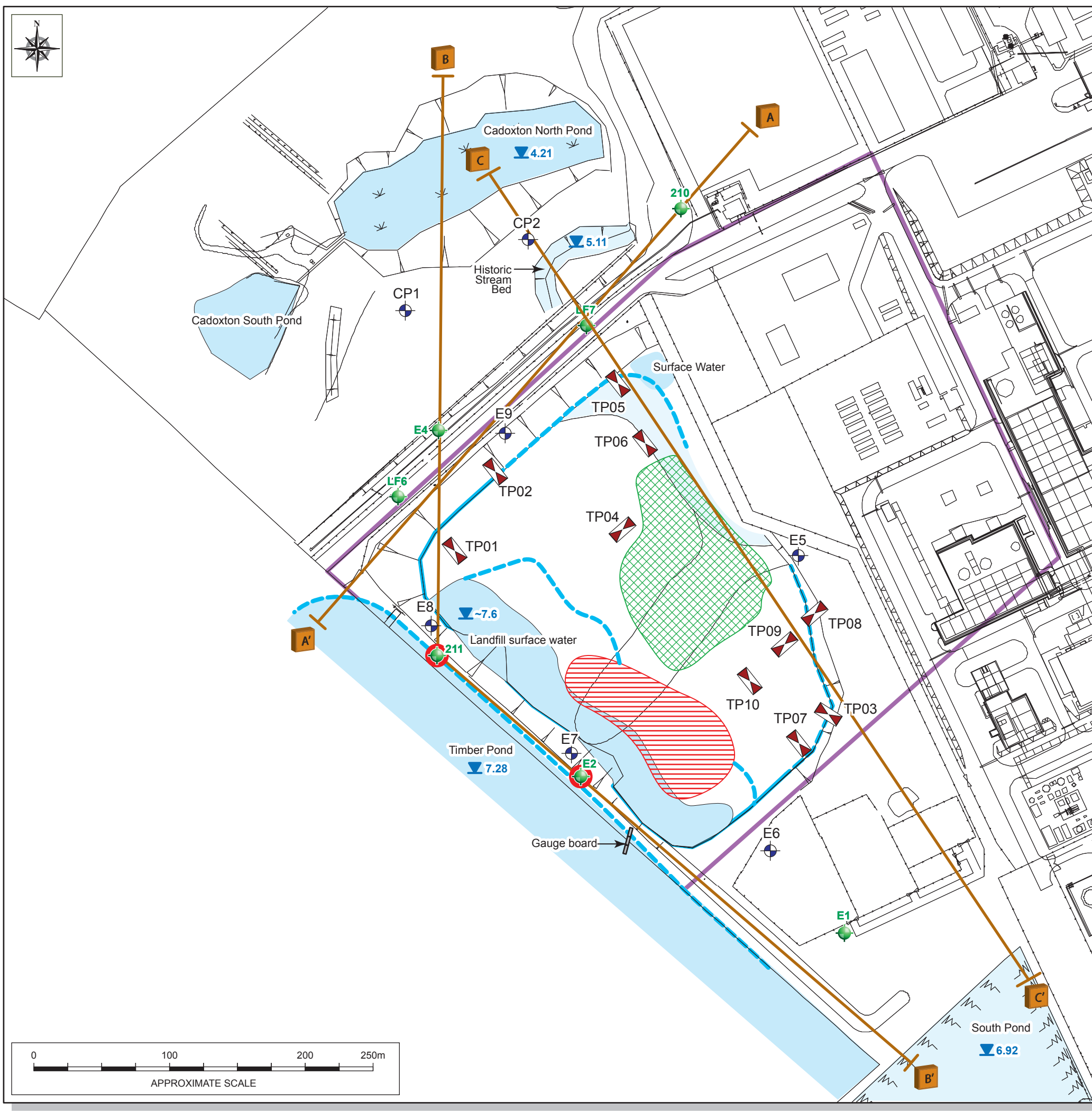
- **Total Petroleum Hydrocarbons** (TPH CWG – aliphatic/aromatic and hydrocarbon chain length split);
- Volatile Organic Compounds (VOC) including **benzene**, **toluene**, **ethylbenzene** and **xylene** (BTEX) and *methyl tert-butyl ether* (MTBE) including TICs (tentatively identified compounds);
- Semivolatile Organic Compounds (SVOC) including speciated Polycyclic Aromatic Hydrocarbons (PAHs) (*naphthalene*, acenaphthylene, **acenaphthene**, fluorene, phenanthrene, **anthracene**, **fluoranthene**, pyrene, benzo(a)anthracene, chrysene, **benzo(bk)fluoranthene**, **benzo(a)pyrene**, **indeno(123cd)pyrene**, dibenzo(ah)anthracene and **benzo(ghi)perylene**), *phenol*, **chlorinated phenols** and phthalates including TICs;
- metals (*aluminium*, **arsenic**, **cadmium**, chromium, *copper*, **lead**, **mercury**, *manganese*, *nickel*, selenium, *zinc*, vanadium, beryllium, *boron*, **chromium VI** and chromium III);
- Biological Oxygen Demand (BOD);
- Chemical Oxygen Demand (COD);
- Ionic Balance suite (ammoniacal nitrogen, bicarbonate alkalinity, total alkalinity, *chloride*, sulphate, nitrate as NO₃, nitrite as NO₂, calcium, iron, magnesium, potassium, sodium and ionic balance calculation);
- Acidity, bromide, phosphate, sulphide, pH and dissolved organic carbon; and

¹⁹ As listed in: <http://www.wfduk.org/resources/groundwater-hazardous-substances-standards>, accessed January 2018

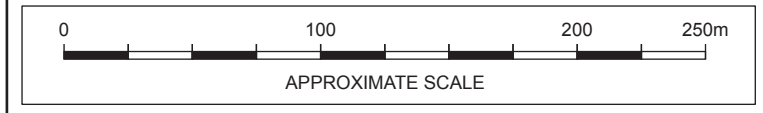
- Silanols (DMSD, *Trimethylsilanol*, MST and silicic acid)

(Note: text format indicates **Hazardous substances** and *Non-hazardous pollutants*¹⁸)

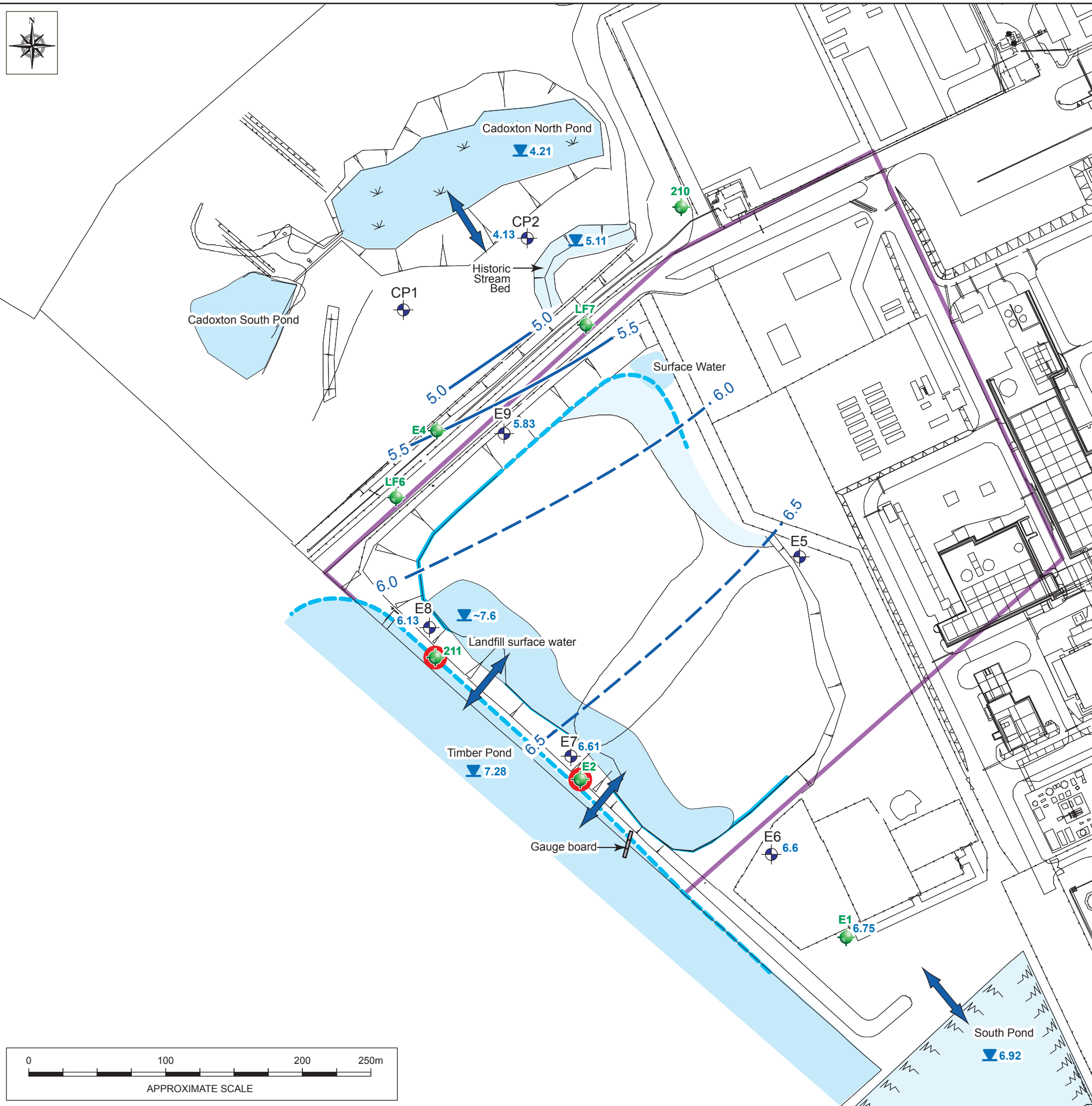
Appendix A – Figures from previous reports



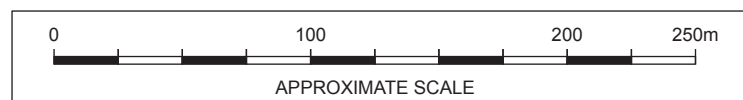
- KEY:
- Approximate area landfilled (1991)
 - Surface water feature
 - Line of section
 - Surface water levels (mAOD) 26/11/12
 - Existing monitoring wells
 - CMT well 2015
 - Lost Well
 - Approximate area of process waste material surface storage (December 2015)
 - Approximate area of rubble storage



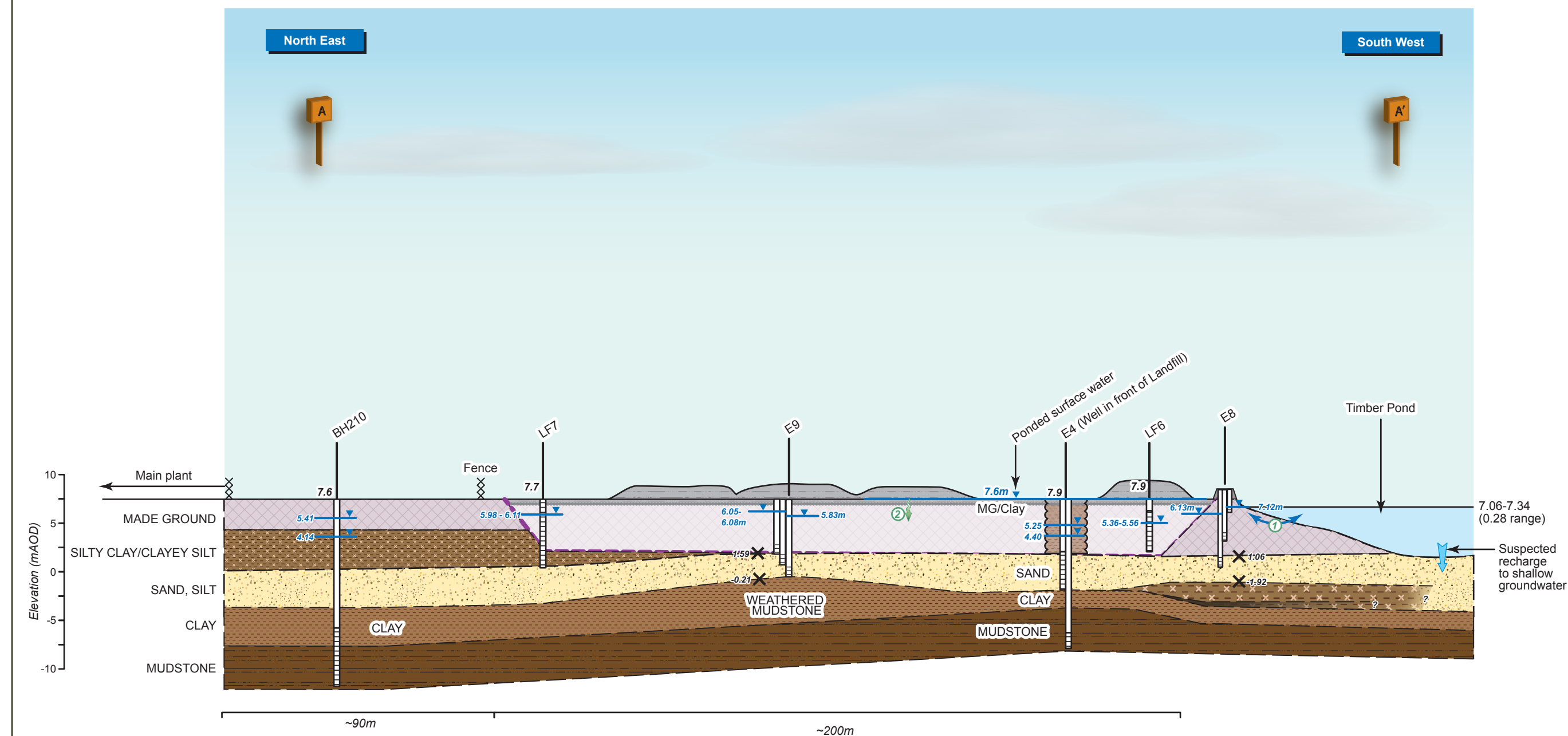
Title SITE FEATURES PLAN			
Location DOW CORNING, BARRY, SOUTH WALES			
Client DOW CORNING LTD			
	App'd: JC	Drawn: SQ/LCS	Date: FEB 2016
	Status: DRAFT	Ref: JC/CAR/SQ/MCH	
	Scale: AS SHOWN	Job No: 60469588	
	Drg. Size: A3	FIGURE 1	



- KEY:
- Approximate area landfilled (1991)
 - Surface water feature
 - Surface water levels (mAOD) 26/11/12
 - Existing monitoring wells
 - CMT well 2015
 - Lost Well
 - Potential Hydraulic Connection Via Deep Made Ground/Sand
 - Groundwater Contour in Sand (mAOD)

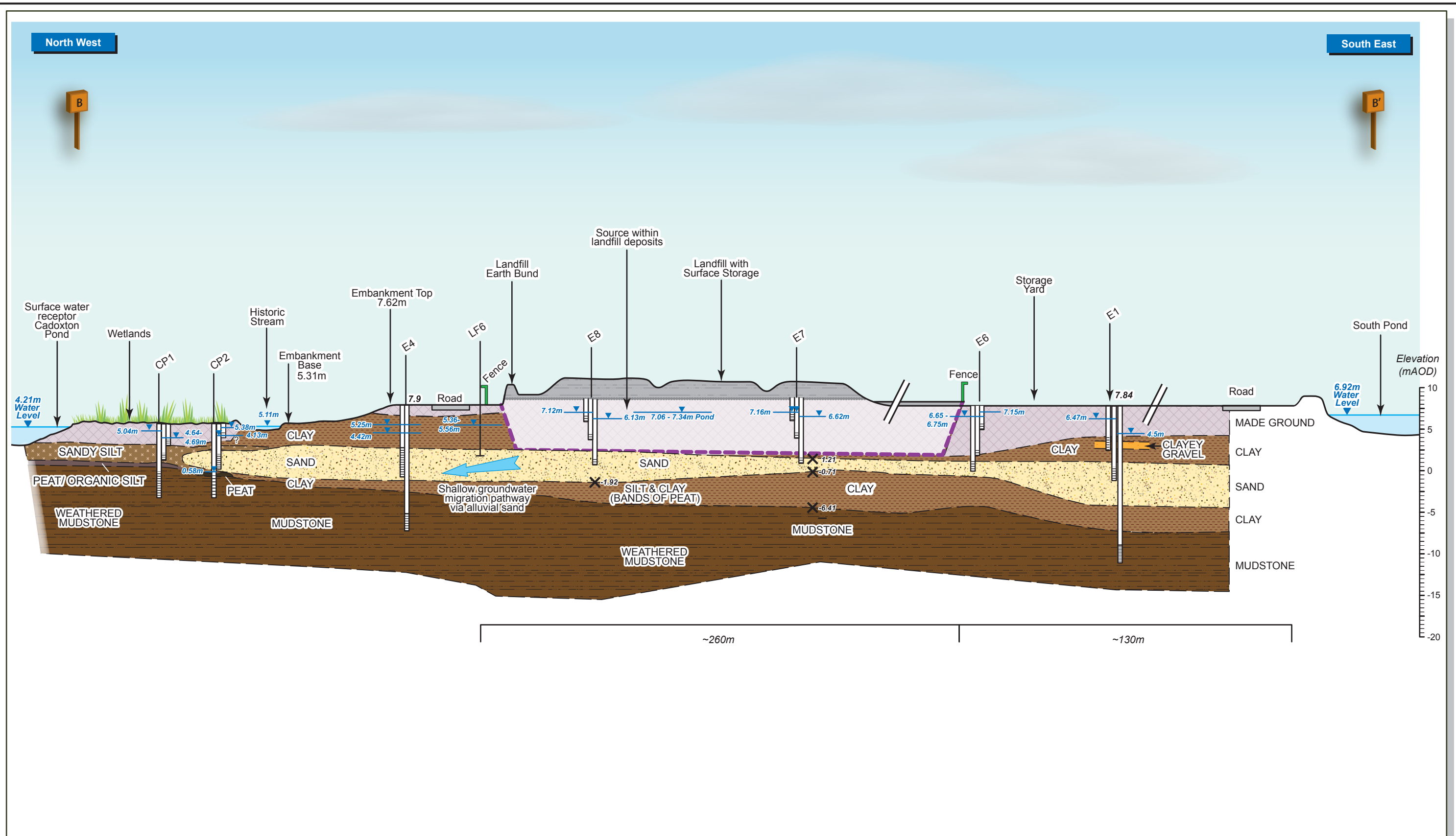


Title	GROUNDWATER CONTOUR PLOT - SAND		
Location	DOW CORNING, BARRY, SOUTH WALES		
Client	DOW CORNING LTD		
	App'd:	Drawn:	Date:
	JC	SO/LCS	FEB 2016
	Status:	Ref:	
	DRAFT	LCH/BRIS/JC/CDF	
	Scale:	Job No:	
	AS SHOWN	60469588	
Drg. Size:	A3		FIGURE 2



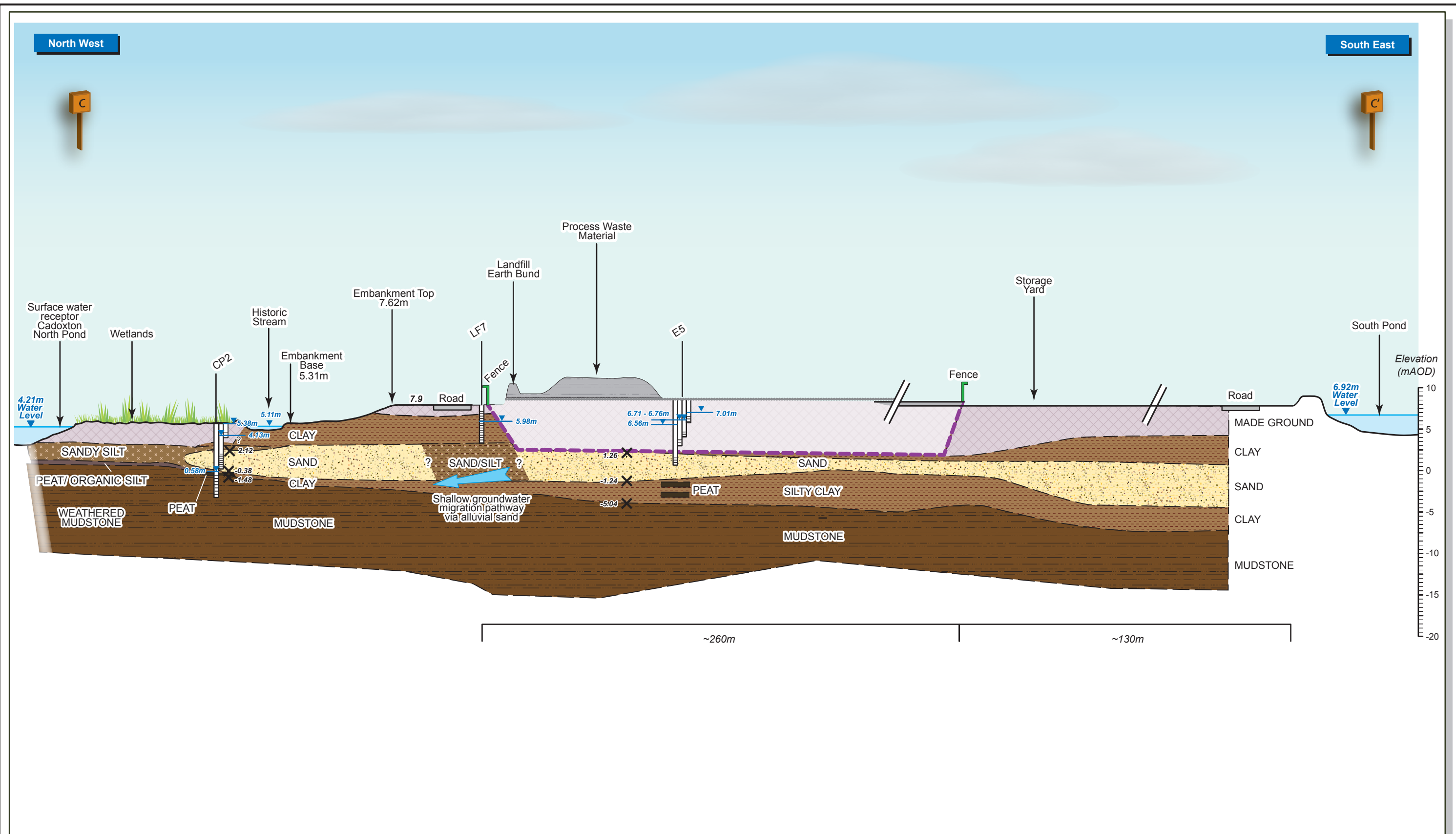
Key:	
	Surface stored materials
	Made Ground
	Silt Clay
	Sand
	Peat
	Mudstone
	Clayey Silt/ Silty Clay
	Potential depth of Landfill mass to 7mbgl
	Water Levels of surface water 26/11/12
	Spot Heights
	Lateral migration to/from Timber Pond
	Vertical infiltration to landfill

Title		CROSS SECTION A-A'	
Location		DOW CORNING, BARRY, SOUTH WALES	
Client		DOW CORNING LTD	
	App'd:	Drawn:	Date:
	JC	RH/LCS	FEB 2016
	DRAFT		Ref:
	Scale: AS SHOWN		JC/CDF/LCS/BRS
Job No:		60469588	
Drg. Size:		A3	
		FIGURE 3	



Key:			
	Surface stored materials		Peat
	Made Ground		Mudstone
	Silt Clay		Sandy Silt
	Sand		Potential depth of Landfill mass to 7mbgl
	Gravel		Water Levels of surface water 26/11/12
	Peat/Organic Silt		Spot Heights

Title CROSS SECTION B-B'			
Location DOW CORNING, BARRY, SOUTH WALES			
Client DOW CORNING LTD			
	App'd:	Drawn:	Date:
	JC	RH/LCS	FEB 2016
	DRAFT		Ref: JC/CDF/LCS/BRS
	Scale: AS SHOWN		Job No: 60469588
Drg. Size: A3		FIGURE 4	



Key:			
	Surface stored materials		Mudstone
	Made Ground		Sandy Silt
	Silt Clay		Potential depth of Landfill mass to 7mbgl
	Sand		Water Levels of surface water 26/11/12
	Peat/Organic Silt		Spot Heights
	Peat		

Title CROSS SECTION C-C'			
Location DOW CORNING, BARRY, SOUTH WALES			
Client DOW CORNING LTD			
	App'd:	Drawn:	Date:
	JC	RH/LCS	FEB 2016
	DRAFT		Ref: JC/CDF/LCS/BRS
	Scale: AS SHOWN		Job No: 60469588
	Drg. Size: A3		FIGURE 5

Appendix B - Groundwater Level Tables, Charts and Contour Figures

Table B1 Groundwater levels in Made Ground wells

Monitoring Zone	Location	Well	Water Level (mAOD)		
			2016-Q3	2017-Q1	2017-Q3
Downgradient well	CP1	Shallow	ND	ND	4.324
Downgradient well	CP2	Shallow	5.594	ND	5.634
Landfill well – MG	E1	Shallow	6.214	7.334	6.234
Landfill well – MG	E5	Shallow	7.462	7.362	6.722
Landfill well – MG	E5	Medium	6.582	7.662	6.552
Landfill well – MG	E6	Shallow	7.091	7.151	7.011
Landfill well – MG	E6	Medium	7.751	7.051	6.451
Landfill well – MG	E7	Shallow	ND	7.166	6.996
Landfill well – MG	E7	Medium	8.816	7.066	6.936
Landfill well – MG	E8	Shallow	7.41	7.61	7.01
Landfill well – MG	E8	Medium	8.24	8.71	6.83
Landfill well – MG	E9	Shallow	7.93	6.03	5.88
Downgradient well	LF7	-	5.854	ND	6.264
ND- No data			MG – Made Ground		

Table B2 Groundwater levels in sand strata wells

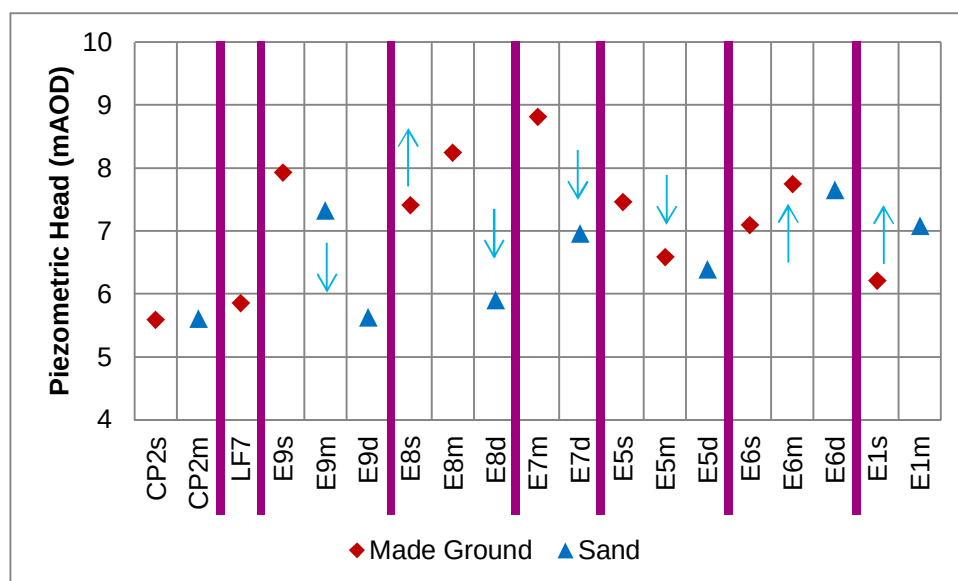
Monitoring Zone	Location	Well	Water Level (mAOD)		
			2016-Q3	2017-Q1	2017-Q3
Downgradient well	CP2	Medium	5.614	ND	5.684
Landfill well – NS	E1	Medium	7.082	6.512	7.012
Landfill well – NS	E5	Deep	6.392	7.062	6.382
Landfill well – NS	E6	Deep	7.651	6.751	6.541
Landfill well – NS	E7	Deep	6.966	6.366	6.366
Landfill well – NS	E8	Deep	5.91	7.91	5.81
Landfill well – NS	E9	Medium	7.33	6.63	5.91
Landfill well – NS	E9	Deep	5.63	7.63	7.03
ND- No data			NS – natural sand		

Table B3 Summary of well screens and piezometric head for 2016-Q3 to 2017-Q3

Well	Top of screen (maOD)	Base of screen (maOD)	Screened Unit	Piezometric Head (maOD)		
				Q3-2016	Q1-2017	Q3-2017
CP1s	3.26	3.01	MG	-	-	4.324
CP2s	4.62	3.62	MG	5.594	-	5.634
CP2m	2.02	-0.28	NS	5.614	-	5.684
LF7	7.06	3.06	MG	5.854	-	6.264
E1s	3.83	2.33	MG	6.214	7.334	6.234
E1m	0.33	-1.67	NS	7.082	6.512	7.012
E5s	3.11	2.81	MG	7.462	7.362	6.722
E5m	2.01	1.71	MG	6.582	7.662	6.552
E5d	-0.59	-0.89	NS	6.392	7.062	6.382
E6s	5.21	4.91	MG	7.091	7.151	7.011
E6m	1.71	1.41	MG	7.751	7.051	6.451
E6d	0.81	0.51	NS	7.651	6.751	6.541
E7s	6.74	6.49	MG	-	7.166	6.996
E7m	3.99	3.69	MG	8.816	7.066	6.936
E7d	1.14	0.84	NS	6.966	6.366	6.366
E8s	6.21	5.91	MG	7.41	7.61	7.01
E8m	3.56	3.26	MG	8.24	8.71	6.83
E8d	0.96	0.66	NS	5.91	7.91	5.81
E9s	2.19	1.89	MG	7.93	6.03	5.88
E9m	1.54	1.24	NS	7.33	6.63	5.91
E9d	0.14	-0.16	NS	5.63	7.63	7.03

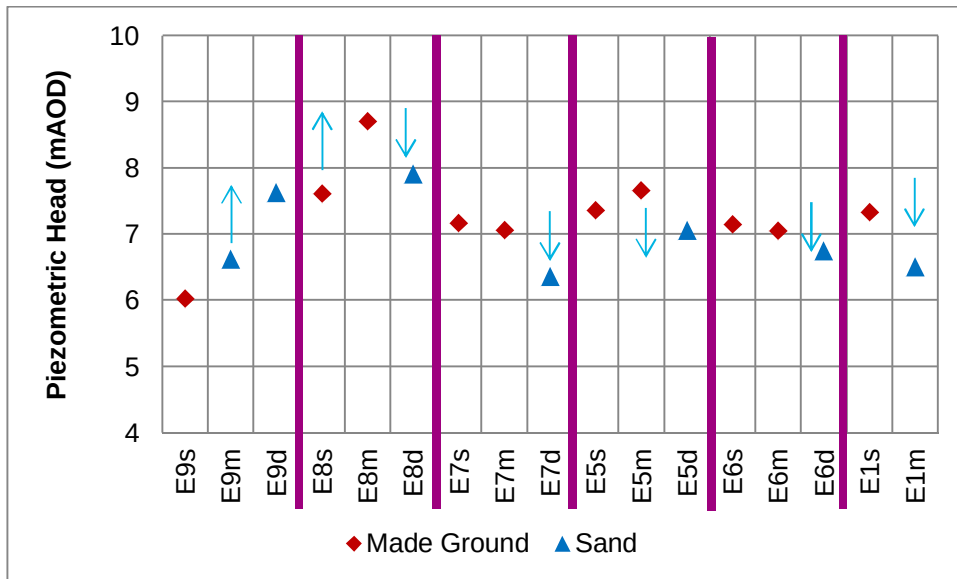
Charts **B1** to **B3** present the piezometric levels for the landfill area and downgradient wells. The wells are broadly aligned on a north (Cadoxton Ponds area) to south (E1) axis from left to right.

Chart B1 Piezometric head in Made Ground and Sand - 2016-Q3



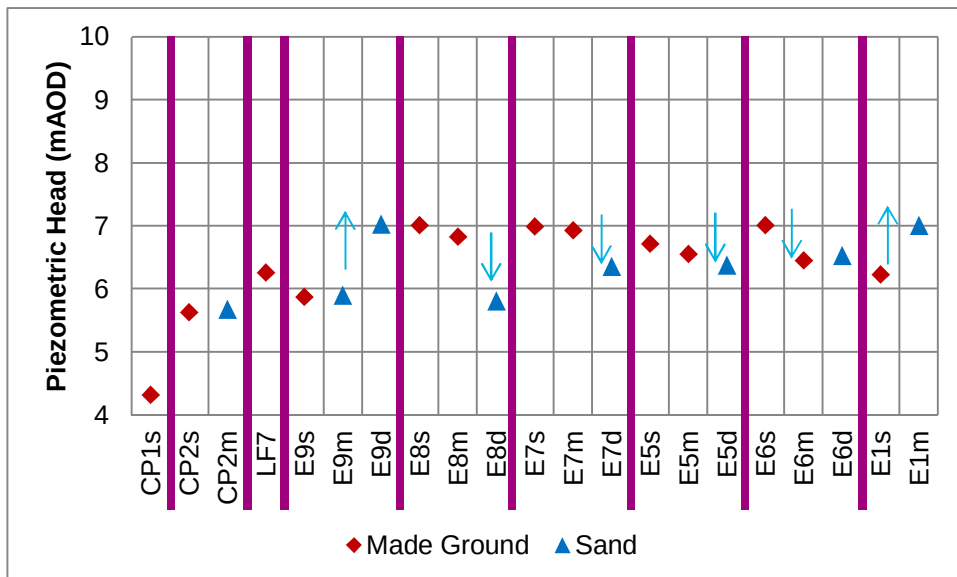
Screened sections of each well are shown shallow (s), mid-level (m) and deep (d) from left to right. Blue arrows indicate inferred vertical gradient at this location.

Chart B2 Piezometric head in Made Ground and Sand - 2017-Q1



Screened sections of each well are shown shallow (s), mid-level (m) and deep (d) from left to right. Blue arrows indicate inferred vertical gradient at this location.

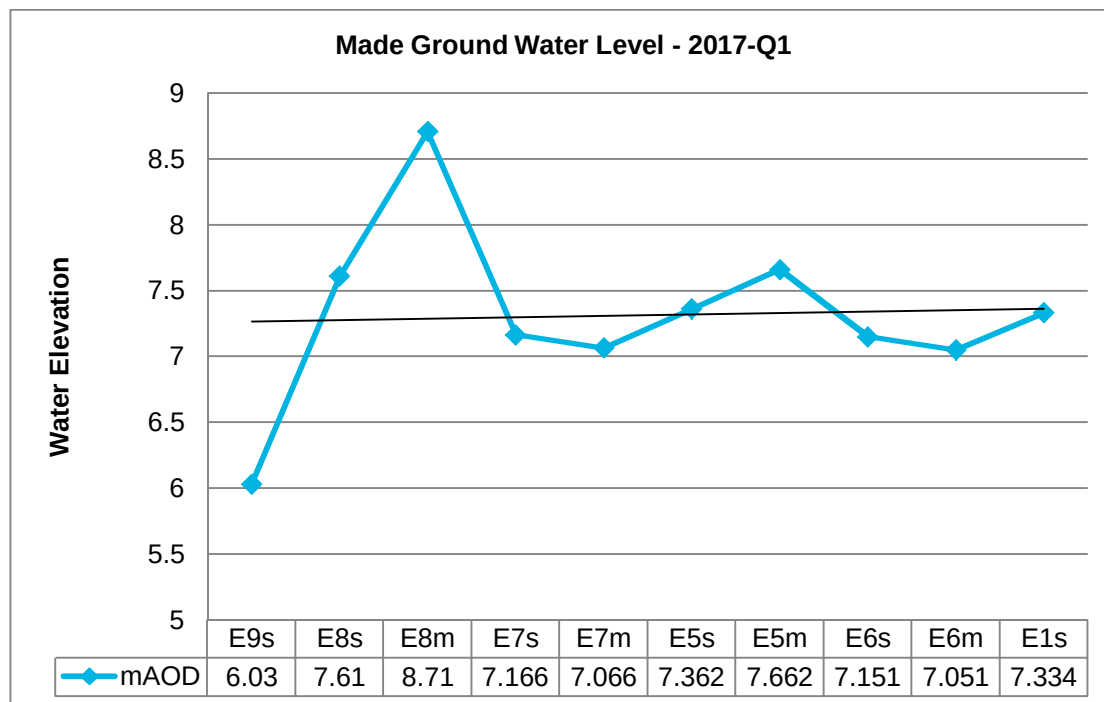
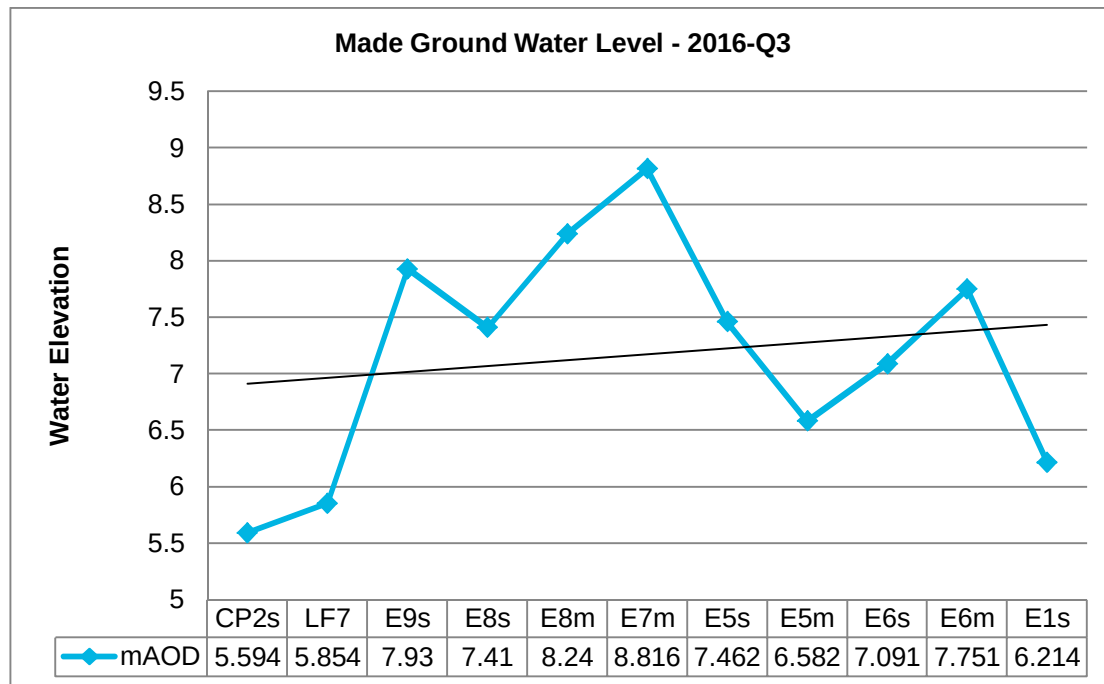
Chart B3 Piezometric head in Made Ground and Sand - 2017-Q3

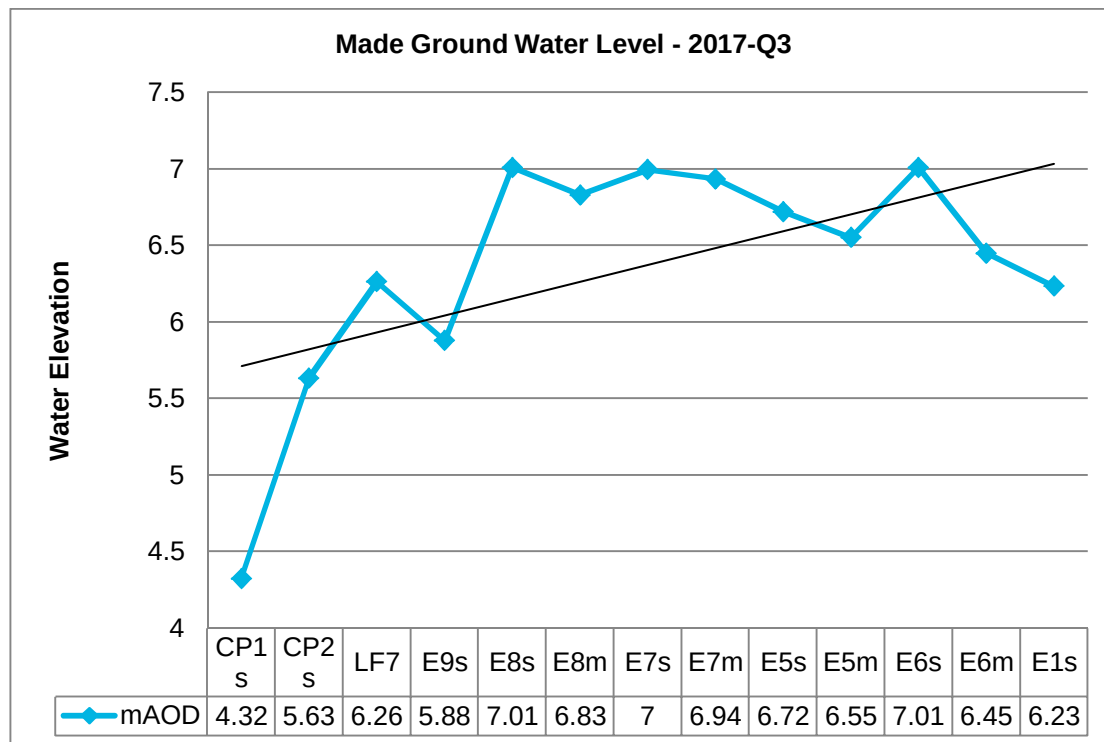


Screened sections of each well are shown shallow (s), mid-level (m) and deep (d) from left to right. Blue arrows indicate inferred vertical gradient at this location.

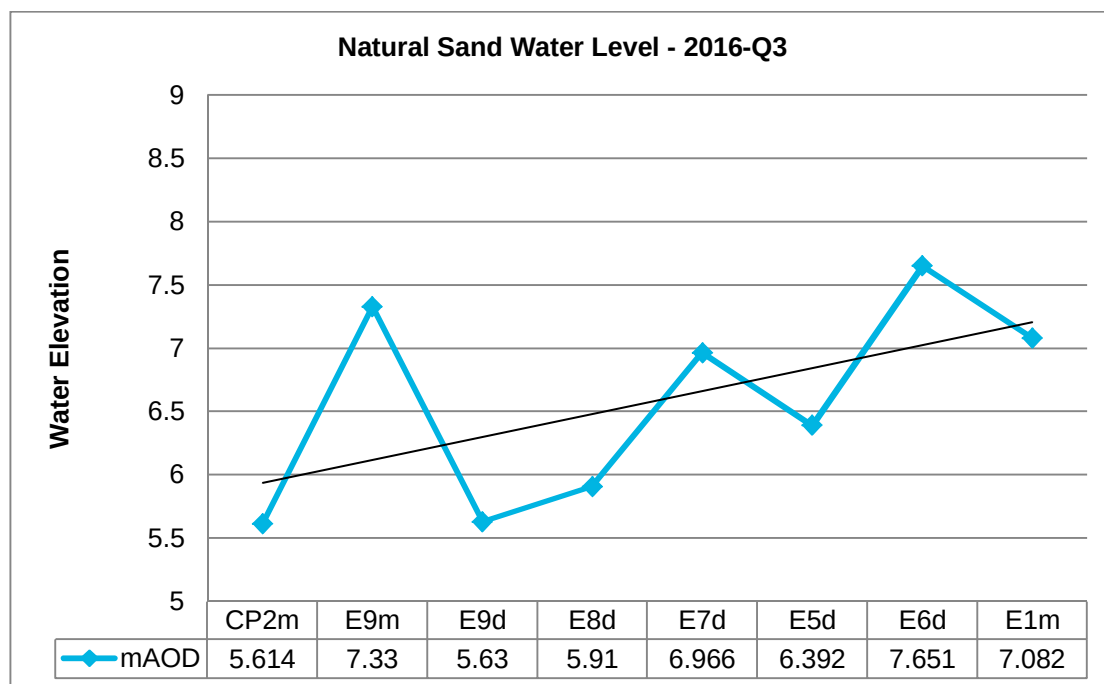
Piezometric levels for individual rounds 2016-Q3 to 2017-Q3 - Made Ground

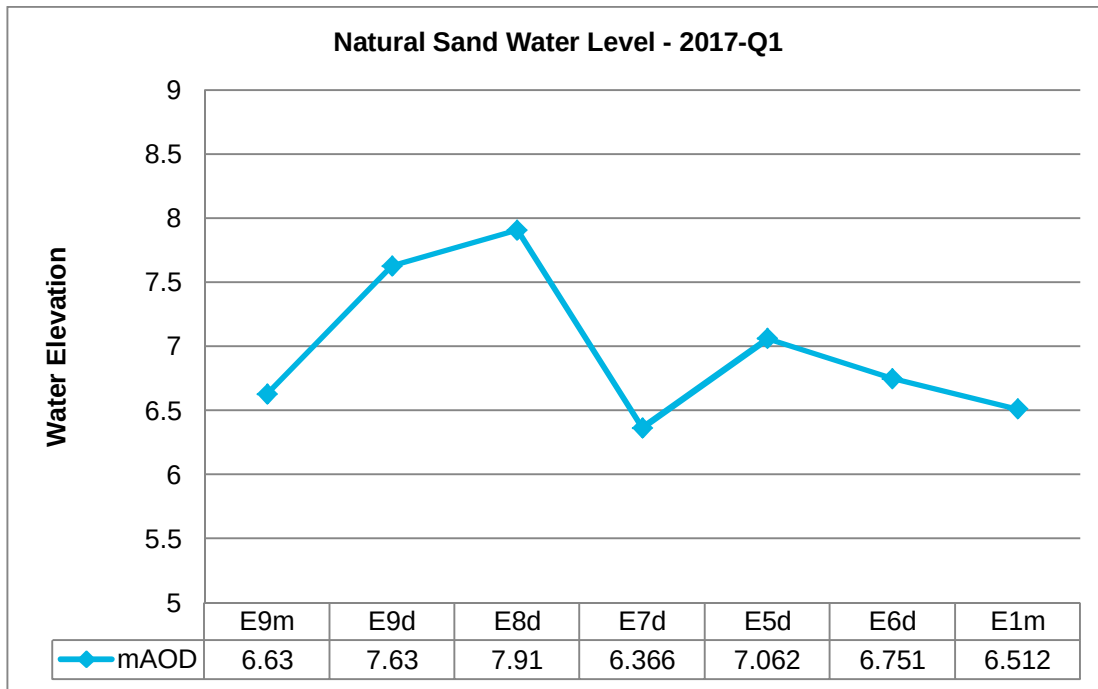
Note: Trend lines, shown in black applied to indicate inferred groundwater flow direction. The chart wells are positioned in relation to their location on a broadly north to south (left to right) axis.



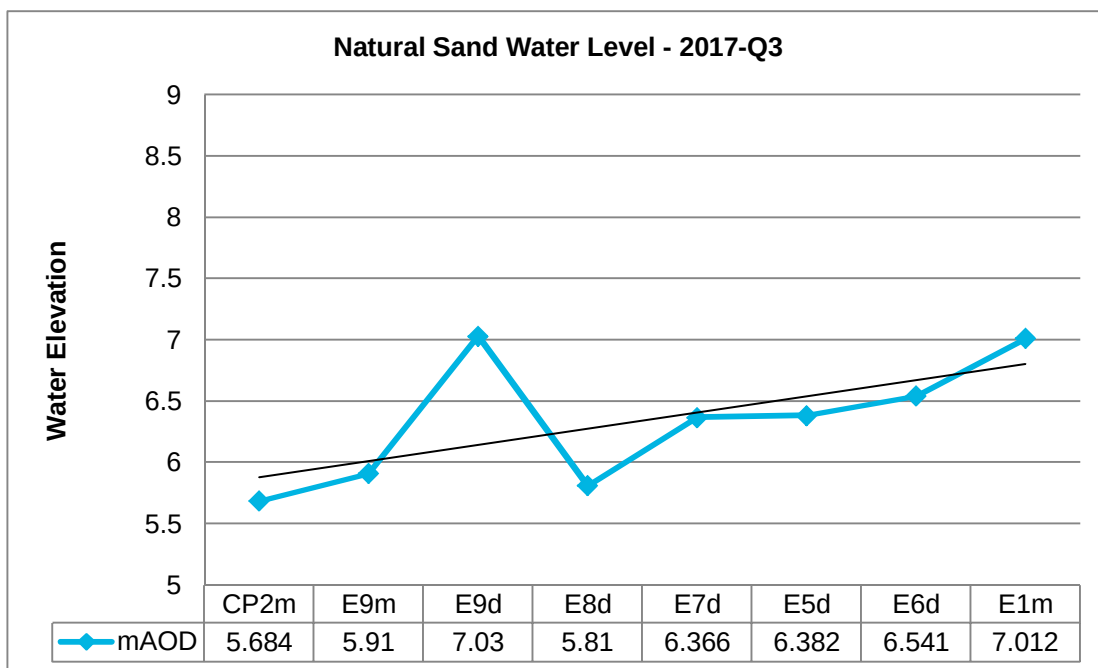


Piezometric levels for individual rounds 2016-Q3 to 2017-Q3 - Alluvial Sand





Note: does not include either Cadoxton Pond locations

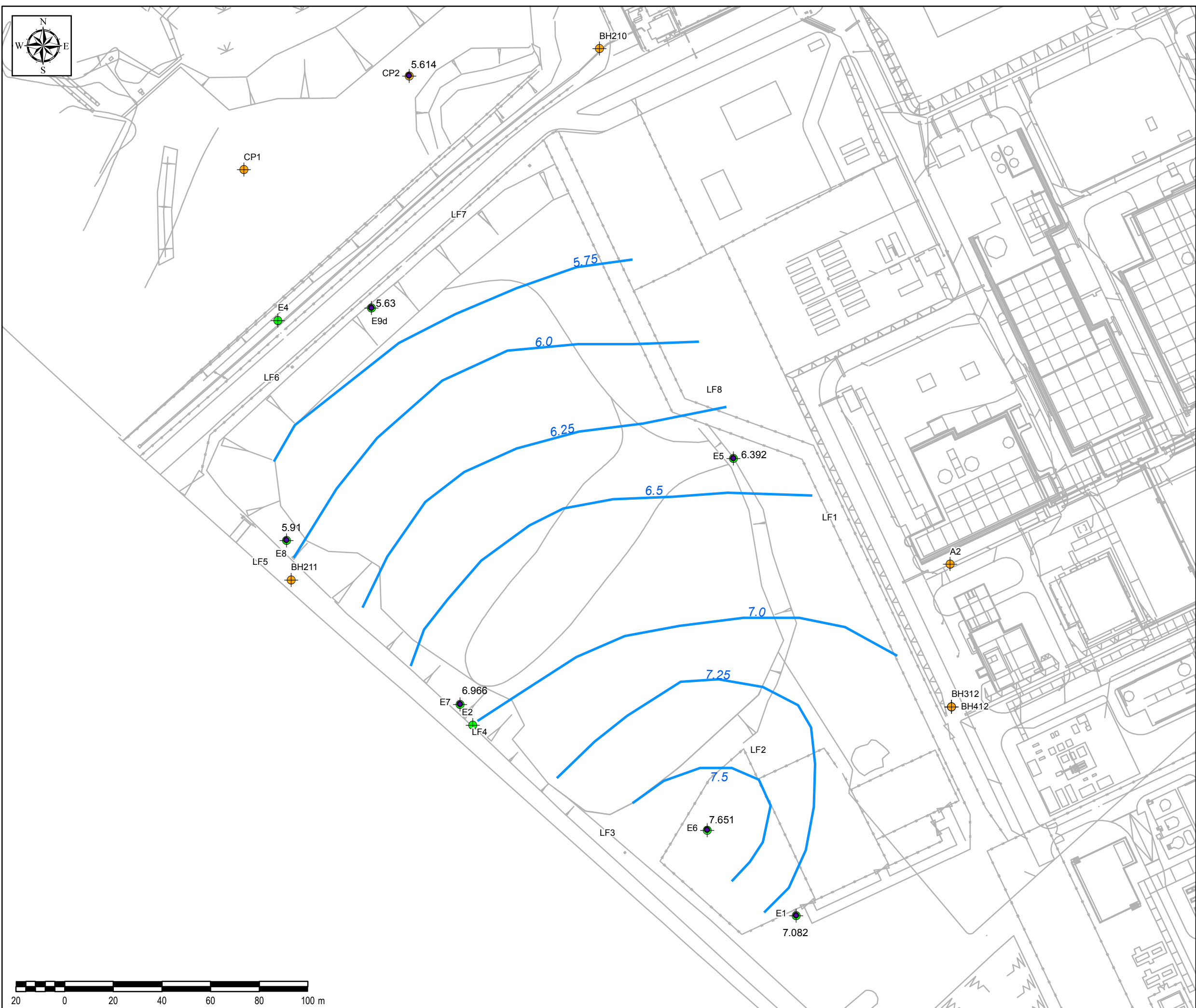


Groundwater Levels - Made Ground 2016-Q3 to 2017-Q3

Monitoring Zone	Monitoring Round	Location	Well	Top of Casing Elevation (mASD)	Top of Well Screen (mBTC)	Base of Well Screen (mBTC)	Depth to Water (mBTC)	Water Level (mAOD)
Northern Pathway	2016-Q3	CP2	s	6.084	1.46	2.46	0.49	5.594
Southern Pathway	2016-Q3	E1	s	7.834	4	5.5	1.62	6.214
Eastern Boundary	2016-Q3	E5	s	8.362	5.25	5.55	0.9	7.462
Eastern Boundary	2016-Q3	E5	m	8.362	6.35	6.65	1.78	6.582
Southern Boundary	2016-Q3	E6	s	8.351	3.14	3.44	1.26	7.091
Southern Boundary	2016-Q3	E6	m	8.351	6.64	6.94	0.6	7.751
Western Boundary	2016-Q3	E7	m	9.566	5.58	5.88	0.75	8.816
Western Boundary	2016-Q3	E8	s	9.11	2.9	3.2	1.7	7.41
Western Boundary	2016-Q3	E8	m	9.11	5.55	5.85	0.87	8.24
Northern Boundary	2016-Q3	E9	s	8.03	5.84	6.14	0.1	7.93
Northern Pathway	2016-Q3	LF7	-	7.884	0.82	4.82	2.03	5.854
Southern Pathway	2017-Q1	E1	s	7.834	4	5.5	0.5	7.334
Eastern Boundary	2017-Q1	E5	s	8.362	5.25	5.55	1	7.362
Eastern Boundary	2017-Q1	E5	m	8.362	6.35	6.65	0.7	7.662
Southern Boundary	2017-Q1	E6	s	8.351	3.14	3.44	1.2	7.151
Southern Boundary	2017-Q1	E6	m	8.351	6.64	6.94	1.3	7.051
Western Boundary	2017-Q1	E7	s	9.566	2.83	3.08	2.4	7.166
Western Boundary	2017-Q1	E7	m	9.566	5.58	5.88	2.5	7.066
Western Boundary	2017-Q1	E8	s	9.11	2.9	3.2	1.5	7.61
Western Boundary	2017-Q1	E8	m	9.11	5.55	5.85	0.4	8.71
Northern Boundary	2017-Q1	E9	s	8.03	5.84	6.14	2	6.03
Northern Pathway	2017-Q3	CP1	s	6.294	3.03	3.28	1.97	4.324
Northern Pathway	2017-Q3	CP2	s	6.084	1.46	2.46	0.45	5.634
Southern Pathway	2017-Q3	E1	s	7.834	4	5.5	1.6	6.234
Eastern Boundary	2017-Q3	E5	s	8.362	5.25	5.55	1.64	6.722
Eastern Boundary	2017-Q3	E5	m	8.362	6.35	6.65	1.81	6.552
Southern Boundary	2017-Q3	E6	s	8.351	3.14	3.44	1.34	7.011
Southern Boundary	2017-Q3	E6	m	8.351	6.64	6.94	1.9	6.451
Western Boundary	2017-Q3	E7	s	9.566	2.83	3.08	2.57	6.996
Western Boundary	2017-Q3	E7	m	9.566	5.58	5.88	2.63	6.936
Western Boundary	2017-Q3	E8	s	9.11	2.9	3.2	2.1	7.01
Western Boundary	2017-Q3	E8	m	9.11	5.55	5.85	2.28	6.83
Northern Boundary	2017-Q3	E9	s	8.03	5.84	6.14	2.15	5.88
Northern Pathway	2017-Q3	LF7	-	7.884	0.82	4.82	1.97	6.264

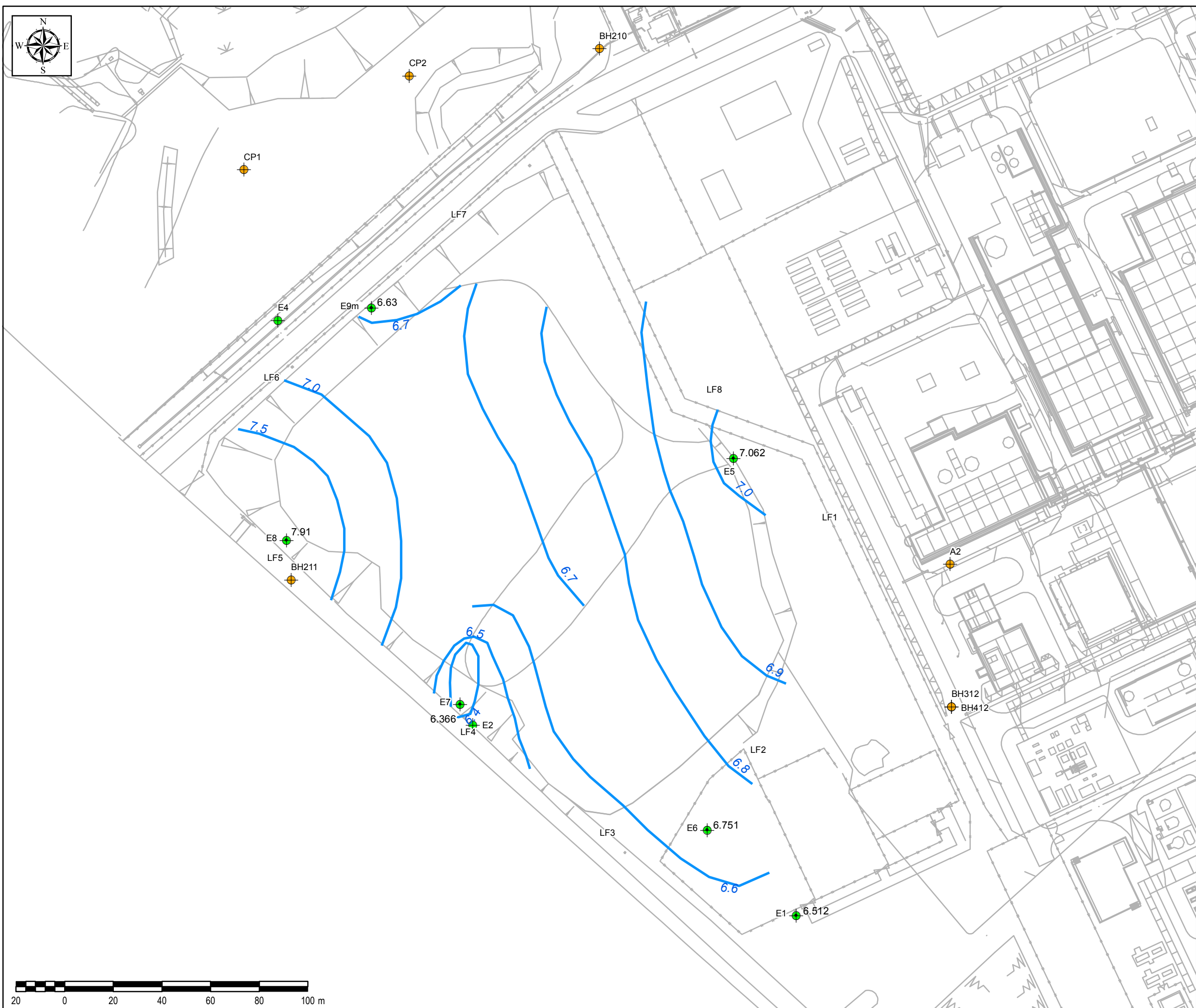
Groundwater Levels - Sand Strata 2016-Q3 to 2017-Q3

Monitoring Zone	Monitoring Round	Location	Well	Top of Casing Elevation (mAOD)	Top of Well Screen (mBTC)	Base of Well Screen (mBTC)	Depth to Water (mBTC)	Water Level (mAOD)
Northern Pathway	2016-Q3	CP2	m	6.084	4.06	6.36	0.47	5.614
Southern Pathway	2016-Q3	E1	m	7.812	7.48	9.48	0.73	7.082
Eastern Boundary	2016-Q3	E5	d	8.362	8.95	9.25	1.97	6.392
Southern Boundary	2016-Q3	E6	d	8.351	7.54	7.84	0.7	7.651
Western Boundary	2016-Q3	E7	d	9.566	8.43	8.73	2.6	6.966
Western Boundary	2016-Q3	E8	d	9.11	8.15	8.45	3.2	5.91
Northern Boundary	2016-Q3	E9	d	8.03	7.89	8.19	2.4	5.63
Northern Boundary	2016-Q3	E9	m	8.03	6.49	6.79	0.7	7.33
Southern Pathway	2017-Q1	E1	m	7.812	7.48	9.48	1.3	6.512
Eastern Boundary	2017-Q1	E5	d	8.362	8.95	9.25	1.3	7.062
Southern Boundary	2017-Q1	E6	d	8.351	7.54	7.84	1.6	6.751
Western Boundary	2017-Q1	E7	d	9.566	8.43	8.73	3.2	6.366
Western Boundary	2017-Q1	E8	d	9.11	8.15	8.45	1.2	7.91
Northern Boundary	2017-Q1	E9	d	8.03	7.89	8.19	0.4	7.63
Northern Boundary	2017-Q1	E9	m	8.03	6.49	6.79	1.4	6.63
Northern Pathway	2017-Q3	CP2	m	6.084	4.06	6.36	0.4	5.684
Southern Pathway	2017-Q3	E1	m	7.812	7.48	9.48	0.8	7.012
Eastern Boundary	2017-Q3	E5	d	8.362	8.95	9.25	1.98	6.382
Southern Boundary	2017-Q3	E6	d	8.351	7.54	7.84	1.81	6.541
Western Boundary	2017-Q3	E7	d	9.566	8.43	8.73	3.2	6.366
Western Boundary	2017-Q3	E8	d	9.11	8.15	8.45	3.3	5.81
Northern Boundary	2017-Q3	E9	d	8.03	7.89	8.19	1	7.03
Northern Boundary	2017-Q3	E9	m	8.03	6.49	6.79	2.12	5.91



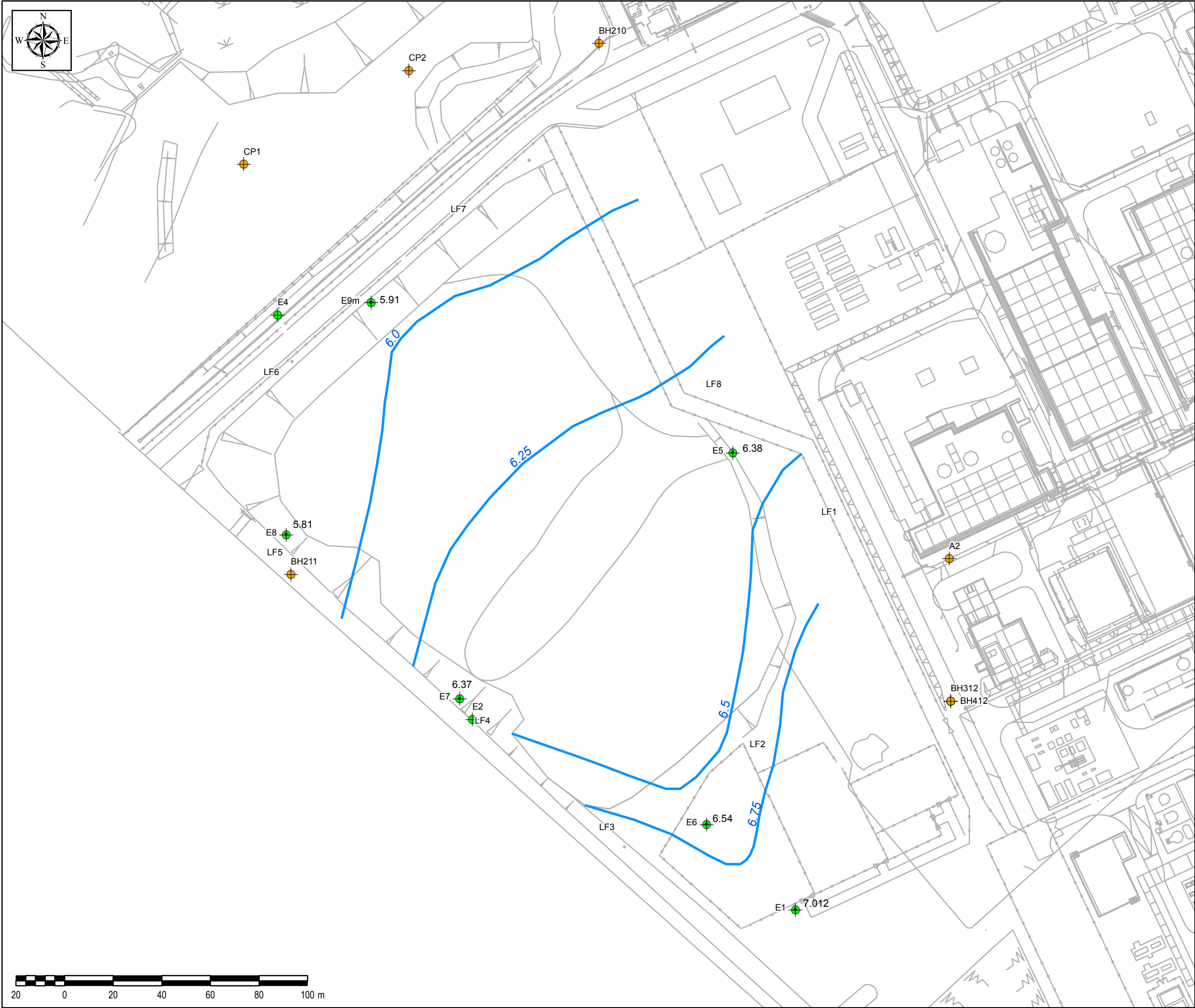
- Key:**
- 2016-Q3 Piezometric level in Sand (mAOD)
 - CMT Well 2015
 - Existing Monitoring Well
 - Contours 2016-Q3 (mAOD)

Title	GROUNDWATER CONTOUR PLOT - SAND 2016-Q3			
Location	Dow Silicones, Barry, South Wales			
Client	Dow Silicones			
AECOM	App'd	Drawn	Date	
	JC	JC	FEB 2018	
	Status	DRAFT		Ref
	Scale	AS SHOWN		JC/CDF
Orig. Size		A3		Job No. 60522562



- Key:**
- 2017-Q1 Piezometric level in Sand (mAOD)
 - CMT Well 2015
 - Existing Monitoring Well
 - Contours 2017-Q1 (mAOD)

Title	GROUNDWATER CONTOUR PLOT - SAND 2017-Q1			
Location	Dow Silicones, Barry, South Wales			
Client	Dow Silicones			
AECOM	App'd	Drawn	Date	
	JC	JC	FEB 2018	
	Status	DRAFT		Ref
	Scale	AS SHOWN		JC/CDF
Dwg. Size		A3		Job No. 60522562



Key:

- 2017-Q1 Piezometric level in Sand (mAOD)
- CMT Well 2015
- Existing Monitoring Well
- Contours 2017-Q3 (mAOD)

Title	GROUNDWATER CONTOUR PLOT - SAND 2017-Q3			
Location	Dow Silicones, Barry, South Wales			
Client	Dow Silicones			
AECOM	App'd	Drawn	Date	
	JC	JC	FEB 2018	
	Status	DRAFT		Ref
	Scale	AS SHOWN		JC/CDF
Dwg. Size		A3		Job No. 60522562

Appendix C - Groundwater Quality Results

Table C1 - BTEX in Groundwater - Upgradient (potential source) wells

Monitoring Round	Location	Well	Benzene	Ethylbenzene	Toluene	Xylene (m)	Xylene (o)	Xylene (p)
	EQS (µg/L)		10	20	74	-	-	-
2015-Q1	A2	d	3.64	<MDL	8.69	<MDL	23	36
	BH312	-	8.95	18.63	98	38	31.187	82
	BH412	-	2.47	<MDL	<MDL	<MDL	9.08	29
2015-Q3	A2	d	11.01	3.70	35.84	3.99	6.73	<MDL
	BH312	-	6.48	10.52	67	19.10	6.61	<MDL
	BH412	-	2.84	<MDL	<MDL	<MDL	2.21	<MDL
2016-Q1	A2	d	11.47	<MDL	5.95	1.47	7.37	22
	BH312	-	4.42	<MDL	<MDL	<MDL	<MDL	46
	BH412	-	5.76	<MDL	<MDL	<MDL	<MDL	33
2016-Q3	A2	d	10.71	28	44	<MDL	1.33	5.72
	BH312	-	1.61	36	25	<MDL	2.53	14.52
	BH412	-	<MDL	26	<MDL	2.30	4.11	<MDL
2017-Q1	A2	d	9.43	4.25	52	4.86	12.75	22
	BH312	-	5.14	13.52	100	24	15.38	46
	BH412	-	1.64	<MDL	<MDL	<MDL	2.37	20
2017-Q3	A2	d	<MDL	3.80	47	4.86	10.42	27
	BH312	-	4.44	12.91	96	21	16.94	53
	BH412	-	<MDL	<MDL	<MDL	<MDL	9.43	22

All results in µg/l. EQS exceedances in **bold**.

<MDL – Less than the Method Detection Limit

d – deep well

Table C2 - BTEX in Groundwater - Landfill wells installed in Made Ground

Monitoring Round	Location	Well	Benzene	Ethylbenzene	Toluene	Xylene (m)	Xylene (o)	Xylene (p)
	EQS (µg/L)		10	20	74	-	-	-
2015-Q1	LF4**	-	<MDL	<MDL	<MDL	<MDL	1.31	3.36
2016-Q3	E5	s	<MDL	11.84	<MDL	<MDL	3.96	<MDL
	E5	m	2.12	<MDL	4.60	<MDL	1.73	<MDL
	E6	s	<MDL	5.33	<MDL	<MDL	<MDL	<MDL
	E6	m	<MDL	5.03	<MDL	<MDL	<MDL	<MDL
	E7	m	<MDL	4.46	<MDL	<MDL	<MDL	<MDL
	E8	s	<MDL	5.91	<MDL	<MDL	<MDL	<MDL
	E8	m	<MDL	3.86	<MDL	<MDL	<MDL	<MDL
2017-Q1	E5	s	4.22	1.57	7.66	3.393	2.39	19.58
	E5	m	2.80	<MDL	4.49	<MDL	2.13	16.40
	E6	m	<MDL	<MDL	<MDL	<MDL	<MDL	6.92
	E7	m	<MDL	<MDL	<MDL	<MDL	1.23	11.15
	E8	s	<MDL	<MDL	<MDL	<MDL	<MDL	8.17
	E8	m	1.12	<MDL	<MDL	<MDL	1.01	5.80
2017-Q3	E5	s	4.07	1.36	10.09	3.861	21.47	17.90
	E5	m	3.76	<MDL	8.18	2.17	19.80	16.12
	E6	m	<MDL	<MDL	<MDL	<MDL	1.39	5.16
	E7	m	<MDL	<MDL	<MDL	<MDL	4.01	9.30
	E8	s	2.79	<MDL	<MDL	<MDL	4.46	8.21
	E8	m	1.29	<MDL	<MDL	<MDL	2.29	4.83

All results in µg/l. No EQS exceedances noted..

<MDL – Less than the Method Detection Limit

s – shallow well m – medium well

**Location LF4 was not accessible during the 2015 AECOM monitoring. Based on site observations in 2016-2017 of lower water levels within the Timber Pond it is possible that LF4 became re-accessible. However, this location is known to be adjacent to another 'lost' well E2. It is possible that groundwater samples labelled LF4 have been collected from E2.

Table C3 - BTEX in Groundwater - Landfill wells in natural sand

Monitoring Round	Location	Well	Benzene	Ethylbenzene	Toluene	Xylene (m)	Xylene (o)	Xylene (p)
	EQS (µg/L)		10	20	74	-	-	-
2016-Q3	E5	d	<MDL	12.93	<MDL	<MDL	1.20	<MDL
	E7	d	<MDL	9.57	<MDL	<MDL	1.707	<MDL
	E8	d	<MDL	4.59	<MDL	<MDL	1.05	1.16
	E9	d	<MDL	3.57	<MDL	<MDL	<MDL	1.23
2017-Q1	E5	d	<MDL	<MDL	<MDL	<MDL	5.39	16.05
	E6	d	<MDL	<MDL	<MDL	<MDL	<MDL	7.23
	E7	d	<MDL	<MDL	<MDL	<MDL	1.79	10.97
	E9	d	<MDL	<MDL	<MDL	<MDL	<MDL	3.79
2017-Q3	E5	d	<MDL	<MDL	<MDL	<MDL	4.87	14.35
	E6	d	<MDL	<MDL	<MDL	<MDL	1.64	5.54
	E7	d	<MDL	<MDL	<MDL	<MDL	4.32	9.16
	E8	d	<MDL	<MDL	<MDL	<MDL	2.57	5.20
	E9	d	<MDL	<MDL	<MDL	<MDL	1.19	5.02

All results in µg/l. No EQS exceedances noted

<MDL – Less than the Method Detection Limit

d – deep well

Table C4 - BTEX in Groundwater - downgradient wells

Monitoring Round	Location	Well	Benzene	Ethylbenzene	Toluene	Xylene (m)	Xylene (o)	Xylene (p)
	EQS (µg/L)		10	20	74	-	-	-
2016-Q3	CP2	s	<MDL	3.77	<MDL	<MDL	<MDL	<MDL
	CP2	m	<MDL	4.28	<MDL	<MDL	<MDL	<MDL
	CP2	d	<MDL	4.79	<MDL	<MDL	<MDL	<MDL
	BH210	-	<MDL	<MDL	<MDL	7.31	<MDL	<MDL
2017-Q3	CP2	s	<MDL	<MDL	<MDL	<MDL	2.30	5.24
	CP2	m	<MDL	<MDL	<MDL	<MDL	2.03	4.33
	CP2	d	<MDL	<MDL	<MDL	<MDL	1.69	4.00

All results in µg/l. No EQS exceedances noted

<MDL – Less than the Method Detection Limit

*Italic – Made Ground***Bold italic** -underlying Mudstone

s – shallow well m – medium well d – deep well

Table C5 – VOCs and SSCs in groundwater - Made Ground

Monitoring Round	Location	Well	Methanol	D4	D5	D6	TMS
2015-Q3	E1	s	<MDL	<MDL	<MDL	<MDL	80
	LF4	-	<MDL	<MDL	<MDL	<MDL	690
2016-Q1	E1	s	<MDL	<MDL	<MDL	<MDL	110
2016-Q3	E1	s	<MDL	<MDL	<MDL	<MDL	280
	E5	s	<MDL	<MDL	<MDL	<MDL	4070
	E5	m	<MDL	<MDL	<MDL	<MDL	4020
	E6	s	<MDL	<MDL	<MDL	<MDL	350
	E6	m	<MDL	<MDL	<MDL	<MDL	950
	E7	m	<MDL	<MDL	<MDL	<MDL	1130
	E8	s	<MDL	<MDL	<MDL	<MDL	1120
	E8	m	<MDL	<MDL	<MDL	<MDL	740
2017-Q1	E1	s	<MDL	<MDL	<MDL	<MDL	630
	E5	s	<MDL	<MDL	<MDL	<MDL	4540
	E5	m	<MDL	<MDL	<MDL	<MDL	4290
	E6	s	<MDL	<MDL	<MDL	<MDL	420
	E6	m	<MDL	<MDL	<MDL	<MDL	880
	E7	m	<MDL	<MDL	<MDL	<MDL	1690
	E8	s	<MDL	<MDL	<MDL	<MDL	2620
	E8	m	<MDL	<MDL	<MDL	<MDL	1330
2017-Q3	E9	s	<MDL	<MDL	<MDL	<MDL	150
	E5	s	<MDL	<MDL	<MDL	<MDL	5440
	E5	m	<MDL	<MDL	<MDL	<MDL	5920
	E6	s	<MDL	<MDL	<MDL	<MDL	360
	E6	m	<MDL	<MDL	<MDL	<MDL	690
	E7	m	<MDL	<MDL	<MDL	<MDL	1950
	E8	s	<MDL	<MDL	<MDL	<MDL	1810
	E8	m	<MDL	<MDL	<MDL	<MDL	960
	E9	s	<MDL	<MDL	<MDL	<MDL	220

Table C6 – VOCs and SSCs in groundwater – Natural ground

Monitoring Round	Location	Well	Methanol	D4	D5	D6	TMS
2015-Q3	E1	m	<MDL	<MDL	<MDL	<MDL	100
	<i>E1</i>	<i>d</i>	<MDL	<MDL	<MDL	<MDL	<i>100</i>
	E5	d	<MDL	<MDL	<MDL	<MDL	2540
2016-Q3	E6	d	<MDL	<MDL	<MDL	<MDL	970
	E7	d	<MDL	<MDL	<MDL	<MDL	1730
	E8	d	<MDL	<MDL	<MDL	<MDL	1020
	E9	d	<MDL	<MDL	<MDL	<MDL	770
	E5	d	<MDL	<MDL	<MDL	<MDL	2280
2017-Q1	E6	d	<MDL	<MDL	<MDL	<MDL	1060
	E7	d	<MDL	<MDL	<MDL	<MDL	1870
	E8	d	<MDL	<MDL	<MDL	<MDL	1190
	E9	m	<MDL	<MDL	<MDL	<MDL	170
	E9	d	<MDL	<MDL	<MDL	<MDL	790
	E5	d	<MDL	<MDL	<MDL	<MDL	2510
2017-Q3	E6	d	<MDL	<MDL	<MDL	<MDL	980
	E7	d	<MDL	<MDL	<MDL	<MDL	1640
	E8	d	<MDL	<MDL	<MDL	<MDL	1110
	E9	m	<MDL	<MDL	<MDL	<MDL	210
	E9	d	<MDL	<MDL	<MDL	<MDL	850

All results in µg/l.

<MDL – Less than the Method Detection Limit

Bold italic -underlying Mudstone

Table C7 – Downgradient well VOCs and SSCs

Monitoring Round	Location	Well	Methanol	D4	D5	D5	TMS
2015-Q3	LF7	-	<MDL	<MDL	<MDL	<MDL	90
	<i>BH210</i>	-	<MDL	<MDL	<MDL	<MDL	<i>140</i>
2016-Q1	LF7	-	<MDL	<MDL	<MDL	<MDL	200
	<i>BH210</i>	-	<MDL	<MDL	<MDL	<MDL	<i>110</i>
	<i>CP1</i>	s	<MDL	<MDL	<MDL	<MDL	<i>1650</i>
2016-Q3	CP2	m	<MDL	<MDL	<MDL	<MDL	1890
	<i>CP2</i>	<i>d</i>	<MDL	<i>1.76</i>	<MDL	<MDL	<i>2000</i>
	<i>BH210</i>	-	<MDL	<MDL	<MDL	<MDL	<i>330</i>
2017-Q1	<i>BH210</i>	-	<MDL	<MDL	<MDL	<MDL	<i>310</i>
	LF7	-	<MDL	<MDL	<MDL	<MDL	160
	CP2	s	<MDL	<MDL	<MDL	<MDL	<i>1850</i>
2017-Q3	CP2	m	<MDL	<MDL	<MDL	<MDL	2140
	<i>CP2</i>	<i>d</i>	<MDL	<MDL	<MDL	<MDL	<i>1830</i>
	<i>BH210</i>	-	<MDL	<MDL	<MDL	<MDL	<i>380</i>

All results in µg/l. <MDL – Less than the Method Detection Limit

Italic – Made Ground

Normal text – sand

Bold italic -underlying Mudstone

Table C8 – Metals in Active Plant Wells (potential up-gradient)

Monitoring Round	EQS (µg/L)	Aluminium	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Selenium	Zinc
		15	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	-	10.9
2015-Q1	A2	<MDL	509	1.77	3,401	<MDL	13,872	914	38	38	1,003	<MDL	115	<MDL	140
	BH312	<MDL	163	0.64	852	<MDL	<MDL	4,694	16	9.9	211	<MDL	7.31	<MDL	5.36
	BH412	<MDL	467	<MDL	650	<MDL	<MDL	2,088	7.47	119	671	<MDL	<MDL	<MDL	2.58
2015-Q3	A2	<MDL	476	2.26	3,459	<MDL	15,723	860	57	38	722	<MDL	108	<MDL	146
	BH312	<MDL	152	0.86	780	3.62	9.63	2,713	23	6.2	159	<MDL	4.43	<MDL	10
	BH412	<MDL	254	<MDL	646	<MDL	<MDL	109	19	28	395	<MDL	<MDL	<MDL	11
2016-Q1	A2	<MDL	466	<MDL	3,282	<MDL	13,289	861	69	32.3	511	<MDL	82	<MDL	112
	BH312	<MDL	145	<MDL	912	4.72	3.16	2,280	39	5.5	93	<MDL	1.89	<MDL	<MDL
	BH412	<MDL	155	<MDL	898	<MDL	3.89	143	39	7.1	143	<MDL	<MDL	<MDL	<MDL
2016-Q3	A2	<MDL	482	1.32	3,621	<MDL	13,288	831	70	35	688	<MDL	84	<MDL	122
	BH312	<MDL	144	<MDL	1,513	<MDL	<MDL	<MDL	39	<MDL	3.59	<MDL	<MDL	<MDL	2.57
	BH412	<MDL	406	<MDL	844	<MDL	<MDL	6,550	20	80	628	<MDL	<MDL	<MDL	2.10
2017-Q1	A2	<MDL	420	1.06	3,422	<MDL	19,717	1,278	120	28	626	10	88	6.62	117
	BH312	<MDL	118	0.57	1,179	<MDL	<MDL	494	47	3.2	61	25	<MDL	<MDL	5.53
	BH412	<MDL	189	0.60	776	4.25	<MDL	6,458	25	32	595	22	<MDL	<MDL	8.52
2017-Q3	A2	<MDL	405	0.92	4,209	<MDL	21,950	1,252	27	30	763	<MDL	94	<MDL	132
	BH312	<MDL	122	<MDL	1,601	<MDL	<MDL	155	9.60	3.9	30	<MDL	<MDL	<MDL	0.49
	BH412	5.7402	179	<MDL	699	<MDL	8.51	20	<MDL	84	393	<MDL	<MDL	<MDL	7.30

EQS exceedances in **bold**.

<MDL – Less than the Method Detection Limit

Table C9– Metals in Made Ground – Landfill Perimeter

Monitoring Round	EQS (µg/L)	Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Selenium	Tin	Zinc
		15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	-	25	10.9
2015-Q1	E1s	<MDL	35.16	1,364	0.83	125	4.86	<MDL	15,639	<MDL	91	961	<MDL	<MDL	<MDL	<MDL	4.03
	LF4	17	11.96	195	<MDL	680	<MDL	2.89	3,391	<MDL	14	5,677	<MDL	<MDL	<MDL	<MDL	1.59
	LF7	<MDL	47.34	687	<MDL	449	11.36	<MDL	41,838	27.51	234	1,802	55.48	2.75	<MDL	<MDL	8.49
2015-Q3	E1s	<MDL	44.24	1,291	1.49	108	3.40	17.95	9,449	<MDL	78	744	41.52	2.24	<MDL	<MDL	34.12
	LF4	<MDL	15.50	257	1.38	1,132	<MDL	30.93	<MDL	<MDL	33	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	LF7	<MDL	58.39	661	1.54	409	8.65	<MDL	37,299	<MDL	208	1,909	4.82	1.48	<MDL	<MDL	9.96
2016-Q1	E1s	<MDL	31.94	1,577	<MDL	135	12.62	<MDL	16,604	<MDL	105	1,056	<MDL	<MDL	<MDL	<MDL	7.10
	LF7	<MDL	53.09	784	<MDL	4,783	28.89	<MDL	50,408	<MDL	2,047	1,964	<MDL	<MDL	<MDL	<MDL	11.01
2016-Q3	E1s	<MDL	19.22	1,742	0.64	241	<MDL	<MDL	19,878	<MDL	241	1,637	<MDL	<MDL	<MDL	<MDL	4.24
	E5s	<MDL	14.05	435	<MDL	3,298	<MDL	5.10	165	33.72	19	243	17.48	<MDL	<MDL	<MDL	1.70
	E5m	<MDL	13.25	443	<MDL	3,178	<MDL	7.72	689	32.11	29	450	3.73	<MDL	<MDL	<MDL	1.90
	E6s	<MDL	14.29	311	<MDL	95	<MDL	<MDL	423	<MDL	<MDL	230	4.26	<MDL	<MDL	<MDL	2.87
	E6m	<MDL	13.44	798	<MDL	1,608	<MDL	<MDL	19,165	<MDL	301	9,184	0.92	<MDL	<MDL	<MDL	4.23
	E7m	<MDL	<MDL	450	<MDL	1,011	<MDL	<MDL	3,171	32.24	24	2,513	0.98	<MDL	<MDL	<MDL	2.90
	E8s	<MDL	<MDL	448	<MDL	1,199	<MDL	<MDL	2,164	25.92	49	1,066	<MDL	<MDL	<MDL	<MDL	2.93
	E8m	<MDL	<MDL	423	<MDL	1,850	<MDL	<MDL	2,430	13.91	130	1,611	0.49	18.67	<MDL	<MDL	6.06
	E9s	<MDL	12.84	746	<MDL	239	<MDL	<MDL	6,712	<MDL	99	2,606	1.21	5.25	<MDL	<MDL	5.80
	LF7	<MDL	53.68	718	1.24	465	7.32	<MDL	42,521	<MDL	200	2,021	16.43	<MDL	<MDL	<MDL	5.82
2017-Q1	E1s	<MDL	23.58	1,596	4.46	169	13.06	<MDL	18,165	10.86	130	1,262	17.88	<MDL	<MDL	<MDL	11.01
	E5s	<MDL	9.07	337	0.45	3,406	<MDL	<MDL	42	58.96	15	144	<MDL	<MDL	6.38	<MDL	3.84
	E5m	<MDL	11.82	362	<MDL	3,122	<MDL	<MDL	1,300	53.55	39	1,107	<MDL	<MDL	<MDL	<MDL	4.06
	E6s	31	11.05	256	<MDL	87	<MDL	<MDL	483	5.04	7	239	<MDL	3.42	<MDL	<MDL	6.35

Monitoring Round	EQS (µg/L)	Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Selenium	Tin	Zinc
		15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	-	25	10.9
2017-Q1	E6m	<MDL	10.43	728	<MDL	1,642	14.59	<MDL	19,713	13.15	184	10,090	<MDL	2.67	<MDL	<MDL	10.21
	E7m	<MDL	<MDL	454	0.69	1,229	3.45	<MDL	4,994	59.04	29	3,008	<MDL	<MDL	<MDL	<MDL	4.90
	E8s	<MDL	<MDL	427	<MDL	1,193	<MDL	<MDL	1,467	38.61	53	1,044	<MDL	<MDL	<MDL	<MDL	4.27
	E8m	<MDL	7.47	488	<MDL	2,682	2.09	<MDL	4,255	29.57	101	2,828	<MDL	24.04	<MDL	<MDL	11.73
	E9s	<MDL	9.02	661	0.54	278	7.39	<MDL	9,503	5.11	97	3,136	4.23	6.55	<MDL	<MDL	8.20
	LF7	<MDL	39.68	738	<MDL	469	41.53	<MDL	47,669	6.26	172	1,783	9.33	2.84	<MDL	<MDL	12.94
2017-Q3	E1s	<MDL	32.57	1,316	<MDL	136	6.23	<MDL	11,971	<MDL	93	897	3.69	<MDL	<MDL	2.44	2.81
	E5s	4	<MDL	338	0.51	3,466	<MDL	<MDL	10	50.25	6	38	14.16	<MDL	<MDL	<MDL	<MDL
	E5m	<MDL	<MDL	366	<MDL	3,212	<MDL	<MDL	1,489	48.49	41	1,300	3.72	<MDL	<MDL	<MDL	0.82
	E6s	36	<MDL	288	<MDL	86	<MDL	<MDL	804	3.85	7	226	<MDL	3.47	<MDL	<MDL	0.56
	E6m	<MDL	<MDL	686	<MDL	1,607	7.43	<MDL	16,182	12.49	146	9,961	<MDL	3.19	<MDL	<MDL	3.48
	E7m	17	<MDL	486	0.59	1,123	<MDL	11.63	2,309	44.28	24	1,776	<MDL	<MDL	<MDL	<MDL	5.94
	E8s	5	<MDL	398	<MDL	1,050	<MDL	<MDL	1,772	30.36	38	978	<MDL	<MDL	<MDL	<MDL	0.69
	E8m	<MDL	<MDL	413	<MDL	2,037	<MDL	<MDL	2,854	20.47	97	2,353	<MDL	20.62	<MDL	<MDL	4.19
	E9s	<MDL	<MDL	642	<MDL	378	5.63	<MDL	10,490	4.42	101	3,841	<MDL	4.89	<MDL	<MDL	3.38
	LF7	<MDL	68.50	449	0.68	333	14.68	<MDL	30,161	<MDL	107	2,155	16.39	2.80	<MDL	<MDL	4.12

EQS exceedances in **bold**.

<MDL – Less than the Method Detection Limit

Note: E1s is considered to be installed on the boundary of Made Ground and underlying clay.

Table C10 – Metals in Natural Sand – Landfill Perimeter

Monitoring Round	EQS (µg/L)	Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/L)	Manganese	Mercury	Nickel	Zinc
		15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	10.9
2015-Q1	E1m	3	27.11	1,761	0.74	180	6.05	<MDL	23,220	<MDL	190	1,697	<MDL	<MDL	2.51
	E4s	<MDL	<MDL	1,994	<MDL	155	<MDL	<MDL	<MDL	<MDL	280	986	<MDL	<MDL	0.00
2015-Q3	E1m	142	51.81	1,522	1.54	126	3.90	39.27	10,859	8.56	94	883	6.84	3.83	34.82
2016-Q1	E1m	271	47.50	1,116	<MDL	87	10.69	66.18	11,671	10.80	57	606	<MDL	4.89	34.89
2016-Q3	E1m	<MDL	35.72	1,538	0.98	<MDL	3.25	<MDL	15,443	<MDL	88	932	<MDL	<MDL	2.98
	E5d	<MDL	<MDL	2,089	<MDL	361	<MDL	<MDL	916	13.73	302	979	3.93	<MDL	1.68
	E6d	<MDL	14.71	788	<MDL	1,616	<MDL	<MDL	18,400	<MDL	301	9,174	2.91	<MDL	5.09
	E7d	<MDL	<MDL	892	<MDL	6,473	<MDL	<MDL	7,699	29.02	118	4,257	0.51	24.43	7.99
	E8d	<MDL	<MDL	1,923	<MDL	3,277	<MDL	<MDL	13,368	11.32	293	3,498	2.72	5.40	5.00
	E9m	<MDL	<MDL	834	<MDL	292	<MDL	<MDL	7,129	<MDL	115	2,034	1.58	6.03	4.76
	E9d	<MDL	<MDL	2,047	<MDL	2,473	<MDL	<MDL	17,749	<MDL	296	5,083	1.19	<MDL	3.75
	E1m	<MDL	39.99	1,375	1.62	99	14.02	<MDL	18,037	6.62	63	774	9.07	<MDL	8.11
2017-Q1	E5d	<MDL	<MDL	1,902	<MDL	340	<MDL	<MDL	828	19.78	212	959	<MDL	<MDL	5.18
	E6d	<MDL	8.80	720	0.66	1,616	14.10	<MDL	18,393	13.48	184	10,150	2.23	3.48	9.95
	E7d	<MDL	7.20	844	<MDL	4,353	6.52	<MDL	10,774	51.34	57	4,806	<MDL	21.87	8.84
	E8d	<MDL	<MDL	1,823	<MDL	3,238	8.94	<MDL	13,742	19.74	169	3,736	<MDL	5.67	7.31
	E9m	<MDL	8.57	707	1.57	366	10.11	6.41	12,790	7.95	107	3,181	2.41	7.24	8.20
	E9d	<MDL	<MDL	1,810	<MDL	2,415	12.51	<MDL	18,618	15.63	176	5,506	<MDL	<MDL	5.79
2017-Q3	E1m	4	40.02	1,363	<MDL	124	8.11	<MDL	16,009	<MDL	75	911	<MDL	<MDL	5.11
	E5d	<MDL	<MDL	1,872	<MDL	350	<MDL	<MDL	632	14.99	155	789	10.81	<MDL	0.00
	E6d	<MDL	<MDL	667	<MDL	1,627	6.98	<MDL	15,311	12.55	147	10,212	<MDL	3.18	3.71
	E7d	<MDL	<MDL	772	<MDL	3,940	4.08	<MDL	11,101	42.93	53	4,773	<MDL	25.50	5.78

Monitoring Round	EQS (µg/L)	Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/L)	Manganese	Mercury	Nickel	Zinc
		15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	10.9
2017-Q3	E8d	<MDL	<MDL	1,733	<MDL	3,208	4.47	1.27	13,145	20.37	137	3,891	<MDL	6.59	6.81
	E9m	<MDL	<MDL	650	<MDL	380	6.19	<MDL	12,067	4.97	108	3,881	2.54	7.91	3.68
	E9d	<MDL	<MDL	1,709	<MDL	2,548	6.78	<MDL	16,961	15.71	151	6,171	<MDL	<MDL	2.55

EQS exceedances in bold.. <MDL – Less than the Method Detection Limit

Table C11 – Metal detections in downgradient Made Ground

Monitoring Round	EQS (µg/L)	Boron	Calcium (mg/l)	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Zinc
		2,000	-	1,000	1.2	-	123	0.07	4	10.9
2016-Q3	CP2s	2,329	1,150	9,291	<MDL	350	2,571	15.38	<MDL	3.58
2017-Q3	CP2s	1,772	1,105	2,698	9.80	157	2,727	<MDL	16.82	8.23

EQS exceedances in bold. <MDL – Less than the Method Detection Limit (also applies to following tables)

Table C12 – Metal detections in downgradient natural sand

Monitoring Round	EQS (µg/L)	Arsenic	Boron	Calcium (mg/l)	Chromium (III+VI)	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Zinc
		50	2,000	-	-	1,000	1.2	-	123	0.07	4	10.9
2016-Q3	CP2m	<MDL	622	574	<MDL	170	<MDL	303	3,657	9.39	3.88	4.35
2017-Q3	CP2m	11.70	1,807	1,168	4.94	12,090	10.99	154	2,530	<MDL	<MDL	1.69

EQS exceedances in bold. <MDL – Less than the Method Detection Limit (also applies to following tables)

Table C13 – Metal detections in downgradient mudstone

Monitoring Round	EQS (µg/L)	Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/l)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Zinc
		15	50	2,000	0.08	-	-	1	1,000	1.2	-	123	0.07	4	10.9
2015-Q1	BH210	<MDL	<MDL	276	<MDL	96.3	<MDL	<MDL	7.33	<MDL	38.1	6.32	<MDL	5.16	<MDL
	E4d	<MDL	<MDL	1,810	<MDL	74	<MDL	<MDL	2,997	<MDL	130	274	<MDL	<MDL	2.05
2015-Q3	BH210	<MDL	<MDL	523	<MDL	151.8	<MDL	<MDL	16.02	<MDL	80.8	7.94	11.49	4.45	7.827
2016-Q1	BH210	<MDL	<MDL	206	<MDL	60.5	<MDL	9.08	18.44	<MDL	27.4	<MDL	<MDL	1.72	8.073
2016-Q3	CP1d	<MDL	21.23	2,099	1.04	180	<MDL	<MDL	2,731	<MDL	267	2,403	43.18	<MDL	3.58
	CP2d	<MDL	18.47	2,195	<MDL	1,226	<MDL	<MDL	12,631	<MDL	339	2,792	3.23	<MDL	3.30
	BH210	<MDL	<MDL	509	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	89.3	15.70	3.06	3.79	2.054
2017-Q1	BH210	<MDL	<MDL	434	1.25	148.3	<MDL	<MDL	4.62	4.34	67.6	13.20	41.19	4.21	3.6415
2017-Q3	CP1d	<MDL	13.06	1,810	<MDL	162	<MDL	<MDL	3,223	<MDL	141	2,460	<MDL	<MDL	1.97
	CP2d	<MDL	<MDL	1,941	<MDL	1,110	2.66	<MDL	8,598	10.73	157	2,351	<MDL	<MDL	2.11
2017-Q3	BH210	2.93	<MDL	516	<MDL	168.4	<MDL	<MDL	4.21	<MDL	96.1	17.8761	2.73	2.58	<MDL

EQS exceedances in bold. <MDL – Less than the Method Detection Limit (also applies to following tables)

Table C14 – Inorganics in Active Plant Wells (potential up-gradient)

Monitoring Round	Well	COD	Chloride (ppm)	Total Alkalinity	Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	A2D	398	874	83.3	<MDL	7.02	<MDL	8,650
	BH312	448	262	97.13	<MDL	7.18	<MDL	2,168
	BH412	154	364	291	<MDL	7.35	113	2,113
2015-Q3	A2D	1,488	902	224	<MDL	6.89	<MDL	8,795
	BH312	499	206	66.3	<MDL	7.46	<MDL	1,973
	BH412	230	217	117	<MDL	6.99	<MDL	1,728
2016-Q1	A2D	ND	837	88	<MDL	6.71	<MDL	8,328
	BH312	ND	242	54	<MDL	7.39	<MDL	2,299
	BH412	ND	252	58	<MDL	7.55	<MDL	2,271
2016-Q3	A2D	2,250	915	68.9	<MDL	6.88	<MDL	9,185
	BH312	1,600	312	55.5	13.398	8.3	<MDL	<MDL
	BH412	155	297	255	<MDL	7.19	90.5	2,438
2017-Q1	A2D	557	1,109	130	<MDL	6.82	<MDL	8,660
	BH312	249	312	59.8	<MDL	7.89	<MDL	2,957
	BH412	167	251	128	<MDL	7.7	45.9	2,068
2017-Q3	A2D	621	244	88.3	<MDL	6.74	<MDL	10,636
	BH312	238	389	41.2	<MDL	8.75	<MDL	4,014
	BH412	74.2	2890	232	<MDL	7.21	180	2,091

ND – No data

<MDL – Less than the Method Detection Limit

Table C15 – Inorganics in Landfill Perimeter wells – Made Ground

Monitoring Round	Well	COD	Chloride (ppm)	Total Alkalinity	Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	E1s	77	907	773	<MDL	7.25	<MDL	687
	LF4	214	126	174	<MDL	7.76	<MDL	1,756
2015-Q3	LF4	877	256	<MDL	<MDL	7.19	<MDL	2,960
2016-Q1	E1s	73	ND	702	<MDL	7.96	<MDL	767
2016-Q3	E1s	102	485	821	<MDL	7.35	<MDL	1,591
	E1s	2,073	828	61	<MDL	7.3	<MDL	8,314
	E5m	1,260	799	62	<MDL	7.35	<MDL	8,055
	E6s	79	172	94	<MDL	7.95	<MDL	<MDL
	E6m	678	713	246	<MDL	7.29	<MDL	5,253
	E7m	1,018	233	84	<MDL	7.63	<MDL	2,624
	E8s	822	346	131	<MDL	8.02	65	3,194
	E8m	600	605	151	<MDL	7.51	224	5,153
	E9s	31	148	456	<MDL	7.79	<MDL	1,005
2017-Q1	E1s	102	501	847	30	8.11	<MDL	956
	E5s	479	465	48	12	8.89	<MDL	8,565
	E5m	461	822	90	<MDL	7.48	57	7,957
	E6s	80	327	102	<MDL	7.87	<MDL	246
	E6m	140	692	269	<MDL	7.38	<MDL	4,857
	E7s	ND	ND	ND	ND	ND	ND	ND
	E7m	438	298	108	<MDL	7.35	<MDL	3,187
	E8s	333	355	120	<MDL	7.45	<MDL	3,196
	E8m	266	877	143	<MDL	7.53	135	7,113
2017-Q3	E9s	32	184	466	<MDL	7.76	<MDL	1,094
	E1s	77	41	728	<MDL	7.52	<MDL	723
	E5s	512	429	84	35	9.76	<MDL	8,679
	E5m	475	435	53	<MDL	7.56	<MDL	8,187
	E6s	70	165	114	<MDL	7.81	<MDL	242
	E6m	113	331	220	<MDL	7.43	<MDL	4,613
	E7s	ND	ND	ND	ND	ND	ND	ND
	E7m	948	273	79	<MDL	7.88	<MDL	2,900
	E8s	321	364	96	<MDL	7.65	<MDL	2,779
	E8m	197	335	132	<MDL	7.44	130	5,484
	E9s	38	214	398	<MDL	7.54	<MDL	1,361

ND – No data

<MDL – Less than the Method Detection Limit

Table C16 – Inorganics in Landfill Perimeter wells – Natural Strata

Monitoring Round	Well	COD	Chloride (ppm)	Total Alkalinity	Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	E1s	<MDL	215	327	<MDL	7.84	249	1,010
	E1m	73	295	906	<MDL	7.02	<MDL	1,234
2016-Q1	E1d	<MDL	ND	328	<MDL	7.94	309	1,062
	E1m	53	ND	562	<MDL	8.21	<MDL	453
2016-Q3	E1m	74	711	790	<MDL	7.52	<MDL	<MDL
	E1d	30	223	310	<MDL	7.28	<MDL	1,097
	E5d	259	985	892	<MDL	7.99	250	2,143
	E6d	1,128	709	282	<MDL	7.16	122	5,273
	E7d	2,020	1,319	108	<MDL	7.27	<MDL	16,648
	E8d	1,115	364	344	<MDL	6.96	119	9,388
	E9m	38	158	544	<MDL	7.78	<MDL	1,203
	E9d	197	1,639	330	<MDL	7.12	527	7,396
	E1m	95	72	508	<MDL	8.18	86	507
	E1d	41	230	347	32	8.23	253	763
2017-Q1	E5d	201	960	967	46	8.11	168	1,722
	E6d	118	710	239	<MDL	7.3	<MDL	4,793
	E7d	200	262	120	<MDL	6.77	<MDL	11,103
	E8d	229	340	263	<MDL	6.94	90	8,780
	E9m	55	200	452	<MDL	7.76	<MDL	1,356
	E9d	165	164	367	<MDL	7.26	486	6,755
	E1m	109	75	846	<MDL	7.31	148	618
2017-Q3	E1d	<MDL	213	328	<MDL	7.58	263	885
	E5d	197	504	962	<MDL	8	205	1,512
	E6d	117	353	202	<MDL	7.35	<MDL	4,670
	E7d	356	607	96	<MDL	7.24	<MDL	10,058
	E8d	226	368	230	<MDL	6.76	87	8,573
	E9m	<MDL	414	361	<MDL	6.55	<MDL	1,393
	E9d	198	348	236	<MDL	7.05	489	6,981

ND – No data

<MDL – Less than the Method Detection Limit

Bold – well screened in underlying mudstone.

Table C17 – Inorganics in downgradient wells

Monitoring Round	Well	COD	Chloride (ppm)	Total Alkalinity	Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	E4s	<MDL	690	609	<MDL	7.7	1,140	1,542
	E4d	31	174	609	<MDL	7.88	107	723
	LF7	<MDL	483	680	<MDL	6.8	<MDL	2,085
	BH210	31	105	42	<MDL	7.78	<MDL	397
2015-Q3	LF7	50	352	599	<MDL	6.66	<MDL	1,877
	BH210	<MDL	184	55	35.1	9.96	<MDL	712
2016-Q1	LF7	78	570	558	<MDL	7.5	<MDL	20,372
	BH210	26	612	68	<MDL	7.77	<MDL	264
2016-Q3	LF7	50	332	614	<MDL	6.9	<MDL	1,984
	BH210	52	1,736	73	7.7	8.68	<MDL	<MDL
	CP1d	95	824	1,130	<MDL	8.11	605	1,549
	CP2s	181	970	466	<MDL	7.86	314	4,310
	CP2m	192	1,252	422	<MDL	6.95	188	2,682
	CP2d	149	1,333	458	<MDL	7.57	360	4,457
	CP2d	149	1,333	458	<MDL	7.57	360	4,457
2017-Q1	LF7	81	248	612	<MDL	6.79	68	1,879
	BH210	54	149	76	21.9	8.86	<MDL	649
2017-Q3	LF7	30	105	579	<MDL	6.99	<MDL	1,272
	BH210	43	219	55	<MDL	8.93	<MDL	816
	CP1d	<MDL	439	1,103	<MDL	8.01	612	983
	CP2s	136	265	304	<MDL	7.26	142	3,404
	CP2m	<MDL	269	281	<MDL	7.29	218	3,548
	CP2d	<MDL	280	332	<MDL	7.27	326	3,418

ND – No data

<MDL – Less than the Method Detection Limit

Surface waters

Table C18 – MST and silicic acid in Surface Waters

Analyte	SW2 Cadoxton River (upstream)		SW3 Cadoxton River (downstream)		South Pond	Timber Pond		Cadoxton North Pond
	2017-Q1	2017-Q3	2017-Q1	2017-Q3	2017-Q3	2017-Q1	2017-Q3	2017-Q3
MST	0.1	0.1	6	9.6	17.4	38.3	36	1.5
Silicic acid	12.9	9.7	12.7	11.6	3	5.3	3.3	6.8

All results in ppm.

Table C19 – Metal detections in Surface Waters

Monitoring Round		Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/L)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Selenium	Zinc
	EQS (µg/L)	15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	-	10.9
2015-Q1	Cadoxton Pond N	112	<MDL	145	<MDL	200	<MDL	<MDL	337	<MDL	25	434	<MDL	<MDL	<MDL	3.35
	Cadoxton Pond S	432	<MDL	197	<MDL	109	<MDL	<MDL	422	<MDL	23	130	1.97	<MDL	<MDL	5.56
	South Pond	12	<MDL	133	<MDL	290	<MDL	5.19	177	<MDL	17	182	<MDL	<MDL	<MDL	6.23
	Cadoxton River SW2	437	<MDL	50	<MDL	88	<MDL	2.96	370	<MDL	19	34	<MDL	<MDL	<MDL	9.99
	Cadoxton River SW3	361	<MDL	56	<MDL	278	<MDL	16	352	<MDL	21	39	<MDL	<MDL	<MDL	14
	Timber Pond	9.25	<MDL	190	<MDL	518	<MDL	11	147	<MDL	18	207	6.50	<MDL	<MDL	2.16
2015-Q3	Cadoxton Pond N	0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	Cadoxton Pond S	0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	South Pond	0	<MDL	<MDL	<MDL	283	<MDL	2.41	539	<MDL	18	378	3.56	<MDL	<MDL	9.58
	Cadoxton River SW2	0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	Cadoxton River SW3	0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	Timber Pond	0	<MDL	216	<MDL	530	<MDL	7.56	140	6.29	20	179	<MDL	<MDL	<MDL	5.71
2016-Q1	Cadoxton Pond N	47	<MDL	139	<MDL	131	4.49	5.82	648	<MDL	20	161	<MDL	<MDL	<MDL	11.1
	Cadoxton Pond S	36	<MDL	175	<MDL	127	<MDL	5.32	169	<MDL	20	87	<MDL	<MDL	<MDL	6.75
	South Pond	0	<MDL	120	<MDL	222	<MDL	6.16	156	<MDL	13	95	<MDL	<MDL	<MDL	9.06
	Cadoxton River SW2	59	<MDL	49	<MDL	81	4.63	7.01	144	<MDL	17	26	<MDL	<MDL	<MDL	12
	Cadoxton River SW3	55	<MDL	56	<MDL	235	4.47	10	134	<MDL	18	29	<MDL	<MDL	<MDL	11
	Timber Pond	0	<MDL	<MDL	<MDL	397	<MDL	15	<MDL	<MDL	15	<MDL	<MDL	<MDL	<MDL	7.95
2016-Q3	Cadoxton Pond N	87	<MDL	220	<MDL	<MDL	<MDL	3.46	506	<MDL	26	287	<MDL	<MDL	<MDL	4.99
	Cadoxton Pond S	109	<MDL	287	<MDL	<MDL	<MDL	2.58	513	<MDL	27	255	<MDL	<MDL	<MDL	6.94
	South Pond	181	<MDL	101	<MDL	259	<MDL	15	1,630	12	16	731	<MDL	<MDL	<MDL	23

Monitoring Round		Aluminium	Arsenic	Boron	Cadmium	Calcium (mg/L)	Chromium (III+VI)	Copper	Iron	Lead	Magnesium (mg/l)	Manganese	Mercury	Nickel	Selenium	Zinc
	EQS (µg/L)	15	50	2000	0.08	-	-	1	1000	1.2	-	123	0.07	4	-	10.9
2017-Q1	Cadoxton River SW2	203	<MDL	58	<MDL	<MDL	<MDL	3.83	219	<MDL	<MDL	29	<MDL	<MDL	<MDL	8.89
	Cadoxton River SW3	228	<MDL	87	<MDL	530	<MDL	18	340	9.93	<MDL	38	<MDL	<MDL	<MDL	20
	Timber Pond	0	<MDL	221	<MDL	425	<MDL	4.85	139	7.00	17	179	<MDL	<MDL	<MDL	2.77
	Cadoxton Pond N	42	<MDL	118	1.27	74	<MDL	12	752	5.18	16	115	15	<MDL	<MDL	13
	Cadoxton Pond S	59	<MDL	179	0.51	79	<MDL	3.69	193	5.42	19	78	13	<MDL	<MDL	14
	South Pond	6.11	23	56	22	155	<MDL	3.24	238	25	10	109	143	<MDL	21	7.19
	Cadoxton River SW2	124	<MDL	29	1.46	64	<MDL	2.70	149	3.88	13	12	53	<MDL	2.61	11
	Cadoxton River SW3	105	<MDL	44	1.57	158	<MDL	5.60	138	7.18	14	17	30	<MDL	<MDL	16
	Timber Pond	3.21	<MDL	155	0.59	297	<MDL	10	50	9.27	12	36	16	<MDL	<MDL	5.50
2017-Q3	Cadoxton Pond N	90	4.94	261	<MDL	94	<MDL	<MDL	397	5.00	24	181	17	<MDL	<MDL	6.29
	Cadoxton Pond S	75	4.91	197	<MDL	92	<MDL	<MDL	579	<MDL	24	344	9.37	<MDL	<MDL	2.24
	South Pond	25	<MDL	19	<MDL	196	<MDL	3.31	314	<MDL	13	176	<MDL	<MDL	<MDL	3.45
	Cadoxton River SW2	68	<MDL	53	<MDL	77	<MDL	3.16	148	<MDL	13	40	<MDL	<MDL	<MDL	6.37
	Cadoxton River SW3	54	<MDL	103	<MDL	637	<MDL	19	79	11	14	28	<MDL	<MDL	<MDL	13
	Timber Pond	16	<MDL	186	<MDL	386	<MDL	19	275	<MDL	14	365	<MDL	<MDL	<MDL	8.19

EQS exceedances in **bold**.

<MDL – Less than the Method Detection Limit

Cadoxton Pond N = North

Cadoxton Pond S = South

Table C20 - Inorganics in Surface Waters

Monitoring Round	Well	COD	Chloride (ppm)	Total Alkalinity	Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	Cadoxton Pond N	30	483	208	<MDL	8.07	<MDL	605
	Cadoxton Pond S	22	211	258	<MDL	8.07	<MDL	370
	South Pond	103	647	95	<MDL	7.66	<MDL	792
	Timber Pond	108	120	82	<MDL	7.8	<MDL	1,368
	Cadoxton River SW2	36	31	272	<MDL	7.98	<MDL	298
	Cadoxton River SW3	40	429	272	<MDL	7.95	<MDL	781
2015-Q3	Cadoxton Pond N	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	Cadoxton Pond S	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	South Pond	<MDL	<MDL	90	<MDL	<MDL	<MDL	781
	Timber Pond	84	118	86	<MDL	6.89	<MDL	1,403
	Cadoxton River SW2	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	Cadoxton River SW3	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
2016-Q1	Cadoxton Pond N	26	ND	188	<MDL	8.42	<MDL	410
	Cadoxton Pond S	25	ND	214	<MDL	8.64	<MDL	400
	South Pond	45	ND	98	<MDL	8.1	<MDL	608
	Timber Pond	<MDL	ND	84	<MDL	7.78	<MDL	1,052
	Cadoxton River SW2	16	40	280	<MDL	8.18	<MDL	274
	Cadoxton River SW3	35	388	252	<MDL	8.1	<MDL	660
2016-Q3	Cadoxton Pond N	30	83	176	<MDL	8.03	<MDL	<MDL
	Cadoxton Pond S	31	327	234	<MDL	7.93	<MDL	<MDL
	South Pond	93	285	78	<MDL	7.32	<MDL	713
	Timber Pond	75	187	78	<MDL	7.24	<MDL	1,129
	Cadoxton River SW2	18	21	195	<MDL	7.98	<MDL	<MDL
	Cadoxton River SW3	76	473	174	<MDL	7.77	<MDL	<MDL
2017-Q1	Cadoxton Pond N	29	230	195	22	8.17	<MDL	252
	Cadoxton Pond S	25	211	249	<MDL	8.06	<MDL	274
	South Pond	38	420	106	<MDL	7.99	<MDL	428
	Timber Pond	69	77	98	<MDL	7.67	<MDL	792
	Cadoxton River SW2	17	29	253	<MDL	7.97	<MDL	214
	Cadoxton River SW3	32	29	243	<MDL	8.2	<MDL	449
2017-Q3	Cadoxton Pond N	32	286	238	<MDL	8.21	<MDL	331
	Cadoxton Pond S	33	362	188	<MDL	7.99	<MDL	327
	South Pond	38	231	73	<MDL	7.56	<MDL	543
	Timber Pond	88	92	73	<MDL	7.06	<MDL	1,023
	Cadoxton River SW2	<MDL	24	220	<MDL	8.16	<MDL	245
	Cadoxton River SW3	80	125	161	<MDL	7.91	44	1,649

<MDL – Less than the Method Detection Limit

Cadoxton Pond N = North Cadoxton Pond S = South

		Method Detection Limit	EAC, WtV, BV, WA, EQS-Fresh	MAC, EQS-Fresh	Location	A2	BH210												BH312												BH412											
	Units				Well Monitoring Round Sample Code	2015-Q1 A2_18 Feb 15d -	2015-Q3 A2_09 Sep 15d -	2016-Q1 A2_24 Feb 16d -	2016-Q3 A2_03 Aug 16d -	2017-Q1 A2_09 Feb 17d -	2017-Q3 A2_31 Jul 17d -	2015-Q1 BH210_18 Feb 15 -	2015-Q3 BH210_08 Sep 15 -	2016-Q1 BH210_24 Feb 16 -	2016-Q3 BH210_03 Aug 16 -	2017-Q1 BH210_07 Feb 17 -	2017-Q3 BH210_22 Feb 17 -	2017-Q3 BH210_01 Aug 17 -	2015-Q1 BH312_18 Feb 15 -	2015-Q3 BH312_09 Sep 15 -	2016-Q1 BH312_24 Feb 16 -	2016-Q3 BH312_03 Aug 16 -	2017-Q1 BH312_06 Feb 17 -	2017-Q3 BH312_01 Aug 17 -	2015-Q1 BH412_18 Feb 15 -	2015-Q3 BH412_08 Sep 15 -	2016-Q1 BH412_24 Feb 16 -	2016-Q3 BH412_03 Aug 16 -	2017-Q1 BH412_06 Feb 17 -	2017-Q3 BH412_01 Aug 17 -												
Dodecamethylcyclotetrasiloxane	µg/L					0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
Methylsilanetriol	µg/L					0	-	-	-	-	-	-	-	-	-	-	0.1	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
Silicic Acid	µg/L					-	-	-	-	-	-	-	-	-	-	-	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Trimethylsilanol	µg/L					0	5,310	5,920	4,930	4,870	4,980	0	140	110	330	310	-	-	7,200	6,710	7,860	4,490	6,240	7,070	3,320	5,130	7,480	3,910	3,750	1,870												
Dodecamethylcyclotetrasiloxane	µg/L					0	0.07	0	0	0	0	0	0	0	0	0	-	0	0.06	0	0	0	0	0	0.08	0	0	0	0	0	0	0										
BTEX																																										
Benzene	µg/L	10 ¹³				3,642	11,011	11,472	10,705	9,433	0	0	0	0	0	0	-	0	8,954	6,483	4,417	1,606	5,135	4,443	2,468	2,842	5,755	0	1,639	0	0											
Toluene	µg/L	740 ¹²				8,687	35,84	1,55	43,832	32,012	46,601	0	0	0	0	0	-	0	87,539	87,539	0	25,159	100,164	96,982	0	0	0	0	0	0	0											
Ethylbenzene	µg/L	20 ¹⁸				0	3,695	0	28,119	4,253	3,804	0	0	0	0	0	-	0	18,632	10,524	0	35,735	13,523	12,906	0	0	0	25,816	0	0	0											
Xylene (m)	µg/L					0	3,986	1,473	0	4,864	4,857	0	0	0	7,314	0	-	0	38,346	19,103	0	0	23,654	21,066	0	0	0	0	2,298	0	0											
Xylene (p)	µg/L					38,275	0	22,201	5,718	22,086	27,346	0	0	0	0	0	-	0	82,457	0	45,677	14,515	48,467	53,328	29,095	0	33,49	0	20,261	21,853												
Xylene (o)	µg/L					23,098	6,725	7,57	1,326	12,753	10,416	0	0	0	0	0	-	0	31,187	6,612	7,533	15,376	16,94	0	0	0	0	0	0	0	0											
VOG																																										
Cyclotetrasiloxane, octamethyl-	µg/L					0	0.02	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
Solvents																																										
Methanol	µg/L					4.93	0	0	0	0	0	0	0	0	0	0	-	0	0	3.48	0	0	0	0	0	0	0	0	0	0	0	0										
Metals																																										
Aluminium	µg/L	15 ¹⁸				0	0	0	0	0	0	0	0	0	0	0	-	2,9319	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,7402									
Arsenic	µg/L	50 ¹²				0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Boron	µg/L	2000 ¹⁴				599,006	475,887	466,355	491,623	420,1727	495,2904	276,416	523,656	205,757	508,668	433,6862	-	516,0754	182,962	151,925	145,485	144,345	118,3514	122,4175	467,143	254,374	155,361	405,591	189,4401	179,3009												
Calcium	µg/L	0.08 ¹³				1,7739	2,2644	0	1,324	1,0591	0.9243	0	0	0	0	0	-	0	0.6397	0.8844	0	0	0.5991	0	0	0	0	0	0	0.5992	0	0	0									
Calcium	mg/L					3,401	3,459	3,282	3,621	3,422	4,209	96.3	151.8	60.5	0	148.3	-	168.4	851.9	779.9	911.5	1,513	1,179	1,601	649.7	844.3	898	844.3	776.1	699.4												
Chromium (III+VI)	µg/L					0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Copper	µg/L	1 ¹²				13,872	15,723	13,289	13,288	19,717	21,950	0	0	0	9.08	0	-	0	0	9.632	3,102	0	0	0	0	3.885	0	0	0	4,2543	0	0	8,5106									
Iron	µg/L	1000 ¹²				913,636	860,169	860,759	831,191	1,278	1,252	7,326	16,019	18,438	0	4,6202	-	4,2097	4,694	2,713	2,280	0	493,8063	154,6671	2,088	108,69	142,559	6,550	6,458	19,9717												
Lead	µg/L	1.2 ¹²				38,0513	57,1194	68,289	70,196	120,0522	27,124	0	0	0	0	4,3962	-	0	15,7006	23,2423	39,433	38,738	46,5191	9,6029	7,4701	19,1658	38,934	19,563	24,6952	0	0	0										
Magnesium	mg/L					38.3	35.2	32.3	34.9	27.7	30.4	38.1	80.8	27.4	89.3	67.6	-	96.1	9.9	6.2	5.5	3.2	3.9	115.1	27.6	30.1	7.1	30.1	31.5	83.7												
Manganese	µg/L	123 ¹²				1,003	721,959	510,785	688,11	625,859	762,5595	6,323	7,936	0	15,695	13,2014	-	17,8761	210,979	159,368	93,122	3,588	61,3376	29,8336	671,043	395,218	142,844	627,936	595,4115	393,0913												
Mercury	µg/L	0.07 ¹⁴				0	0	0	0	10,4343	0	0	0	0	0	3.06	-	2,7342	0	0	0	0	25,3675	0	0	0	0	0	0	0	0	0	0									
Nickel	µg/L	4 ¹²				115,193	107,635	81,864	84,274	87,8032	94,1173	5,158	4,451	1.72	3,792	4,2657	-	2,5758	7,309	4,429	1,889	0	0	0	0	0	0	0	0	0	0	0										
Selenium	µg/L					0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Zinc	µg/L	10.9 ¹²				140,065	146,101	112,195	121,727	116,9159	132,3062	0	7,827	8,073	2,054	3,6415	-	0	5,357	10,162	0	2,568	5,5301	0.4945	2,578	11,051	0	2,097	8,5182	7,3039												
Tin	µg/L	25 ¹²				0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Inorganics																																										
Hardness as CaCO3	mg/L					8,650	8,795	8,328	9,185	8,659	10,636	397.3	711.8	263.8	0	648.5	-	816.1	2,168	1,973	2,299	0	2,957	4,014	2,113	1,728	2,271	2,438	2,088	2,081												

Comments
#1 WFD England/Wales: 2015 - MAC-EQS Inland
#2 WFD England/Wales: 2015 - Freshwater Standards
#3 WFD England/Wales: 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

	Units	Method Detection Limit	GAC_WPV_BW AA-EQS-Fresh	WL_DowCorning Barry_EQS_L_File	Location Well Monitoring_Round SampleCode	Cadoston North Pond						Cadoston South Pond					
						2015-Q1	2015-Q3	2016-Q1	2016-Q3	2017-Q1	2017-Q3	2015-Q1	2015-Q3	2016-Q1	2016-Q3	2017-Q1	2017-Q3
						Cadoston North Pond_18 Feb 15 -	Cadoston North Pond_08 Sep 15 -	Cadoston North Pond_23 Feb 16 -	Cadoston North Pond_03 Aug 16 -	Cadoston North Pond_07 Feb 17 -	Cadoston North Pond_01 Aug 17 -	Cadoston South Pond_18 Feb 15 -	Cadoston South Pond_08 Sep 15 -	Cadoston South Pond_23 Feb 16 -	Cadoston South Pond_03 Aug 16 -	Cadoston South Pond_07 Feb 17 -	Cadoston South Pond_01 Aug 17 -
Dodecamethylcyclohexasiloxane	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Methylsilanetriol	ppm					-	-	-	-	-	1.5	-	-	-	-	-	-
Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Silicic Acid	ppm					-	-	-	-	-	6.8	-	-	-	-	-	-
Trimethylsilanol	µg/L					0	0	0	0	0	-	0	0	0	0	0	0
Decamethylcyclopentasiloxane	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
BTEX																	
Benzene	µg/L		10 ¹²			0	0	0	0	0	0	0	0	0	0	0	0
Toluene	µg/L		74 ¹²			0	0	0	0	0	0	0	0	0	0	0	0
Ethylbenzene	µg/L		20 ¹²			0	0	0	0	0	0	0	0	0	0	0	0
Xylene (m)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Xylene (o)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Xylene (p)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
VOC																	
Cyclohexasiloxane, octamethyl-	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Solvents																	
Methanol	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Metals																	
Aluminium	µg/L		15 ¹⁴			111,896	0	46,926	86,924	42,2512	89,819	431,636	0	36,402	108,929	59,0206	74,7035
Arsenic	µg/L		50 ¹²			0	0	0	0	0	4,9445	0	0	0	0	0	4,9128
Boron	µg/L		2000 ¹⁴			145,362	0	138,695	219,562	117,6563	261,0355	197,133	0	175,398	287,292	176,7723	196,5582
Calcium	µg/L		0.02 ¹⁴			0	0	0	0	1,2734	0	0	0	0	0	0.6133	0
Calcium	mg/L					200.4	0	131.3	0	74.3	0	109.4	0	126.9	0	79	91.6
Chromium (tr+vi)	µg/L					0	0	4,494	0	0	0	0	0	0	0	0	0
Copper	µg/L		1 ¹²			0	0	5,831	3.46	12,2995	0	0	0	5.32	2,562	3,6676	0
Iron	µg/L		1000 ¹²			336,737	0	648,172	505,868	751,7865	397,0606	421,843	0	169,406	512,842	192,9455	578,579
Lead	µg/L		1.2 ¹²			0	0	0	0	5,1789	5,002	0	0	0	0	5,4189	0
Magnesium	mg/L					25.3	0	19.9	26.4	16.4	23.7	23.4	0	20.1	27.3	18.9	23.9
Manganese	µg/L		124 ¹²			433,884	0	161,288	286,618	115,2779	161,1291	129,861	0	87,371	255,405	77,8969	344,3549
Mercury	µg/L		0.07 ¹²			0	0	0	0	14,994	17,4719	1,9749	0	0	0	12,7637	9,3741
Nickel	µg/L		4 ¹²			0	0	0	0	0	0	0	0	0	0	0	0
Selenium	µg/L					0	0	0	0	0	0	0	0	0	0	0	0
Zinc	µg/L		10.9 ¹²			3.35	0	11.1	4,991	13,0681	6,2658	5,563	0	6,747	6,941	13,5228	2,2389
Tin	µg/L		20 ¹²			0	0	0	0	0	0	0	0	0	0	0	0
Inorganics																	
Hardness as CaCO3	mg/L					604.6	0	409.8	0	262.4	331.4	369.7	0	399.8	0	273.8	327.1

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

Comments

- #1 WFD England/Wales, 2015 - MAC-EQS Inland
- #2 WFD England/Wales, 2015 - Freshwater Standards
- #3 WFD England/Wales, 2015 - AA-EQS Inland
- #4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
- #5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
- #6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
- #7 PNEC (EU REACH) - Freshwater
- #8 Hardness - assumed value - data required.

		Method Detection Limit	GAC, WWT, BW, AA, EQS - Fresh	MAC, EQS - Fresh	Location Well Monitoring Round Sample Code	E1 d	2015-Q1 E1: 18 Feb 15d	2015-Q2 E1: 08 Sep 15d	2016-Q1 E1: 23 Mar 16d	2016-Q2 E1: 03 Aug 16d	2017-Q1 E1: 09 Feb 17d	2017-Q2 E1: 31 Jul 17d	2015-Q1 m E1: 18 Feb 15m	2015-Q2 E1: 08 Sep 15m	2016-Q1 E1: 23 Feb 16m	2016-Q2 E1: 03 Aug 16m	2017-Q1 E1: 09 Feb 17m	2017-Q2 E1: 31 Jul 17m	2015-Q1 s E1: 18 Feb 15s	2015-Q2 E1: 08 Sep 15s	2016-Q1 E1: 23 Feb 16s	2016-Q2 E1: 03 Aug 16s	2017-Q1 E1: 09 Feb 17s	2017-Q2 E1: 31 Jul 17s	E4 d	2015-Q1 E4: 18 Feb 15d	2015-Q2 E4: 18 Feb 15s	2016-Q3 E5: 04 Aug 16d	2017-Q1 E5: 08 Feb 17d	2017-Q2 E5: 01 Aug 17d	2017-Q3 E5: 31 Jul 17d	2016-Q3 E5: 04 Aug 16m	2017-Q1 E5: 08 Feb 17m	2017-Q3 E5: 01 Aug 17m				
Dodecamethylcyclotrisiloxane	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-			
Methylsilanetriol	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89.4			
Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-			
Silicic Acid	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.1	-	-	-	0	-			
Trimethylsilanol	µg/L					0	0	0	100	0	0	0	0	100	0	0	0	0	80	110	280	630	0	0	0	0	0	0	0	0	0	0	0	0	0	14.9		
Dodecamethylcyclotetrasiloxane	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-			
BTEX																																				-		
Benzene	µg/L	10 ¹²				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.123			
Toluene	µg/L	24 ¹²				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.688			
Ethylbenzene	µg/L	20 ¹²				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Xylene (m)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Xylene (p)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Xylene (o)	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
VOC						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Cyclotetrasiloxane, octamethyl-	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Solvents						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Methanol	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Metals						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Aluminium	µg/L	15 ¹²				0	0	0	0	0	0	0	2,548	142,344	271,248	0	0	0	4,2592	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-		
Arsenic	µg/L	50 ¹²				0	0	0	0	10,6538	10,3437	27,1079	51,8058	47,456	35,721	39,9907	40,02	35,1553	44,2403	31,939	19,224	23,5787	32,5722	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Boron	µg/L	2000 ¹²				153,451	201,62	159,084	158,977	154,4271	152,6147	1,761	1,522	1,116	1,536	1,375	1,363	1,364	1,281	1,577	1,742	1,598	1,316	1,610	1,994	2,089	1,902	0	0	0	0	0	0	0	0	-		
Cadmium	µg/L	0.08 ¹²				0	0	0	0	1,3845	0	0.737	1,5379	0	0.978	1,6233	0	0.8271	1,4677	0	0.639	4,4666	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Calcium	mg/L					190.8	197.9	214.7	217.7	161.3	196.2	180.2	87.4	0	98.8	124	125.4	134.7	107.8	168.5	135.9	74.3	155.3	380.6	339.7	-	350.4	3178	-	350.4	3178	3,122	-	-	-	-		
Chromium (III+VI)	µg/L					0	0	0	0	6,048	6,048	10,69	3,245	14,0195	8,1098	4,86	3,399	12,624	0	13,0647	6,2316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Copper	µg/L	1 ¹²	6 ¹²			0	0	3,925	2,952	0	0	38,272	66,176	10,899	11,671	15,443	18,037	16,009	15,639	9,449	16,804	19,878	18,165	11,971	2,997	0	0	0	0	0	0	0	0	0	0	-		
Iron	µg/L	1000 ¹²				28,566	171,506	38,794	0	1,760	1,171	23,220	10,899	11,671	15,443	18,037	16,009	15,639	9,449	16,804	19,878	18,165	11,971	2,997	0	0	0	0	0	0	0	0	0	0	0	0	-	
Lead	µg/L	1.2 ¹²				0	0	0	0	3,295	0	8,561	10,798	0	6,6173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Magnesium	mg/L					129.6	132	127.7	134.4	67.4	95.9	190.3	94.2	97.1	87.5	63.2	74.8	90.8	75	104.7	240.5	130.1	93.1	130.4	280.4	0	0	0	0	0	0	0	0	0	0	0	-	
Manganese	µg/L	122 ¹²				5.99	43,528	13.13	4.404	48,7934	21,7929	1,697	882,828	605,917	931,831	774,0648	911,0035	961,449	743,786	1,056	1,637	1,262	897,4429	274,326	986,347	979,177	958,8596	-	788,6686	450,426	1,107	-	-	-	-			
Mercury	µg/L	0.07 ¹²				0	0	0	0	19,8671	0	0	6,8417	0	0	9,0676	0	0	41,5247	0	0	17,8799	3,6907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Nickel	µg/L	4 ¹²				0	0.923	0	0	0	0	0	2,832	4,886	0	0	0	0	2,243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Selenium	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Zinc	µg/L	10,9 ¹²				3,129	4,509	4,961	2,582	5,0374	0,5641	2,514	34,817	34,888	2,975	8,1134	5,1145	4,027	34,12	7,095	4,241	11,0091	2,9107	2,051	0	0	0	0	0	0	0	0	0	0	0	0	-	
Tin	µg/L	25 ¹²				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Inorganics						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Hardness as CaCO3	mg/L					1,010	1,038	1,062	1,097	762.7	884.8	1,234	701.3	453.4	0	506.8	617.7	687.1	590.5	767.3	1,591	956.3	722.7	722.8	1,542	2,143	1,722	-	1,512	8,065	7,957	-	-	-	-	-		

Comments
#1 WFD England/Wales: 2015 - MAC-EQS Inland
#2 WFD England/Wales: 2015 - Freshwater Standards
#3 WFD England/Wales: 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-S3 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-S3 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

Units	Location	Well Monitoring Point Sample Code	E5				E6				E7				E8				E9				E10				E11				E12				E13				E14				E15				E16				E17				E18				E19				E20				E21				E22				E23				E24				E25				E26				E27				E28				E29				E30				E31				E32				E33				E34				E35				E36				E37				E38				E39				E40				E41				E42				E43				E44				E45				E46				E47				E48				E49				E50				E51				E52				E53				E54				E55				E56				E57				E58				E59				E60				E61				E62				E63				E64				E65				E66				E67				E68				E69				E70				E71				E72				E73				E74				E75				E76				E77				E78				E79				E80				E81				E82				E83				E84				E85				E86				E87				E88				E89				E90				E91				E92				E93				E94				E95				E96				E97				E98				E99				E100				E101				E102				E103				E104				E105				E106				E107				E108				E109				E110				E111				E112				E113				E114				E115				E116				E117				E118				E119				E120				E121				E122				E123				E124				E125				E126				E127				E128				E129				E130				E131				E132				E133				E134				E135				E136				E137				E138				E139				E140				E141				E142				E143				E144				E145				E146				E147				E148				E149				E150				E151				E152				E153				E154				E155				E156				E157				E158				E159				E160				E161				E162				E163				E164				E165				E166				E167				E168				E169				E170				E171				E172				E173				E174				E175				E176				E177				E178				E179				E180				E181				E182				E183				E184				E185				E186				E187				E188				E189				E190				E191				E192				E193				E194				E195				E196				E197				E198				E199				E200				E201				E202				E203				E204				E205				E206				E207				E208				E209				E210				E211				E212				E213				E214				E215				E216				E217				E218				E219				E220				E221				E222				E223				E224				E225				E226				E227				E228				E229				E230				E231				E232				E233				E234				E235				E236				E237				E238				E239				E240				E241				E242				E243				E244				E245				E246				E247				E248				E249				E250				E251				E252				E253				E254				E255				E256				E257				E258				E259				E260				E261				E262				E263				E264				E265				E266				E267				E268				E269				E270				E271				E272				E273				E274				E275				E276				E277				E278				E279				E280				E281				E282				E283				E284				E285				E286				E287				E288				E289				E290				E291				E292				E293				E294				E295				E296				E297				E298				E299				E300				E301				E302				E303				E304				E305				E306				E307				E308				E309				E310				E311				E312				E313				E314				E315				E316				E317				E318				E319				E320				E321				E322				E323				E324				E325				E326				E327				E328				E329				E330				E331				E332				E333				E334				E335				E336				E337				E338				E339				E340				E341				E342				E343				E344				E345				E346				E347				E348				E349				E350				E351				E352				E353				E354				E355				E356				E357				E358				E359				E360				E361				E362				E363				E364				E365				E366				E367				E368				E369				E370				E371				E372				E373				E374				E375				E376				E377				E378				E379				E380				E381				E382				E383				E384				E385				E386				E387				E388				E389				E390				E391				E392				E393				E394				E395				E396				E397				E398				E399				E400				E401				E402				E403				E404				E405				E406				E407				E408				E409				E410				E411				E412				E413				E414				E415				E416				E417				E418				E419				E420				E421				E422				E423				E424				E425				E426				E427				E428				E429				E430				E431				E432				E433				E434				E435				E436				E437				E438				E439				E440				E441				E442				E443				E444				E445				E446				E447				E448				E449				E450				E451				E452				E453				E454				E455				E456				E457				E458				E459				E460				E461				E462				E463				E464				E465				E466				E467				E468				E469				E470				E471				E472				E473				E474				E475				E476				E477				E478				E479				E480				E481				E482				E483				E484				E485				E486				E487				E488				E489				E490				E491				E492				E493				E494				E495				E496				E497				E498				E499				E500				E501				E502				E503				E504				E505				E506				E507				E508				E509				E510				E511				E512				E513				E514				E515				E516				E517				E518				E519				E520				E521				E522				E523				E524				E525				E526				E527				E528				E529				E530				E531				E532				E533				E534				E535				E536				E537				E538				E539				E540				E541				E542				E543				E544				E545				E546				E547				E548				E549				E550				E551				E552				E553				E554				E555				E556				E557				E558				E559				E560				E561				E562				E563				E564				E565				E566				E567				E568				E569				E570				E571				E572				E573				E574				E575				E576				E577				E578				E579				E580				E581				E582				E583				E584				E585				E586				E587				E588				E589				E590				E591				E592				E593				E594				E595				E596				E597				E598				E599				E600				E601				E602				E603				E604				E605				E606				E607				E608				E609				E610				E611				E612				E613				E614				E615				E616				E617				E618				E619				E620				E621				E622				E623				E624				E625				E626				E627				E628				E629				E630				E631				E632				E633				E634				E635				E636				E637				E638				E639				E640				E641			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16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m	E8_31 Jul 17m	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_04 Aug 16d	E8_08 Feb 17d	E8_01 Aug 17d	E8_31 Jul 17d	E8_04 Aug 16m	E8_08 Feb 17m	E8_01 Aug 17m

Comments
#1 WFD England/Wales: 2015 - MAC-EQS Inland
#2 WFD England/Wales: 2015 - Freshwater Standards
#3 WFD England/Wales: 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

	Unit	Method Detection Limit	CAC, WFD, EU, WIA, EQS - Fresh	WLD, Dore, Combing, WFA, EQS - Re	Location	Well		LF4								LF7								South Pond										
						Monitoring Round	Sample Code	2015-Q1		2015-Q3		2016-Q1		2016-Q3		2017-Q1		2017-Q3		2015-Q1		2015-Q3		2016-Q1		2016-Q3		2017-Q1		2017-Q3				
								LF4_28 Mar 15 -	LF4_08 Sep 15 -	LF7_25 Mar 15 -	LF7_08 Sep 15 -	LF7_24 Feb 16 -	LF7_03 Aug 16 -	LF7_08 Feb 17 -	LF7_01 Aug 17 -	South Pond 18 Feb 15 -	South Pond 08 Sep 15 -	South Pond 23 Feb 16 -	South Pond 03 Aug 16 -	South Pond 09 Feb 17 -	South Pond 01 Aug 17 -	South Pond 31 Jul 17 -												
Dodecamethylcyclotrihexasiloxane	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Methylsilanoltriol	ppm							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.4	-	0	0		
Hexamethylcyclotriazane, Bis(trimethylsilyl)amine	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Silicic Acid	ppm							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	0	0		
Trimethylsilanol	µg/L							0	690	0	90	200	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Decamethylcyclotrihexasiloxane	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
BTX																																		
Benzene	µg/L		10 ¹²					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Toluene	µg/L		76 ¹²					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Ethylbenzene	µg/L		20 ¹²					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Xylene (m)	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Xylene (p)	µg/L							3.363	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Xylene (o)	µg/L							1.311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
VOC																																		
Cyclohexane, octamethyl-	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Solvents																																		
Methanol	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	
Metals																																		
Aluminium	µg/L		15 ¹²					16.637	0	0	0	0	0	0	0	12.196	0	0	0	181.099	6.1101	-	24.892											
Arsenic	µg/L		50 ¹²					11.956	15.5007	47.336	58.3909	53.09	53.678	39.678	68.5035	0	0	0	0	23.236	0	-	0											
Boron	µg/L		200 ¹²					194.927	257.02	696.732	660.894	784.133	717.835	738.1086	449.2118	133.299	0	0	120.132	101.139	56.1053	-	18.8599											
Cadmium	µg/L		0.08 ¹²					0	1.3759	0	1.5397	1.242	0.6768	0	0	0	0	0	0	0	0	-	0											
Calcium	mg/L							679.9	1.132	449.2	409.1	4.783	464.5	469.3	332.6	269.5	283.3	222.1	258.5	154.6	-	195.8												
Chromium (III+V)	µg/L							0	11.36	8.65	28.887	7.323	41.5272	14.6792	0	0	0	0	0	0	-	0												
Copper	µg/L		1 ¹²	6 ¹²				2.893	30.933	0	0	0	0	0	0	5.194	2.414	6.156	14.546	3.243	-	3.145												
Iron	µg/L		1000 ¹²					3.391	0	41.838	37.299	50.408	42.521	47.669	30.161	177.033	538.722	156.044	1.630	237.6749	-	314.2776												
Lead	µg/L		1.2 ¹²					0	0	27.514	0	0	0	6.2573	0	0	0	0	11.8	24.7247	-	0												
Magnesium	mg/L							14.2	32.5	233.9	207.8	2.047	200.1	171.8	107.1	16.9	18	12.9	16.4	10.3	-	13.2												
Manganese	µg/L		120 ¹²					5.677	0	1.902	1.909	1.964	2.021	1.783	2.155	162.129	378.225	95.019	730.763	109.0926	-	176.0343												
Mercury	µg/L		0.07 ¹²					0	0	55.475	4.8163	0	16.433	9.3289	16.9915	0	3.5552	0	0	142.8485	-	0												
Nickel	µg/L		6 ¹²					0	0	2.747	1.481	0	2.8438	2.9214	0	0	0	0	0	0	-	0												
Selenium	µg/L							0	0	0	0	0	0	0	0	0	0	0	0	20.9155	-	0												
Zinc	µg/L		10.9 ¹²					1.587	0	8.49	9.96	11.009	5.82	12.9413	4.1231	6.229	9.578	9.055	23.261	7.1908	-	3.4477												
Tin	µg/L		50 ¹²					0	0	0	0	0	0	0	0	0	0	0	0	0	-	0												
Inorganics																																		
Hardness as CaCO3	mg/L							1.756	2.960	2.085	1.877	20.372	1.984	1.879	1.272	792.3	781.4	608	713.2	428.3	-	543.4												

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Envt Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-S3 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-S3 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

[illegible]

Comments

#1 WFD England/Wales. 2015 - MAC-EQS Inland

#2 WFD England/Wales. 2015 - Freshwater Standards

#3 WFD England/Wales. 2015 - AA-EQS Inland

#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland

#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015

#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015

#7 PNEC (EU REACH) - Freshwater

#8 Hardness - assumed value - data required.

	Method Detection Limit	SAC, WTR, EU, WIA, EQS-Fresh	WL, DowCorning, WAT, EQS-Fresh	Location	Timber Pond												
					Well Monitoring Round Sample Code	2015-Q1		2015-Q3		2016-Q1		2016-Q3		2017-Q1		2017-Q3	
						Timber Pond 25 Mar 15 -	Timber Pond 09 Sep 15 -	Timber Pond 24 Feb 16 -	Timber Pond 04 Aug 16 -	Timber Pond 08 Feb 17 -	Timber Pond 22 Feb 17 -	Timber Pond 01 Aug 17 -	Timber Pond 31 Jul 17 -				
Dodecamethylcyclotrihexasiloxane	µg/L				0	0	0	0	0	-	-	-	0				
Methyldisilanol	ppm				0	0	0	0	0	38.3	36	-	0				
Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	0	0	0	-	-	-	0				
Silicic Acid	ppm				-	-	-	-	-	5.3	3.3	-	-				
Trimethylsilanol	µg/L				0	0	0	0	0	-	-	-	0				
Decamethylcyclotrihexasiloxane	µg/L				0	0	0	0	0	-	-	-	0				
BTX																	
Benzene	µg/L	10 ^{#1}			0	0	0	0	0	0	-	-	0				
Toluene	µg/L	74 ^{#1}			0	0	0	0	0	0	-	-	0				
Ethylbenzene	µg/L	20 ^{#8}			0	0	0	0	0	-	-	-	0				
Xylene (m)	µg/L				0	0	0	0	0	-	-	-	0				
Xylene (p)	µg/L				0	0	0	0	0	-	-	-	0				
Xylene (o)	µg/L				0	0	0	0	0	-	-	-	0				
VOC																	
Cyclohexane, octamethyl-	µg/L				0	0	0	0	0	0	-	-	0				
Solvents																	
Methanol	µg/L				0	0	0	0	0	0	-	-	0				
Metals																	
Aluminium	µg/L	15 ^{#6}			9.253	0	0	0	3.2134	-	-	-	16.4096				
Arsenic	µg/L	50 ^{#2}			0	0	0	0	0	-	-	-	0				
Boron	µg/L	200 ^{#14}			190.273	216.44	0	221.037	155.1423	-	-	-	186.3411				
Cadmium	µg/L	0.08 ^{#1}			0	0	0	0	0.5889	-	-	-	0				
Calcium	mg/L				518.1	529.5	397.1	425	297	-	-	-	386.2				
Chromium (B+VI)	µg/L				0	0	0	0	0	-	-	-	0				
Copper	µg/L	1 ^{#1}	6 ^{#8}		10.916	7.567	14.87	4.845	10.3702	-	-	-	18.6781				
Iron	µg/L	1000 ^{#2}			146.623	139.93	0	138.667	49.9055	-	-	-	275.4074				
Lead	µg/L	1.2 ^{#3}			0	6.293	0	6.995	8.2993	-	-	-	0				
Magnesium	mg/L				19.1	19.5	14.6	15.5	12.3	-	-	-	14.4				
Manganese	µg/L	120 ^{#2}			206.756	178.979	0	179.043	36.4698	-	-	-	364.8617				
Mercury	µg/L	0.07 ^{#4}			6.504	0	0	0	15.9784	-	-	-	0				
Nickel	µg/L	4 ^{#5}			0	0	0	0	0	-	-	-	0				
Selenium	µg/L				0	0	0	0	0	-	-	-	0				
Zinc	µg/L	10.9 ^{#7}			2.159	5.713	7.947	2.765	5.5028	-	-	-	8.1901				
Tin	µg/L	25 ^{#8}			0	0	0	0	0	-	-	-	0				
Inorganics																	
Hardness as CaCO3	mg/L				1.388	1.403	1.052	1.129	792.3	-	-	-	1.023				

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regt (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 Hardness - assumed value - data required.

Upgradient wells								
Date	Sampling point	Chemical Oxygen Demand	Chloride (ppm)	M Alkalinity (Total Alkalinity)	P Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO3/L)
2015-Q1	A2D	398	874.2	83.2566	0	7.02	0	8649.5
2015-Q1	BH_210	31	105.4	41.6283	0	7.78	0	397.3
2015-Q1	BH_312	448	261.6	97.1327	0	7.18	0	2167.8
2015-Q1	BH_412	154	363.9	291.3981	0	7.35	113	2112.7
2015-Q3	A2D	1488	902	224.25	0	6.89	0	8795
2015-Q3	BH_210	0	183.8	54.6	35.1	9.96	0	711.8
2015-Q3	BH_312	499	206.3	66.3	0	7.46	0	1973
2015-Q3	BH_412	230	217.2	117	0	6.99	0	1728
2016-Q1	A2D		837.1	88	0	6.71	0	8328
2016-Q1	BH_210	26.1	611.8	68	0	7.77	0	263.8
2016-Q1	BH_312		242	54	0	7.39	0	2298.7
2016-Q1	BH_412		252.1	58	0	7.55	0	2271.4
2016-Q3	A2D	2250	914.5	68.904	0	6.88	0	9184.8
2016-Q3	BH_210	52.2	1736.4	72.732	7.656	8.68	0	0
2016-Q3	BH_312	1600	312.1	55.506	13.398	8.3	0	0
2016-Q3	BH_412	154.8	296.5	254.562	0	7.19	90.5	2438
2017-Q1	A2D	556.8	1108.9	129.5385	0	6.82	0	8659.4
2017-Q1	BH_210	53.7	149.4	75.7302	21.9219	8.86	0	648.5
2017-Q1	BH_312	248.7	312.3	59.787	0	7.89	0	2956.6
2017-Q1	BH_412	166.6	250.9	127.5456	0	7.7	45.9	2068
2017-q3	A2D	621	244.1	88.335	0	6.74	0	10635.6
2017-q3	BH_210	43.4	218.6	54.964	0	8.93	0	816.1
2017-q3	BH_312	237.6	389	41.223	0	8.75	0	4013.5
2017-q3	BH_412	74.2	289.8	231.634	0	7.21	180	2090.9

Landfill wells - Made Ground								
Date	Sampling point	Chemical Oxygen Demand	Chloride (ppm)	M Alkalinity (Total Alkalinity)	P Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO3/L)
2015-Q1	E1S	77	907.3	773.097	0	7.25	0	687.1
2015-Q1	LF_4	214	126.2	174	0	7.76	0	1756.2
2015-Q3	LF_4	877	256	0	0	7.19	0	2959.6
2016-Q1	E1S	73.2		702	0	7.96	0	767.3
2016-Q3	E1S	102	484.6	821.106	0	7.35	0	1591.4
2016-Q3	E5S	2073	828.2	61.3836	0	7.3	0	8314
2016-Q3	E5M	1260	798.8	62	0	7.35	0	8054.8
2016-Q3	E6S	79.2	172.3	94.12152	0	7.95	0	0
2016-Q3	E6M	678	713.1	245.5344	0	7.29	0	5253
2016-Q3	E7M	1018	233.1	83.89092	0	7.63	0	2623.8
2016-Q3	E8S	822	346.1	130.95168	0	8.02	65	3194
2016-Q3	E8M	600	604.6	151.41288	0	7.51	224	5153.4
2016-Q3	E9S	30.8	147.9	456.28476	0	7.79	0	1005.1
2017-Q1	E1S	102.4	501.3	846.9825	29.8935	8.11	0	956.3
2017-Q1	E5S	478.8	465.4	47.8296	11.9574	8.89	0	8564.7
2017-Q1	E5M	461.4	821.6	89.6805	0	7.48	57	7956.7
2017-Q1	E6S	79.7	326.5	101.6379	0	7.87	0	245.9
2017-Q1	E6M	139.5	692.3	269.0415	0	7.38	0	4856.8
2017-Q1	E7S							
2017-Q1	E7M	438	297.6	107.6166	0	7.35	0	3187.1
2017-Q1	E8S	333	355.1	119.574	0	7.45	0	3195.6
2017-Q1	E8M	266.4	876.7	143.4888	0	7.53	135	7113.3
2017-Q1	E9S	31.6	183.8	466.3386	0	7.76	0	1093.5
2017-q3	E1S	77.3	41	728.273	0	7.52	0	722.7
2017-q3	E5S	512.4	429	84.409	35.334	9.76	0	8678.7
2017-q3	E5M	474.6	434.8	53.001	0	7.56	0	8186.7
2017-q3	E6S	70.1	165	113.854	0	7.81	0	241.6
2017-q3	E6M	113	331.3	219.856	0	7.43	0	4613.1
2017-q3	E7S							
2017-q3	E7M	948	272.8	78.52	0	7.88	0	2900.4
2017-q3	E8S	321	363.6	96.187	0	7.65	0	2779.3
2017-q3	E8M	196.5	334.6	131.521	0	7.44	130	5484.4
2017-q3	E9S	38.2	213.8	398.489	0	7.54	0	1361.1

Landfill Wells - Natural								
Date	Sampling point	Chemical Oxygen Demand	Chloride (ppm)	M Alkalinity (Total Alkalinity)	P Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO3/L)
2015-Q1	E1D	0	215.3	327.0795	0	7.84	249	1009.9
2015-Q1	E1M	73	294.9	905.9111	0	7.02	0	1233.7
2016-Q1	E1D	0		328	0	7.94	309	1061.8
2016-Q1	E1M	53.3		562	0	8.21	0	453.4
2016-Q3	E1D	30	223.4	310.068	0	7.28	0	1096.9
2016-Q3	E1M	73.6	710.5	790.482	0	7.52	0	0
2016-Q3	E5D	259	985.2	892.10832	0	7.99	250	2143.3
2016-Q3	E6D	1128	709.4	282.36456	0	7.16	122	5272.7
2016-Q3	E7D	2020	1319.3	108	0	7.27	0	16647.6
2016-Q3	E8D	1115	364.2	343.74816	0	6.96	119	9387.6
2016-Q3	E9M	38.2	158.1	544	0	7.78	0	1203.3
2016-Q3	E9D	196.9	1638.5	330	0	7.12	527	7395.5
2017-Q1	E1D	41.4	229.5	346.7646	31.8864	8.23	253	762.7
2017-Q1	E1M	95	71.8	508.1895	0	8.18	85.5	506.8
2017-Q1	E5D	200.9	959.8	966.5565	45.8367	8.11	168	1721.7
2017-Q1	E6D	118	710.1	239.148	0	7.3	0	4793.4
2017-Q1	E7D	200.4	261.9	119.574	0	6.77	0	11103
2017-Q1	E8D	229.2	339.9	263.0628	0	6.94	90.1	8779.9
2017-Q1	E9M	54.9	199.6	452.3883	0	7.76	0	1355.8
2017-Q1	E9D	165	164.2	366.6936	0	7.26	486	6755.2
2017-q3	E1D	0	212.9	327.821	0	7.58	263	884.9
2017-q3	E1M	109	74.9	846.053	0	7.31	148	617.7
2017-q3	E5D	196.7	503.6	961.87	0	8	205	1511.5
2017-q3	E6D	117	352.6	202.189	0	7.35	0	4669.6
2017-q3	E7D	356.4	607	96.187	0	7.24	0	10058.2
2017-q3	E8D	226.2	367.9	229.671	0	6.76	87.2	8573.4
2017-q3	E9M	0	414.4	361.192	0	6.55	0	1392.7
2017-q3	E9D	198	347.5	235.56	0	7.05	489	6981.1

Downgradient wells								
Date	Sampling point	Chemical Oxygen Demand	Chloride (ppm)	M Alkalinity (Total Alkalinity)	P Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO3/L)
2015-Q1	E4D	31	173.5	608.5661	0	7.88	107	722.6
2015-Q1	E4S	0	689.6	608.5661	0	7.7	1140	1542.4
2015-Q1	LF_7	0	482.8	680	0	6.8	0	2084.5
2015-Q3	LF_7	50.4	351.5	598.65	0	6.66	0	1877.2
2016-Q1	LF_7	78	569.7	558	0	7.5	0	20371.8
2016-Q3	LF_7	49.8	332	614.394	0	6.9	0	1983.9
2016-Q3	CP1-D	94.8	823.8	1130	0	8.11	605	1548.6
2016-Q3	CP2-S	180.6	970.1	466	0	7.86	314	4310.2
2016-Q3	CP2-M	191.7	1252.4	421.50072	0	6.95	188	2681.6
2016-Q3	CP2-D	149.4	1332.9	458.33088	0	7.57	360	4456.8
2017-Q1	LF_7	81.2	248.2	611.8203	0	6.79	67.8	1879.2
2017-Q1	CP1-M	0	0	0	0	0	0	0
2017-Q1	CP1-D	0	0	0	0	0	0	0
2017-Q1	CP2-S	0	0	0	0	0	0	0
2017-Q1	CP2-M	0	0	0	0	0	0	0
2017-Q1	CP2-D	0	0	0	0	0	0	0
2017-q3	LF_7	30.2	104.8	579.085	0	6.99	0	1271.5
2017-q3	CP1-D	0	439.2	1103.206	0	8.01	612	982.9
2017-q3	CP2-S	135.9	264.6	304.265	0	7.26	142	3404.3
2017-q3	CP2-M	0	268.9	280.709	0	7.29	218	3548.2
2017-q3	CP2-D	0	279.5	331.747	0	7.27	326	3417.9

Surface Waters								
Date	Sampling point	Chemical Oxygen Demand	Chloride (ppm)	M Alkalinity (Total Alkalinity)	P Alkalinity (as Carbonates)	pH	Sulphates	Hardness (mg equ. CaCO ₃ /L)
2015-Q1	CAD_PND1	30	483.4	208.1415	0	8.07	0	604.6
2015-Q1	CAD_PND2	22	211.1	257.699	0	8.07	0	369.7
2015-Q1	FRESHW_PND	103	646.6	95.1504	0	7.66	0	792.3
2015-Q1	SW2	36	31	271.5751	0	7.98	0	298.1
2015-Q1	SW3	40	428.5	271.5751	0	7.95	0	781.1
2015-Q1	TIMBER_PND	108	120.4	82	0	7.8	0	1368.3
2015-Q3	CAD_PND1	0	0	0	0	0	0	0
2015-Q3	CAD_PND2	0	0	0	0	0	0	0
2015-Q3	FRESHW_PND	0	0	89.7	0	0	0	781.4
2015-Q3	SW2	0	0	0	0	0	0	0
2015-Q3	SW3	0	0	0	0	0	0	0
2015-Q3	TIMBER_PND	84.2	118.2	85.8	0	6.89	0	1402.5
2016-Q1	CAD_PND1	25.7		188	0	8.42	0	409.8
2016-Q1	CAD_PND2	24.8		214	0	8.64	0	399.8
2016-Q1	FRESHW_PND	44.6		98	0	8.1	0	608
2016-Q1	SW2	16	40	280	0	8.18	0	274
2016-Q1	SW3	35	387.5	252	0	8.1	0	660.3
2016-Q1	TIMBER_PND	0		84	0	7.78	0	1051.9
2016-Q3	CAD_PND1	29.9	82.9	176.088	0	8.03	0	0
2016-Q3	CAD_PND2	31.4	326.9	233.508	0	7.93	0	0
2016-Q3	FRESHW_PND	92.9	285.1	78.474	0	7.32	0	713.2
2016-Q3	SW2	18.1	21.4	195.228	0	7.98	0	0
2016-Q3	SW3	76.3	473	174.174	0	7.77	0	0
2016-Q3	TIMBER_PND	75.4	186.6	78.474	0	7.24	0	1129.2
2017-Q1	CAD_PND1	28.7	230.1	195.3042	21.9219	8.17	0	252.4
2017-Q1	CAD_PND2	24.8	211.3	249.1125	0	8.06	0	273.8
2017-Q1	FRESHW_PND	37.7	419.6	105.6237	0	7.99	0	428.3
2017-Q1	SW2	16.5	28.9	253.0983	0	7.97	0	214.1
2017-Q1	SW3	32.3	29.1	243.1338	0	8.2	0	449
2017-Q1	TIMBER_PND	68.7	77.3	97.6521	0	7.67	0	792.3
2017-q3	CAD_PND1	31.7	286.2	237.523	0	8.21	0	331.4
2017-q3	CAD_PND2	32.7	362	188.448	0	7.99	0	327.1
2017-q3	FRESHW_PND	38.3	230.9	72.631	0	7.56	0	543.4
2017-q3	SW2	0	24.3	219.856	0	8.16	0	245.1
2017-q3	SW3	80.4	124.5	160.966	0	7.91	44.3	1649.1
2017-q3	TIMBER_PND	88	92	72.631	0	7.06	0	1023.3

Q1 2017 Boreholes; tested 22 Feb

Boreholes	ppm DMSD Me ₂ SiOH 2	ppm TMS Me ₃ SiOH	ppm MST MeSi(OH) 3	ppm Si(OH) ₄
BH210	5.3	0.3	0.1	0
CP1 M	0.2	0	0	3.1
CP1 D	0.2	0	0	7.4
CP2 S	78.2	1.9	2.6	12.3
CP2 M	45.8	2.2	3	21
CP2 D	39.9	1.8	2.3	15.7
Blank	0.2	0.1	0.1	0.6

SW2 UpRiver	0.2	ND	0.1	12.9
SW3 DownRiver	11.7	0.1	6	12.7
Timber Pond	19.8	ND	38.3	5.3

Q3 2017 Boreholes

Boreholes	ppm DMSD Me ₂ SiOH 2	ppm TMS Me ₃ SiOH	ppm MST MeSi(OH) 3	ppm Si(OH) ₄
BH210	12.3	0.4	0.3	4.2
CP1 M	No sample	No sample	No sample	No sample
CP1 D	0.2	ND	0	10.9
CP2 S	81.5	1.9	4	29.6
CP2 M	50.6	2.1	4.3	31.1
CP2 D	36.7	1.8	2	21.1
SW2 UpRiver	0.3	ND	0.1	9.7
SW3 DownRiver	42	0.2	9.6	11.6
Timber Pond	20.4	ND	36	3.3
Freshwater pond	9.3	ND	17.4	3
Cadoxton Pond 1	2.2	ND	1.5	6.8
Blank		<0.1		

Q3 2017 Boreholes

Boreholes	ppm DMSD Me ₂ SiOH 2	ppm TMS	ppm MST MeSi(OH) 3	ppm Si(OH) ₄
E5 S	155.1	5.4	87.3	14.3
E5 M	165.7	5.9	89.4	14.9
E5 D	83.6	2.5	1.1	33.1
E6 S	8.9	0.4	0.4	6.9
E6 M		0.7		
E6 D	60.9	1	0.9	16.5
E7 M	106	2	169.6	16.9
E7 D	106.1	1.6	150.8	18.2
E8 S		1.8		
E8 M	68.9	1	56.5	13.5
E8 D	71	1.1	29.2	29.9
E9 S		0.2		
E9 M	7.6	0.2	0.6	26.3
E9 D	47.3	0.9	9.1	45.1

Appendix D - Borehole Logs

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 22/11/99 END DATE: 23/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF2	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
										METHOD: CABLE PERCUSSION			
										LOGGED BY: P.WALKER			
APPROVED BY:									SCREEN TYPE & DIAMETER: uPVC 50mm				
									DESCRIPTION		COMMENTS		
									0	Loose brown silty SAND with rootlets and occasional angular cobbles (MADE GROUND)	No visual or olfactory evidence of contamination	0	
									1	Stiff medium brown silty CLAY with occasional gravel and coarse sand (MADE GROUND) Becoming brown silty clay with occasional gravel and sand at 0.6m	Dry	1	
									2	Sand content increasing with red sandstone cobbles and gravel and less silt / clay at 1.8m Becoming red slightly sandy clayey silt at 2.4m With occasional sandstone cobbles at 2.5m	No visual or olfactory evidence of contamination Dry	2	
									3		No visual or olfactory evidence of contamination Very dry	3	
									4		No visual or olfactory evidence of contamination Wet Poor returns from 4.5m	4	
									5	Loose red very silty sandy coarse gravel with large red sandstone cobbles and grey sandstone / mudstone cobbles (MADE GROUND)	No visual or olfactory evidence of contamination Wet Poor returns from 4.5m	5	
									6			6	
									7	Soft damp grey / brown very fine SAND with silt and very small white fragments (NATURAL ALLUVIUM)	No visual or olfactory evidence of contamination Very wet from 7.0m	7	
									8	Borehole terminated at 8.0 mbgl		8	
									9			9	
									10			10	

1. Location
'Southern' edge of landfill / Lagoon

2. Notes

LEGEND

- Disturbed Sample
- Undisturbed Sample
- Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

Project Title: **LANDFILL MONITORING WELL INSTALLATION WORKS**

Location: **DOW CORNING, BARRY**

Client: **DOW CORNING LTD.**

Job No: 11681-038-402 JAN 2000 DRAFT

DAMES & MOORE

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 26/11/99 END DATE: 30/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF3	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
										METHOD: CABLE PERCUSSION			
										LOGGED BY: P.WALKER			
										APPROVED BY:			
BOREHOLE DIAMETER: 150mm		SCREEN TYPE & DIAMETER: uPVC 50mm											
SCREEN SLOT SIZE: 0.5mm													
									DESCRIPTION	COMMENTS			
									Soft red brown sandy SILT with frequent rootlets gravel and sandstone / mudstone cobbles (MADE GROUND)	No visual or olfactory evidence of contamination Dry			
									Gravel / cobble content increasing from 2.3m	No visual or olfactory evidence of contamination Dry			
									With patches of very dry stiff red silt from 3.0m	No visual or olfactory evidence of contamination Dry			
									Very dense dry and silty from 3.5m	No visual or olfactory evidence of contamination Dry			
									Increase in cobble and stone from 3.8m	No visual or olfactory evidence of contamination Wet			
									Soft grey SILT with some sand and few shell fragments (NATURAL ALLUVIUM)	No visual or olfactory evidence of contamination			
									Becoming very soft fine sand with silt and shell fragments from 6.9m				
									Becoming silty and firm from 7.3m				
									Borehole terminated at 7.8 mbgl				
									1. Location Western edge of Lagoon on elevated bund 2. Notes				

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 26/11/99 END DATE: 26/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF4	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
										BOREHOLE DIAMETER: 150mm			
										SCREEN TYPE & DIAMETER: uPVC 50mm			
APPROVED BY:									SCREEN SLOT SIZE: 0.5mm				
									DESCRIPTION	COMMENTS			
									0	Soft red brown sandy SILT with gravel and cobbles	No visual or olfactory evidence of contamination	0	
									1	Becoming firm deep red brown with cobbles from 1.0m	Dry	1	
									2	Becoming dense and increasing in cobble / gravel from 2.1m	No visual or olfactory evidence of contamination Dry to damp	2	
									3		No visual or olfactory evidence of contamination Dry	3	
									4	Soft grey slightly sandy SILT with occasional shell fragments	No visual or olfactory evidence of contamination Damp	4	
									5			5	
									6	Borehole terminated at 6.0 mbgl		6	
									7			7	
									8			8	
									9			9	
									10			10	

1. Location Western edge of Lagoon on top of elevated bund 2. Notes	LEGEND Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table		Project Title: LANDFILL MONITORING WELL INSTALLATION WORKS Location: DOW CORNING, BARRY Client: DOW CORNING LTD. Job No: 11681-038-402 JAN 2000 DRAFT		
			DAMES & MOORE		

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 23/11/99 END DATE: 24/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF5	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
									METHOD: CABLE PERCUSSION	BOREHOLE DIAMETER: 150mm			
									LOGGED BY: P.WALKER	SCREEN TYPE & DIAMETER: uPVC 50mm			
									APPROVED BY:	SCREEN SLOT SIZE: 0.5mm			
									DESCRIPTION		COMMENTS		
									0 Brown red sandy SILT with rootlets Red brown sandy SILT with large red and green / grey sandstone clasts		0 No visual or olfactory evidence of contamination Dry, very hard		
									1 1550 2 Loose grey brown brown silty sandy coarse GRAVEL with large grey green clasts		2 Water strike at 2.2m, very wet Poor returns		
									3 0830 3 Becoming silty clayey from 2.9m				
									4 Soft brown silty CLAY with occasional coarse sand and gravel Becoming soft grey to blue / brown silty CLAY with few gravel and sand from 3.5m		4 No visual or olfactory evidence of contamination Wet		
									5 Becoming soft very grey brown with no sand or gravel from 4.5m Becoming more silty with fine sand and shell fragments from 5.0m		5 No visual or olfactory evidence of contamination Wet and soft		
									6 Borehole terminated at 6.5 mbgl				
									7 8 9 10				

1. Location

Western edge of Lagoon on top of elevated bund

2. Notes

LEGEND

☒ Disturbed Sample

■ Undisturbed Sample

Q Headspace Analysis

† Down Borehole Analysis

▼ Groundwater Table

▽ Perched Water Table

Project Title: LANDFILL MONITORING WELL INSTALLATION WORKS

Location: DOW CORNING, BARRY

Client: DOW CORNING LTD.

Job No: 11681-038-402

JAN 2000

DRAFT

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PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 22/11/99 END DATE: 21/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF6	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
									METHOD: CABLE PERCUSSION		BOREHOLE DIAMETER: 150mm		
									LOGGED BY: P.WALKER		SCREEN TYPE & DIAMETER: uPVC 50mm		
									APPROVED BY:		SCREEN SLOT SIZE: 0.5mm		
									DESCRIPTION		COMMENTS		
									0		0		
									TARMAC / ASHALT (MADE GROUND)		No visual or olfactory evidence of contamination		
									Red brown silty sandy coarse gravel cobble fill (MADE GROUND)		Dry		
									Without cobbles and increasing in silt and clay content from 0.5m		Poor returns		
									Becoming very dense from 1.2m				
									2		2		
Stiff red / red to brown SILT with frequent large angular red sandstone cobbles and green grey mudstone cobbles (MADE GROUND)		Water strike at 2.2m, very wet											
Without cobbles and becoming increasingly silty with green / grey sandy mottles from 3.1m		Poor returns											
3		3											
4		4											
Firm black organic SILT with fine shell fragments (NATURALALLUVIUM)		No visual or olfactory evidence of contamination											
5		5											
Very soft grey fine silty SAND with shell fragments (NATURALALLUVIUM)		Wet											
6		6											
Borehole terminated at 6.8 mbgl		Damp											
7		7											
8		8											
9		9											
10		10											

1. Location

Western edge of Lagoon on top of elevated bund

2. Notes

LEGEND

Disturbed Sample
 Undisturbed Sample
 Headspace Analysis
 Down Borehole Analysis
 Groundwater Table
 Perched Water Table

Project Title: LANDFILL MONITORING WELL INSTALLATION WORKS

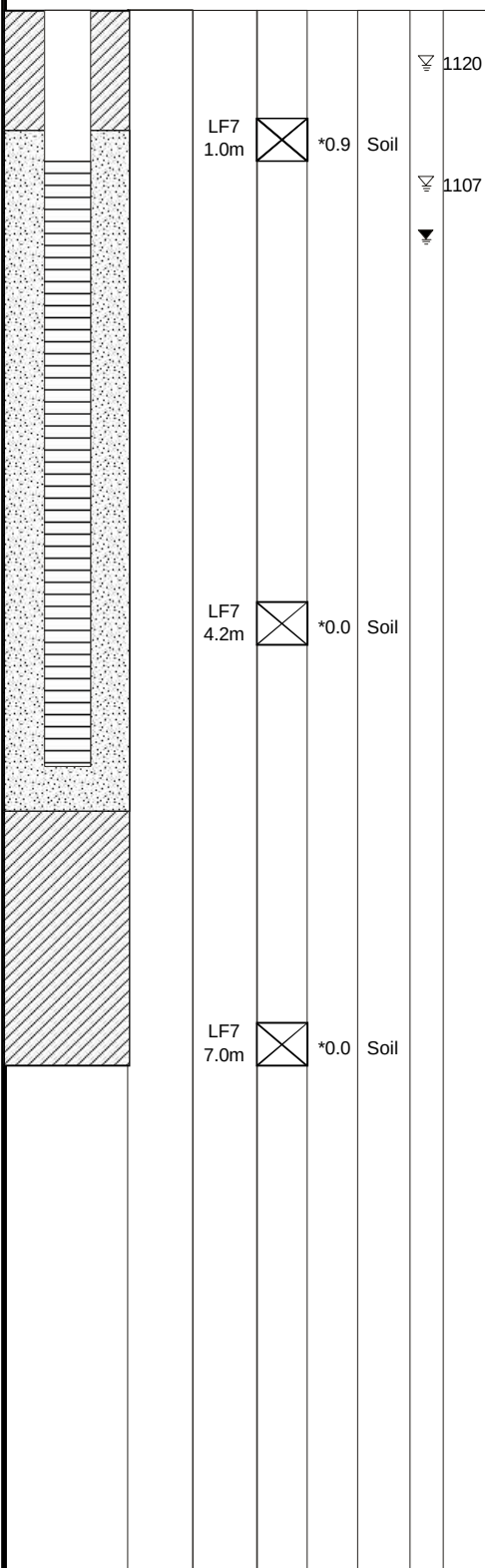
Location: DOW CORNING, BARRY

Client: DOW CORNING LTD.

Job No: 11681-038-402

JAN 2000

DRAFT

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 25/11/99			BOREHOLE NUMBER: LF7 PAGE 1 OF 1						
			END DATE: 25/11/99																
			DRILLER: JACKSONS							METHOD: CABLE PERCUSSION			BOREHOLE DIAMETER: 150mm						
			LOGGED BY: P.WALKER							SCREEN TYPE & DIAMETER: uPVC 50mm									
APPROVED BY:			SCREEN SLOT SIZE: 0.5mm																
											DESCRIPTION			COMMENTS					
											0			ASPHALT (MADE GROUND)			No visual or olfactory evidence of contamination Very compact Very poor returns Water strike at 1.5m		
											1			Compacted grey sandy GRAVEL fill (MADE GROUND) Becoming silty from 0.2m Becoming grey brown with large cobbles from 0.5m With large red sandstone cobbles from 0.7m Becoming red brown very stiff sandy clayey SILT with large red sandstone and grey green mudstone cobbles with occasional yellow mottles and black patches from 1.2m					
											2			Dense sandy GRAVEL with frequent green grey sandstone cobbles and silty matrix Cobbles becoming very large from 2.0m With slightly silty sand from 2.2m			Very wet Very poor returns		
											3			Becoming very silty with occasional large cobbles from 3.0m Becoming soft red / brown very sandy SILT with frequent gravel and occasional cobbles from 3.5m			No visual or olfactory evidence of contamination		
											4			Loose dense COBBLES / GRAVEL with sandy silt matrix			No visual or olfactory evidence of contamination Very wet		
											5			Soft grey sandy clayey SILT with fine sand and shell fragments with occasional gravel / cobbles Cobbles and gravel decrease from 5.5m			No visual or olfactory evidence of contamination Very wet		
											6			No gravel from 6.0m					
7											Borehole terminated at 7.0 mbgl								
8																			
9																			
10																			

1. Location

Outside northern fence boundary, on road

2. Notes

LEGEND

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Disturbed Sample

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Undisturbed Sample

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Headspace Analysis

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Down Borehole Analysis

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Groundwater Table

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Perched Water Table

Project Title:

LANDFILL MONITORING
WELL INSTALLATION WORKS

Location:

DOW CORNING, BARRY

Client:

DOW CORNING LTD.

Job No:

11681-038-402

JAN 2000

DRAFT

DCM

GROUP

DAMES & MOORE

PIEZOMETER CONSTRUCTION	LABORATORY TESTING	SPT 'N' VALUE	SAMPLE			SYMBOL	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 24/11/99 END DATE: 24/11/99 DRILLER: JACKSONS		BOREHOLE NUMBER: LF8	
			TYPE	NUMBER	DEPTH					PAGE 1 OF 1			
									METHOD: CABLE PERCUSSION		BOREHOLE DIAMETER: 150mm		
									LOGGED BY: P.WALKER		SCREEN TYPE & DIAMETER: uPVC 50mm		
									APPROVED BY:		SCREEN SLOT SIZE: 0.5mm		
									DESCRIPTION		COMMENTS		
									Very dense compacted HARDCORE BALLAST with coarse sandy gravel (MADE GROUND) Becoming less dense from 0.2m		No visual or olfactory evidence of contamination Poor returns unable to sample		
									Firm grey brown very sandy SILT with frequent gravel and mudstone / sandstone cobbles Red to red / brown sandy silty GRAVEL with large angular sub angular clasts Silt content increasing from 2.0m		Damp No visual or olfactory evidence of contamination Poor returns Very damp		
									Loose dense COBBLES / GRAVEL with sandy silt matrix		Water strike at 3.4m No visual or olfactory evidence of contamination Poor returns		
									Loose grey coarse GRAVEL with weathered sandstone cobbles with a silty sandy matrix Less silty sandy matrix from 3.8m				
									With frequent shell and black fragments from 4.7m				
									Silty sandy matrix from 5.5m				
									Becoming very silty with less gravel and cobbles from 6.5m				
									Soft grey brown silty fine sand with shell fragments (NATURAL ALLUVIUM)				
									Borehole terminated at 8.0 mbgl				

1. Location
Outside northern fence boundary, on road

2. Notes

LEGEND

- Disturbed Sample
- Undisturbed Sample
- Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

Project Title: **LANDFILL MONITORING WELL INSTALLATION WORKS**

Location: **DOW CORNING, BARRY**

Client: **DOW CORNING LTD.**

Job No: 11681-038-402 JAN 2000 DRAFT

DAMES & MOORE

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 15.7.97		BOREHOLE NUMBER: 210 PAGE 1 OF 2	
	NUMBER	TYPE					END DATE: 15.7.97			
							DRILLER: DRILCORP		BOREHOLE DIAMETER: 200mm	
							METHOD: Light Cable Percussion/Rotary Air Force		SCREEN TYPE & DIAMETER: 50 mm ID UPVC	
		LOGGED BY: K MADAWEE		SCREEN SLOT SIZE: 1 mm						
		APPROVED BY:								
							DESCRIPTION	COMMENTS		
BH210 SO-0.5m BH210 SO-2.7m	1.9.97 1.9.97	0 1 2 3 4 5 6 7 8 9 10	Firm brown sandy SILT with some clay and frequent rootlets (MADE GROUND) Dry	0						
			Firm brown sandy silty CLAY with frequent fine to coarse rounded to angular gravel, some ash and slag fragments and occasional pieces of wood (MADE GROUND) No odour Wet from 0.7m No odour	1						
			Soft to firm blue-grey (mottled black) very clayey SILT with some organic matter (ALLUVIUM) WET	3						
			becoming softer from 6.5 mbgl	6						
			becoming much sandier from 7 mbgl	7						
			Firm brown spongy PEAT with frequent wood and organic matter. Strong H₂S odour	9						
			Soft blue-grey sandy SILT with some clay. (ALLUVIUM)	10						
			LOCATION/NOTES: 1. Located near Southgate House are of marshland in northeast corner of the site. 2. Drilled to 15 m using Light Cable Percussive techniques LEGEND Disturbed Sample Undisturbed Sample ✱ Headspace Analysis ↑ Down Borehole Analysis ▼ Groundwater Table ▽ Perched Water Table Project Title: SOIL AND GROUNDWATER INVESTIGATION Location: BARRY, SOUTH GLAMORGAN Client: DOW CORNING LTD Job No: 11681-023-401 DRAFT DAMES & MOORE							

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 15.7.97	BOREHOLE NUMBER: 210 PAGE 2 OF 2	
	NUMBER TYPE						END DATE: 15.7.97		
							DRILLER: DRILCORP		
							METHOD: Light Cable Percussion/Rotary Air Force	BOREHOLE DIAMETER: 200mm	
							LOGGED BY: K MADAWEЕ		SCREEN TYPE & DIAMETER: 50 mm ID UPVC
APPROVED BY:		SCREEN SLOT SIZE: 1 mm							
						DESCRIPTION		COMMENTS	
						Soft to firm red-brown very silty CLAY with occasional coarse sub-rounded to sub-angular mudstone and sandstone gravel (WEATHERED BEDROCK)			
						Moderately weak to moderately strong red-brown silty MUDSTONE			
						Borehole terminated at 19 mbgl			
LOCATION/NOTES: 1. Located near Southgate House are of marshland in northeast corner of the site. 2. Drilled to 15 m using Light Cable Percussive techniques						LEGEND ☒ Disturbed Sample ■ Undisturbed Sample * Headspace Analysis † Down Borehole Analysis ▼ Groundwater Table ▽ Perched Water Table		Project Title: SOIL AND GROUNDWATER INVESTIGATION Location: BARRY, SOUTH GLAMORGAN Client: DOW CORNING LTD Job No: 11681-023-401 DRAFT 	

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 17.7.97		BOREHOLE NUMBER: 211 PAGE 1 OF 3		
	NUMBER	TYPE					END DATE: 17.7.97				
							DRILLER: DRILCORP				
							METHOD: Light Cable Percussion/Rotary Air Force				
LOGGED BY: K MADAWEE							BOREHOLE DIAMETER: 200mm				
APPROVED BY:							SCREEN TYPE & DIAMETER: 50 mm ID UPVC				
							SCREEN SLOT SIZE: 1 mm				
						DESCRIPTION			COMMENTS		
		BH211 SO-0.5m	X			0	Dense, brown very gravelly SAND with some silt and clay, occasional brick and concrete fragments and ash (MADE GROUND)			Dry No odour	
		BH211 SO-1.7m	X			1					
						2	Soft to firm grey very silty CLAY with frequent shells and fine sandstone gravel to cobbles (possibly RE-WORKED ALLUVIUM)			WET from 1.6m	
						3	Soft to firm grey-blue (mottled black) very silty CLAY with some shell fragments (ALLUVIUM)				
						4					
						5					
						6					
						7					
						8					
						9					
						10					
LOCATION/NOTES: 1. Located along the western edge of the lagoons - western area of the site. 2. Drilled to 17.5m using light cable percussive techniques..						LEGEND ☒ Disturbed Sample ■ Undisturbed Sample * Headspace Analysis † Down Borehole Analysis ▼ Groundwater Table ▽ Perched Water Table		Project Title: SOIL AND GROUNDWATER INVESTIGATION Location: BARRY, SOUTH GLAMORGAN Client: DOW CORNING LTD Job No: 11681-023-401			DRAFT
						 DAMES & MOORE GROUP					

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 17.7.97	BOREHOLE NUMBER: 211 PAGE 2 OF 3			
							END DATE: 17.7.97				
							DRILLER: DRILCORP				
	NUMBER	TYPE					METHOD: Light Cable Percussion/Rotary Air Force		BOREHOLE DIAMETER: 200mm		
							LOGGED BY: K MADAWEE		SCREEN TYPE & DIAMETER: 50 mm ID UPVC		
APPROVED BY:			SCREEN SLOT SIZE: 1 mm								
						DESCRIPTION		COMMENTS			
						Soft to stiff, red-brown very silty CLAY with frequent sub-rounded to angular fine gravel to cobble sized clasts of weathered mudstone (WEATHERED BEDROCK)					
LOCATION/NOTES: 1. Located along the western edge of the lagoons - western area of the site. 2. Drilled to 17.5m using light cable percussive techniques..						LEGEND ☒ Disturbed Sample ■ Undisturbed Sample * Headspace Analysis † Down Borehole Analysis ▼ Groundwater Table ▽ Perched Water Table		Project Title: SOIL AND GROUNDWATER INVESTIGATION Location: BARRY, SOUTH GLAMORGAN Client: DOW CORNING LTD Job No: 11681-023-401 DRAFT 			

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 17.7.97		BOREHOLE NUMBER: 211 PAGE 3 OF 3	
	NUMBER	TYPE					END DATE: 17.7.97			
							DRILLER: DRILCORP			
							METHOD: Light Cable Percussion/Rotary Air Flow			
						BOREHOLE DIAMETER: 200mm				
						LOGGED BY: K MADAWE		SCREEN TYPE & DIAMETER: 50 mm ID UPVC		
						APPROVED BY:		SCREEN SLOT SIZE: 1 mm		
						DESCRIPTION		COMMENTS		
						Weak to moderately weak red-brown silty MUDSTONE.				
						Borehole terminated at 25.0 mbgl				
LOCATION/NOTES: 1. Located along the western edge of the lagoons - western area of the site. 2. Drilled to 17.5m using light cable percussive techniques..						LEGEND Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table		Project Title: SOIL AND GROUNDWATER INVESTIGATION Location: BARRY, SOUTH GLAMORGAN Client: DOW CORNING LTD Job No: 11681-023-401		
								DRAFT		

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 24.7.97		BOREHOLE NUMBER: 212 PAGE 1 OF 3					
	NUMBER	TYPE					END DATE: 25.7.97							
							DRILLER: DRILCORP							
							METHOD: Light Cable Percussion/Rotary Air Force							
LOGGED BY: K MADAWEE							BOREHOLE DIAMETER: 200mm							
APPROVED BY:							SCREEN TYPE & DIAMETER: 50 mm ID UPVC							
							SCREEN SLOT SIZE: 1 mm							
						DESCRIPTION			COMMENTS					
BH212 SO-0.6m BH212 SO-3.0m ▼ 1.9.97						0			Dense brown very clayey SILT with some sand (MADE GROUND)			0		
						1			Soft to firm grey very silty CLAY with frequent shells and fine sandstone gravel to cobbles (possibly RE-WORKED ALLUVIUM)			No odour		
						2								
						3						WET at 3m		
						4								
						5			Soft grey (mottled black-white) silty to very silty CLAY with some organic matter. (ALLUVIUM)					
						6								
						7								
						8			Soft greyish-brown very sandy SILT with some clay (ALLUVIUM)					
						9								
						10			Soft to firm grey-blue silty CLAY					
						11								
						12								
						13								
						14								

LOCATION/NOTES:

- Located along southwestern corner of lagoons - western are of site.
- Drilled to 16 m using Light Cable Percussion rig.

LEGEND

- Disturbed Sample
- Undisturbed Sample
- ✱ Headspace Analysis
- † Down Borehole Analysis
- ▼ Groundwater Table
- ▽ Perched Water Table

Project Title: **SOIL AND GROUNDWATER INVESTIGATION**

Location: **BARRY, SOUTH GLAMORGAN**

Client: **DOW CORNING LTD**

Job No: **11681-023-401** **DRAFT**

DAMES & MOORE

GROUP

[illegible]

WELL CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	START DATE: 24.7.97		BOREHOLE NUMBER: 212 PAGE 3 OF 3	
	NUMBER	TYPE					END DATE: 25.7.97			
							DRILLER: DRILCORP			
							METHOD: Light Cable Percussion/Rotary Air Flow			
						BOREHOLE DIAMETER: 200mm				
						LOGGED BY: K MADAWE		SCREEN TYPE & DIAMETER: 50 mm ID UPVC		
						APPROVED BY:		SCREEN SLOT SIZE: 1 mm		
						DESCRIPTION		COMMENTS		
						20		20		
						21		21		
						22		22		
						23		23		
						24		24		
						25		25		
						26		26		
						27		27		
						28		28		
						29		29		
30		30								
LOCATION/NOTES: 1. Located along southwestern corner of lagoons - western are of site. 2. Drilled to 16 m using Light Cable Percussion rig.						LEGEND ☒ Disturbed Sample ■ Undisturbed Sample * Headspace Analysis † Down Borehole Analysis ▼ Groundwater Table ▽ Perched Water Table		Project Title: SOIL AND GROUNDWATER INVESTIGATION		
								Location: BARRY, SOUTH GLAMORGAN		
								Client: DOW CORNING LTD		
								Job No: 11681-023-401		
								DRAFT		
								DAMES & MOORE		

Style: AGS4_URS_ENV_VWS File: J:\CARDIFF-JOBSDOW CORNING LTD\47075117 BARRY LANDFILL DATA ASSESSMENT\TECHNICAL SITE INVESTIGATION 2015\LOGS\DOW CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:20

URS Infrastructure & Environment UK Ltd www.ursglobal.com

Client: Dow Corning.

Project: Landfill Assessment

Contract No: 47075117



Record of Windowless
Window Sampler Hole
CP1

Samples & in situ Tests						Strata					
Depth	Type/ No.	Schel'd Tests	PID (ppm)	Sampler Range/ %Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thick- ness)	DESCRIPTION	Visual/Olfactory Observations	Instru- ment/ Backfill
-1	0.50	PID	0.0			5.26		(0.60)	Brown sandy gravelly clay with low cobble content and roots throughout. Cobbles are angular to subangular of brick and concrete. Gravel is subangular fine to coarse of brick. (Made Ground)	Dry, NVO	
						0.60					
	1.00	PID	0.0			4.86		(0.30)	Grey clayey subangular fine to coarse gravel of hardcore backfill. (Made Ground).	Strong organic odour	
						1.00			Stiff brown mottled orange occasionally stained black slightly sandy slightly gravelly clay. Gravel is subangular fine to medium of chert, brick and sandstone. (Made Ground).		
	1.50	PID	0.0					1.20	Stiff black dark grey clay with numerous rootlets throughout. (Made Ground)		
-2	2.00	ES PID D	0.0					(1.70)	Firm orange brown silty clay with gravel sized pockets of orange coarse sand. (Possibly Re-Worked)	Dry, NVO	
	2.20										
	2.50	PID	0.0								
-3	3.00	D PID	0.0			2.96		2.90	Very soft grey sandy clayey SILT.	Damp, NVO	
	3.50	ES PID	0.0								
-4	4.00	PID	0.0					(2.10)	Becoming dark grey		
	4.50	PID	0.0						Very soft (rods fall in with no pressure)		
-5	5.00	ES PID	0.0			0.86		5.00	Soft grey organic SILT with roots throughout.	Dry, NVO	
						0.46		(0.40)	5.40		
-6	5.50	PID	0.0					(0.40)	Firm dark brown pseudo fibrous silty PEAT.	Damp, NVO	
	5.80	D				0.06		5.80	Becoming clayey		
	6.00	PID	0.0			-0.27		(0.33)	6.13		
-7	6.50	ES PID	0.0						Highly weathered silty mudstone recovered as: Hard red brown mottled green clayey sandy subangular gravel.	Damp, NVO	
	7.00	PID	0.0					(2.27)			
	7.50	D PID	0.0								
	8.00	PID	0.0								
-8	8.50	PID	0.0			-2.54		8.40	Weathered silty sandy mudstone recovered as: Hard red brown occasionally green silty sandy subangular medium to coarse gravel.	Damp. Material damp when core split open. NVO	
	9.00	D PID	0.0					(2.60)	Red brown gravelly coarse SAND		
	9.50	PID	0.0								

GENERAL REMARKS

Hand dug pit excavated to 1.2m bgl.

Boring Progress

Water Observations

Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:

CCJ

Checked by:

Status:

Equipment:

Comacchio GEO 305

Contractor:

Tor Drilling Ltd

Co-ordinates:

NGR E: 313292.82m

NGR N: 168457.04m

Ground Level:

OS Level: 5.86mAOD

Date:

Start: 07/09/2015

End: 15/09/2015



Sheet 1 of 2

Style: AGS4_LRS_ENV_VWS File: J:\CARDIFF-JOB\SDOW CORNING LTD\47065177 BARRY LANDFILL DATA ASSESSMENT\TECHNICAL SITE INVESTIGATION 2015\SDOW CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:20

URS Infrastructure & Environment UK Ltd www.ursglobal.com

Client: Dow Corning.															
Project: Landfill Assessment											Record of Windowless Window Sampler Hole				
Contract No: 47075117											CP1				
Samples & in situ Tests							Strata								
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill				
10.00	PID		0.0	20 40 60 80			x . x . x . x .		Weathered silty sandy mudstone recovered as: Hard red brown occasionally green silty sandy subangular medium to coarse gravel. <i>Stratum text copied from layer at -2.536mAOD from previous sheet.</i> Red brown gravelly coarse SAND (possibly caused by washing away fines with water flush)	Dry, NVO					
10.20	D						x . x . x . x .								
10.50	PID		0.0				x . x . x . x .	(2.60)							
							x . x . x . x .								
11						-5.14	x . x . x . x .	11.00							
Borehole terminated at 11.00m															
12															
13															
14															
15															
16															
17															
18															
19															
20															
GENERAL REMARKS								Boring Progress		Water Observations					
Hand dug pit excavated to 1.2m bgl.								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.															
Logged by: CCJ		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313292.82m		Ground Level: OS Level: 5.86mAOD		Date: Start: 07/09/2015		Sheet 2 of 2			
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168457.04m				End: 15/09/2015					
Status:															

Site: AGS4_URS_ENV_WIS File: J:\CARDIFF-JOB\DOWN CORNING LANDFILL DATA ASSESSMENT\TECHNICAL SITE INVESTIGATION 2015\LOGS\DOWN CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:22

URS Infrastructure & Environment UK Ltd www.ursglobal.com

Client: Dow Corning.															
Project: Landfill Assessment										Record of Windowless Window Sampler Hole					
Contract No: 47075117										CP2					
Samples & in situ Tests						Strata									
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instru-ment/Backfill				
1	0.50	PID	0.0			5.12		(0.70)	Dark brown sandy clayey topsoil with frequent rootlets (Made Ground)	Dry					
	1.00	PID	0.0			4.62		(0.50)	Soft brown sandy clay/silt (Made Ground)	Damp					
	1.50	D ES PID	0.0						(1.00)	Firm to stiff orange brown occasionally grey slightly sandy silty clay with gravel sized pockets of orange coarse sand. Grey laminations with organic material within (Possible re-worked).		Wet within grey laminations			
2	2.00	PID	0.0			3.62		2.20							
	2.50	PID	0.0					(0.80)	Soft grey sandy silty CLAY.						
3	3.00	D PID	0.0			2.82		3.00							
	3.50	PID	0.0					(0.70)	Soft grey clayey slightly sandy SILT with rare organic material throughout. Very soft falling under weight of rods	Damp					
	3.80	D ES PID	0.0					2.12	3.70	Grey silty fine to coarse SAND.					
4	4.00		0.0			1.52		4.30							
	4.50	D ES PID	0.0					(1.90)	Grey fine to coarse SAND with rare shell fragments.	Wet					
6	6.00	PID	0.0			-0.38		6.20	slightly gravelly; subangular fine						
	6.20	D				-0.88		(0.50)	Firm to stiff grey silty CLAY with organic material throughout.						
	6.50	PID	0.0					(0.60)	broken shell fragments Firm dark brown pseudo fibrous PEAT.	Damp with Organic Odour					
7	7.00	PID	0.0			-1.48		7.30	grey brown fine to medium SAND (possibly fallen in from above)						
	7.30	ES				-1.88		(0.40)	Highly weathered mudstone recovered as: red brown sandy clayey silty angular to subangular fine to medium gravel.						
	7.50	D PID	0.0					(1.20)	Black organic material (highly degraded) Highly weathered mudstone recovered as: red brown sandy silty subangular fine to coarse gravel mottled green	Damp					
9	8.00	PID	0.0			-3.08		8.90							
	8.50	D PID	0.0					(0.70)	Weathered mudstone recovered as: red brown rare green sandy subangular fine to medium gravel. becoming silty						
	9.00	PID	0.0					-3.78	9.60	coarse subangular gravel Possible water strike (highly weathered material) Weathered mudstone recovered as: very weak red brown rare green silty subangular gravel of silty mudstone.		Dry			
10	9.50	PID	0.0			-4.18		10.00							
GENERAL REMARKS								Boring Progress		Water Observations					
Hand dug pit excavated to 1.2m bgl.								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.															
Logged by: CCJ/JC		Equipment: Comacchio GEO 305		Co-ordinates: NGR E: 313360.69m		Ground Level: OS Level: 5.82mAOD		Date: Start: 09/09/2015							
Checked by:		Contractor: Tor Drilling Ltd		NGR N: 168495.64m				End: 11/09/2015							
Status:										Sheet 1 of 2					

Site: AGS4_URS_ENV_WIS File: J:\CARDIFF-JOBSDOW CORNING LTD\47075117 BARRY LANDFILL DATA ASSESSMENT\TECHNICAL SITE INVESTIGATION 2015\LOGS\DOWN CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:24

Client: Dow Corning.																	
Project: Landfill Assessment										Record of Windowless Window Sampler Hole							
Contract No: 47075117										E5							
Samples & in situ Tests						Strata											
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill						
1								(1.20)	Grey silica waste (Made Ground)								
						6.76		1.20									
						6.26		1.70									
2	2.00	ES	1113.0					(0.50)	Brown grey sandy gravel and cobbles. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of sandstone. Cobbles are subangular of sandstone (Made Ground).								
	2.20	ES	1153.0			5.81		2.15	Brown mottled grey/black (ashy) very sandy gravelly fine to coarse silt with low cobble content. Gravel is angular to subrounded of sandstone with occasional glass. Cobbles are subangular of sandstone (Made Ground).								
	2.50	PID	384.0					2.30	Black sandy very ashy silt (Made Ground).								
3									No recovery								
								(1.20)									
						4.46		3.50									
4	4.00	PID	104.0					(0.50)	Soft brown grey mottled green-grey occasionally black/dark grey silty sandy gravelly CLAY with medium cobble content and occasional organic fibres/roots. Sand is fine to coarse. Gravel is angular to subangular fine to coarse sandstone, siltstone with occasional coal fragments. Cobbles are angular to subangular sandstone (Made Ground).								
						3.96		4.00									
						3.36		4.60	No recovery								
5	5.00	ES	16.0					(0.60)	Soft brown grey mottled green-grey occasionally black/dark grey silty sandy CLAY with a medium cobble content. Cobbles are of concrete and sandstone (Made Ground).								
		PID	3.1			2.76		5.20									
	5.50	PID							Soft to firm grey brown mottled dark grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and rare slag (Possibly Re-worked).								
6	6.00	ES						(1.50)									
	6.20	PID	5.4						Band of sandstone gravel.	Wet.							
						1.26		6.70									
7	7.00	PID	4.6					6.80	Dark brown mottled brown/dark grey slightly sandy silty CLAY with frequent shells.								
									Brown grey with occasional orange/brown, brown and dark grey silt laminations fine to coarse SAND with occasional shell fragments.								
8	8.00	ES	2.6					(2.40)		Damp. Slight organic odour							
		PID															
9	9.00	PID	5.4														
						-1.24		9.20									
	9.50	ES	110.6					(0.70)	Soft to firm grey very silty CLAY with occasional organic rootlets.								
		PID				-1.94		9.90									
10																	
GENERAL REMARKS										Boring Progress							
Vac-ex previously completed to 1.2m bgl										Water Observations							
CP4										Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.																	
Logged by: JC / MW		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313494.00m				Ground Level: OS Level: 7.96mAOD		Date: Start: 17/09/2015					
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168338.28m						End:					
Status:														Sheet 1 of 2			

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Client: Dow Corning.															
Project: Landfill Assessment											Record of Windowless Window Sampler Hole				
Contract No: 47075117											E5				
Samples & in situ Tests							Strata								
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instru-ment/Backfill				
10.00	PID		45.0	20 40 60 80				10.00	Dark red-brown mottled grey and cream organic SILT with frequent organic material and shell fragments. No recovery						
11						-2.64		10.60	Firm dark red brown slightly silty clayey fibrous PEAT with wood fragments.	Strong organic odour					
						-2.94		10.90	Light grey mottled dark grey slightly silty CLAY.						
								(0.60)	No recovery						
						-3.54		11.50							
12						-3.94		11.90	Soft light grey mottled CLAY.	Wet Slight organic odour					
						-4.54		12.50	Firm reddish brown slightly silty slightly clayey fibrous PEAT with frequent wood fragments.						
						-4.84		12.80	Soft to firm light grey slightly silty slightly sand CLAY with frequent organic matter including wood.						
13								13.00	Medium strong reddish brown fine to coarse SANDSTONE with occasional rounded gravel.						
						-5.54		13.50							
14									Borehole terminated at 13.50m						
15															
16															
17															
18															
19															
20															
GENERAL REMARKS								Boring Progress		Water Observations					
Vac-ex previously completed to 1.2m bgl CP4								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.															
Logged by: JC / MW		Equipment: Comacchio GEO 305			Co-ordinates: NGR E: 313494.00m		Ground Level: OS Level: 7.96mAOD		Date: Start: 17/09/2015						
Checked by:		Contractor: Tor Drilling Ltd			NGR N: 168338.28m				End:						
Status:											Sheet 2 of 2				

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Client: Dow Corning.													
Project: Landfill Assessment										Record of Windowless Window Sampler Hole			
Contract No: 47075117										E6			
Samples & in situ Tests						Strata							
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instru-ment/Backfill		
1				20 40 60 80				0.10	Grey silica waste material (Made Ground)	Damp, NVO. Rare purple/magenta mottle - possible paint residue.			
								(0.60)	Grey sandy subangular medium to coarse gravel of limestone hardcore fill (Made Ground)				
								7.21	0.70			Stiff (sticky) grey brown occasionally orange silty clay (Made Ground)	
								6.91	(0.30)			1.00	Grey sandy laminated silt with low cobble content. Cobbles are subangular of sandstone (Made Ground)
									1.20			1.40	No Recovery
1.50	PID		2.2					(0.75)	Soft to firm dark brown/grey slightly sandy gravelly, very clayey silt. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of siltstone. (Made Ground).	Damp, NVO. Rare purple/magenta mottle - possible paint residue.			
2	2.00	ES PID	6.8			5.76		2.15	Stiff red brown mottled dark grey/black sandy clayey gravelly SILT. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of siltstone and coal. (Made Ground). Rare gravel sized pockets of yellow coarse sand. Dark grey-black and red-brown mottled black.				
2.50	PID		3.5					(0.85)	Increase in gravels. Slight black staining			Damp, NVO Damp, NVO	
3	3.00	ES PID	3.2			4.91		3.00	Small piece of 2mm wire				
3.50	PID		3.2					(1.00)	Stiff red brown occasionally mottled black organic clayey sandy gravelly silt. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of siltstone/mudstone and coal. Rare rootlets/organic fibers. (Made Ground).			Damp, NVO	
4	4.00	PID	2.5			3.91	4.00	No Recovery	Damp, NVO				
						3.61	(0.30)	4.30			Grey brown silty sandy gravel and clay with low cobble content. Sand is fine to coarse. Gravel is angular to subangular medium to coarse of siltstone. Cobbles are angular of siltstone. (Made Ground).		
4.50	PID		3.9			3.16	(0.45)	4.75			Firm red brown and brown grey mottled dark grey/black sandy gravelly silty clay with frequent rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of siltstone. Black mottles are ashy/fine coal gravel (Reworked material).		
5	5.00	ES PID	3.9					(1.45)		Damp, slight organic odour			
6	6.00	PID	1.1			1.71		6.20	Red/orange brown sandy silty angular to subangular fine to coarse GRAVEL of mudstone. (Reworked material).				
	6.25	ES PID	1.5			1.41		(0.30)	6.50			Soft dark grey slightly sandy very silty CLAY with frequent shells.	
	6.50	PID	7.2									Green-grey fine to coarse SAND with rare shells/fragments.	
	6.60	ES										3cm band of grey very sandy SILT	
7	7.00	PID	2.7							Wet, NVO			
												3cm band of grey very sandy SILT	
8	8.00	ES PID	1.3					(2.75)					
	8.50	PID	0.1										
9	9.00	PID	0.1										
						-1.59	9.50		Blue-grey occasionally mottled dark grey slightly sandy silty CLAY.	Damp NVO Damp, strong sulphur odour			
	9.50	PID	0.0				9.75		Dark brown, red-brown and red fibrous PEAT with frequent wood and organic matter.				
10								10.00					
GENERAL REMARKS										Boring Progress			
Vac-ex previously completed to 1.2m bgl										Water Observations			
										Date	Time	Hole Depth	Standing Level
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.													
Logged by: JC		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313483.22m		Ground Level: OS Level: 7.91mAOD		Date: Start: 06/10/2015			
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168185.57m				End: 08/10/2015			
Status:										Sheet 1 of 2			



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Client: Dow Corning.																	
Project: Landfill Assessment										Record of Windowless Window Sampler Hole							
Contract No: 47075117										E6							
Samples & in situ Tests							Strata										
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill						
10.00	PID		2.0	20 40 60 80					No Recovery	(decomposition)							
11								(2.20)									
12						-4.29		12.20	Soft blue sandy very silty CLAY.	Wet, slight sulphur odour							
12.50	PID		2.0			-4.99		(0.70)									
13								12.90	Soft blue grey mottled dark grey slightly sandy silty CLAY with pockets of dark brown fibrous PEAT.	Damp, NVO							
13.00	PID		0.8					(0.75)									
13.50	PID		0.6			-5.74		13.65	Firm dark brown CLAY with occasional rootlets/fibres.	Damp, NVO							
14								13.90	Firm brown mottled organic/brown light grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of siltstone/sandstone. Occasional black mottle and rootlets.								
14.00	PID		0.9			-6.29		(0.30) 14.20	Weathered Bedrock recovered as: Very stiff orange brown clayey gravelly SILT. Gravel is angular to subangular fine to medium of mudstone.	Dry, NVO							
14.50	PID		0.7			-6.59		(0.30) 14.50									
Borehole terminated at 14.50m																	
15																	
16																	
17																	
18																	
19																	
20																	
GENERAL REMARKS									Boring Progress			Water Observations					
Vac-ex previously completed to 1.2m bgl									Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed	
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.																	
Logged by: JC		Equipment: Comacchio GEO 305					Co-ordinates: NGR E: 313483.22m		Ground Level: OS Level: 7.91mAOD		Date: Start: 06/10/2015				Sheet 2 of 2		
Checked by:		Contractor: Tor Drilling Ltd					NGR N: 168185.57m		End: 08/10/2015								
Status:																	

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Client: Dow Corning.																	
Project: Landfill Assessment										Record of Windowless Window Sampler Hole							
Contract No: 47075117										E7							
Samples & in situ Tests						Strata											
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instru-ment/Backfill						
1	1.50	PID	3.0			7.94		(0.90)	Grey and brown clayey sandy subangular medium to coarse gravel of brick and limestone hardcore fill with low cobble content. (Made Ground)	Dry							
						7.44		(0.50)	Stiff grey mottled brown sticky clay with medium cobble content. Cobbles are angular to subangular of brick and mudstone with fossils (Made Ground)								
2	2.00	PID	0.7			6.84		(0.60)	Grey brown clayey silty sandy gravel with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, concrete and brick. Cobbles are subangular of brick and concrete (Made Ground).	Slight chemical odour, wet							
						6.44		(0.40)	Red slightly sandy subangular fine to coarse gravel of type 1 hardcore (Made Ground)								
3	3.00	ES PID	5.0			5.94		(0.50)	Red sandy silty fine subangular gravel of Type 1 hardcore (Made Ground)	Chemical odour, wet							
						3.10		(0.30)	becoming brown								
4	4.00	PID	1.7			4.57		(0.47)	Dark brown/ black clayey sandy silty topsoil with rootlets (Made Ground)	Damp, NVO							
						4.27		(0.30)	Red clayey sandy fine subangular gravel of subbase/type 1 (Made Ground)								
5	4.80	ES PID	84.0			4.10		(0.47)	Firm grey/blue mottled orange gravelly clay/silt (Made Ground)	NVO Wet, NVO Very soft. Very wet (Water strike?), NVO Damp, NVO							
						4.74		(0.35)	Firm red brown slightly gravelly slightly sandy silt (Made Ground)								
6	7.10	ES PID	4.7			1.56		(0.38)	Firm grey blue mottled brown occasionally orange clayey silt with organic material throughout (Made Ground)	Wet, NVO Wet, Chemical odour							
						1.21		(0.35)	Soft red brown gravelly slightly sandy silt. Gravel is subangular coarse of sandstone (Made Ground)								
7	7.50	PID	1.0			1.21		(0.35)	Soft grey slightly sandy clayey silt with rare gravel and some organic material (Made Ground - possible reworked)	Wet, NVO Slight saline odour							
						7.63		(0.35)	Dark brown slightly silty sandy subangular fine to coarse gravel of sandstone with frequent rootlets (Made Ground)								
8	8.00	ES PID	2.1			0.71		(5.70)	Dark grey very sandy SILT	Wet, NVO Slight saline odour							
						0.71		(5.70)	Dark grey laminations								
9	9.00	PID	3.1			0.71		(5.70)	Soft to firm grey slightly sandy silty thinly laminated CLAY (0.5mm).								
						0.71		(5.70)									
10	9.10	PID	2.9			0.71		(5.70)									
						0.71		(5.70)									
11	9.25	PID	2.8			0.71		(5.70)									
						0.71		(5.70)									
12	9.50	PID	1.6			0.71		(5.70)									
						0.71		(5.70)									
GENERAL REMARKS										Boring Progress							
Vac-ex previously completed to 1.2m bgl										Water Observations							
										Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.																	
Equipment: Comacchio GEO 305										Ground Level: OS Level: 8.84mAOD		Date: Start: 30/09/2015		End: 05/10/2015		AGS	
Contractor: Tor Drilling Ltd										Co-ordinates: NGR E: 313381.69m NGR N: 168237.18m						Sheet 1 of 2	

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Client: Dow Corning.																
Project: Landfill Assessment											Record of Windowless Window Sampler Hole					
Contract No: 47075117											E7					
Samples & in situ Tests							Strata									
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill					
10.00	PID		1.8	20 40 60 80					Soft to firm grey slightly sandy silty thinly laminated CLAY (0.5mm). <i>Stratum text copied from layer at -0.711m AOD from previous sheet.</i> No recovery Soft	Damp. NVO						
10.50	ES PID		1.4													
11.00	PID		1.3													
11.50	PID		2.0					Grading to darker grey								
12.00	PID		1.8					Dark grey laminated light/mid grey								
12.50	PID		2.0					(5.70)								
13.00	PID		2.7													
13.50	PID															
14.00	PID		2.5						Very soft. Wet. NVO							
15.00	PID		1.8			-6.41		15.25								
						-6.96		(0.55) 15.80	Weathered bedrock recovered as; orange brown mottled grey / light grey silty sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse of mudstone/siltstone.							
16.00	PID		0.1			-7.16		16.00	Weathered bedrock recovered as; Orange red brown occasionally mottled grey silty sandy angular to subangular fine to coarse gravel of mudstone.							
									Borehole terminated at 16.00m							
17																
18																
19																
20																
GENERAL REMARKS									Boring Progress		Water Observations					
Vac-ex previously completed to 1.2m bgl									Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.																
Logged by: JC / CCJ		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313381.69m		Ground Level: OS Level: 8.84mAOD		Date: Start: 30/09/2015				Sheet 2 of 2		
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168237.18m		End: 05/10/2015								
Status:																

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Client: Dow Corning.															
Project: Landfill Assessment										Record of Windowless Window Sampler Hole					
Contract No: 47075117										E8					
Samples & in situ Tests						Strata									
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill				
1	1.50	PID	6.2			7.66		(1.20)	Light brown to brown clayey sandy gravelly cobbles of concrete, brick and sandstone (Made Ground).	Dry, NVO					
						1.20									
2	1.95 2.00 2.20	ES PID PID	26.3 1282.0			6.66		1.40	Reddish brown slightly silty slightly clayey sandy subangular fine to coarse gravel. Sand is fine to coarse (Made Ground)	Damp, NVO					
								1.60							
								(0.60)	Soft to firm reddish brown slightly silty sandy clay with occasional subangular gravel (Made Ground)						
								2.20	Soft light grey silty sandy clay. Sand is fine to coarse (Made Ground)						
3	2.60 2.85 2.90 3.00 3.10	ES PID ES PID	105.0 74.0			6.01		(0.65)	Dense grey slightly clayey slightly silty sandy gravel or gravelly sand. Sand is fine to medium. Gravel is coarse subangular of mixed lithology (Made Ground). medium to coarse gravel of brick (loss of fines) Thin band of clayey gravel slightly reddish	Ammonia odour					
								2.85							
								3.00	Firm brown dark grey slightly silty slightly gravelly clay with rootlets (Made Ground)						
								3.10							
4	3.50 3.90	PID PID	0.0 1.4			5.56		(0.30)	Firm reddish brown slightly silty slightly gravelly clay. Gravel is fine subrounded of sandstone with cobbles of sandstone and occasional rootlets (Made Ground)	Strong odour					
								3.30							
								(0.40)	Firm reddish brown slightly silty slightly sandy slightly gravelly clay with wood and rootlets (Made Ground). gravel with cobble						
								3.70							
5	5.10	ES PID	34.0			4.86		(0.30)	Firm light grey slightly silty CLAY (possible reworked ground)	Wet, NVO					
								4.40							
								(0.50)	Slightly silty slightly clayey fine to medium sand (Made Ground).						
								4.60	Soft to firm light grey slightly silty clay with occasional slightly degraded vegetation and organic matter.						
6						4.26		4.80	Cobble of medium strong to strong sandstone (Made Ground)	NVO					
								5.00	No recovery						
								5.20	Brown slightly clayey to clayey slightly gravelly to gravelly coarse sand. Gravel is fine to medium subangular of mixed lithology (Made Ground)						
								(0.50)	Grading into brown clayey gravel and cobbles (Made Ground)						
7	7.60	PID	0.0			3.16		5.70	Dark grey fine to coarse gravel of sandstone with occasional small pockets of clay (Made Ground)	Very wet, NVO					
								(0.30)							
								6.00	No recovery. Augering through cobbles						
								(1.00)							
8	8.20	PID	0.0			1.86		7.00	No recovery. Too wet	Wet, NVO					
								(0.30)							
								7.30							
								(0.50)	Brown grey clayey silt / silty clay with possible occasional band of medium to coarse sand. Possible organic material (possible Made Ground)						
9						1.06		7.80	Silty fine to medium SAND.	NVO					
10						-1.14		10.00		Wet, NVO					
GENERAL REMARKS								Boring Progress		Water Observations					
Vac-ex previously completed to 1.2m bgl CP5								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.								Ground Level:		Date:					
Logged by: MW		Equipment: Comacchio GEO 305		Co-ordinates: NGR E: 313310.25m		OS Level: 8.86mAOD		Start:							
Checked by:		Contractor: Tor Drilling Ltd		NGR N: 168304.65m				End: 30/09/2015							
Status:										Sheet 1 of 2					

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Client: Dow Corning.																	
Project: Landfill Assessment											Record of Windowless Window Sampler Hole						
Contract No: 47075117											E8						
Samples & in situ Tests						Strata											
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instru-ment/Backfill						
11	10.80	PID	0.9			-1.79		(0.65)	No recovery	Damp, NVO							
								10.65									
								10.78	Grey brown fine to medium SAND.								
									Soft grey clayey SILT.								
	11.20	PID	0.7														
	11.50	PID	1.0					(1.62)									
	12.00	PID	1.4														
	12.50	PID	0.5														
13	13.00	PID	0.5			-3.54		12.40	Red brown clayey subangular fine GRAVEL of mudstone.	Damp, slight organic odour Dry, NVO							
								12.60	Grey silty subangular fine GRAVEL of silty mudstone.								
								12.76	Grey SILT.								
								12.83	Orange brown fibrous PEAT with wood fragments.								
								(0.89)									
									Driller notes very soft								
	14	14.00	PID	0.0			-4.86		13.72			Dark brown pseudo fibrous PEAT.	Damp, NVO				
								13.80	Grey clayey SILT with some organic material.								
								13.89	Soft red brown silty CLAY.								
								14.00	Stiff red occasionally green silty CLAY with rare organic material throughout.								
								(0.50)									
14.50		PID	0.9			-5.64		14.50	Firm red brown with green silt laminations with rare organic material throughout.								
								(0.40)									
15.00		PID	0.0			-6.04		14.90	Firm red brown occasionally grey slightly gravelly silty CLAY.								
								(0.53)									
16							-6.57		15.43	Weathered bedrock recovered as hard red brown with rare grey clayey/silty subangular fine to coarse GRAVEL of siltstone.							
								(1.07)									
17						-7.64		16.50	Borehole terminated at 16.50m								
18																	
19																	
20																	
GENERAL REMARKS									Boring Progress			Water Observations					
Vac-ex previously completed to 1.2m bgl CP5									Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed	
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.																	
Logged by: MW		Equipment: Comacchio GEO 305					Co-ordinates: NGR E: 313310.25m		Ground Level: OS Level: 8.86mAOD		Date: Start: End: 30/09/2015		Sheet 2 of 2				
Checked by:		Contractor: Tor Drilling Ltd					NGR N: 168304.65m										
Status:																	

Style: AGS4_URS_ENV_VWS File: J:\CARDIFF-JOB\SDOW CORNING INVESTIGATION 2015\LOGS\SDOW CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:35

URS Infrastructure & Environment UK Ltd www.ursglobal.com

Client: Dow Corning.															
Project: Landfill Assessment										Record of Windowless Window Sampler Hole					
Contract No: 47075117										E9					
Samples & in situ Tests						Strata									
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill				
0.50	ES PID					7.19		(0.50)	Silty very sandy gravel with medium cobble content. Gravel is subangular of limestone. Cobbles are of process slag material. (Made Ground)	Damp, NVO					
	1.00	PID	0.0					(1.35)	Firm brown clay with pockets of black ashy gravel. (Made Ground)	Slightly damp, NVO					
2.00	PID		0.0			5.84		1.85	Grey and red gravel of siltstone. (Made Ground)	Slightly damp, NVO					
	2.50	ES				5.39		(0.45)	Firm red/brown slightly gravelly clay with occasional pockets of ash. Gravel is of limestone (Made Ground)	Slightly damp, NVO					
3.00	PID		0.0							Slightly damp, NVO. (Slight burnt odour where ashy)					
	4.00	PID	0.0					(3.80)		Slightly damp, NVO.					
4.80	ES		0.6							Damp, NVO					
	5.00	PID													
6.80	ES		1.0			1.59		6.10	Grey brown laminated fine to coarse SAND.						
	7.00	PID						(1.80)	Running sands	Wet, NVO					
8.00	ES		1.2			-0.21		7.90	Soft to firm grey/brown very sandy CLAY.						
	8.70	ES				-0.81		(0.60)	Stiff brown mottled grey occasionally black gravelly CLAY with some organic material present.						
8.80	PID		0.7			-1.36		9.05	Weathered bedrock recovered as: Stiff to very stiff brown/grey/green gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone.						
								(2.25)	Wet gravel band	Damp, NVO					
GENERAL REMARKS															
Hand dug pit excavated to 1.2m bgl. CP3								Boring Progress		Water Observations					
								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.															
Logged by: JC		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313345.16m		Ground Level: OS Level: 7.69mAOD		Date: Start: 15/09/2015				Sheet 1 of 2	
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168400.12m				End: 17/09/2015					
Status:															

Style: AGS4_URS_ENV_VWS File: J:\CARDIFF-JOB\SDOW CORNING LTD\47065177 BARRY LANDFILL DATA ASSESSMENT\TECHNICAL SITE INVESTIGATION 2015\LOGS\SDOW CORNING LANDFILL ASSESSMENT.GPJ Printed: 21/01/2016 17:02:35

URS Infrastructure & Environment UK Ltd www.ursglobal.com

Client: Dow Corning.															
Project: Landfill Assessment											Record of Windowless Window Sampler Hole				
Contract No: 47075117											E9				
Samples & in situ Tests								Strata							
Depth	Type/No.	Schel'd Tests	PID (ppm)	Sampler Range/%Recv	Water Level	Reduced Level m(AOD)	Legend	Depth (Thickness)	DESCRIPTION	Visual/Olfactory Observations	Instrument/Backfill				
10.00	PID		1.3	20 40 60 80					Weathered bedrock recovered as; Stiff to very stiff brown/grey/green gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone. <i>Stratum text copied from layer at -1.363mAOD from previous sheet.</i> Wet gravel band Intermittent grey bands c.5 to 10cm thickness						
10.30	ES							(2.25)							
11.00	PID		0.1					11.30							
						-3.61									
Borehole terminated at 11.30m															
12															
13															
14															
15															
16															
17															
18															
19															
20															
GENERAL REMARKS								Boring Progress		Water Observations					
Hand dug pit excavated to 1.2m bgl. CP3								Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed
Exploratory hole logs should be read in conjunction with corresponding Key Sheets.															
Logged by: JC		Equipment: Comacchio GEO 305				Co-ordinates: NGR E: 313345.16m		Ground Level: OS Level: 7.69mAOD		Date: Start: 15/09/2015					
Checked by:		Contractor: Tor Drilling Ltd				NGR N: 168400.12m				End: 17/09/2015					
Status:												Sheet 2 of 2			

Appendix E - Groundwater Risk Assessment

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Copper	From Level 1
Target Concentration	C _T 1.00E-03	mg/l From Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	6.60E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{0.2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	I	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	5.40E+02	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	V	1.88E-01	m/d	
Retardation factor	Rf	4.59E+03	fraction	
Decay rate used	I	1.68E-104	d ⁻¹	
Rate of contaminant flow due to retardation	u	4.09E-05	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	4.49E-02	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.47E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	4.49E-02	mg/l
after		1.0E+100	days
Ogata Banks			

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

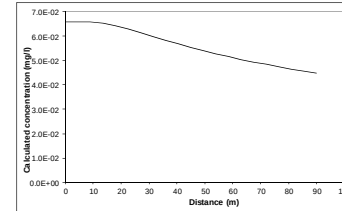
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	5.40E+02	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.40E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	m
Transverse dispersivity	az	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	m
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed			



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used.

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	2001/01/18
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	6.60E-02
4.5	6.60E-02
9.0	6.59E-02
13.5	6.53E-02
18.0	6.43E-02
22.5	6.29E-02
27.0	6.14E-02
31.5	5.99E-02
36.0	5.83E-02
40.5	5.69E-02
45.0	5.54E-02
49.5	5.41E-02
54.0	5.28E-02
58.5	5.16E-02
63.0	5.05E-02
67.5	4.94E-02
72.0	4.84E-02
76.5	4.74E-02
81.0	4.65E-02
85.5	4.57E-02
90.0	4.49E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Trimethylsilanol		from Level 1
Target Concentration	1.24E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.45E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	5.73E-01	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	1.88E-01	m/d	
Retardation factor	Rf	5.87E+00	fraction	
Decay rate used	λ	1.31E-101	d ⁻¹	
Rate of contaminant flow due to retardation	u	3.20E-02	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.67E+00	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.82E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	1.67E+00	mg/l
		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

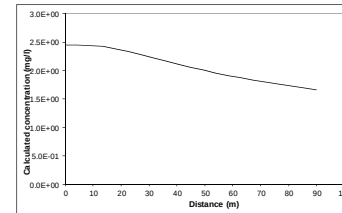
Entry if specify partition coefficient (option)	Kd		l/kg
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)	foc	1.18E-02	fraction
Fraction of organic carbon in aquifer	foc	1.18E-02	fraction
Organic carbon partition coefficient	Koc	4.86E+01	l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.73E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	az	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m

Note values of dispersivity must be > 0
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀x)^{2.414}; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Cadmium	from Level 1
Target Concentration	8.00E-05	from Level 1
C _T		

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.00E-03	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{0.2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadzoux Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	2.56E+03	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Dispersed plume thickness exceeds aquifer thickness! Reduce vertical dispersivity

Groundwater flow velocity	v	1.88E-01	m/d
Retardation factor	Rf	2.18E+04	fraction
Decay rate used	λ	3.54E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	8.64E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.36E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.18E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	1.36E-03	mg/l
after		1.0E+100	days
Ogata Banks			

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

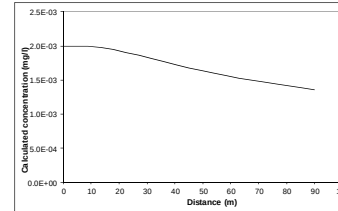
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	2.56E+03	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.56E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	az	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ X) ^{2.414} , az = ax/10, ay = ax/100 are assumed					



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed: Dow Corning
Completed by: Kevin Shepherd
Date: 20/01/2018
Version: 1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	2.0E-03
4.5	2.00E-03
9.0	2.00E-03
13.5	1.98E-03
18.0	1.95E-03
22.5	1.91E-03
27.0	1.86E-03
31.5	1.81E-03
36.0	1.77E-03
40.5	1.72E-03
45.0	1.68E-03
49.5	1.64E-03
54.0	1.60E-03
58.5	1.56E-03
63.0	1.53E-03
67.5	1.50E-03
72.0	1.47E-03
76.5	1.44E-03
81.0	1.41E-03
85.5	1.38E-03
90.0	1.36E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Lead	from Level 1
Target Concentration	C _T 1.20E-03	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	5.10E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature vau
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	3.60E+04	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	1.88E-01	m/d	
Retardation factor	Rf	3.08E+05	fraction	
Decay rate used	λ	2.52E-106	d ⁻¹	
Rate of contaminant flow due to retardation	u	6.14E-07	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	3.47E-02	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.77E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	3.47E-02	mg/l
		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

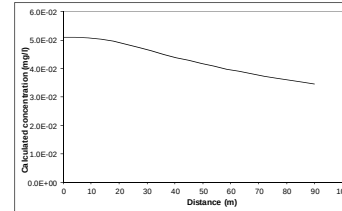
Entry if specify partition coefficient (option)	Kd	3.60E+04	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	3.60E+04	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	az	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m

Note values of dispersivity must be > 0
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀x)^{2.414}; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed: Dow Corning
Completed by: Kevin Shephard
Date: 20/01/2018
Version: 1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	5.10E-02
4.5	5.10E-02
9.0	5.09E-02
13.5	5.08E-02
18.0	4.97E-02
22.5	4.86E-02
27.0	4.74E-02
31.5	4.63E-02
36.0	4.51E-02
40.5	4.39E-02
45.0	4.28E-02
49.5	4.18E-02
54.0	4.08E-02
58.5	3.99E-02
63.0	3.90E-02
67.5	3.82E-02
72.0	3.74E-02
76.5	3.67E-02
81.0	3.60E-02
85.5	3.53E-02
90.0	3.47E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Mercury		from Level 1
Target Concentration	7.00E-05	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.00E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	7.50E+03	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	ay	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Variable			
----------	--	--	--

Groundwater flow velocity	v	1.88E-01	m/d	
Retardation factor	Rf	6.38E+04	fraction	
Decay rate used	λ	1.21E-105	d ⁻¹	
Rate of contaminant flow due to retardation	u	2.95E-06	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	6.80E-03	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.03E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	6.80E-03	mg/l
after		1.0E+100	days
			Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

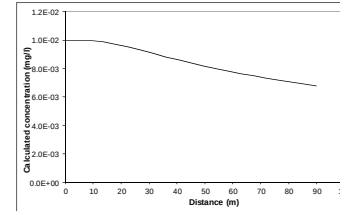
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	7.50E+03	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	7.50E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	ay	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ X) ^{2.414} ; az = ax/10, ay = ax/100 are assumed					



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included; the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used.

Site being assessed: Dow Corning
Completed by: Kevin Shepherd
Date: 20/01/2018
Version: 1

Calculated concentrations for distance-concentration graph

Distance	Concentration
0	1.0E-02
4.5	1.00E-02
9.0	9.98E-03
13.5	9.90E-03
18.0	9.74E-03
22.5	9.53E-03
27.0	9.30E-03
31.5	9.07E-03
36.0	8.84E-03
40.5	8.62E-03
45.0	8.40E-03
49.5	8.20E-03
54.0	8.01E-03
58.5	7.82E-03
63.0	7.65E-03
67.5	7.49E-03
72.0	7.33E-03
76.5	7.19E-03
81.0	7.05E-03
85.5	6.92E-03
90.0	6.80E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Copper	From Level 1
Target Concentration	C _T 1.00E-03	mg/l From Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	6.60E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{0.2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	1.60E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	5.40E+02	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	3.76E-02	m/d	
Retardation factor	Rf	4.59E+03	fraction	
Decay rate used	λ	1.68E-104	d ⁻¹	
Rate of contaminant flow due to retardation	u	8.19E-06	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	4.49E-02	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.47E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	4.49E-02	mg/l
after		1.0E+100	days
Ogata Banks			

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

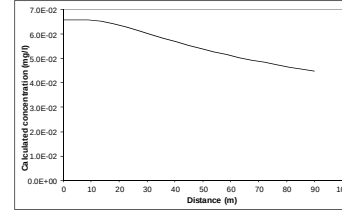
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	5.40E+02	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.40E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	m
Transverse dispersivity	az	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	m
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed			



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used.

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	2001/2018
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	6.60E-02
4.5	6.60E-02
9.0	6.59E-02
13.5	6.53E-02
18.0	6.43E-02
22.5	6.29E-02
27.0	6.14E-02
31.5	5.99E-02
36.0	5.83E-02
40.5	5.69E-02
45.0	5.54E-02
49.5	5.41E-02
54.0	5.28E-02
58.5	5.16E-02
63.0	5.05E-02
67.5	4.94E-02
72.0	4.84E-02
76.5	4.74E-02
81.0	4.65E-02
85.5	4.57E-02
90.0	4.49E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Trimethylsilanol	from Level 1
Target Concentration	1.24E-01	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.45E+00	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	ρ	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	1.60E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadotown Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only

Parameters values determined from options

Partition coefficient	Kd	5.73E-01	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Dispersed plume thickness exceeds aquifer thickness! Reduce vertical dispersivity

Calculated Parameters

Groundwater flow velocity	v	3.76E-02	m/d
Retardation factor	Rf	5.87E+00	fraction
Decay rate used	λ	1.31E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	6.40E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.67E+00	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.82E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	1.67E+00	mg/l Ogata Banks
after		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.18E-02	fraction
Organic carbon partition coefficient	Koc	4.88E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.73E-01	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

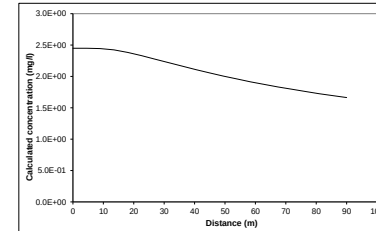
		Enter value	Calc value Xu & Eckstein	m
Longitudinal dispersivity	ax	0.00E+00	9.00E+00	4.18E+00
Transverse dispersivity	az	0.00E+00	9.00E-01	4.18E-01
Vertical dispersivity	ay	0.00E+00	9.00E-02	4.18E-02

Note values of dispersivity must be > 0

For calculated value, assumes $\alpha_x = 0.1 \times x$, $\alpha_y = 0.01 \times y$, $\alpha_z = 0.001 \times z$

Xu & Eckstein (1995) report $\alpha_x = 0.83(\log_{10}x)^{2.41x}$, $\alpha_y = a \times 10$, $\alpha_z = a \times 100$ are assumed

Note values of dispersivity must be > 0
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀)^{2.414}, az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	11/11/11
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E+00
4.5	2.45E+00
9.0	2.45E+00
13.5	2.42E+00
18.0	2.39E+00
22.5	2.34E+00
27.0	2.28E+00
31.5	2.22E+00
36.0	2.17E+00
40.5	2.11E+00
45.0	2.06E+00
49.5	2.01E+00
54.0	1.96E+00
58.5	1.92E+00
63.0	1.87E+00
67.5	1.83E+00
72.0	1.80E+00
76.5	1.76E+00
81.0	1.73E+00
85.5	1.70E+00
90.0	1.67E+00

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	C _{tr}	Cadmium	mg/l	from Level 1
Target Concentration		8.00E-05		from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.00E-03	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	1.60E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	2.56E+03	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	3.76E-02	m/d	
Retardation factor	Rf	2.18E+04	fraction	
Decay rate used	λ	3.54E-105	d ⁻¹	
Rate of contaminant flow due to retardation	u	1.73E-06	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.36E-03	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.18E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	1.36E-03	mg/l
		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

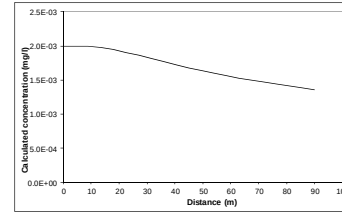
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	2.56E+03	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.56E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	az	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed					



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used.

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	2.0E-03
4.5	2.00E-03
9.0	2.00E-03
13.5	1.98E-03
18.0	1.95E-03
22.5	1.91E-03
27.0	1.86E-03
31.5	1.81E-03
36.0	1.77E-03
40.5	1.72E-03
45.0	1.68E-03
49.5	1.64E-03
54.0	1.60E-03
58.5	1.56E-03
63.0	1.53E-03
67.5	1.50E-03
72.0	1.47E-03
76.5	1.44E-03
81.0	1.41E-03
85.5	1.38E-03
90.0	1.36E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	Lead	from Level 1
Target Concentration	C _T 1.20E-03	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	5.10E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	1.60E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	3.60E+04	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	ay	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	3.76E-02	m/d	
Retardation factor	Rf	3.06E+05	fraction	
Decay rate used	λ	2.52E-106	d ⁻¹	
Rate of contaminant flow due to retardation	u	1.23E-07	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	3.47E-02	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00		

Remedial Targets

Remedial Target	1.77E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	3.47E-02	mg/l
		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

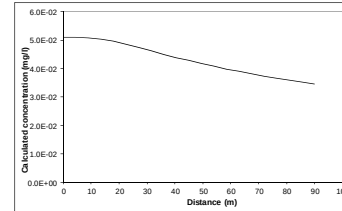
Entry if specify partition coefficient (option)	Kd	3.60E+04	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,ion}		l/kg
Sorption coefficient for related species	K _{oc,ion}		l/kg
Sorption coefficient for ionised species	K _{oc,ion}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	3.60E+04	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	ay	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m

Note values of dispersivity must be > 0
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀x)^{2.414}, az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99. This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	5.10E-02
4.5	5.10E-02
9.0	5.09E-02
13.5	5.08E-02
18.0	4.97E-02
22.5	4.86E-02
27.0	4.74E-02
31.5	4.63E-02
36.0	4.51E-02
40.5	4.39E-02
45.0	4.28E-02
49.5	4.18E-02
54.0	4.08E-02
58.5	3.99E-02
63.0	3.90E-02
67.5	3.82E-02
72.0	3.74E-02
76.5	3.67E-02
81.0	3.60E-02
85.5	3.53E-02
90.0	3.47E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Mercury		from Level 1
Target Concentration	7.00E-05	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Variable	Value	Unit	Source
Initial contaminant concentration in groundwater at plume core	1.00E-02	mg/l	
Half life for degradation of contaminant in water	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	1.70E+00	g/cm ³	Fill material, literature vau
Effective porosity of aquifer	2.00E-01	fraction	From URS QRA
Hydraulic gradient	1.60E-02	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	4.70E-01	m/d	From URS QRA
Distance to compliance point	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	0.00E+00	m	Steady state
Time since pollutant entered groundwater	1.00E+100	days	time variant options only
Parameters values determined from options			
Partition coefficient	7.50E+03	l/kg	see options
Longitudinal dispersivity	9.00E+00	m	see options
Transverse dispersivity	9.00E-01	m	see options
Vertical dispersivity	9.00E-02	m	see options
Dispersed plume thickness exceeds aquifer thickness! Reduce vertical dispersivity			
Calculated Parameters			
Groundwater flow velocity	3.76E-02	m/d	
Retardation factor	6.39E+04	fraction	
Decay rate used	1.21E-105	d ⁻¹	
Rate of contaminant flow due to retardation	5.90E-07	m/d	
Contaminant concentration at distance x, assuming one-way vertical dispersion	6.80E-03	mg/l	
Attenuation factor (one way vertical dispersion, CO/CED)	1.47E+00		

Remedial Targets

Remedial Target	1.03E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	6.80E-03	mg/l	Ogata Banks
after	1.0E+100	days	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

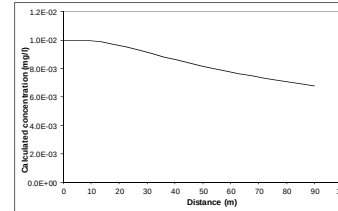
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	7.50E+03	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	7.50E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Variable	Value	Unit	Source
Longitudinal dispersivity	ax	9.00E+00	m
Transverse dispersivity	ay	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	m
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} ; az = ax/10, ay = ax/100 are assumed			



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included; the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed: Dow Corning

Completed by: Kevin Shepherd

Date: 20/01/2018

Version: 1

Calculated concentrations for distance-concentration graph

Distance	Concentration
----------	---------------

Distance	Concentration
0	1.0E-02
4.5	1.00E-02
9.0	9.98E-03
13.5	9.90E-03
18.0	9.74E-03
22.5	9.53E-03
27.0	9.30E-03
31.5	9.07E-03
36.0	8.84E-03
40.5	8.62E-03
45.0	8.40E-03
49.5	8.20E-03
54.0	8.01E-03
58.5	7.82E-03
63.0	7.65E-03
67.5	7.49E-03
72.0	7.33E-03
76.5	7.19E-03
81.0	7.05E-03
85.5	6.92E-03
90.0	6.80E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.2



Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Copper		from Level 1
Target Concentration	C _T 1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	6.60E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{0.2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-03	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadroxton Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	5.40E+02	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Variable	
----------	--

Groundwater flow velocity	v	1.88E-02	m/d
Retardation factor	Rf	4.59E+03	fraction
Decay rate used	λ	1.68E-104	d ⁻¹
Rate of contaminant flow due to retardation	u	4.09E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	4.49E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.47E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀ 4.49E-02	mg/l	Ogata Banks
	1.0E+100	days	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

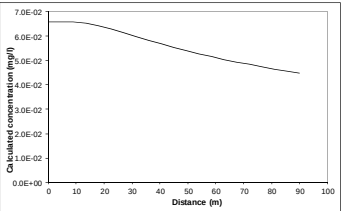
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	5.40E+02	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.40E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	m
Transverse dispersivity	az	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	m
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed			



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

Calculated concentrations for distance-concentration graph

Distance	Concentration
----------	---------------

0	6.60E-02
4.5	6.60E-02
9.0	6.59E-02
13.5	6.53E-02
18.0	6.43E-02
22.5	6.29E-02
27.0	6.14E-02
31.5	5.99E-02
36.0	5.83E-02
40.5	5.69E-02
45.0	5.54E-02
49.5	5.41E-02
54.0	5.28E-02
58.5	5.16E-02
63.0	5.05E-02
67.5	4.94E-02
72.0	4.84E-02
76.5	4.74E-02
81.0	4.65E-02
85.5	4.57E-02
90.0	4.49E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant		Value	Unit	Source
Target Concentration	C _T	Trimethylsilanol 1.24E-01	mg/l	from Level 1 from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks Equations in HRA publication

Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.45E+00	mg/l	Source of parameter value Max. detected in Sands, 20015-17
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	No degradation
Calculated decay rate	λ	7.70E-101	days ⁻¹	Width of landfill // to GW flow
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Based on 2016 CSM
Plume thickness at source	Sy	4.00E+00	m	Same as plume thickness
Saturated aquifer thickness	da	4.00E+00	m	Fill material, literature valu
Bulk density of aquifer materials	ρ	1.70E+00	g/cm ³	From URS QRA
Effective porosity of aquifer	n	2.00E-01	fraction	Based on 2015-2017 data
Hydraulic gradient	i	8.00E-03	fraction	From URS QRA
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	Landfill to Cadooton Ponds
Distance to compliance point	x	9.00E+01	m	Assume receptor in line with source
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Steady state
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	time variant options only
Time since pollutant entered groundwater	t	1.00E+100	days	
Parameters values determined from options				
Partition coefficient	Kd	5.73E-01	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Dispersed plume thickness exceeds aquifer thickness! Reduce vertical dispersivity

Calculated Parameters Variable

Groundwater flow velocity	v	1.88E-02	m/d
Retardation factor	Rf	5.87E+00	fraction
Decay rate used	λ	1.31E-101	d ⁻¹
Rate of contaminant flow due to retardation	u	3.20E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.67E+00	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.82E-01	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	1.67E+00	mg/l Ogata Banks
after		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)	Kd		l/kg
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)	foc	1.18E-02	fraction
Fraction of organic carbon in aquifer	foc	4.88E+01	l/kg
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,i}		l/kg
Sorption coefficient for related species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	5.73E-01	l/kg

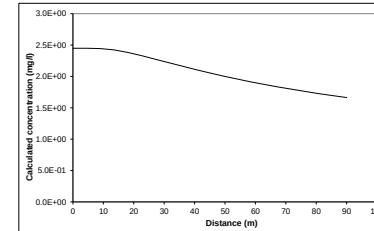
Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	Enter value 0.00E+00	Calc value Xu & Eckstein 9.00E+00	4.18E+00	m
Transverse dispersivity	az	0.00E+00	9.00E-01	4.18E-01	m
Vertical dispersivity	ay	0.00E+00	9.00E-02	4.18E-02	m

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x
Xu & Eckstein (1995) report ax = 0.83(log₁₀)^{2.414}, az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	00000000
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E+00
4.5	2.45E+00
9.0	2.45E+00
13.5	2.42E+00
18.0	2.39E+00
22.5	2.34E+00
27.0	2.28E+00
31.5	2.22E+00
36.0	2.17E+00
40.5	2.11E+00
45.0	2.06E+00
49.5	2.01E+00
54.0	1.96E+00
58.5	1.92E+00
63.0	1.87E+00
67.5	1.83E+00
72.0	1.80E+00
76.5	1.76E+00
81.0	1.73E+00
85.5	1.70E+00
90.0	1.67E+00

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Contaminant	C _{tr}	Cadmium	from Level 1
Target Concentration		8.00E-05	mg/l from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	2.00E-03	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature value
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-03	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadston Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	2.56E+03	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	ay	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Groundwater flow velocity	v	1.88E-02	m/d
Retardation factor	Rf	2.18E+04	fraction
Decay rate used	λ	3.54E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	8.64E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	1.36E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.18E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	1.36E-03	mg/l
		1.0E+100	days
			Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

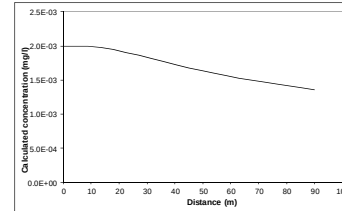
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	2.56E+03	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.56E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	ay	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed					



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used.

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks	
From calculation sheet	
Distance	Concentration
	mg/l
0	2.0E-03
4.5	2.00E-03
9.0	2.00E-03
13.5	1.98E-03
18.0	1.95E-03
22.5	1.91E-03
27.0	1.86E-03
31.5	1.81E-03
36.0	1.77E-03
40.5	1.72E-03
45.0	1.68E-03
49.5	1.64E-03
54.0	1.60E-03
58.5	1.56E-03
63.0	1.53E-03
67.5	1.50E-03
72.0	1.47E-03
76.5	1.44E-03
81.0	1.41E-03
85.5	1.38E-03
90.0	1.36E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.2



Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Lead		from Level 1
Target Concentration	1.20E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	5.10E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{1/2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature vau
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-03	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadroxton Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	3.60E+04	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Variable	
----------	--

Groundwater flow velocity	v	1.88E-02	m/d
Retardation factor	Rf	3.08E+05	fraction
Decay rate used	λ	2.52E-106	d ⁻¹
Rate of contaminant flow due to retardation	u	6.14E-08	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	3.47E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.77E-03	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point after	C _{ED} /C ₀	3.47E-02	mg/l
		1.0E+100	days

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

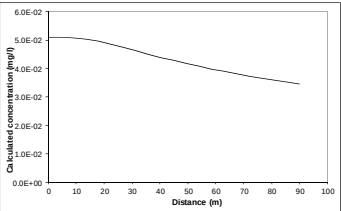
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	3.60E+04	l/kg
Soil water partition coefficient			
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer			
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	3.60E+04	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	m
Transverse dispersivity	az	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	m
Note values of dispersivity must be > 0			
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x			
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed			



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

Calculated concentrations for distance-concentration graph

Distance	Concentration
----------	---------------

0	5.10E-02
4.5	5.10E-02
9.0	5.09E-02
13.5	5.08E-02
18.0	4.97E-02
22.5	4.86E-02
27.0	4.74E-02
31.5	4.63E-02
36.0	4.51E-02
40.5	4.39E-02
45.0	4.28E-02
49.5	4.18E-02
54.0	4.08E-02
58.5	3.99E-02
63.0	3.90E-02
67.5	3.82E-02
72.0	3.74E-02
76.5	3.67E-02
81.0	3.60E-02
85.5	3.53E-02
90.0	3.47E-02

R&D Publication 20 Remedial Targets Worksheet, Release 3.2



Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

Variable	Value	Unit	Source
Contaminant	Mercury		from Level 1
Target Concentration	7.00E-05	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks	Equations in HRA publication
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Approach for simulating vertical dispersion:

Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants:

Apply degradation rate to dissolved pollutants only

Initial contaminant concentration in groundwater at plume core	C ₀	1.00E-02	mg/l	Source of parameter value
Half life for degradation of contaminant in water	t _{0.2}	9.00E+99	days	Max. detected in Sands, 20015-17
Calculated decay rate	λ	7.70E-101	days ⁻¹	No degradation
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.90E+02	m	Width of landfill // to GW flow
Plume thickness at source	Sy	4.00E+00	m	Based on 2016 CSM
Saturated aquifer thickness	da	4.00E+00	m	Same as plume thickness
Bulk density of aquifer materials	r	1.70E+00	g/cm ³	Fill material, literature vau
Effective porosity of aquifer	n	2.00E-01	fraction	From URS QRA
Hydraulic gradient	i	8.00E-03	fraction	Based on 2015-2017 data
Hydraulic conductivity of aquifer	K	4.70E-01	m/d	From URS QRA
Distance to compliance point	x	9.00E+01	m	Landfill to Cadroxton Ponds
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	Assume receptor in line with source
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	Steady state
Time since pollutant entered groundwater	t	1.00E+100	days	time variant options only
Parameters values determined from options				
Partition coefficient	Kd	7.50E+03	l/kg	see options
Longitudinal dispersivity	ax	9.00E+00	m	see options
Transverse dispersivity	az	9.00E-01	m	see options
Vertical dispersivity	ay	9.00E-02	m	see options

Calculated Parameters

Variable	
----------	--

Groundwater flow velocity	v	1.88E-02	m/d
Retardation factor	Rf	6.38E+04	fraction
Decay rate used	λ	1.21E-105	d ⁻¹
Rate of contaminant flow due to retardation	u	2.95E-07	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C _{ED}	6.80E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	AF	1.47E+00	

Remedial Targets

Remedial Target	1.03E-04	mg/l	For comparison with measured groundwater concentration.
Ogata Banks			
Distance to compliance point	90	m	
Concentration of contaminant at compliance point	C _{ED} /C ₀	6.80E-03	mg/l
after		1.0E+100	days
			Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target. The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

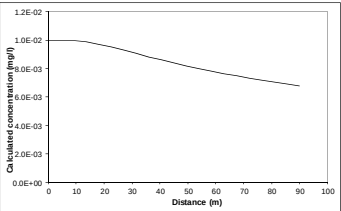
User specified value for partition coefficient

Entry if specify partition coefficient (option)	Kd	7.50E+03	l/kg
Soil water partition coefficient	Kd		
Entry for non-polar organic chemicals (option)	foc		fraction
Fraction of organic carbon in aquifer	foc		
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)	K _{oc,n}		l/kg
Sorption coefficient for related species	K _{oc,n}		l/kg
Sorption coefficient for ionised species	K _{oc,i}		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	7.50E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

Longitudinal dispersivity	ax	9.00E+00	9.00E+00	9.00E+00	m
Transverse dispersivity	az	9.00E-01	9.00E-01	9.00E-01	m
Vertical dispersivity	ay	9.00E-02	9.00E-02	9.00E-02	m
Note values of dispersivity must be > 0					
For calculated value, assumes ax = 0.1 * x, az = 0.01 * x, ay = 0.001 * x					
Xu & Eckstein (1995) report ax = 0.83(log ₁₀ x) ^{2.414} , az = ax/10, ay = ax/100 are assumed					



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source. Three solution methods are included, the preferred option is Ogata Banks. By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action. Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

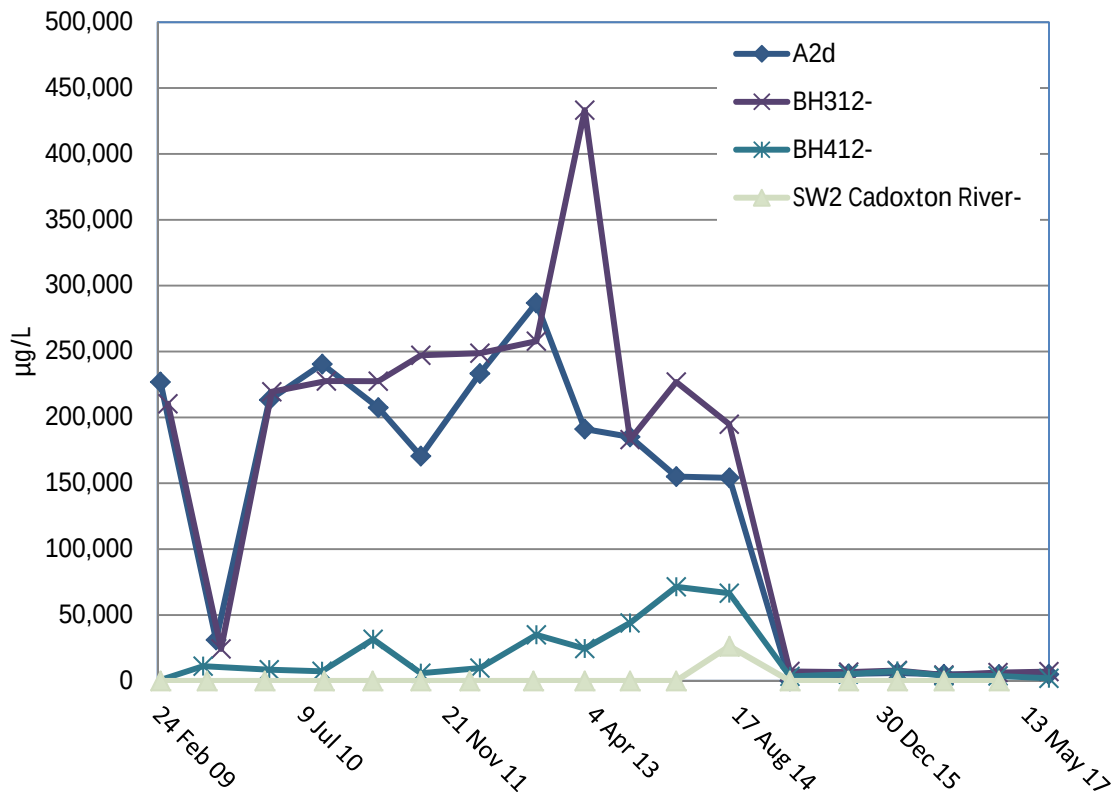
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O₂, NO₃, SO₄ etc than an alternative solution should be used

Site being assessed:	Dow Corning
Completed by:	Kevin Shepherd
Date:	20/01/2018
Version:	1

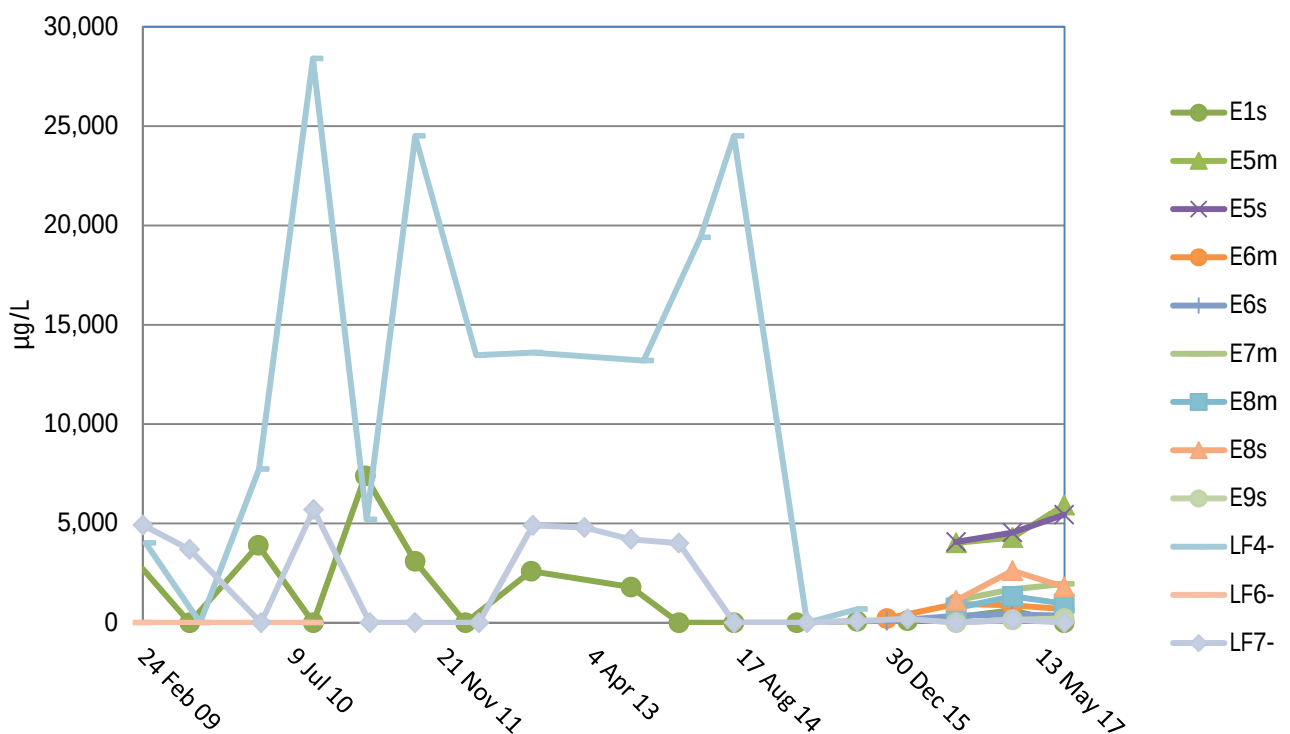
Calculated concentrations for distance-concentration graph

Distance	Concentration
	mg/l
0	1.0E-02
4.5	1.00E-02
9.0	9.98E-03
13.5	9.90E-03
18.0	9.74E-03
22.5	9.53E-03
27.0	9.30E-03
31.5	9.07E-03
36.0	8.84E-03
40.5	8.62E-03
45.0	8.40E-03
49.5	8.20E-03
54.0	8.01E-03
58.5	7.82E-03
63.0	7.65E-03
67.5	7.49E-03
72.0	7.33E-03
76.5	7.19E-03
81.0	7.05E-03
85.5	6.92E-03
90.0	6.80E-03

Trimethylsilanol - Up-gradient Locations

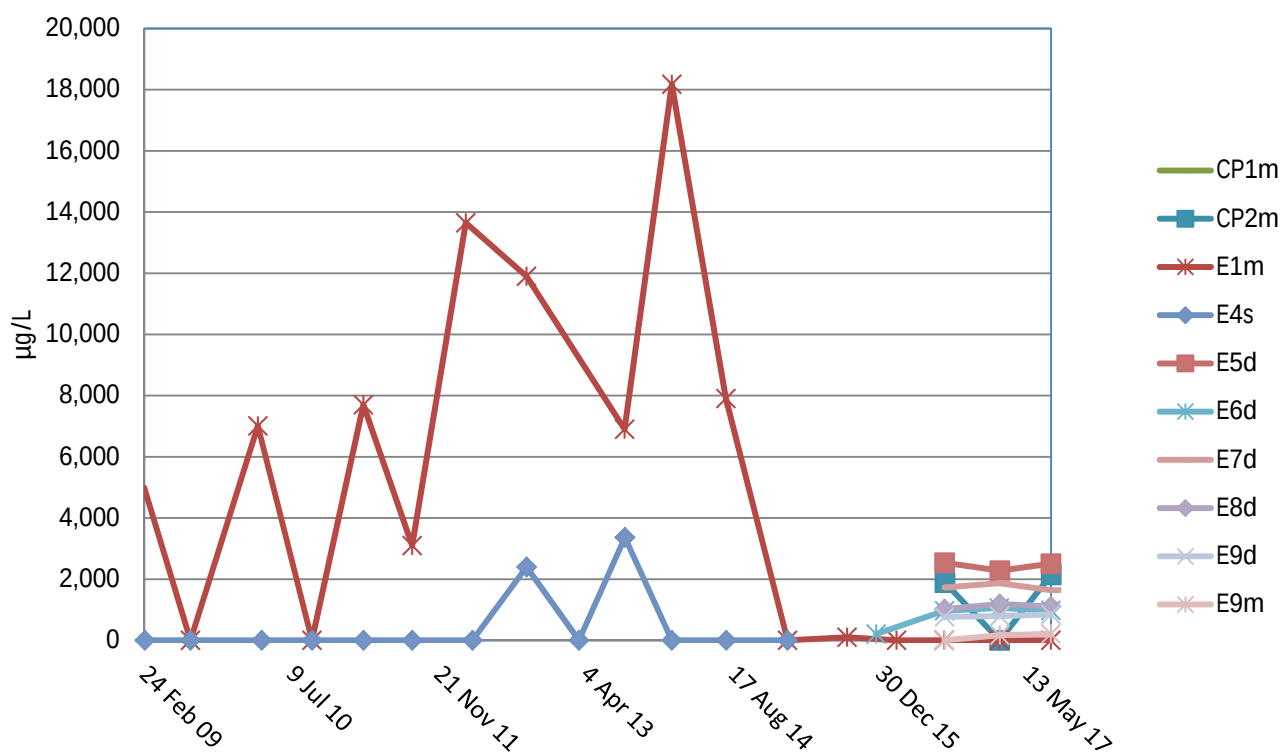


Trimethylsilanol - Peripheral Wells screened in the Made Ground

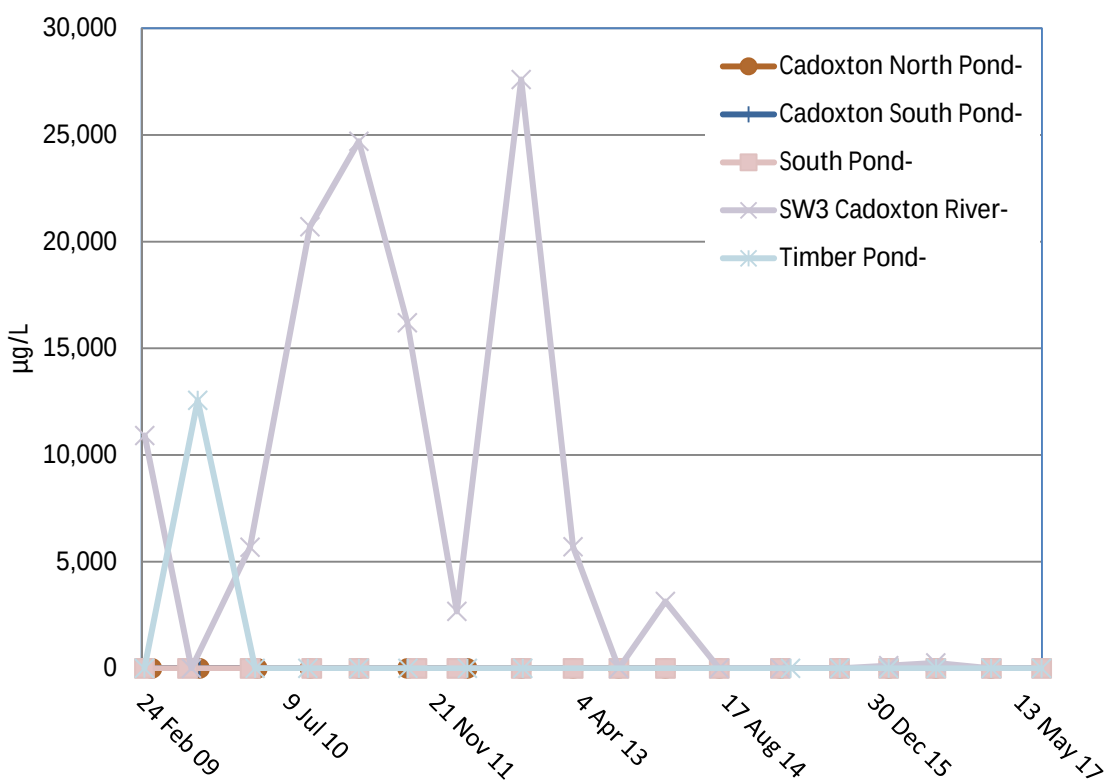


Landfill Assessment, Dow Corning, Barry

Trimethylsilanol - Peripheral / Path Wells Screened in Natural Sands

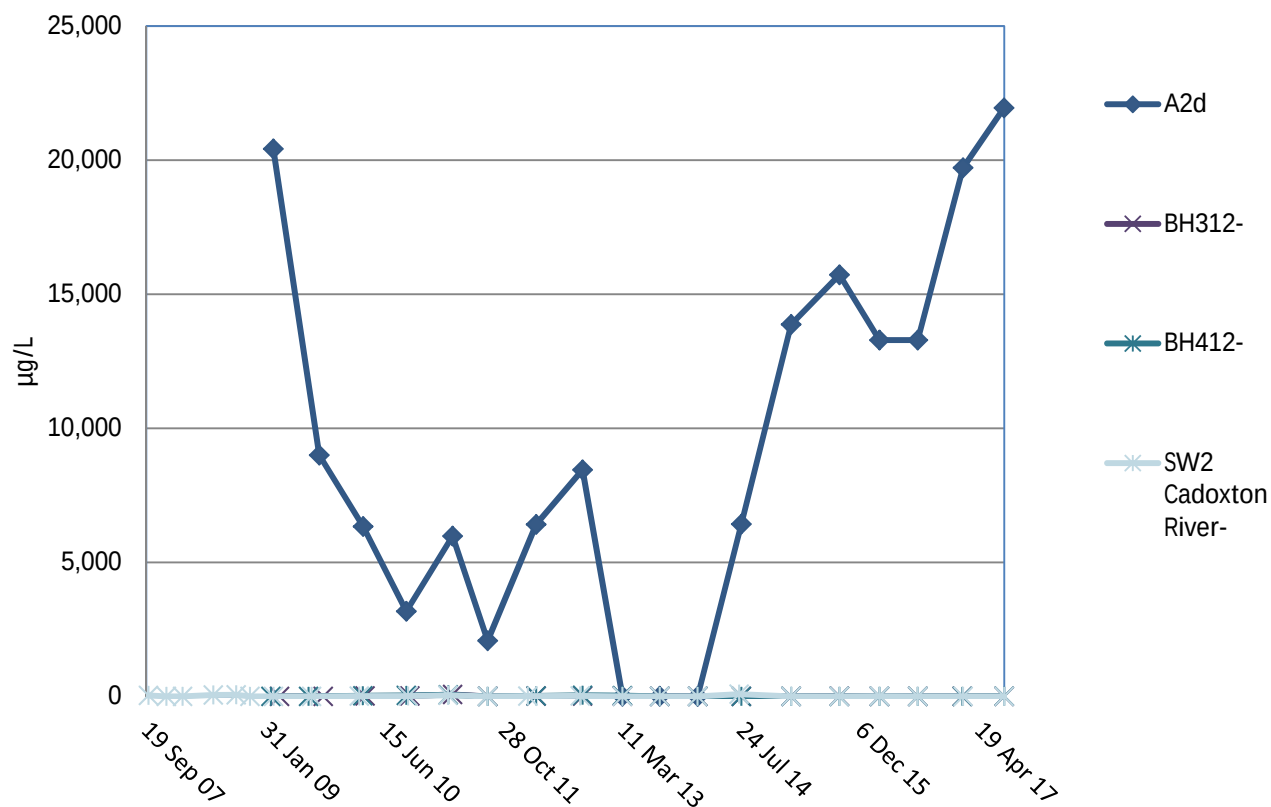


Trimethylsilanol - Potential Surface Water Receptors

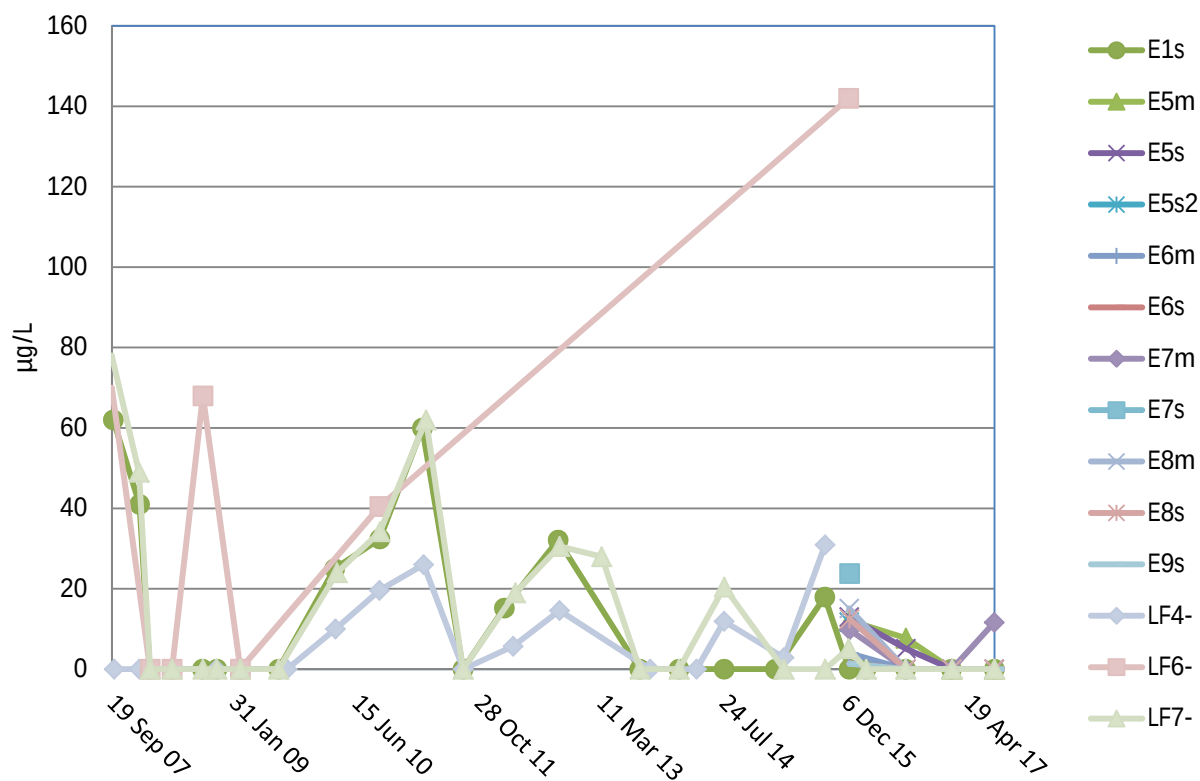


Landfill Assessment, Dow Corning, Barry

Copper - Up-gradient Locations

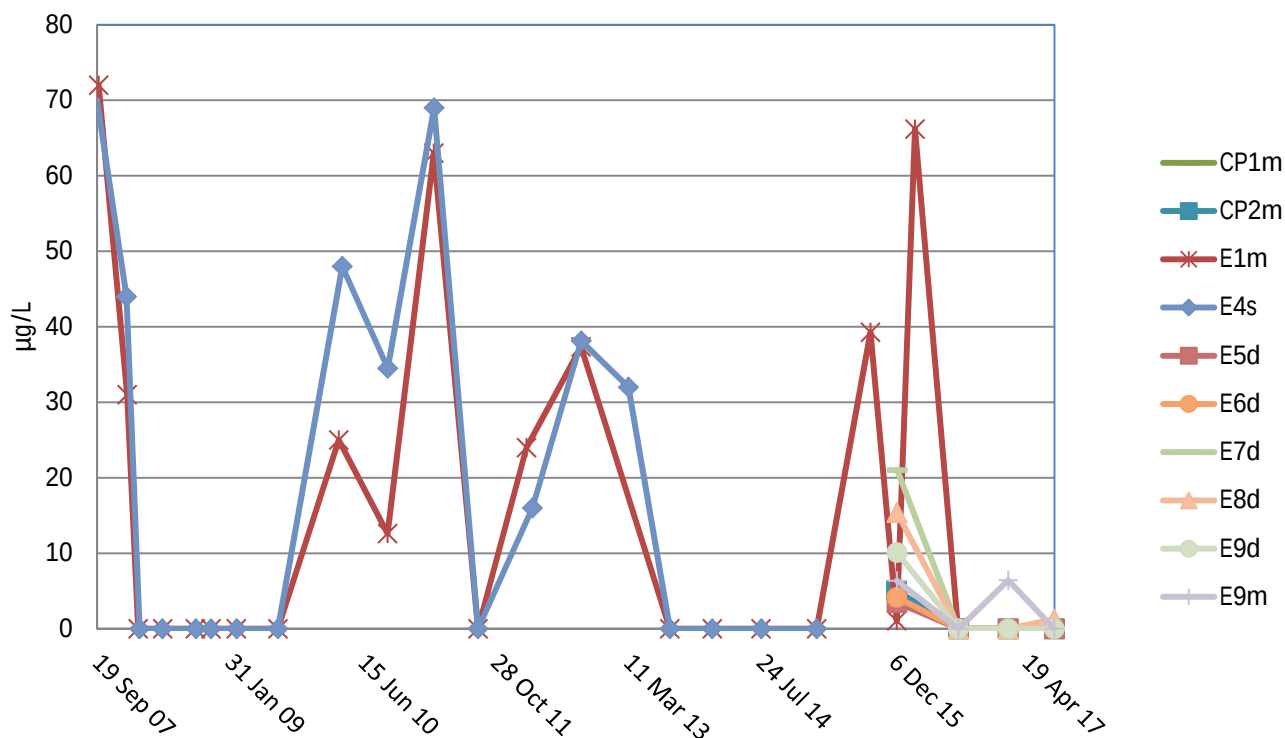


Copper - Peripheral Wells screened in the Made Ground

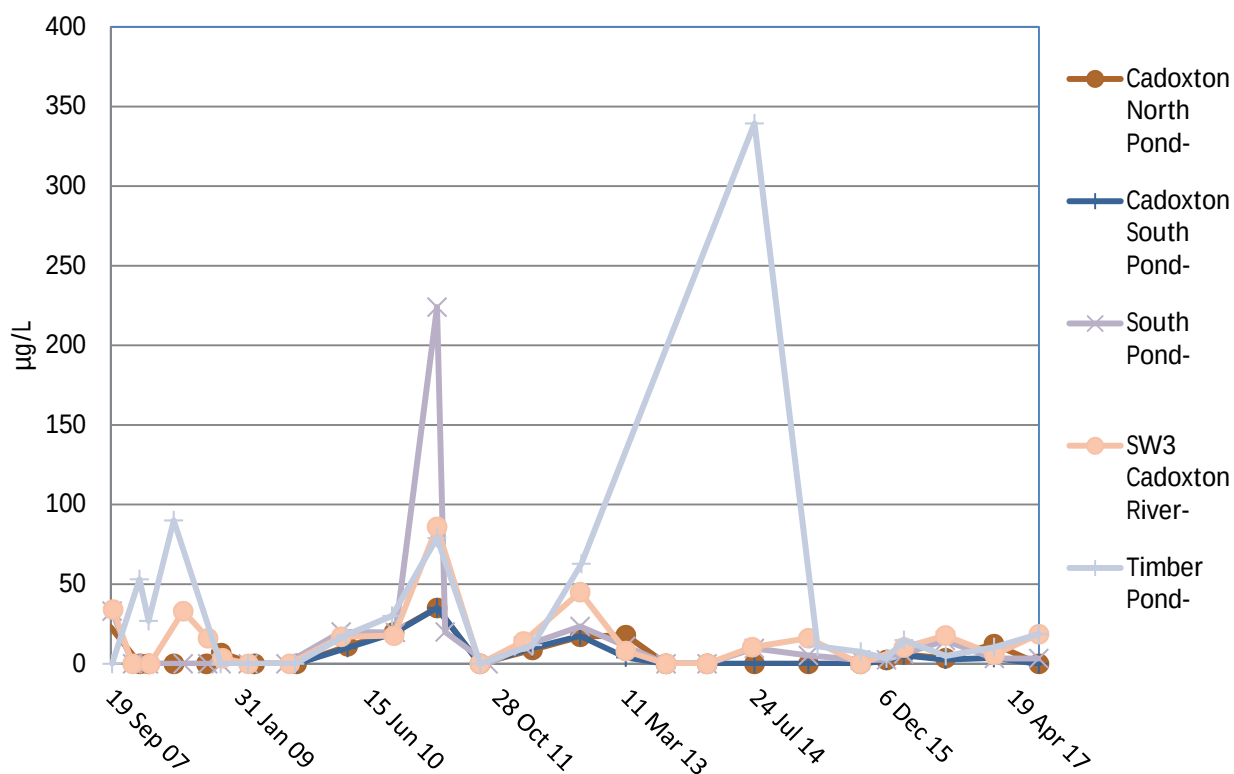


Landfill Assessment, Dow Corning, Barry

Copper - Peripheral / Path Wells Screened in Natural Sands

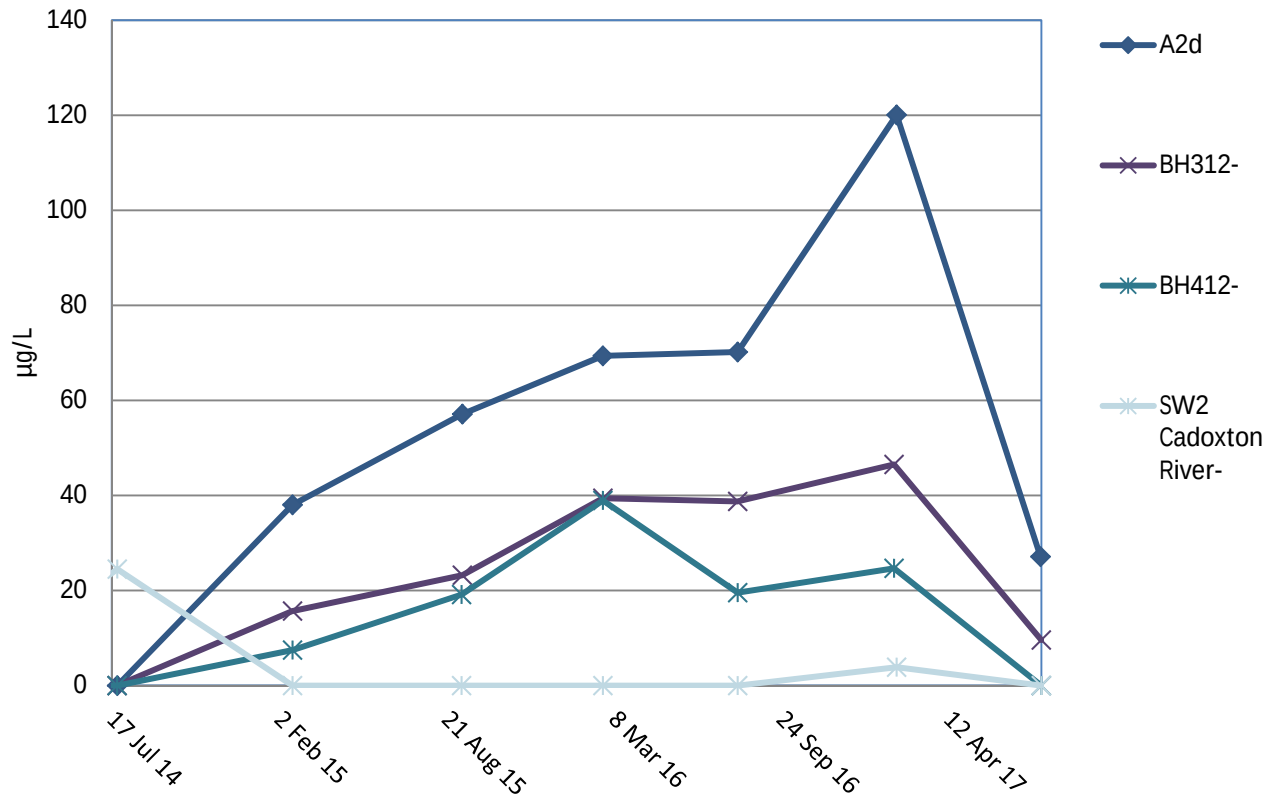


Copper - Potential Surface Water Receptors

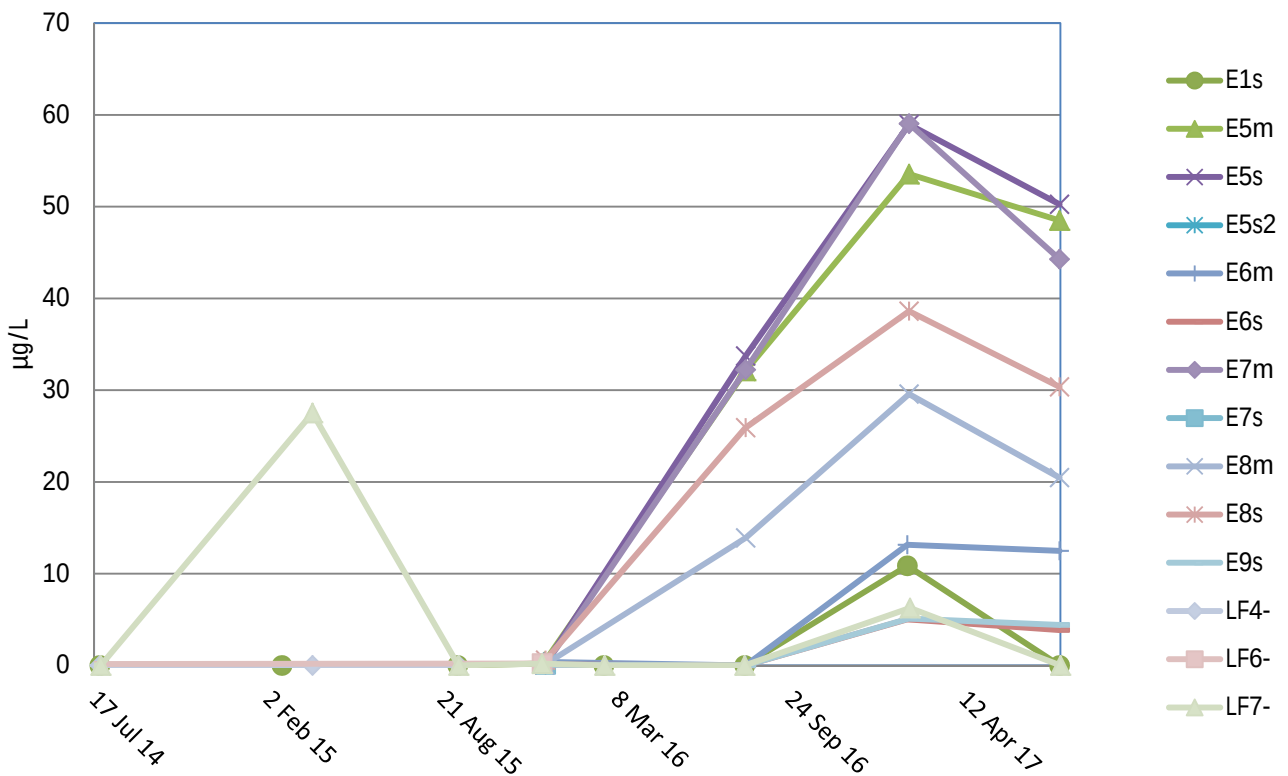


Landfill Assessment, Dow Corning, Barry

Lead - Up-gradient Locations

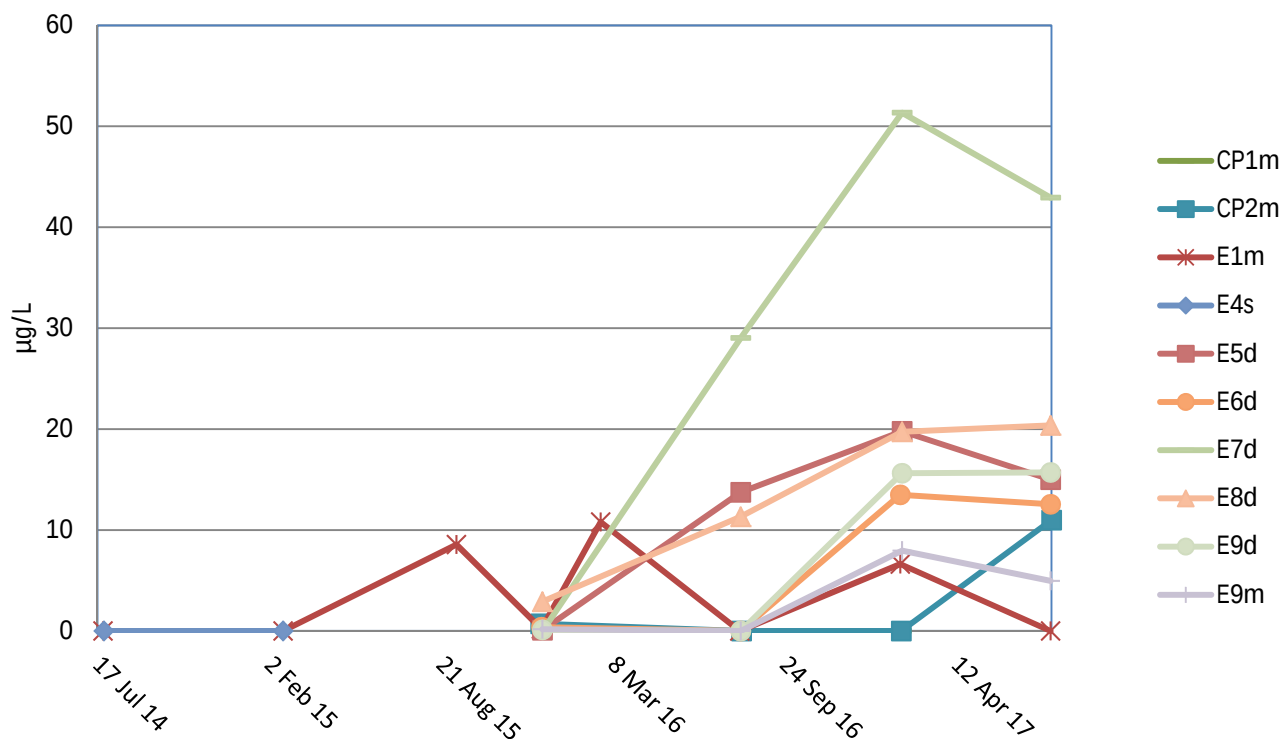


Lead - Peripheral Wells screened in the Made Ground

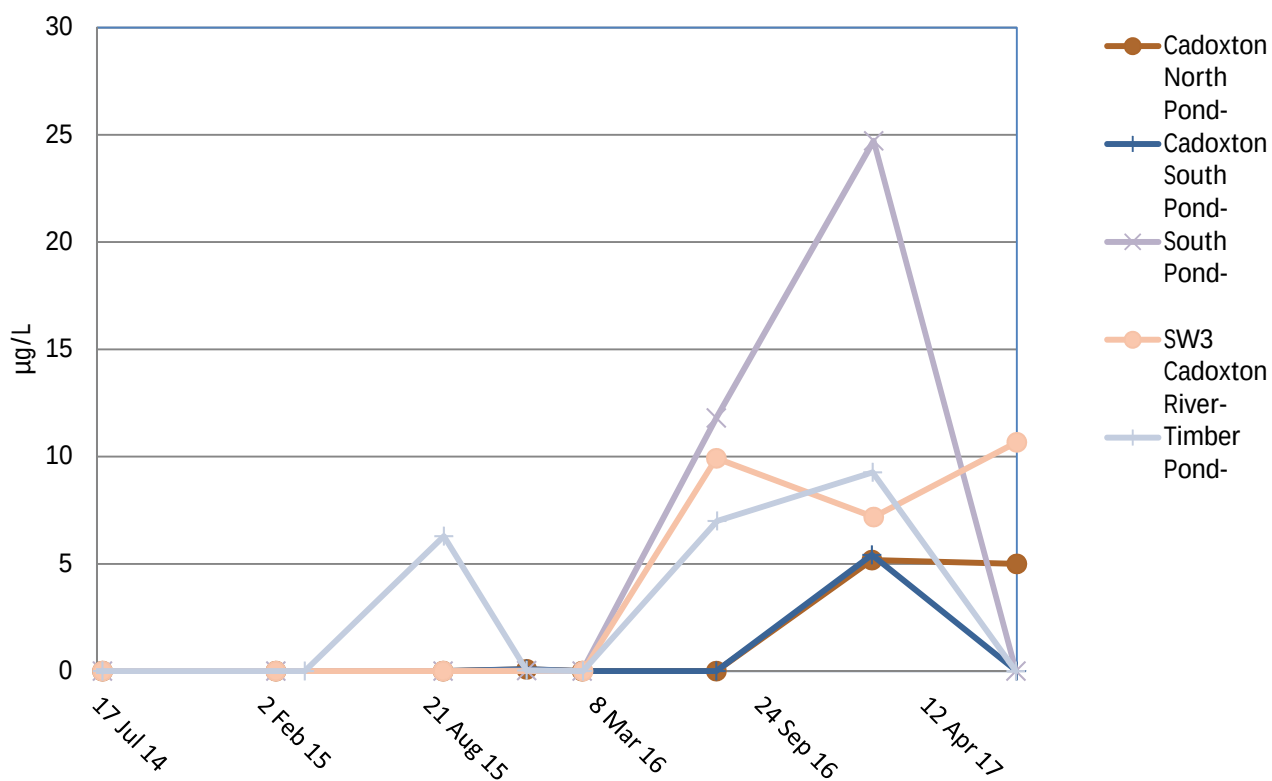


Landfill Assessment, Dow Corning, Barry

Lead - Peripheral / Path Wells Screened in Natural Sands

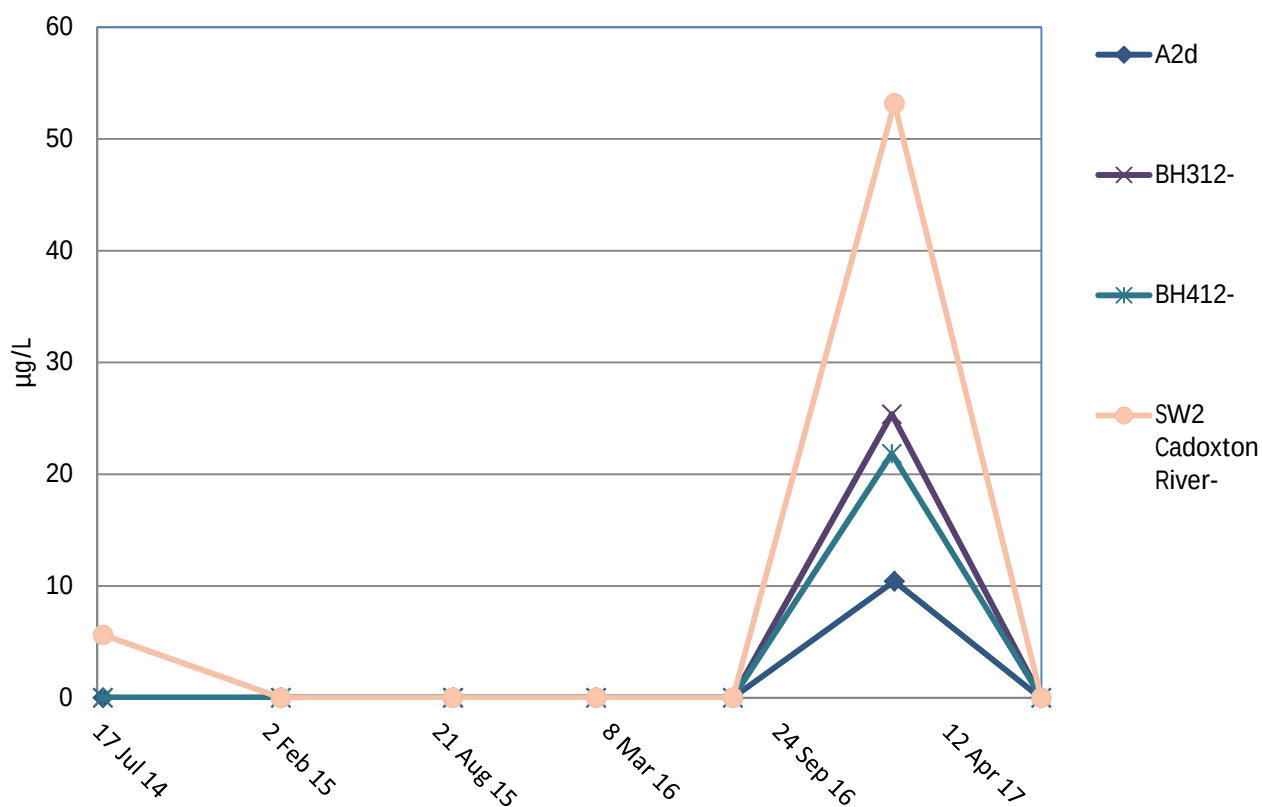


Lead - Potential Surface Water Receptors

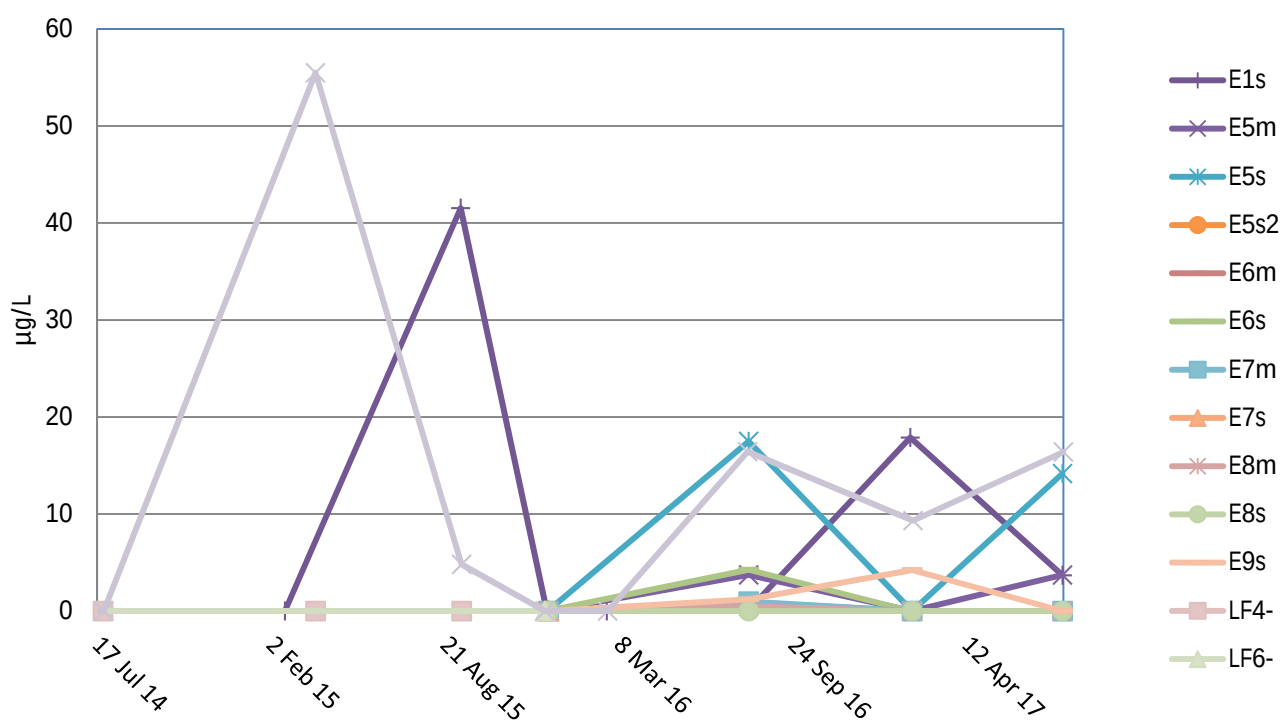


Landfill Assessment, Dow Corning, Barry

Mercury - Up-gradient Locations

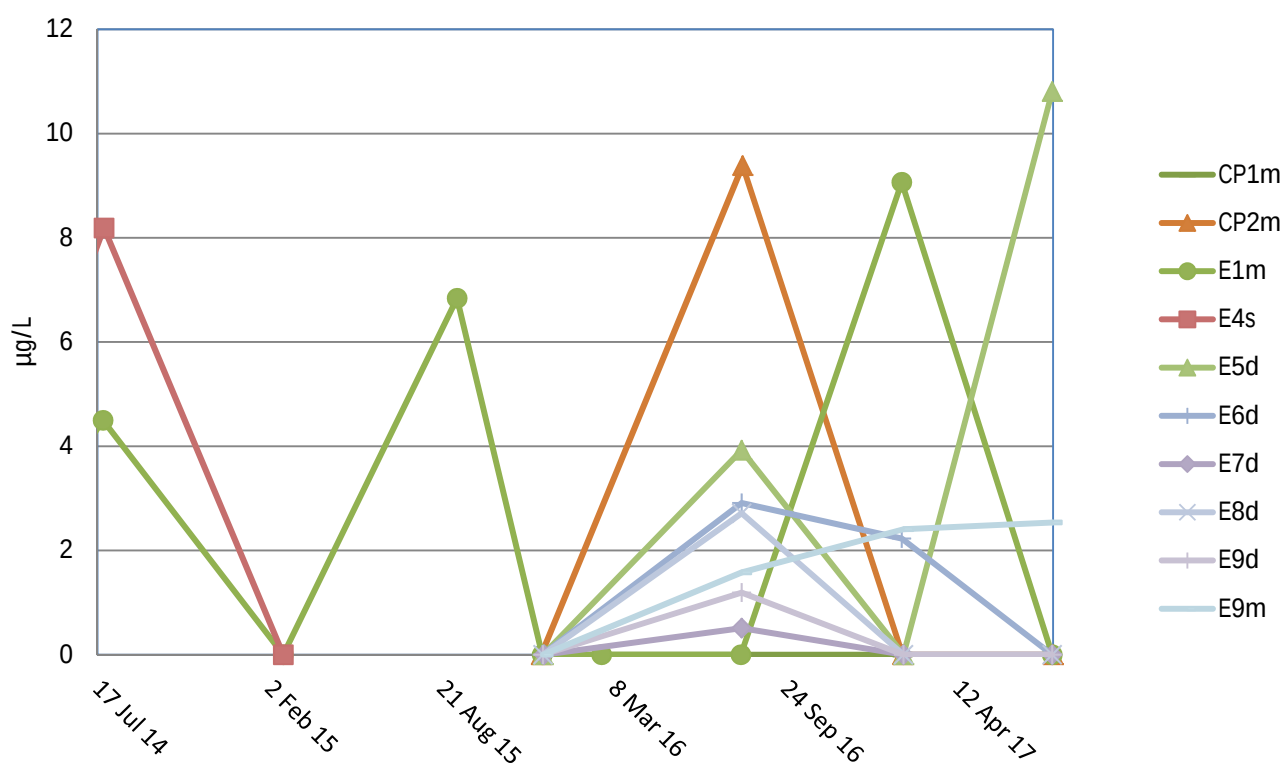


Mercury - Peripheral Wells screened in the Made Ground

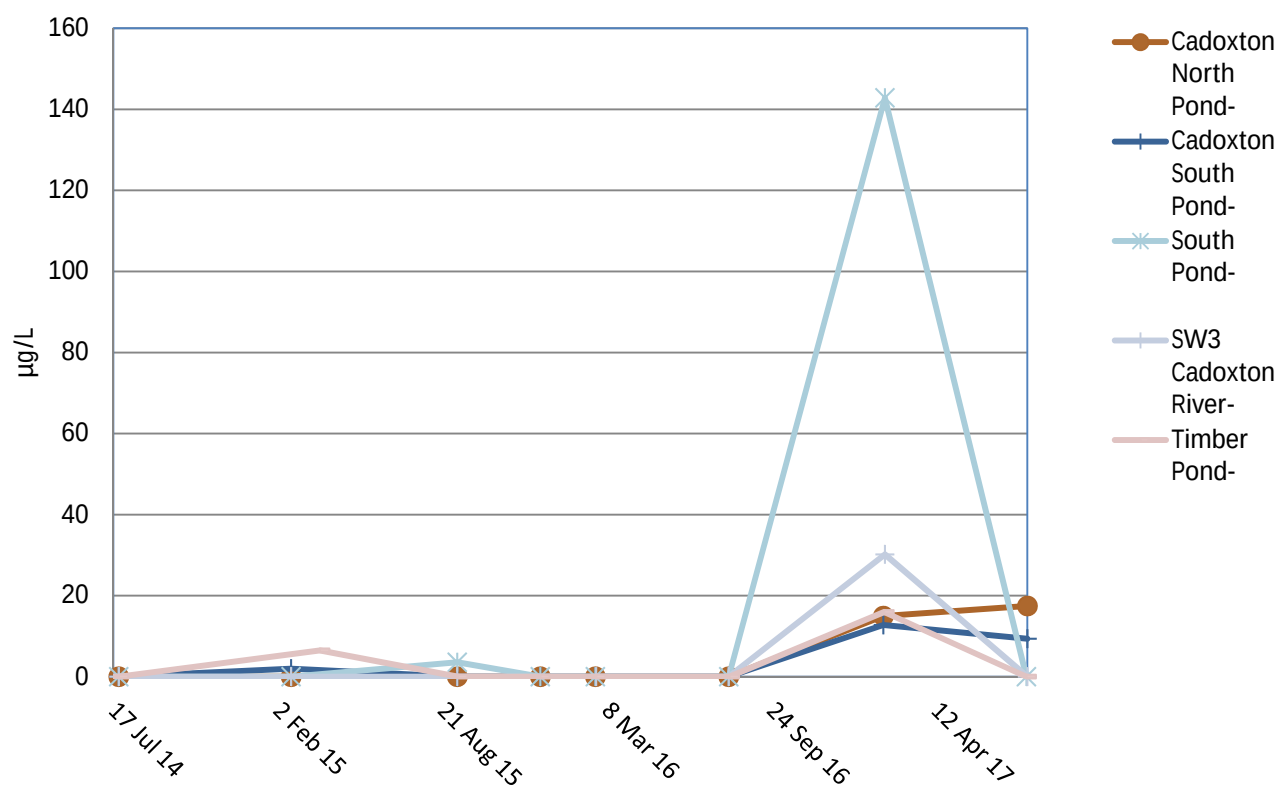


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Mercury - Peripheral / Path Wells Screened in Natural Sands

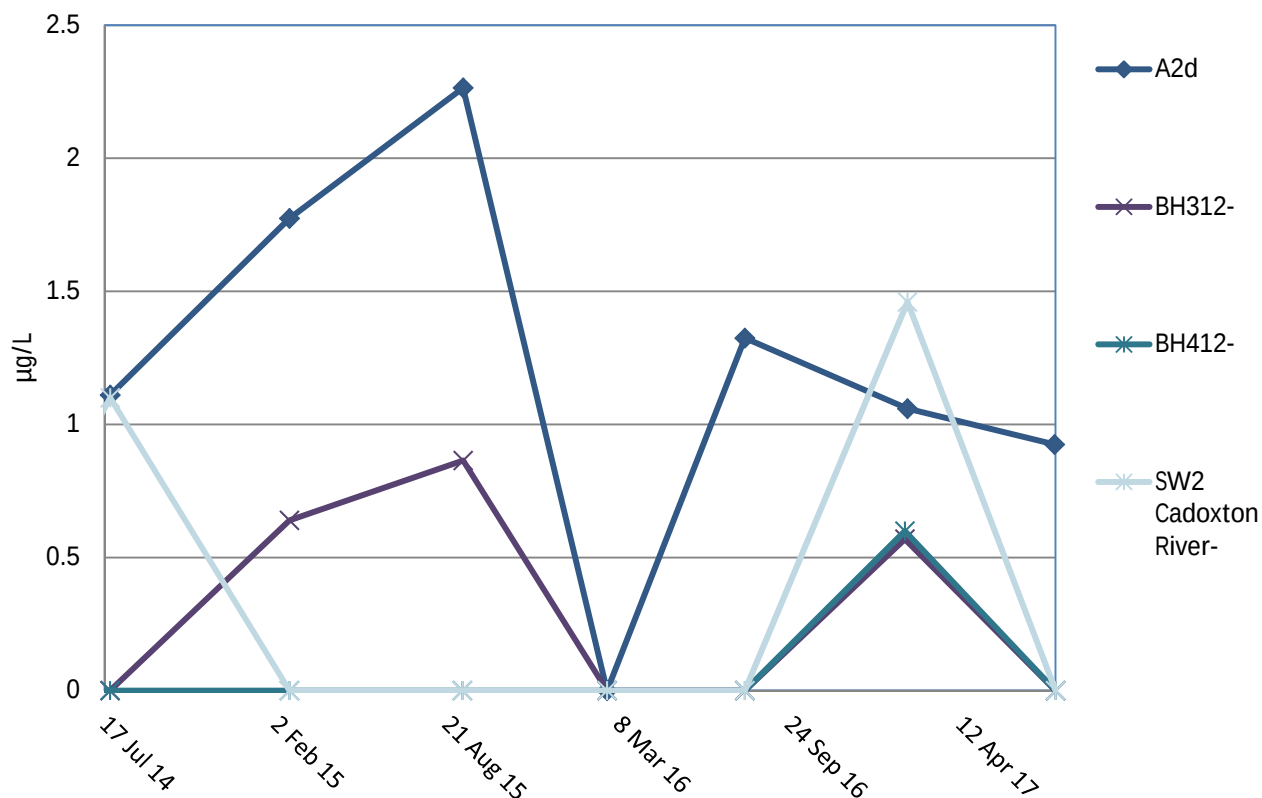


Mercury - Potential Surface Water Receptors

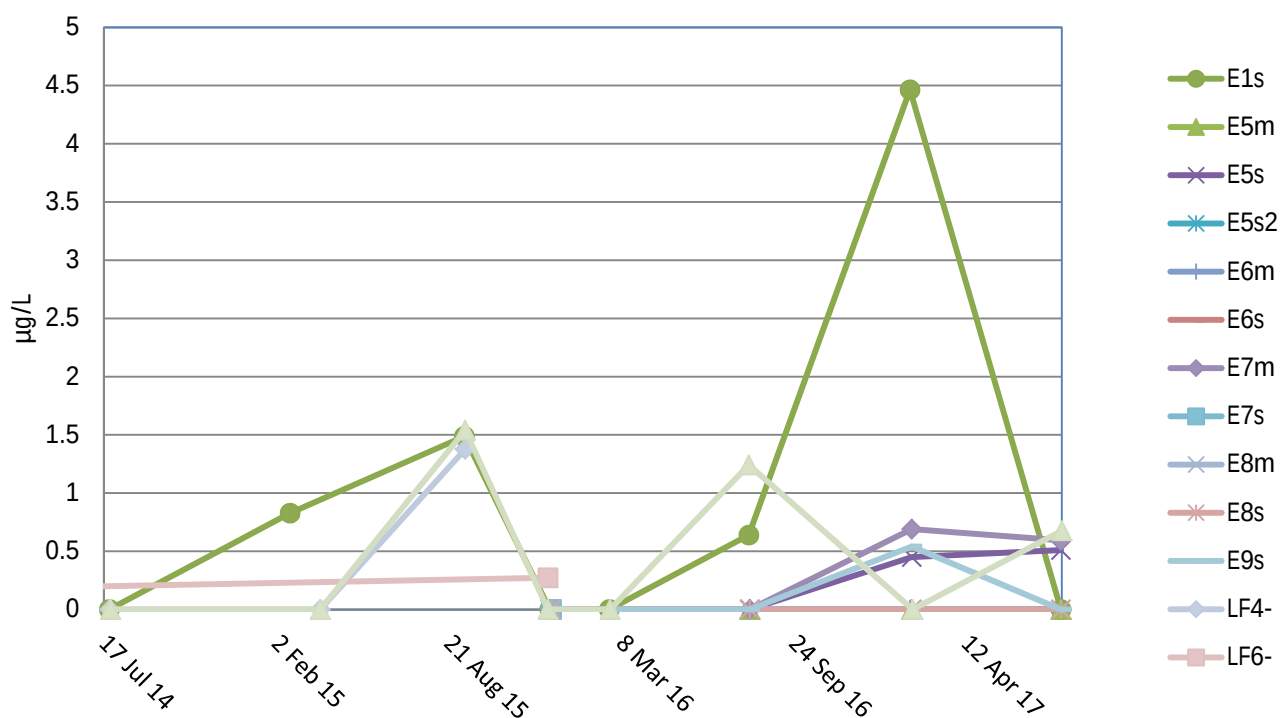


Landfill Assessment, Dow Corning, Barry

Cadmium - Up-gradient Locations

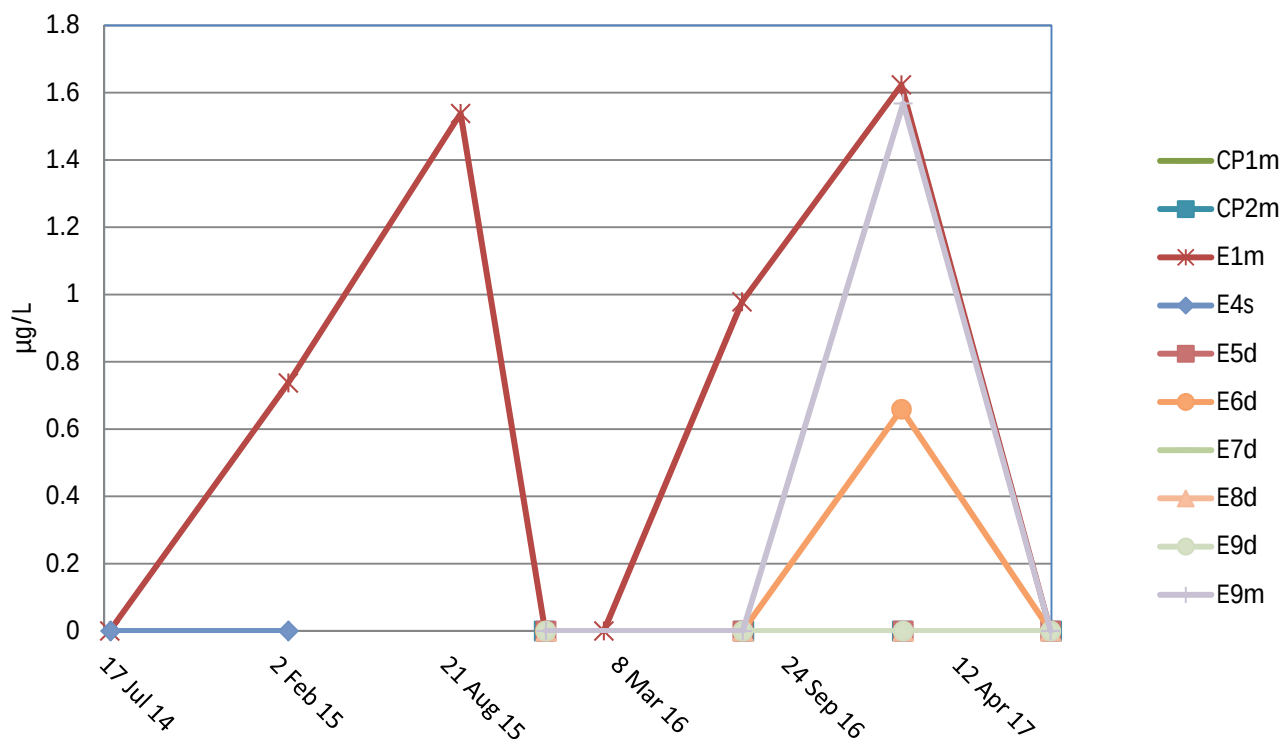


Cadmium - Peripheral Wells screened in the Made Ground

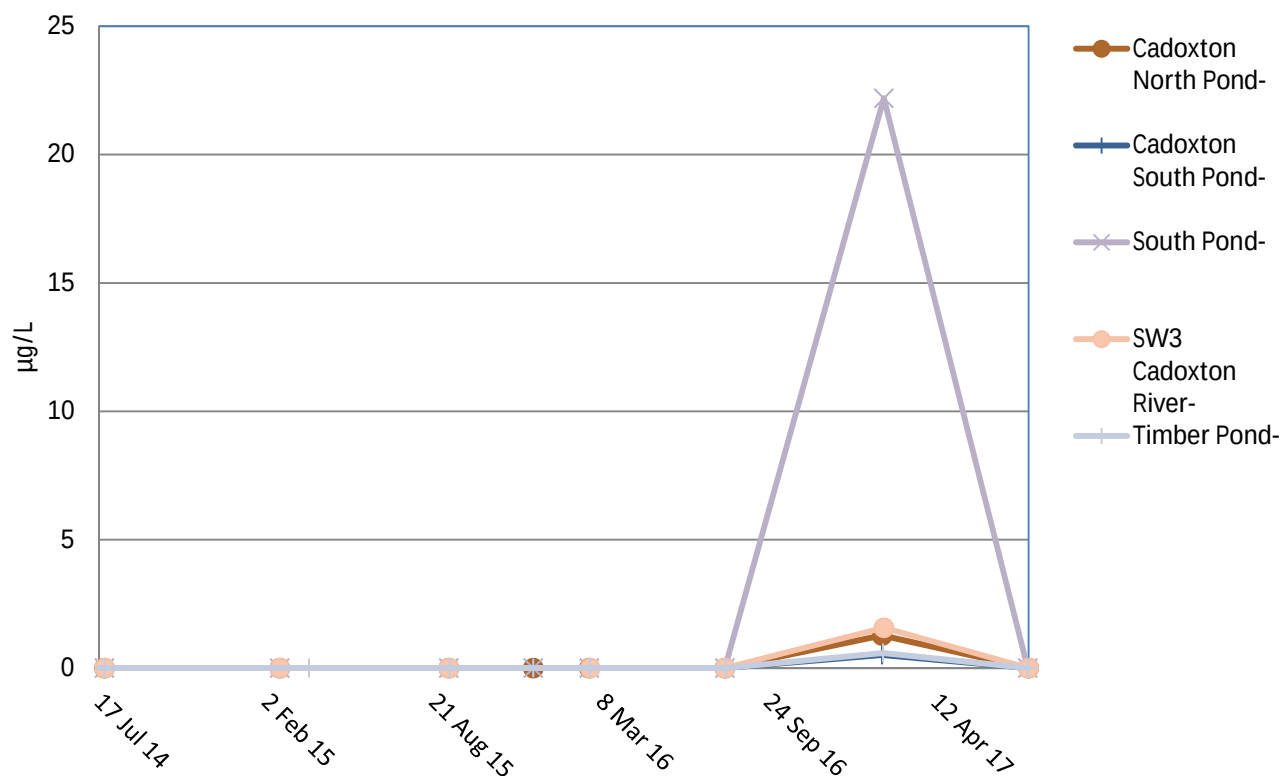


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Cadmium - Peripheral / Path Wells Screened in Natural Sands



Cadmium - Potential Surface Water Receptors



Landfill Assessment, Dow Corning, Barry

Table E1
Waste Leachate Analytical Results
Landfill Assessment
Dow Corning Ltd

					Location	TP01	TP03	TP04	TP05	TP06	TP07	TP08		TP09		TP10
					Average Depth (m)	0.5	0.75	0.5	0.25	0.25	1.65	0.5	1.75	1.5	2.5	1
					Date	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Lab Report Number	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576
Other Analytes																
Acidity	mg/L	4				5.48	5.48	<4	<4	<4	<4	<4	7.3	<4	<4	<4
Bis(2-chloroisopropyl)ether	µg/L					1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
TPH																
GRO >C5-C12	µg/L	50				2,880	1,120	2,780	1,970	22,500	849	6,600	2,330	10,600	958	3,250
>C5-C6 Aliphatics	µg/L	10				256	343	319	169	677	188	424	166	883	309	512
>C6-C8 Aliphatics	µg/L	10				872	247	822	415	6,620	190	1,470	131	2,710	101	746
>C8-C10 Aliphatics	µg/L	10				690	168	579	399	5,700	190	1,350	517	2,350	125	709
>C10-C12 Aliphatics	µg/L	10				364	151	405	431	3,450	92	1,470	660	1,860	198	484
>C12-C16 Aliphatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C16-C21 Aliphatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C16-C35 Aliphatics	µg/L					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
>C21-C35 Aliphatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>C12-C35 Aliphatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC5-EC7 Aromatics	µg/L	10		10 ^{#3}		<10	<10	<10	<10	<100	<10	<50	<50	<50	<10	<10
>EC7-EC8 Aromatics	µg/L	10		74 ^{#2}		<10	<10	<10	<10	<100	<10	<50	<50	<50	<10	<10
>EC8-EC10 Aromatics	µg/L	10				460	112	386	266	3,800	126	901	380	1,560	88	473
>EC10-EC12 Aromatics	µg/L	10				242	101	270	287	2,300	62	979	440	1,240	132	323
>EC12-EC16 Aromatics	µg/L	10				68	<10	22	10	29	51	51	<10	41	<10	39
>EC16-EC21 Aromatics	µg/L	10				22	<10	<10	11	15	20	19	13	17	<10	17
>EC16-EC35 Aromatics	µg/L	10				22	<10	<10	11	15	20	19	13	17	<10	17
>EC21-EC35 Aromatics	µg/L	10				<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
>EC12-EC35 Aromatics	µg/L	10				90	<10	22	21	44	71	70	13	58	<10	56
>C5-C35 Aliphatics & Aromatics	µg/L	10				2,970	1,120	2,800	1,990	22,600	920	6,670	2,340	10,700	957	3,300
BTEX																
Benzene	µg/L	1		10 ^{#3}		<7	<7	<7	<7	<70	<1	<35	<10	<35	<7 - 10.6	<7
Toluene	µg/L	1		74 ^{#2}		<4	<4	<4	<4	<40	<1	<20	24.1 - 32	<20	<4 - 18.1	<4
Ethylbenzene	µg/L	1		20 ^{#6}		<5	<5	<5	<5	<50	<1	<25	<10	<25	<5	<5
Xylene (m & p)	µg/L	1				<8 - 130	<8	<8	<8	<80	<1	<40	<10	<40 - 167	<8 - 12.6	<8
Xylene Total	µg/L	2		30 ^{#6}		<11	<11	<11	<11	<11	<2	<11	<11	<11 - 299	<11	<11
Xylene (o)	µg/L	1				<3	<3	<3	<3	<30	<1	<15	<10	<15 - 132	<10 - 5	<3
Total BTEX	µg/L	28				<28	<28	<28	<28	<28	<28	<28	32	<28	<28	<28
Oxygenates																
MTBE	µg/L	1		5,100 ^{#7}		<3	<3	<3	<3	<30	<1	<15	<10	<15	<3	<3
Tert Amyl Methyl Ether	µg/L	1		510 ^{#7}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Chlorinated Hydrocarbons																
Chloromethane	µg/L	1				<100	<100	<100	<100	<100	14	<100	<10	<100	<10	<100
Vinyl chloride	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Chloroethane	µg/L	1				<100	<100	<100	<100	<100	1.97	<100	<10	<100	<10	<100
1,1-dichloroethene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Dichloromethane	µg/L	3		20 ^{#3}		<300	<300	<300	<300	<300	3.93	<300	<30	<300	<30	<300
trans-1,2-dichloroethene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,1-dichloroethane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
cis-1,2-dichloroethene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Chloroform	µg/L	1		2.5 ^{#3}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,1,1-trichloroethane	µg/L	1		100 ^{#6}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Carbon tetrachloride	µg/L	1		12 ^{#3}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Trichloroethene	µg/L	1		10 ^{#3}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,1,2-trichloroethane	µg/L	1		400 ^{#6}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Tetrachloroethene	µg/L	1		10 ^{#3}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Sum of PCE and TCE	µg/L					<200	<200	<200	<200	<200	<2	<200	<20	<200	<20	<200
TCE+DCE+VC	µg/L					<500	<500	<500	<500	<500	<5	<500	<50	<500	<50	<500
PCE+TCE+DCE+VC	µg/L					<600	<600	<600	<600	<600	<6	<600	<60	<600	<60	<600
VOC																
2,2-dichloropropane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Bromochloromethane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,1-dichloropropene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,2-dichloroethane	µg/L	1		10 ^{#3}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,2-dichloropropane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Dibromomethane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Bromodichloromethane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
cis-1,3-dichloropropene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
trans-1,3-dichloropropene	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,3-dichloropropane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Chlorodibromomethane	µg/L	1				<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,1,1,2-tetrachloroethane	µg/L	1				<100	<100	<100	<100							

Table E1
Waste Leachate Analytical Results
Landfill Assessment
Dow Corning Ltd

	Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Location	TP01	TP03	TP04	TP05	TP06	TP07	TP08		TP09		TP10
				Average Depth (m)	0.5	0.75	0.5	0.25	0.25	1.65	0.5	1.75	1.5	2.5	1
				Date	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
				Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
				Lab Report Number	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576
Acenaphthylene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Acenaphthene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fluorene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Phenanthrene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Anthracene	µg/L	1	0.1 ^{#3}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Fluoranthene	µg/L	1	0.0063 ^{#3}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pyrene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benz(a)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chrysene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	µg/L	1	0.00017 ^{#3}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ^{#4}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	1	0.0082 ^{#1}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene	µg/L	1	0.017 ^{#1}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1	0.017 ^{#1}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(b)&(k)fluoranthene	µg/L				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
PAHs (sum of 4)	µg/L				<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Coal Tar (Bap as surrogate marker)	µg/L				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
SVOC															
SVOC TICs	µg/L				1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2-methylnaphthalene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-bromophenyl phenyl ether	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-chlorophenyl phenyl ether	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Azobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bis(2-chloroethoxy) methane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bis(2-chloroethyl)ether	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbazole	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibenzofuran	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hexachloroethane	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
9,10-Anthracenedione	µg/L				1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Phenolics															
2-methylphenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-nitrophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4-dimethylphenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-chloro-3-methylphenol	µg/L	1	40 ^{#6}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-methylphenol	µg/L	1			<1	9.13	<1	<1	<1	<1	<1	<1	7.22	1.53	<1
4-nitrophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Phenol	µg/L	1	7.7 ^{#2}		<1	9.02	<1	<1	<1	<1	<1	<1	11.3	65.3	<1
2-chloronaphthalene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Amino Aliphatics															
N-nitrosodi-n-propylamine	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Anilines															
2-nitroaniline	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3-nitroaniline	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-chloroaniline	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-nitroaniline	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Explosives															
2,4-Dinitrotoluene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,6-dinitrotoluene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nitrobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Halogenated Benzenes															
1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ^{#4}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Chlorobenzene	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Bromobenzene	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
2-chlorotoluene	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
4-chlorotoluene	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,3-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ^{#4}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ^{#4}		<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Hexachlorobenzene	µg/L	1	0.05 ^{#1}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Halogenated Hydrocarbons															
Dichlorodifluoromethane	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Bromomethane	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Trichlorofluoromethane	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
1,2-dibromoethane	µg/L	1			<100	<100	<100	<100	<100	<1	<100	<10	<100	<10	<100
Halogenated Phenols															
2-chlorophenol	µg/L	1	50 ^{#6}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4-dichlorophenol	µg/L	1	4.2 ^{#2}		<1	<1	<1	<1	<1	<1	<1	<1	<1	57	<1
2,4,5-trichlorophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4,6-trichlorophenol	µg/L	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pentachlorophenol	µg/L	1	0.4 ^{#3}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Phthalates															
Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ^{#3}		<2	<2	<2	<2	<2	<2	<2	<2	4.66	<2	<2
Butyl benzyl phthalate	µg/L	1	7.5 ^{#2}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Di-n-butyl phthalate	µg/L	1	8 ^{#6}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Di-n-octyl phthalate	µg/L	5	20 ^{#6}		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Diethylphthalate	µg/L	1	200 ^{#6}		<1	<1	<1	<1	<1	<3	<1	<1	<1	<1	<1
Dimethyl phthalate	µg/L	1	800 ^{#6}		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Solvents															
Carbon disulfide	µg/L	1			<100	<100	<100	<100	<100	2.07	<100	30.8	<100	21.2	<100
Isophorone	µg/L	1			<2	<1	<2	<2	<1	<1	<2	<2	<2	<2	<2

Table E1
Waste Leachate Analytical Results
Landfill Assessment
Dow Corning Ltd

				Location	TP01	TP03	TP04	TP05	TP06	TP07	TP08		TP09		TP10
				Average Depth (m)	0.5	0.75	0.5	0.25	0.25	1.65	0.5	1.75	1.5	2.5	1
				Date	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
				Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
				Lab Report Number	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576	344576
Metals															
Arsenic	µg/L	0.12	50 ^{#2}		3.48	4.66	2.79	7.67	1.75	1.28	4.83	9.64	5.44	13.5	4.64
Barium	µg/L	0.03			104	243	727	226	1,360	279	591	527	575	213	857
Beryllium	µg/L	0.07			<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
Boron	µg/L	9.4	2,000 ^{#6}		253	74.4	221	226	282	168	402	242	206	151	215
Cadmium	µg/L	0.1	0.08 ^{#3}		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.205	<0.1	0.102	<0.1
Calcium	mg/L	0.012			289	538	1,120	408	1,420	545	1,900	395	653	207	940
Chromium (III+VI)	µg/L	0.22			2.66	3.49	0.737	1.29	0.442	<0.22	1.58	0.774	1.51	1.95	1.11
Copper	µg/L	0.85	1 ^{#2}		39.1	278	80.6	23.3	19.6	51.5	638	99.3	195	322	95.8
Iron	µg/L	19	1,000 ^{#2}		<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19
Lead	µg/L	0.02	1.2 ^{#3}		0.306	0.07	0.068	0.047	0.086	0.063	0.063	0.132	0.036	1.04	0.039
Magnesium	mg/L	0.036			0.285	0.139	0.827	0.312	22.2	3.34	7.7	24.7	2.88	0.0708	2.11
Mercury	µg/L	0.01	0.07 ^{#1}		<0.01	<0.01	<0.01	<0.01	0.0101	<0.01	<0.01	<0.01	0.0156	<0.01	<0.01
Nickel	µg/L	0.15	4 ^{#3}		3.98	13.8	17	5.69	16.3	12.7	18.6	6.46	11.1	9.39	11
Selenium	µg/L	0.39			33.9	3.94	1.77	2.4	<0.39	3.35	3.91	2.59	2.41	5.5	10.2
Vanadium	µg/L	0.24	20 ^{#6}		13.3	26.9	2.63	257	<0.24	<0.24	3.9	11	11.3	158	2.46
Zinc	µg/L	0.41	10.9 ^{#2}		2.5	<0.41	<0.41	<0.41	1.05	5.47	2.2	1.72	0.414	0.805	0.526
Potassium	mg/L	1			1.73	38.3	8.38	2.96	4.64	2.93	3.43	21.6	15.6	55.5	21.1
Chromium (hexavalent)	µg/L	30	3.4 ^{#2}		<30	<30	<30	<30	34.1	<30	<30	<30	<30	<30	82.4
Organics															
Dissolved Organic Carbon	mg/L	3			59.8	65.1	41.8	28.2	37.3	15.6	60.1	24.3	56.3	63.7	54.6
Inorganics															
Sodium	mg/L	0.076			4.79	35.6	5.46	7.74	13.3	5.18	11.7	37.7	30.8	123	33.1
Bromide	µg/L	60			<60	155	157	<60	169	<300	365	380	390	437	145
Chloride	mg/L	10	250 ^{#6}		444	956	2,400	829	3,040	1,100	3,580	700	1,390	519	2,200
Nitrate (as NO3-)	mg/L	0.3			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.455	<0.3	<0.3	<0.3	<0.3
Nitrite (as NO2-)	mg/L	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.107	<0.05	<0.05	<0.05	0.067
Ortho Phosphate as P	mg/L	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.0372	<0.02	<0.02	<0.02
Sulphide	mg/L	0.01			<0.01	0.0142	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Alkalinity (total) as CaCO3	mg/L	2			100	120	95	38	21	10.5	105	46.5	50	125	36.5
Ionic Balance	%				0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Alkalinity (Bicarbonate as CaCO3)	mg/L	2			<2	<2	<2	7	20	10.5	<2	46.5	20	<2	6.5
Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ^{#2}		<0.2	2.01	<0.2	<0.2	<0.2	<0.2	<0.2	3.79	<0.2	2.56	<0.2
Soluble Sulphate 2:1 extract as SO4 BRE	g/L	0.002			-	-	-	-	-	<0.002	-	-	-	-	-
Sulphate (soluble)	mg/L	2			22.5	30.7	26.8	21.1	<2	-	<2	52.6	38.2	111	13.3

Comments
#1 WFD England/Wales. 2015 - MAC-EQS Inland
#2 WFD England/Wales. 2015 - Freshwater Standards
#3 WFD England/Wales. 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key
XXX Exceedance of GAC Protective of Fresh Water Receptor

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location	A2						BH210							
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	d						-							
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	09/02/2017	31/07/2017	18/02/2015	08/09/2015	15/12/2015	24/02/2016	03/08/2016	07/02/2017	22/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	A2_18 Feb 15d	A2_09 Sep 15d	A2_24 Feb 16d	A2_03 Aug 16d	A2_09 Feb 17d	A2_31 Jul 17d	BH210_18 Feb 15	BH210_08 Sep 15	12651480	BH210_24 Feb 16	BH210_03 Aug 16	BH210_07 Feb 17	BH210_22 Feb 17	BH210_01 Aug 17
TPH	GRO >C5-C12	µg/L	50				-	-	-	-	-	-	-	-	<50	-	-	-	-	-
	>C5-C6 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C6-C8 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C8-C10 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C10-C12 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C12-C16 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C16-C21 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C16-C35 Aliphatics	µg/L					-	-	-	-	-	-	-	-	<20	-	-	-	-	-
	>C21-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C12-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC5-EC7 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC7-EC8 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC8-EC10 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC10-EC12 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC12-EC16 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC16-EC21 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC21-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>EC12-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-	-	-	-	-	-	-	-	<10	-	-	-	-	-
BTEX	Benzene	µg/L	1	10 ¹³			3.642	11.011	11.472	10.705	9.433	0.00E+00	0	0	<1	0	0	0	-	0
	Toluene	µg/L	1	74 ¹²			8.687	35.84	5.95	43.832	52.012	46.901	0	0	<1	0	0	0	-	0
	Ethylbenzene	µg/L	1	20 ¹⁶			0	3.695	0	28.119	4.253	3.804	0	0	<1	0	0	0	-	0
	Xylene (m & p)	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Xylene (m)	µg/L					0	3.986	1.473	0	4.864	4.857	0	0	-	0	7.314	0	-	0
	Xylene (p)	µg/L					36.275	0	22.201	5.718	22.086	27.346	0	0	-	0	0	0	-	0
	Xylene Total	µg/L	2	30 ¹⁶			59.373	10.711	31.044	7.044	39.703	42.619	0	0	<2	0	7.314	0	-	0
	Xylene (o)	µg/L	1				23.098	6.725	7.37	1.326	12.753	10.416	0	0	<1	0	0	0	-	0
	Total BTEX	µg/L	28				71.702	61.257	48.466	89.7	105.401	93.324	0	0	<28	0	7.314	0	-	0
Oxygenates	MTBE	µg/L	1	5.100 ¹⁷			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Tert Amyl Methyl Ether	µg/L	1	510 ¹⁷			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Vinyl chloride	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Chloroethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Dichloromethane	µg/L	3	20 ¹³			-	-	-	-	-	-	-	-	<3	-	-	-	-	-
	trans-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1-dichloroethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	cis-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Chloroform	µg/L	1	2.5 ¹³			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1,1-trichloroethane	µg/L	1	100 ¹⁶			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Carbon tetrachloride	µg/L	1	12 ¹³			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Trichloroethene	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1,2-trichloroethane	µg/L	1	400 ¹⁶			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Tetrachloroethene	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Sum of PCE and TCE	µg/L					-	-	-	-	-	-	-	-	<2	-	-	-	-	-
	TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	<5	-	-	-	-	-
	PCE+TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	<6	-	-	-	-	-
VOC	2,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bromochloromethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-dichloroethane	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Dibromomethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bromodichloromethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	cis-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	trans-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,3-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Chlorodibromomethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1,1,2-tetrachloroethane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Styrene	µg/L	1	50 ¹⁶			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bromoform	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Isopropylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2,3-trichloropropane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	n-propylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,3,5-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	tert-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2,4-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	sec-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	p-isopropyltoluene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	n-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-dibromo-3-chloropropane	µg/L	1				-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Hexachlorobutadiene	µg/L	1	0.6 ¹¹			-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-Dichloroethene	µg/L					-	-	-	-	-	-	-	-	<2	-	-	-	-	-
	Trihalomethanes	µg/L					-	-	-	-	-	-	-	-	<4	-	-	-	-	-
	Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclotetrasiloxane, octamethyl-	µg/L					0	0.02	0	0	0	0	0	0	-	0	0	0	-	0

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location						BH210										
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	A2															
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	09/02/2017	31/07/2017	18/02/2015	08/09/2015	15/12/2015	24/02/2016	03/08/2016	07/02/2017	22/02/2017	01/08/2017		
		Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
		SampleCode	A2_18 Feb 15d	A2_09 Sep 15d	A2_24 Feb 16d	A2_03 Aug 16d	A2_09 Feb 17d	A2_31 Jul 17d	BH210_18 Feb 15	BH210_08 Sep 15	12651480	BH210_24 Feb 16	BH210_03 Aug 16	BH210_07 Feb 17	BH210_22 Feb 17	BH210_01 Aug 17						
PAH	Naphthalene	µg/L	1	2 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Acenaphthylene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Acenaphthene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Fluorene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Phenanthrene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Anthracene	µg/L	1	0.1 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Fluoranthene	µg/L	1	0.0063 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Pyrene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Benz(a)anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Chrysene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Benzo(a) pyrene	µg/L	1	0.00017 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Dibenz(a,h)anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Benzo(g,h,i)perylene	µg/L	1	0.0082 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Benzo(b)fluoranthene	µg/L	1	0.017 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
Benzo(k)fluoranthene	µg/L	1	0.017 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-			
Benzo(b)&(k)fluoranthene	µg/L				-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-			
PAHs (sum of 4)	µg/L				-	-	-	-	-	-	-	-	-	<4	-	-	-	-	-			
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-			
Coal Tar (BaP as surrogate marker)	µg/L				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-			
SVOC	2-methylnaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-bromophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-chlorophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Azobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Bis(2-chloroethoxy) ether	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Carbazole	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Dibenzofuran	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Hexachlorocyclopentadiene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Hexachloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
Bis(2-chloroisopropyl) ether	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Phenolics	2-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2,4-dimethylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-chloro-3-methylphenol	µg/L	1	40 th		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Phenol	µg/L	1	7.7 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2-chloronaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
PCBs	1,1-Biphenyl	-				-	-	-	-	-	-	-	-	-	0	-	-	-	-	-		
						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
Anilines	Aniline	-				-	-	-	-	-	-	-	-	-	0	-	-	-	-	-		
	2-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	3-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-chloroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2,6-dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Nitrobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Chlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Bromobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	4-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,3-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,4-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,2-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,2,4-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,2,3-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Hexachlorobenzene	µg/L	1	0.05 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Trichlorobenzene (total)	µg/L		0.4 nd		-	-	-	-	-	-	-	-	-	<3	-	-	-	-	-		
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Bromomethane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Trichlorofluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	1,2-dibromoethane	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
						-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	-	-	-	-	-	-	-	0	-	-	-	-	-		
	2,6-dichlorophenol	-				-	-	-	-	-	-	-	-	-	0	-	-	-	-	-		
	2-chlorophenol	µg/L	1	50 th		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2,4-dichlorophenol	µg/L	1	4.2 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2,4,5-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	2,4,6-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		
	Pentachlorophenol	µg/L	1	0.4 nd		-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location		A2							BH210												
						Well	d																				
							Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	09/02/2017	31/07/2017	18/02/2015	08/09/2015	15/12/2015	24/02/2016	03/08/2016	07/02/2017	22/02/2017	01/08/2017						
							Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal						
Sample Type		A2_18 Feb 15d		A2_09 Sep 15d		A2_24 Feb 16d		A2_03 Aug 16d		A2_09 Feb 17d		A2_31 Jul 17d		BH210_18 Feb 15		BH210_08 Sep 15		BH210_24 Feb 16		BH210_03 Aug 16		BH210_07 Feb 17		BH210_22 Feb 17		BH210_01 Aug 17	
SampleCode																											
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³			-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶			-	-	-	-	-	-	-	-	-	<5	-	-	-	-	-	-	-	-	-	-	-
	Diethylphthalate	µg/L	1	200 ¹⁶			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
	Dimethyl phthalate	µg/L	1	800 ¹⁶			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Solvents	Carbon disulfide	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
	Isophorone	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
	Methanol	µg/L					4.93	0	0	0	0	0	0	0	0	-	0	0	0	0	-	-	0	-	0	-	0
Metals	Aluminium	µg/L		15 ¹⁶			0	0	0	0	0	0	0	0	0	-	0	0	0	0	-	-	0	-	2.9319	-	2.9319
	Arsenic	µg/L		50 ¹²			0	0	0	0	0	0	0	0	0	-	0	0	0	0	-	-	0	-	0	-	0
	Arsenic (Filtered)	µg/L	0.12	50 ¹²			-	-	-	-	-	-	-	-	-	9.54	-	-	-	-	-	-	-	-	-	-	-
	Barium (Filtered)	µg/L	0.03				-	-	-	-	-	-	-	-	-	216	-	-	-	-	-	-	-	-	-	-	-
	Beryllium (Filtered)	µg/L	0.07				-	-	-	-	-	-	-	-	-	<0.07	-	-	-	-	-	-	-	-	-	-	-
	Boron	µg/L		2,000 ¹⁶			509.006	475.887	466.355	481.623	420.1727	405.2904	276.416	523.456	-	205.757	508.668	433.6862	-	-	-	-	516.0754	-	516.0754	-	
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶			-	-	-	-	-	-	-	-	-	457	-	-	-	-	-	-	-	-	-	-	-
	Cadmium	µg/L		0.08 ¹³			1.7739	2.2644	0	1.324	1.0591	0.9243	0	0	-	0	0	1.2515	-	-	-	-	0	-	0	-	0
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Calcium	mg/L					3.401	3.459	3.282	3.621	3.422	4.209	96.3	151.8	-	60.5	0	148.3	-	-	-	-	168.4	-	168.4	-	168.4
	Calcium (Filtered)	mg/L	0.012				-	-	-	-	-	-	-	-	-	360	-	0	-	-	-	-	-	-	-	-	-
	Chromium (III+VI)	µg/L					0	0	0	0	0	0	0	0	-	0	0	0	0	-	-	0	-	0	-	0	-
	Chromium (III+VI) (Filtered)	µg/L	0.22				-	-	-	-	-	-	-	-	-	3.19	-	-	-	-	-	-	-	-	-	-	-
	Copper	µg/L		1 ¹²	6 ¹⁶		13.872	15.723	13.289	13.288	19.717	21.950	0	0	-	9.08	0	0	0	-	-	0	-	0	-	0	-
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁶		-	-	-	-	-	-	-	-	-	2.17	-	-	-	-	-	-	-	-	-	-	-
	Iron	µg/L		1,000 ¹²			913.636	860.168	860.759	831.191	1.278	1.252	7.326	16.019	-	18.438	0	4.6202	-	-	-	-	4.2097	-	4.2097	-	4.2097
	Iron (Filtered)	µg/L	19	1,000 ¹²			-	-	-	-	-	-	-	-	-	<190	-	-	-	-	-	-	-	-	-	-	-
	Lead	µg/L		1.2 ¹³			38.0513	57.1194	69.389	70.186	120.0622	27.124	0	0	-	0	0	4.3362	-	-	-	-	0	-	0	-	0
	Lead (Filtered)	µg/L	0.02	1.2 ¹³			-	-	-	-	-	-	-	-	-	0.194	-	-	-	-	-	-	-	-	-	-	-
	Magnesium	mg/L					38.3	38.2	32.3	34.9	27.7	30.4	38.1	80.8	-	27.4	89.3	67.6	-	-	-	-	96.1	-	96.1	-	96.1
	Magnesium (Filtered)	mg/L	0.036				-	-	-	-	-	-	-	-	-	501	-	-	-	-	-	-	-	-	-	-	-
	Manganese	µg/L		123 ¹²			1.003	721.959	510.785	688.11	625.859	762.5595	6.323	7.935	-	0	15.695	13.2014	-	-	-	-	17.8761	-	17.8761	-	17.8761
	Mercury	µg/L		0.07 ¹¹			0	0	0	0	10.4343	0	0	11.4931	-	0	3.06	41.1872	-	-	-	-	2.7342	-	2.7342	-	2.7342
	Mercury (Filtered)	µg/L	0.01	0.07 ¹¹			-	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-
	Nickel	µg/L		4 ¹³			115.193	107.635	81.864	84.274	87.8032	94.1173	5.158	4.451	-	1.72	3.792	4.2057	-	-	-	-	2.5758	-	2.5758	-	2.5758
	Nickel (Filtered)	µg/L	0.15	4 ¹³			-	-	-	-	-	-	-	-	-	5.72	-	-	-	-	-	-	-	-	-	-	-
	Selenium	µg/L					0	0	0	0	6.6227	0	0	0	-	0	0	0	0	-	-	0	-	0	-	0	-
Selenium (Filtered)	µg/L	0.39				-	-	-	-	-	-	-	-	-	30.1	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (Filtered)	µg/L	0.24	20 ¹⁶			-	-	-	-	-	-	-	-	-	0.863	-	-	-	-	-	-	-	-	-	-	-	
Zinc	µg/L		10.9 ¹²			140.065	146.101	112.195	121.727	116.9159	132.3062	0	7.827	-	8.073	2.054	3.6415	-	-	-	-	0	-	0	-	0	
Zinc (Filtered)	µg/L	0.41	10.9 ¹²			-	-	-	-	-	-	-	-	-	2.08	-	-	-	-	-	-	-	-	-	-	-	
Potassium (Filtered)	mg/L	1				-	-	-	-	-	-	-	-	-	114	-	-	-	-	-	-	-	-	-	-	-	
Tin	µg/L		25 ¹⁶			0	0	0	0	0	0	0	0	-	0	0	0	0	-	-	0	-	0	-	0	-	
Chromium (hexavalent)	µg/L	30	3.4 ¹²			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Organics	Dissolved Organic Carbon	mg/L	3				-	-	-	-	-	-	-	-	-	<3	-	-	-	-	-	-	-	-	-	-	
Inorganics	Acidity	mg/L	4				-	-	-	-	-	-	-	-	-	27.4	-	-	-	-	-	-	-	-	-	-	
	BOD	mg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	
	Sulphur	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076				-	-	-	-	-	-	-	-	-	2.750	-	-	-	-	-	-	-	-	-	-	
	Bromide	µg/L	20				-	-	-	-	-	-	-	-	-	22.800	-	-	-	-	-	-	-	-	-	-	
	Chloride	mg/L	2	250 ¹⁶			-	-	-	-	-	-	-	-	-	6.080	-	-	-	-	-	-	-	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3				-	-	-	-	-	-	-	-	-	<0.3	-	-	-	-	-	-	-	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05				-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	
	Ortho Phosphate as P	mg/L	0.02				-	-	-	-	-	-	-	-	-	<0.02	-	-	-	-	-	-	-	-	-	-	
	Sulphide	mg/L	0.01				-	-	-	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2				-	-	-	-	-	-	-	-	-	425	-	-	-	-	-	-	-	-	-	-	
	Hardness as CaCO3	mg/L					8.650	8.795	8.328	9.185	8.659	10.636	397.3	711.8	-	263.8	0	648.5	-	-	-	-	816.1	-	816.1	-	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				-	-	-	-	-	-	-	-	-	425	-	-	-	-	-	-	-	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²			-	-	-	-	-	-	-	-	-	3.17	-	-	-	-	-	-	-	-	-	-	-
	Sulphate (soluble)	mg/L	2				-	-	-	-	-	-	-	-	-	498	-	-	-	-	-	-	-	-	-	-	
	COD	mg/L	7				-	-	-	-	-	-	-	-	-	219	-	-	-	-	-	-	-	-	-	-	
	pH (Lab)	pH_Units	1				-	-	-	-	-	-	-	-	-	7.83	-	-	-	-	-	-	-	-	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location						BH210										
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	A2															
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	09/02/2017	31/07/2017	18/02/2015	08/09/2015	15/12/2015	24/02/2016	03/08/2016	07/02/2017	22/02/2017	01/08/2017		
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
						SampleCode	A2_18 Feb 15d	A2_09 Sep 15d	A2_24 Feb 16d	A2_03 Aug 16d	A2_09 Feb 17d	A2_31 Jul 17d	BH210_18 Feb 15	BH210_08 Sep 15	12651480	BH210_24 Feb 16	BH210_03 Aug 16	BH210_07 Feb 17	BH210_22 Feb 17	BH210_01 Aug 17		
Other	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dodecamethylcyclohexasiloxane	µg/L				0	0	0	0	0	0	0	0	0	-	0	0	0	-	0	-	
	Unknown 5 VOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methylsilanetriol	ppm				-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.3	-	
	Unknown 1 SVOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 SVOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 5 SVOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	ethyl-dimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo-, -trisilacyclohexane-, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldioxa-trisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	0	0	0	0	0	0	0	0	-	0	0	0	-	0	-
	Hexamethyldisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm				-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4.2	-
	Trimethylsilanol	µg/L				124 ^m	0	5,310	5,920	4,930	4,870	4,980	0	140	-	110	330	310	-	-	-	-
	Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Volatile TIC	-				-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L				-	0	0.07	0	0	0	0	0	0	0	-	0	0	0	-	0	-
	Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzenesulfonamide-, methyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 SVOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 VOC 151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 VOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 SVOC 151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
xxx	Exceedance of GAC Protective of Fresh Water Receptor
xxx	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	BH312						BH412					
						Well												
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SampleCode	BH312_18 Feb 15	BH312_09 Sep 15	BH312_24 Feb 16	BH312_03 Aug 16	BH312_06 Feb 17	BH312_01 Aug 17	BH412_18 Feb 15	BH412_08 Sep 15	BH412_24 Feb 16	BH412_03 Aug 16	BH412_06 Feb 17	BH412_01 Aug 17						
TPH	GRO >C5-C12	µg/L	50				-	-	-	-	-	-	-	-	-	-	-	-
	>C5-C6 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C6-C8 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C9-C10 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C10-C12 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C12-C16 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C16-C21 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C16-C35 Aliphatics	µg/L					-	-	-	-	-	-	-	-	-	-	-	-
	>C21-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C12-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC5-EC7 Aromatics	µg/L	10		10 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	>EC7-EC8 Aromatics	µg/L	10		74 ^{R2}		-	-	-	-	-	-	-	-	-	-	-	-
	>EC8-EC10 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC10-EC12 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC12-EC16 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC16-EC21 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC21-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>EC12-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-
BTEX	Benzene	µg/L	1		10 ^{R3}		8.954	6.483	4.417	1.606	5.135	4.443	2.468	2.842	5.755	0	1.639	0
	Toluene	µg/L	1		74 ^{R2}		97.929	67.339	0	25.199	100.164	95.892	0	0	0	0	0	0
	Ethylbenzene	µg/L	1		20 ^{R6}		18.632	10.524	0	35.735	13.523	12.906	0	0	0	25.816	0	0
	Xylene (m & p)	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (m)	µg/L					38.346	19.103	0	0	23.654	21.066	0	0	0	2.298	0	0
	Xylene (p)	µg/L					82.457	0	45.677	14.515	46.467	53.328	29.095	0	33.49	0	20.261	21.863
	Xylene Total	µg/L	2		30 ^{R6}		151.99	25.715	45.677	17.048	85.497	91.334	38.178	2.207	33.49	6.41	22.631	31.296
	Xylene (o)	µg/L	1				31.187	6.612	0	2.533	15.376	16.94	9.083	2.207	0	4.112	2.37	9.433
Total BTEX	µg/L	28				277.505	110.061	50.094	79.588	204.319	204.575	40.646	5.049	39.245	32.226	24.27	31.296	
Oxygenates	MTBE	µg/L	1		5.100 ^{R7}		-	-	-	-	-	-	-	-	-	-	-	-
	Tert Amyl Methyl Ether	µg/L	1		510 ^{R7}		-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Vinyl chloride	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Chloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Dichloromethane	µg/L	3		20 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Chloroform	µg/L	1		2.5 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	1,1,1-trichloroethane	µg/L	1		100 ^{R6}		-	-	-	-	-	-	-	-	-	-	-	-
	Carbon tetrachloride	µg/L	1		12 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	Trichloroethene	µg/L	1		10 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2-trichloroethane	µg/L	1		400 ^{R6}		-	-	-	-	-	-	-	-	-	-	-	-
	Tetrachloroethene	µg/L	1		10 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	Sum of PCE and TCE	µg/L					-	-	-	-	-	-	-	-	-	-	-	-
	TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	-	-	-	-
PCE+TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
VOC	2,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Bromochloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloroethane	µg/L	1		10 ^{R3}		-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Dibromomethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Bromodichloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,3-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Chlorodibromomethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,1,1,2-tetrachloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Styrene	µg/L	1		50 ^{R6}		-	-	-	-	-	-	-	-	-	-	-	-
	Bromoform	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Isopropylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2,2-tetrachloroethane	µg/L	1		140 ^{R2}		-	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-trichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	n-propylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	tert-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	sec-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	p-isopropyltoluene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	n-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dibromo-3-chloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobutadiene	µg/L	1		0.6 ^{R1}		-	-	-	-	-	-	-	-	-	-	-	-
	1,2-Dichloroethene	µg/L					-	-	-	-	-	-	-	-	-	-	-	-
Trihalomethanes	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Cyclotetrasiloxane, octamethyl-	µg/L					0	0	0	0	0	0	0	0	0	0	0	0	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	BH312						BH412						
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	BH312_18 Feb 15	BH312_09 Sep 15	BH312_24 Feb 16	BH312_03 Aug 16	BH312_06 Feb 17	BH312_01 Aug 17	BH412_18 Feb 15	BH412_08 Sep 15	BH412_24 Feb 16	BH412_03 Aug 16	BH412_06 Feb 17	BH412_01 Aug 17	
PAH	Naphthalene	µg/L	1	2 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		
	Acenaphthylene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Acenaphthene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Fluorene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Phenanthrene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Anthracene	µg/L	1	0.1 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		
	Fluoranthene	µg/L	1	0.0063 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		
	Pyrene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Benz(a)anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Chrysene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Benzo(a) pyrene	µg/L	1	0.00017 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁶⁴		-	-	-	-	-	-	-	-	-	-	-	-		
	Diben(z(a,h))anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁶¹		-	-	-	-	-	-	-	-	-	-	-	-		
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁶¹		-	-	-	-	-	-	-	-	-	-	-	-		
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁶¹		-	-	-	-	-	-	-	-	-	-	-	-		
	PAHs (sum of 4)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-		
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-			
Coal Tar (Bap as surrogate marker)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-			
SVOC	2-methylnaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-bromophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-chlorophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Azobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Bis(2-chloroethyl)ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Carbazole	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Dibenzofuran	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Hexachlorocyclopentadiene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Hexachloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Bis(2-chloroisopropyl) ether	-				-	-	-	-	-	-	-	-	-	-	-	-		
Phenolics	2-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	2-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	2,4-dimethylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-chloro-3-methylphenol	µg/L	1	40 ⁶⁶		-	-	-	-	-	-	-	-	-	-	-	-		
	4-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Phenol	µg/L	1	7.7 ⁶²		-	-	-	-	-	-	-	-	-	-	-	-		
	2-chloronaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
PCBs	1,1-Biphenyl	-				-	-	-	-	-	-	-	-	-	-	-	-		
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
Anilines	Aniline	-				-	-	-	-	-	-	-	-	-	-	-	-		
	2-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	3-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-chloroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	2,6-dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Nitrobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴		-	-	-	-	-	-	-	-	-	-	-	-		
	Chlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Bromobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	2-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	4-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	1,3-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	1,4-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴		-	-	-	-	-	-	-	-	-	-	-	-		
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴		-	-	-	-	-	-	-	-	-	-	-	-		
	Hexachlorobenzene	µg/L	1	0.05 ⁶¹		-	-	-	-	-	-	-	-	-	-	-	-		
	Trichlorobenzene (total)	µg/L		0.4 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Bromomethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Trichlorofluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-dibromoethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	-	-	-	-	-	-	-	-	-	-		
	2,6-dichlorophenol	-				-	-	-	-	-	-	-	-	-	-	-	-		
	2-chlorophenol	µg/L	1	50 ⁶⁶		-	-	-	-	-	-	-	-	-	-	-	-		
	2,4-dichlorophenol	µg/L	1	4.2 ⁶²		-	-	-	-	-	-	-	-	-	-	-	-		
	2,4,5-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	2,4,6-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Pentachlorophenol	µg/L	1	0.4 ⁶³		-	-	-	-	-	-	-	-	-	-	-	-		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	BH312						BH412					
						Well												
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017	18/02/2015	09/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	BH312_18 Feb 15	BH312_09 Sep 15	BH312_24 Feb 16	BH312_03 Aug 16	BH312_06 Feb 17	BH312_01 Aug 17	BH412_18 Feb 15	BH412_09 Sep 15	BH412_24 Feb 16	BH412_03 Aug 16	BH412_06 Feb 17	BH412_01 Aug 17
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹⁰³		-	-	-	-	-	-	-	-	-	-	-		
	Butyl benzyl phthalate	µg/L	1	7.5 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-		
	Di-n-butyl phthalate	µg/L	1	8 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-		
	Di-n-octyl phthalate	µg/L	5	20 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-		
	Diethylphthalate	µg/L	1	200 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-		
	Dimethyl phthalate	µg/L	1	800 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-		
Solvents																		
	Carbon disulfide	µg/L	1			-	-	-	-	-	-	-	-	-	-	-		
	Isophorone	µg/L	1			-	-	-	-	-	-	-	-	-	-	-		
	Methanol	µg/L			0	3.48	0	0	0	0	0	0	0	0	0	0		
Metals																		
	Aluminium	µg/L		15 ¹⁰⁶		0	0	0	0	0	0	0	0	0	0	5.7402		
	Arsenic	µg/L		50 ¹⁰²		0	0	0	0	0	0	0	0	0	0	0		
	Arsenic (Filtered)	µg/L	0.12	50 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-		
	Barium (Filtered)	µg/L	0.03			-	-	-	-	-	-	-	-	-	-	-		
	Beryllium (Filtered)	µg/L	0.07			-	-	-	-	-	-	-	-	-	-	-		
	Boron	µg/L		2,000 ¹⁰⁶		162,952	151,935	145,485	144,345	118,3514	122,4175	467,143	254,374	155,361	405,591	189,4481	179,3009	
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-	-	
	Cadmium	µg/L		0.08 ¹⁰³		0.6397	0.8644	0	0	0.5691	0	0	0	0	0	0.5992	0	
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹⁰³		-	-	-	-	-	-	-	-	-	-	-	-	
	Calcium	mg/L				851.9	779.9	911.5	1,513	1,179	1,601	649.7	646.4	898	844.3	776.1	699.4	
	Calcium (Filtered)	mg/L	0.012			-	-	-	-	-	-	-	-	-	-	-	-	
	Chromium (III+VI)	µg/L				0	3.618	4.715	0	0	0	0	0	0	0	4.2543	0	
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	-	-	-	-	-	-	-	-	-	-	-	
	Copper	µg/L		1 ¹⁰²		0	9.632	3.162	0	0	0	0	3.888	0	0	0	8.5106	
	Copper (Filtered)	µg/L	0.85	1 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-	-	
	Iron	µg/L		1,000 ¹⁰²		4,694	2,713	2,280	0	493,8083	154,6671	2,088	108.69	142,559	6,550	6,458	19,9717	
	Iron (Filtered)	µg/L	19	1,000 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-	-	
	Lead	µg/L		1.2 ¹⁰³		15,7006	23,2423	39,433	38,738	46,5191	9,6029	7,4701	19,1658	38,934	19,563	24,6652	0	
	Lead (Filtered)	µg/L	0.02	1.2 ¹⁰³		-	-	-	-	-	-	-	-	-	-	-	-	
	Magnesium	mg/L				9.9	6.2	5.5	0	3.2	3.9	119.1	27.6	7.1	80.1	31.6	83.7	
	Magnesium (Filtered)	mg/L	0.036			-	-	-	-	-	-	-	-	-	-	-	-	
	Manganese	µg/L		123 ¹⁰²		210,979	159,368	93,122	3,588	61,3376	29,8336	671,043	395,218	142,844	627,936	595,4115	393,0913	
	Mercury	µg/L		0.07 ¹⁰¹		0	0	0	0	25,3675	0	0	0	0	0	0	21,8379	
	Mercury (Filtered)	µg/L	0.01	0.07 ¹⁰¹		-	-	-	-	-	-	-	-	-	-	-	-	
	Nickel	µg/L		4 ¹⁰³		7,309	4,429	1,889	0	0	0	0	0	0	0	0	0	
	Nickel (Filtered)	µg/L	0.15	4 ¹⁰³		-	-	-	-	-	-	-	-	-	-	-	-	
	Selenium	µg/L				0	0	0	0	0	0	0	0	0	0	0	0	
	Selenium (Filtered)	µg/L	0.39			-	-	-	-	-	-	-	-	-	-	-	-	
	Vanadium (Filtered)	µg/L	0.24		20 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-	
	Zinc	µg/L		10.9 ¹⁰²		5,357	10,162	0	2,568	5,5301	0,4945	2,578	11,051	0	2,097	8,5162	7,3039	
	Zinc (Filtered)	µg/L	0.41	10.9 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-	-	
	Potassium (Filtered)	mg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	
	Tin	µg/L		25 ¹⁰⁶		0	0	0	0	0	0	0	0	0	0	0	0	
	Chromium (hexavalent)	µg/L	30	3.4 ¹⁰²		-	-	-	-	-	-	-	-	-	-	-	-	
	Organics																	
Dissolved Organic Carbon	mg/L	3				-	-	-	-	-	-	-	-	-	-	-		
Inorganics																		
Acidity	mg/L	4				-	-	-	-	-	-	-	-	-	-	-		
BOD	mg/L	1				-	-	-	-	-	-	-	-	-	-	-		
Sulphur	µg/L					-	-	-	-	-	-	-	-	-	-	-		
Sodium (Filtered)	mg/L	0.076				-	-	-	-	-	-	-	-	-	-	-		
Bromide	µg/L	20				-	-	-	-	-	-	-	-	-	-	-		
Chloride	mg/L	2		250 ¹⁰⁶		-	-	-	-	-	-	-	-	-	-	-		
Nitrate (as NO3-)	mg/L	0.3				-	-	-	-	-	-	-	-	-	-	-		
Nitrite (as NO2-)	mg/L	0.05				-	-	-	-	-	-	-	-	-	-	-		
Ortho Phosphate as P	mg/L	0.02				-	-	-	-	-	-	-	-	-	-	-		
Sulphide	mg/L	0.01				-	-	-	-	-	-	-	-	-	-	-		
Alkalinity (total) as CaCO3	mg/L	2				-	-	-	-	-	-	-	-	-	-	-		
Hardness as CaCO3	mg/L				2,168	1,973	2,299	0	2,957	4,014	2,113	1,728	2,271	2,438	2,068	2,091		
Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	-		
Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	-		
Ammoniacal Nitrogen as N	mg/L	0.2		300 (total ammonia as nitrogen) ¹⁰²		-	-	-	-	-	-	-	-	-	-	-		
Sulphate (soluble)	mg/L	2			-	-	-	-	-	-	-	-	-	-	-	-		
COD	mg/L	7			-	-	-	-	-	-	-	-	-	-	-	-		
pH (Lab)	pH_Units	1				-	-	-	-	-	-	-	-	-	-	-		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	BH312						BH412					
						Date	18/02/2015	09/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	06/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	BH312_18 Feb 15	BH312_09 Sep 15	BH312_24 Feb 16	BH312_03 Aug 16	BH312_06 Feb 17	BH312_01 Aug 17	BH412_18 Feb 15	BH412_08 Sep 15	BH412_24 Feb 16	BH412_03 Aug 16	BH412_06 Feb 17	BH412_01 Aug 17
Other	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Dodecamethylcyclohexasiloxane	µg/L				0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	methylsilanetriol	ppm				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	ethyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	0	0	0	0	0	0	0	0	0	0	0
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm				-	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilanol	µg/L				124 ^{#8}	7,200	6,710	7,860	4,490	6,240	7,070	3,320	5,130	7,480	3,910	3,750	1,870
Trimethylsilanol isomer	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Trimethylsilyl fluoride	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Volatile TIC	-					-	-	-	-	-	-	-	-	-	-	-	-	
Decamethylcyclopentasiloxane	µg/L					0	0.06	0	0	0	0	0	0.08	0	0	0	0	
Benzenepropanoic acid	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Benzenesulfonamide, -methyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	

Comments

- #1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env1 Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key

XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Cadoxton North Pond							
						Location							Sample Code
						Well							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017	
Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal					
SampleCode		Cadoxton North Pond_18 Feb 15_	Cadoxton North Pond_08 Sep 15_	12677367	Cadoxton North Pond_23 Feb 16_	Cadoxton North Pond_03 Aug 16_	Cadoxton North Pond_07 Feb 17_	Cadoxton North Pond_01 Aug 17_					
TPH	GRO >C5-C12	µg/L	50			-	-	<50	-	-	-	-	
	>C5-C6 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C6-C8 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C8-C10 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C10-C12 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C12-C16 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C16-C21 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C16-C35 Aliphatics	µg/L				-	-	<20	-	-	-	-	
	>C21-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>C12-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC5-EC7 Aromatics	µg/L	10	10 ¹³		-	-	<10	-	-	-	-	
	>EC7-EC8 Aromatics	µg/L	10	74 ¹²		-	-	<10	-	-	-	-	
	>EC8-EC10 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC10-EC12 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC12-EC16 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC16-EC21 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC21-EC35 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>EC12-EC35 Aromatics	µg/L	10			-	-	<10	-	-	-	-	
	>C5-C35 Aliphatics & Aromatics	µg/L	10			-	-	<10	-	-	-	-	
BTEX	Benzene	µg/L	1	10 ¹³		0	0	<1	0	0	0	0	
	Toluene	µg/L	1	74 ¹²		0	0	<1	0	0	0	0	
	Ethylbenzene	µg/L	1	20 ¹⁶		0	0	<1	0	0	0	0	
	Xylene (m & p)	µg/L	1			-	-	<1	-	-	-	-	
	Xylene (m)	µg/L				0	0	-	0	0	0	0	
	Xylene (p)	µg/L				0	0	-	0	0	0	0	
	Xylene Total	µg/L	2	30 ¹⁶		0	0	<2	0	0	0	0	
	Xylene (o)	µg/L	1			0	0	<1	0	0	0	0	
	Total BTEX	µg/L	28			0	0	<28	0	0	0	0	
Oxygenates	MTBE	µg/L	1			-	-	<1	-	-	-	-	
	Tert Amyl Methyl Ether	µg/L	1	5.100 ¹⁷	510 ¹⁷	-	-	<1	-	-	-	-	
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	-	<1	-	-	-	-	
	Vinyl chloride	µg/L	1			-	-	<1	-	-	-	-	
	Chloroethane	µg/L	1			-	-	<1	-	-	-	-	
	1,1-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	
	Dichloromethane	µg/L	3	20 ¹³		-	-	<3	-	-	-	-	
	trans-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	
	1,1-dichloroethane	µg/L	1			-	-	<1	-	-	-	-	
	cis-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	
	Chloroform	µg/L	1	2.5 ¹³		-	-	<1	-	-	-	-	
	1,1,1-trichloroethane	µg/L	1	100 ¹⁶		-	-	<1	-	-	-	-	
	Carbon tetrachloride	µg/L	1	12 ¹³		-	-	<1	-	-	-	-	
	Trichloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	
	1,1,2-trichloroethane	µg/L	1	400 ¹⁶		-	-	<1	-	-	-	-	
	Tetrachloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	
	Sum of PCE and TCE	µg/L				-	-	<2	-	-	-	-	
	TCE+DCE+VC	µg/L				-	-	<5	-	-	-	-	
	PCE+TCE+DCE+VC	µg/L				-	-	<6	-	-	-	-	
VOC	2,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	
	Bromochloromethane	µg/L	1			-	-	<1	-	-	-	-	
	1,1-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	
	1,2-dichloroethane	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	
	1,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	
	Dibromomethane	µg/L	1			-	-	<1	-	-	-	-	
	Bromodichloromethane	µg/L	1			-	-	<1	-	-	-	-	
	cis-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	
	trans-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	
	1,3-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	
	Chlorodibromomethane	µg/L	1			-	-	<1	-	-	-	-	
	1,1,1,2-tetrachloroethane	µg/L	1			-	-	<1	-	-	-	-	
	Styrene	µg/L	1	50 ¹⁶		-	-	<1	-	-	-	-	
	Bromoform	µg/L	1			-	-	<1	-	-	-	-	
	Isopropylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²		-	-	<1	-	-	-	-	
	1,2,3-trichloropropane	µg/L	1			-	-	<1	-	-	-	-	
	n-propylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,3,5-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	tert-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,2,4-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	sec-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	p-isopropyltoluene	µg/L	1			-	-	<1	-	-	-	-	
	n-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,2-dibromo-3-chloropropane	µg/L	1			-	-	<1	-	-	-	-	
	Hexachlorobutadiene	µg/L	1	0.6 ¹¹		-	-	<1	-	-	-	-	
	1,2-Dichloroethene	µg/L				-	-	<2	-	-	-	-	
	Trihalomethanes	µg/L				-	-	<4	-	-	-	-	
	Cyclotrisiloxane, hexamethyl-	µg/L				-	-	-	-	-	-	-	
Cyclotetrasiloxane, octamethyl-	µg/L				0	0	-	0	0	0	0		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Cadoxton North Pond						
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well						
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	Cadoxton North Pond_18 Feb 15_	Cadoxton North Pond_08 Sep 15_	12577367	Cadoxton North Pond_23 Feb 16_	Cadoxton North Pond_03 Aug 16_	Cadoxton North Pond_07 Feb 17_
							Cadoxton North Pond_01 Aug 17_					
PAH	Naphthalene	µg/L	1	2 ⁶³			-	-	<1	-	-	-
	Acenaphthylene	µg/L	1				-	-	<1	-	-	-
	Acenaphthene	µg/L	1				-	-	<1	-	-	-
	Fluorene	µg/L	1				-	-	<1	-	-	-
	Phenanthrene	µg/L	1				-	-	<1	-	-	-
	Anthracene	µg/L	1	0.1 ⁶³			-	-	<1	-	-	-
	Fluoranthene	µg/L	1	0.0063 ⁶³			-	-	<1	-	-	-
	Pyrene	µg/L	1				-	-	<1	-	-	-
	Benzo(a)anthracene	µg/L	1				-	-	<1	-	-	-
	Chrysene	µg/L	1				-	-	<1	-	-	-
	Benzo(a) pyrene	µg/L	1	0.00017 ⁶³			-	-	<1	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁶⁴			-	-	<1	-	-	-
	Dibenz(a,h)anthracene	µg/L	1				-	-	<1	-	-	-
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁶¹			-	-	<1	-	-	-
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁶¹			-	-	<1	-	-	-
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁶¹			-	-	<1	-	-	-
	Benzo(b)&(k)fluoranthene	µg/L					-	-	<2	-	-	-
	PAHs (sum of 4)	µg/L					-	-	<4	-	-	-
	benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L					-	-	<2	-	-	-
	Coal Tar (Bap as surrogate marker)	µg/L					-	-	<1	-	-	-
SVOC	2-methylnaphthalene	µg/L	1				-	-	<1	-	-	-
	4-bromophenyl phenyl ether	µg/L	1				-	-	<1	-	-	-
	4-chlorophenyl phenyl ether	µg/L	1				-	-	<1	-	-	-
	Azobenzene	µg/L	1				-	-	<1	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	1				-	-	<1	-	-	-
	Bis(2-chloroethyl)ether	µg/L	1				-	-	<1	-	-	-
	Carbazole	µg/L	1				-	-	<1	-	-	-
	Dibenzofuran	µg/L	1				-	-	<1	-	-	-
	Hexachlorocyclopentadiene	µg/L	1				-	-	<1	-	-	-
	Hexachloroethane	µg/L	1				-	-	<1	-	-	-
	Bis(2-chloroisopropyl) ether	-					-	-	0	-	-	-
Phenolics	2-methylphenol	µg/L	1				-	-	<1	-	-	-
	2-nitrophenol	µg/L	1				-	-	<1	-	-	-
	2,4-dimethylphenol	µg/L	1				-	-	<1	-	-	-
	4-chloro-3-methylphenol	µg/L	1	40 ⁶⁶			-	-	<1	-	-	-
	4-methylphenol	µg/L	1				-	-	<1	-	-	-
	4-nitrophenol	µg/L	1				-	-	<1	-	-	-
	Phenol	µg/L	1	7.7 ⁶²			-	-	<1	-	-	-
	2-chloronaphthalene	µg/L	1				-	-	<1	-	-	-
PCBs	1,1-Biphenyl	-					-	-	0	-	-	-
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1				-	-	<1	-	-	-
Anilines	Aniline	-					-	-	0	-	-	-
	2-nitroaniline	µg/L	1				-	-	<1	-	-	-
	3-nitroaniline	µg/L	1				-	-	<1	-	-	-
	4-chloroaniline	µg/L	1				-	-	<1	-	-	-
	4-nitroaniline	µg/L	1				-	-	<1	-	-	-
Explosives	2,4-Dinitrotoluene	µg/L	1				-	-	<1	-	-	-
	2,6-dinitrotoluene	µg/L	1				-	-	<1	-	-	-
	Nitrobenzene	µg/L	1				-	-	<1	-	-	-
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴			-	-	<1	-	-	-
	Chlorobenzene	µg/L	1				-	-	<1	-	-	-
	Bromobenzene	µg/L	1				-	-	<1	-	-	-
	2-chlorotoluene	µg/L	1				-	-	<1	-	-	-
	4-chlorotoluene	µg/L	1				-	-	<1	-	-	-
	1,3-dichlorobenzene	µg/L	1				-	-	<1	-	-	-
	1,4-dichlorobenzene	µg/L	1				-	-	<1	-	-	-
	1,2-dichlorobenzene	µg/L	1				-	-	<1	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴			-	-	<1	-	-	-
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁶⁴			-	-	<1	-	-	-
	Hexachlorobenzene	µg/L	1	0.05 ⁶¹			-	-	<1	-	-	-
	Trichlorobenzene (total)	µg/L		0.4 ⁶³			-	-	<3	-	-	-
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1				-	-	<1	-	-	-
	Bromomethane	µg/L	1				-	-	<1	-	-	-
	Trichlorofluoromethane	µg/L	1				-	-	<1	-	-	-
	1,2-dibromoethane	µg/L	1				-	-	<1	-	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-					-	-	0	-	-	-
	2,6-dichlorophenol	-					-	-	0	-	-	-
	2-chlorophenol	µg/L	1	50 ⁶⁶			-	-	<1	-	-	-
	2,4-dichlorophenol	µg/L	1	4.2 ⁶²			-	-	<1	-	-	-
	2,4,5-trichlorophenol	µg/L	1				-	-	<1	-	-	-
	2,4,6-trichlorophenol	µg/L	1				-	-	<1	-	-	-
	Pentachlorophenol	µg/L	1	0.4 ⁶³			-	-	<1	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Cadoxton North Pond						
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well						
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	Cadoxton North Pond_18 Feb 15_	Cadoxton North Pond_08 Sep 15_	12677367	Cadoxton North Pond_23 Feb 16_	Cadoxton North Pond_03 Aug 16_	Cadoxton North Pond_07 Feb 17_
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³			-	-	<2	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²			-	-	<1	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 ¹³			-	-	<1	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶			-	-	<5	-	-	-
	Diethylphthalate	µg/L	1	200 ¹⁶			-	-	<1	-	-	-
	Dimethyl phthalate	µg/L	1	800 ¹⁶			-	-	<1	-	-	-
Solvents	Carbon disulfide	µg/L	1				-	-	<1	-	-	-
	Isophorone	µg/L	1				-	-	<1	-	-	-
	Methanol	µg/L					0	0	-	0	0	0
Metals	Aluminium	µg/L		15 ¹⁶			111.896	0	-	46.926	86.924	42.2512
	Arsenic	µg/L		50 ¹²			0	0	-	0	0	4.9445
	Arsenic (Filtered)	µg/L	0.12				-	-	0.871	-	-	-
	Barium (Filtered)	µg/L	0.03				-	-	161	-	-	-
	Beryllium (Filtered)	µg/L	0.07				-	-	<0.07	-	-	-
	Boron	µg/L		2 000 ¹⁶			145.362	0	-	138.895	219.562	117.8563
	Boron (Filtered)	µg/L	9.4				-	-	159	-	-	-
	Cadmium	µg/L		0.08 ¹³			0	0	-	0	0	1.2734
	Cadmium (Filtered)	µg/L	0.1				-	-	<0.1	-	-	0
	Calcium	mg/L		0.08 ¹³			200.4	0	-	131.3	0	74.3
	Calcium (Filtered)	mg/L	0.012				-	-	247	-	-	93.7
	Chromium (III+VI)	µg/L					0	0	-	4.494	0	0
	Chromium (III+VI) (Filtered)	µg/L	0.22				-	-	1.41	-	-	-
	Copper	µg/L		1 ¹²	6 ¹⁸		0	0	-	5.821	3.46	12.2995
	Copper (Filtered)	µg/L	0.85		6 ¹⁹		-	-	2.37	-	-	0
	Iron	µg/L		1 000 ¹²			336.737	0	-	648.172	505.868	751.7865
	Iron (Filtered)	µg/L	19				-	-	<19	-	-	397.0606
	Lead	µg/L		1.2 ¹³			0	0	-	0	0	5.1789
	Lead (Filtered)	µg/L	0.02				-	-	0.087	-	-	5.002
	Magnesium	mg/L					25.3	0	-	19.9	26.4	16.2
	Magnesium (Filtered)	mg/L	0.036				-	-	26.8	-	-	23.7
	Manganese	µg/L		123 ¹²			433.884	0	-	161.288	286.818	115.2779
	Mercury	µg/L		0.07 ¹¹			0	0	-	0	0	181.1291
	Mercury (Filtered)	µg/L	0.01				-	-	<0.01	-	-	17.4719
	Nickel	µg/L		4 ¹³			0	0	-	0	0	-
	Nickel (Filtered)	µg/L	0.15				-	-	3.96	-	-	0
	Selenium	µg/L					0	0	-	0	0	0
	Selenium (Filtered)	µg/L	0.39				-	-	0.504	-	-	-
	Vanadium (Filtered)	µg/L	0.24				-	-	0.494	-	-	-
	Zinc	µg/L		10.9 ¹²			3.35	0	-	11.1	4.991	13.0681
	Zinc (Filtered)	µg/L	0.41				-	-	28.2	-	-	6.2858
	Potassium (Filtered)	mg/L	1				-	-	10.6	-	-	-
	Tin	µg/L		25 ¹⁶			0	0	-	0	0	0
	Chromium (hexavalent)	µg/L	30				-	-	-	-	-	-
Organics	Dissolved Organic Carbon	mg/L	3				-	-	10.9	-	-	-
Inorganics	Acidity	mg/L	4				-	-	14.6	-	-	-
	BOD	mg/L	1				-	-	-	-	-	-
	Sulphur	µg/L					-	-	-	-	-	-
	Sodium (Filtered)	mg/L	0.076				-	-	90.2	-	-	-
	Bromide	µg/L	20				-	-	623	-	-	-
	Chloride	mg/L	2				-	-	614	-	-	-
	Nitrate (as NO3-)	mg/L	0.3				-	-	0.364	-	-	-
	Nitrite (as NO2-)	mg/L	0.05				-	-	<0.05	-	-	-
	Ortho Phosphate as P	mg/L	0.02				-	-	<0.02	-	-	-
	Sulphide	mg/L	0.01				-	-	<0.01	-	-	-
	Alkalinity (total) as CaCO3	mg/L	2				-	-	175	-	-	-
	Hardness as CaCO3	mg/L					604.6	0	-	409.8	0	252.4
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				-	-	175	-	-	331.4
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				-	-	189	-	-	-
	Ammoniacal Nitrogen as N	mg/L	0.2				-	-	<0.2	-	-	-
	Sulphate (soluble)	mg/L	2				-	-	16.6	-	-	-
	COD	mg/L	7				-	-	44.8	-	-	-
	pH (Lab)	pH_Units	1				-	-	7.79	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	Cadoxton North Pond						
		Units				Well	-						
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	Cadoxton North Pond_18 Feb 15_	Cadoxton North Pond_08 Sep 15_	12577367	Cadoxton North Pond_23 Feb 16_	Cadoxton North Pond_03 Aug 16_	Cadoxton North Pond_07 Feb 17_	Cadoxton North Pond_01 Aug 17_
Other	Benzene acetic acid (TIC)	µg/L					-	-	-	-	-	-	-
	Dodecamethylcyclohexasiloxane	µg/L				0	0	0	0	0	0	0	0
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	methylsilanetriol	ppm				-	-	-	-	-	-	-	1.5
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	ethyl-dimethylsilanol	µg/L				-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L				-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L				-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-
	HexamethylDisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	-	0	0	0	0	0
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-
	Silicic Acid	ppm				-	-	-	-	-	-	-	6.8
	Trimethylsilanol	µg/L			124 ^{#8}	0	0	-	0	0	0	0	-
	Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-
	Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	-	-
	Volatile TIC					-	-	0	-	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L				0	0	-	0	0	0	0	0
	Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-
	Benzenesulfonamide, -methyl-	µg/L				-	-	-	-	-	-	-	-
	Unknown 2 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 2 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-
	Unknown 2 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-
	Unknown 2 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-

Comments

- #1 WFD England/Wales. 2015 - MAC-EQS Inland
 - #2 WFD England/Wales. 2015 - Freshwater Standards
 - #3 WFD England/Wales. 2015 - AA-EQS Inland
 - #4 Water Env1 Regs (Scotland) 2015, AA-EQS Inland
 - #5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
 - #6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
 - #7 PNEC (EU REACH) - Freshwater
 - #8 PNEC - data provided by Dow Corning
 - #9 Hardness - assumed value - data required.
- GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Cadoxton South Pond															
						Location															
						Well	Date	18/02/2015		08/09/2015		18/12/2015		23/02/2016		03/08/2016		07/02/2017		01/08/2017	
						Sample Type	SampleCode	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
								Cadoxton South Pond_18 Feb 15_-	Cadoxton South Pond_08 Sep 15_-	12677368	Cadoxton South Pond_23 Feb 16_-	Cadoxton South Pond_03 Aug 16_-	Cadoxton South Pond_07 Feb 17_-	Cadoxton South Pond_01 Aug 17_-							
TPH	GRO >C5-C12	µg/L	50			-	-	<50	-	-	-	-	-								
	>C5-C6 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C6-C8 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C8-C10 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C10-C12 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C12-C16 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C16-C21 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C16-C35 Aliphatics	µg/L				-	-	<20	-	-	-	-	-								
	>C21-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C12-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC5-EC7 Aromatics	µg/L	10	10 ¹³		-	-	<10	-	-	-	-	-								
	>EC7-EC8 Aromatics	µg/L	10	74 ¹²		-	-	<10	-	-	-	-	-								
	>EC8-EC10 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC10-EC12 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC12-EC16 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC16-EC21 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC21-EC35 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>EC12-EC35 Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	>C5-C35 Aliphatics & Aromatics	µg/L	10			-	-	<10	-	-	-	-	-								
	BTEX	Benzene	µg/L	1	10 ¹³		0	0	<1	0	0	0	0	0							
Toluene		µg/L	1	74 ¹²		0	0	<1	0	0	0	0	0								
Ethylbenzene		µg/L	1	20 ¹⁵		0	0	<1	0	0	0	0	0								
Xylene (m & p)		µg/L	1			-	-	<1	-	-	-	-	-								
Xylene (m)		µg/L				0	0	-	0	0	0	0	0								
Xylene (p)		µg/L				0	0	-	0	0	0	0	0								
Xylene Total		µg/L	2	30 ¹⁶		0	0	<2	0	0	0	0	0								
Xylene (o)		µg/L	1			0	0	<1	0	0	0	0	0								
Total BTEX		µg/L	28			0	0	<28	0	0	0	0	0								
Oxygenates	MTBE	µg/L	1	5,100 ¹⁷		-	-	<1	-	-	-	-	-								
	Tert Amyl Methyl Ether	µg/L	1	510 ¹⁷		-	-	<1	-	-	-	-	-								
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	-	<1	-	-	-	-	-								
	Vinyl chloride	µg/L	1			-	-	<1	-	-	-	-	-								
	Chloroethane	µg/L	1			-	-	<1	-	-	-	-	-								
	1,1-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	-								
	Dichloromethane	µg/L	3	20 ¹³		-	-	<3	-	-	-	-	-								
	trans-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,1-dichloroethane	µg/L	1			-	-	<1	-	-	-	-	-								
	cis-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	-								
	Chloroform	µg/L	1	2.6 ¹³		-	-	<1	-	-	-	-	-								
	1,1,1-trichloroethane	µg/L	1	100 ¹⁵		-	-	<1	-	-	-	-	-								
	Carbon tetrachloride	µg/L	1	12 ¹³		-	-	<1	-	-	-	-	-								
	Trichloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	-								
	1,1,2-trichloroethane	µg/L	1	400 ¹⁵		-	-	<1	-	-	-	-	-								
	Tetrachloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	-								
	Sum of PCE and TCE	µg/L				-	-	<2	-	-	-	-	-								
	TCE+DCE+VC	µg/L				-	-	<5	-	-	-	-	-								
	PCE+TCE+DCE+VC	µg/L				-	-	<6	-	-	-	-	-								
VOC	2,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	-								
	Bromochloromethane	µg/L	1			-	-	<1	-	-	-	-	-								
	1,1-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,2-dichloroethane	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	-								
	1,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	-								
	Dibromomethane	µg/L	1			-	-	<1	-	-	-	-	-								
	Bromodichloromethane	µg/L	1			-	-	<1	-	-	-	-	-								
	cis-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	-								
	trans-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,3-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	-								
	Chlorodibromomethane	µg/L	1			-	-	<1	-	-	-	-	-								
	1,1,1,2-tetrachloroethane	µg/L	1			-	-	<1	-	-	-	-	-								
	Styrene	µg/L	1	50 ¹⁶		-	-	<1	-	-	-	-	-								
	Bromoform	µg/L	1			-	-	<1	-	-	-	-	-								
	Isopropylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²		-	-	<1	-	-	-	-	-								
	1,2,3-trichloropropane	µg/L	1			-	-	<1	-	-	-	-	-								
	n-propylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,3,5-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	tert-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,2,4-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	sec-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	p-isopropyltoluene	µg/L	1			-	-	<1	-	-	-	-	-								
	n-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	-								
	1,2-dibromo-3-chloropropane	µg/L	1			-	-	<1	-	-	-	-	-								
	Hexachlorobutadiene	µg/L	1	0.6 ¹³		-	-	<1	-	-	-	-	-								
	1,2-Dichloroethene	µg/L				-	-	<2	-	-	-	-	-								
	Trihalomethanes	µg/L				-	-	<4	-	-	-	-	-								
	Cyclotrisiloxane, hexamethyl-	µg/L				-	-	-	-	-	-	-	-								
	Cyclotetrasiloxane, octamethyl-	µg/L				0	0	-	0	0	0	0	0								

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Cadoxton South Pond							
						Location							
						Well							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SampleCode		Cadoxton South Pond_18 Feb 15_	Cadoxton South Pond_08 Sep 15_	12677368	Cadoxton South Pond_23 Feb 16_	Cadoxton South Pond_03 Aug 16_	Cadoxton South Pond_07 Feb 17_	Cadoxton South Pond_01 Aug 17_					
PAH	Naphthalene	µg/L	1	2 ⁴³		-	-	<1	-	-	-	-	
	Acenaphthylene	µg/L	1			-	-	<1	-	-	-	-	
	Acenaphthene	µg/L	1			-	-	<1	-	-	-	-	
	Fluorene	µg/L	1			-	-	<1	-	-	-	-	
	Phenanthrene	µg/L	1			-	-	<1	-	-	-	-	
	Anthracene	µg/L	1	0.1 ⁴³		-	-	<1	-	-	-	-	
	Fluoranthene	µg/L	1	0.0063 ⁴³		-	-	<1	-	-	-	-	
	Pyrene	µg/L	1			-	-	<1	-	-	-	-	
	Benz(a)anthracene	µg/L	1			-	-	<1	-	-	-	-	
	Chrysene	µg/L	1			-	-	<1	-	-	-	-	
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³		-	-	<1	-	-	-	-	
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴		-	-	<1	-	-	-	-	
	Dibenz(a,h)anthracene	µg/L	1			-	-	<1	-	-	-	-	
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁴⁴		-	-	<1	-	-	-	-	
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	<1	-	-	-	-	
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	<1	-	-	-	-	
	Benzo(b)&(k)fluoranthene	µg/L				-	-	<2	-	-	-	-	
PAHs (sum of 4)	µg/L				-	-	<4	-	-	-	-		
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	<2	-	-	-	-		
Coal Tar (Bap as surrogate marker)	µg/L				-	-	<1	-	-	-	-		
SVOC	2-methylnaphthalene	µg/L	1			-	-	<1	-	-	-	-	
	4-bromophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	
	4-chlorophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	
	Azobenzene	µg/L	1			-	-	<1	-	-	-	-	
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	<1	-	-	-	-	
	Bis(2-chloroethyl)ether	µg/L	1			-	-	<1	-	-	-	-	
	Carbazole	µg/L	1			-	-	<1	-	-	-	-	
	Dibenzofuran	µg/L	1			-	-	<1	-	-	-	-	
	Hexachlorocyclopentadiene	µg/L	1			-	-	<1	-	-	-	-	
	Hexachloroethane	µg/L	1			-	-	<1	-	-	-	-	
	Bis(2-chloroisopropyl) ether	-				-	-	0	-	-	-	-	
	Phenolics	2-methylphenol	µg/L	1			-	-	<1	-	-	-	-
2-nitrophenol		µg/L	1			-	-	<1	-	-	-	-	
2,4-dimethylphenol		µg/L	1			-	-	<1	-	-	-	-	
4-chloro-3-methylphenol		µg/L	1	40 ⁴⁶		-	-	<1	-	-	-	-	
4-methylphenol		µg/L	1			-	-	<1	-	-	-	-	
4-nitrophenol		µg/L	1			-	-	<1	-	-	-	-	
Phenol		µg/L	1	7.7 ⁴²		-	-	<1	-	-	-	-	
2-chloronaphthalene		µg/L	1			-	-	<1	-	-	-	-	
PCBs	1,1-Biphenyl	-				-	-	0	-	-	-	-	
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	-	<1	-	-	-	-	
Anilines	Aniline	-				-	-	0	-	-	-	-	
	2-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	
	3-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	
	4-chloroaniline	µg/L	1			-	-	<1	-	-	-	-	
	4-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	
	2,6-dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	
	Nitrobenzene	µg/L	1			-	-	<1	-	-	-	-	
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	
	Chlorobenzene	µg/L	1			-	-	<1	-	-	-	-	
	Bromobenzene	µg/L	1			-	-	<1	-	-	-	-	
	2-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	
	4-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	
	1,3-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,4-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,2-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	
	Hexachlorobenzene	µg/L	1	0.05 ⁴¹		-	-	<1	-	-	-	-	
	Trichlorobenzene (total)	µg/L		0.4 ⁴³		-	-	<3	-	-	-	-	
	Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	<1	-	-	-	-
Bromomethane		µg/L	1			-	-	<1	-	-	-	-	
Trichlorofluoromethane		µg/L	1			-	-	<1	-	-	-	-	
1,2-dibromoethane		µg/L	1			-	-	<1	-	-	-	-	
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	0	-	-	-	-	
	2,6-dichlorophenol	-				-	-	0	-	-	-	-	
	2-chlorophenol	µg/L	1	50 ⁴⁶		-	-	<1	-	-	-	-	
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²		-	-	<1	-	-	-	-	
	2,4,5-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	
	2,4,6-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	
	Pentachlorophenol	µg/L	1	0.4 ⁴³		-	-	<1	-	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Cadoxton South Pond							
						Location							
						Well							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	SampleCode	Cadoxton South Pond_18 Feb 15_	Cadoxton South Pond_08 Sep 15_	12677368	Cadoxton South Pond_23 Feb 16_	Cadoxton South Pond_03 Aug 16_	Cadoxton South Pond_07 Feb 17_	Cadoxton South Pond_01 Aug 17_
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.9 ¹²		-	-	-	<2	-	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²		-	-	-	<1	-	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶		-	-	-	<1	-	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶		-	-	-	<5	-	-	-	-
	Diethylphthalate	µg/L	1	200 ¹⁶		-	-	-	<1	-	-	-	-
	Dimethyl phthalate	µg/L	1	800 ¹⁶		-	-	-	<1	-	-	-	-
Solvents	Carbon disulfide	µg/L	1			-	-	-	<1	-	-	-	-
	Isophorone	µg/L	1			-	-	-	<1	-	-	-	-
	Methanol	µg/L				0	0	-	-	0	0	0	0
Metals	Aluminium	µg/L		15 ¹⁶		431.636	0	-	36.402	108.929	59.0295	74.7035	
	Arsenic	µg/L		50 ¹²		0	0	-	0	0	0	4.9128	
	Arsenic (Filtered)	µg/L	0.12	50 ¹²		-	-	1.48	-	-	-	-	
	Barium (Filtered)	µg/L	0.03			-	-	165	-	-	-	-	
	Beryllium (Filtered)	µg/L	0.07			-	-	<0.07	-	-	-	-	
	Boron	µg/L		2,000 ¹⁶		197.133	0	-	175.398	287.292	178.7723	196.5582	
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶		0	-	210	-	-	-	-	
	Cadmium	µg/L		0.08 ¹³		0	0	-	0	0	0.5133	0	
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³		-	-	<0.1	-	-	-	-	
	Calcium	mg/L				109.4	0	-	126.9	0	79	91.6	
	Calcium (Filtered)	mg/L	0.012			-	-	257	-	-	-	-	
	Chromium (III+VI)	µg/L				0	0	-	0	0	0	0	
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	-	1.06	-	-	-	-	
	Copper	µg/L		1 ¹²	6 ¹⁶	0	0	-	5.32	2.582	3.6876	0	
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁶	-	-	2.1	-	-	-	-	
	Iron	µg/L		1,000 ¹²		421.843	0	-	169.406	512.842	192.9455	578.579	
	Iron (Filtered)	µg/L	19	1,000 ¹²		-	-	<19	-	-	-	-	
	Lead	µg/L		1.2 ¹³		0	0	-	0	0	5.4189	0	
	Lead (Filtered)	µg/L	0.02	1.2 ¹³		-	-	-	-	-	-	-	
	Magnesium	mg/L				23.4	0	-	0.089	20.1	27.3	18.6	23.9
	Magnesium (Filtered)	mg/L	0.036			-	-	26	-	-	-	-	
	Manganese	µg/L		120 ¹²		129.881	0	-	87.371	255.405	77.8869	344.3549	
	Mercury	µg/L		0.07 ¹⁴		1.9749	0	-	0	0	12.7637	9.3741	
	Mercury (Filtered)	µg/L	0.01	0.07 ¹⁴		-	-	<0.01	-	-	-	-	
	Nickel	µg/L		4 ¹³		0	0	-	0	0	0	0	
	Nickel (Filtered)	µg/L	0.15	4 ¹³		-	-	4.37	-	-	-	-	
	Selenium	µg/L				0	0	-	0	0	0	0	
	Selenium (Filtered)	µg/L	0.39			-	-	1.37	-	-	-	-	
	Vanadium (Filtered)	µg/L	0.24	20 ¹⁶		-	-	0.429	-	-	-	-	
	Zinc	µg/L		10.9 ¹²		5.563	0	-	6.747	6.941	13.5228	2.2389	
	Zinc (Filtered)	µg/L	0.41	10.9 ¹²		-	-	27.6	-	-	-	-	
	Potassium (Filtered)	mg/L	1			-	-	11.2	-	-	-	-	
	Tin	µg/L		25 ¹⁶		0	0	-	0	0	0	0	
	Chromium (hexavalent)	µg/L	30	3.4 ¹²		-	-	-	-	-	-	-	
Organics	Dissolved Organic Carbon	mg/L	3			-	-	-	10.7	-	-	-	
Inorganics	Acidity	mg/L	4			-	-	-	14.6	-	-	-	
	BOD	mg/L	1			-	-	-	-	-	-	-	
	Sulphur	µg/L				-	-	-	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076			-	-	-	83.6	-	-	-	
	Bromide	µg/L	20			-	-	-	1.190	-	-	-	
	Chloride	mg/L	2	250 ¹⁶		-	-	-	596	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3			-	-	-	1.25	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05			-	-	-	0.082	-	-	-	
	Ortho Phosphate as P	mg/L	0.02			-	-	-	<0.02	-	-	-	
	Sulphide	mg/L	0.01			-	-	-	<0.01	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2			-	-	-	190	-	-	-	
	Hardness as CaCO3	mg/L				369.7	0	-	399.8	0	273.8	327.1	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	-	-	190	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	-	-	200	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²		-	-	-	<0.2	-	-	-	
	Sulphate (soluble)	mg/L	2			-	-	-	23.7	-	-	-	
	COD	mg/L	7			-	-	-	46.4	-	-	-	
	pH (Lab)	pH_Units	1			-	-	-	7.95	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Cadoxton South Pond							
						Location							
						Well							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	07/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	Cadoxton South Pond_18 Feb 15_	Cadoxton South Pond_08 Sep 15_	12677368	Cadoxton South Pond_23 Feb 16_	Cadoxton South Pond_03 Aug 16_	Cadoxton South Pond_07 Feb 17_	Cadoxton South Pond_01 Aug 17_
Other		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC								
	Benzene acetic acid (TIC)	µg/L					-	-	-	-	-	-	-
	Dodecamethylcyclhexasiloxane	µg/L				0	0	-	0	0	0	0	
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	
	methylsilanetriol	ppm				-	-	-	-	-	-	-	
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	
	ethyl dimethylsilanol	µg/L					-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L					-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L					-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L					-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L					-	-	-	-	-	-	-
	Hexanoic Acid	mg/L					-	-	-	-	-	-	-
	Dioxa, -trisilacyclohexane, -hexamethyl-	µg/L					-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L					-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	-	0	0	0	0
	HexamethylDisiloxane	µg/L					-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L					-	-	-	-	-	-	-
	Silicic Acid	ppm					-	-	-	-	-	-	-
	Trimethylsilanol	µg/L				124 ^{ab}	0	0	-	0	0	0	0
	Trimethylsilanol isomer	µg/L					-	-	-	-	-	-	-
	Trimethylsilyl fluoride	µg/L					-	-	-	-	-	-	-
	Volatile TIC	-					-	-	0	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L					0	0	-	0	0	0	0
	Benzenepropanoic acid	µg/L					-	-	-	-	-	-	-
	Benzenesulfonamide, -methyl-	µg/L					-	-	-	-	-	-	-
	Unknown 2 SVOC_151219-32	µg/L					-	-	-	-	-	-	-
	Unknown 2 VOC_151219-32	µg/L					-	-	-	-	-	-	-
Unknown 2 VOC_151218-69	µg/L					-	-	-	-	-	-	-	
Unknown 2 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	

Comments

- #1 WFD England/Wales. 2015 - MAC-EQS Inland
- #2 WFD England/Wales. 2015 - Freshwater Standards
- #3 WFD England/Wales. 2015 - AA-EQS Inland
- #4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
- #5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
- #6 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
- #7 PNEC (EU REACH) - Freshwater
- #8 PNEC - data provided by Dow Corning
- #9 Hardness - assumed value - data required.
- GAC: Generic Assessment Criteria
- (blank): No assessment criteria available
- -: Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		CP1				CP1		CP1		CP1	CP1	CP2			CP2	
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	Date	d				d		d	m	m	s	d			d	
						Sample Type	29/09/2015	14/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	07/02/2017	22/02/2017	16/12/2015	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017
						SampleCode	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
TPH	GRO >C5-C12	µg/L	50			12156117		12651479	CP1_05 Aug 16d	CP1_07 Feb 17d	CP1_22 Feb 17d	CP1_01 Aug 17d	CP1_01 Aug 17d	12660938	CP1_07 Feb 17m	CP1_22 Feb 17m	12660937	12651482	CP2_05 Aug 16d	CP2_07 Feb 17d	CP2_22 Feb 17d	CP2_01 Aug 17d
	>C5-C6 Aliphatics	µg/L	10				<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C6-C8 Aliphatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C8-C10 Aliphatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C10-C12 Aliphatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C12-C16 Aliphatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C16-C21 Aliphatics	µg/L	10				17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C16-C35 Aliphatics	µg/L					205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C21-C35 Aliphatics	µg/L	10				188	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C12-C35 Aliphatics	µg/L	10				205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC5-EC7 Aromatics	µg/L	10	10 ¹³			<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC7-EC8 Aromatics	µg/L	10	74 ¹²			<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC8-EC10 Aromatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC10-EC12 Aromatics	µg/L	10				<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC12-EC16 Aromatics	µg/L	10				16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC16-EC21 Aromatics	µg/L	10				31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC21-EC35 Aromatics	µg/L	10				113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>EC12-EC35 Aromatics	µg/L	10				160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BTEX	Benzene	µg/L	1	10 ¹³			<1	-	0	0	-	-	0	-	0	-	-	-	0	0	-	-
	Toluene	µg/L	1	74 ¹²			<1	-	0	0	-	-	0	-	0	-	-	-	0	0	-	-
	Ethylbenzene	µg/L	1	20 ¹⁶			<1	-	0	0	-	-	0	-	0	-	-	4.791	0	-	-	-
	Xylene (m & p)	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (m)	µg/L					-	-	0	0	-	-	0	-	0	-	-	0	0	-	-	-
	Xylene (p)	µg/L					-	-	0	0	-	-	0	-	0	-	-	0	0	-	-	-
	Xylene Total	µg/L	2	30 ¹⁶			<2	-	0	0	-	-	0	-	0	-	-	0	0	-	-	-
	Xylene (o)	µg/L	1				<1	-	0	0	-	-	0	-	0	-	-	0	0	-	-	-
	Total BTEX	µg/L	28				<28	-	0	0	-	-	0	-	0	-	-	4.791	0	-	-	-
Oxygenates	MTBE	µg/L	1	5,100 ¹⁷			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert Amyl Methyl Ether	µg/L	1	510 ¹⁷			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vinyl chloride	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chloroethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dichloromethane	µg/L	3	20 ¹³			<3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloroethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chloroform	µg/L	1	2,6 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,1-trichloroethane	µg/L	1	100 ¹⁵			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbon tetrachloride	µg/L	1	12 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichloroethene	µg/L	1	10 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2-trichloroethane	µg/L	1	400 ¹⁶			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tetrachloroethene	µg/L	1	10 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sum of PCE and TCE	µg/L					<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TCE+DCE+VC	µg/L					<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PCE+TCE+DCE+VC	µg/L					<6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOC	2,2-dichloropropane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromochloromethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1-dichloropropene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloroethane	µg/L	1	10 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichloropropane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibromomethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromodichloromethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	cis-1,3-dichloropropene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	trans-1,3-dichloropropene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3-dichloropropane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorodibromomethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,1,2-tetrachloroethane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Styrene	µg/L	1	50 ¹⁶			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromoform	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Isopropylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-trichloropropane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	n-propylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3,5-trimethylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-butylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-trimethylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	sec-butylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	p-isopropyltoluene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	n-butylbenzene	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dibromo-3-chloropropane	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobutadiene	µg/L	1	0,6 ¹³			<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-Dichloroethene	µg/L					<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trihalomethanes	µg/L					<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclotetrasiloxane, octamethyl-	µg/L					-	-	0	0	-	-	0	-	0	-	-	1.76	0	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

	Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	CP1				GP1		CP1		CP1	GP1	CP2		CP2			
					Well	d				d	d	m	m	s	d		d				
					Date	29/09/2015	14/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	07/02/2017	22/02/2017	16/12/2015	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017
					Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SampleCode	12156117	12651479	CP1_05 Aug 16d	CP1_07 Feb 17d	CP1_22 Feb 17d	CP1_01 Aug 17d	CP1_01 Aug 17d	12660938	CP1_07 Feb 17m	CP1_22 Feb 17m	12660937	12651482	CP2_05 Aug 16d	CP2_07 Feb 17d	CP2_22 Feb 17d	CP2_01 Aug 17d					
PAH	Naphthalene	µg/L	1	2 ⁴³		<1	-	-	-	-	-	-	-	-	-	-	-	-			
	Acenaphthylene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Acenaphthene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Fluorene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Phenanthrene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Anthracene	µg/L	1	0.1 ⁴³		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Fluoranthene	µg/L	1	0.0063 ⁴³		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Pyrene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benz(a)anthracene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Chrysene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Dibenz(a,h)anthracene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(g,h,i)perylene	µg/L	1	0.0062 ⁴¹		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(b)&(k)fluoranthene	µg/L				<8	-	-	-	-	-	-	-	-	-	-	-	-			
PAHs (sum of 4)	µg/L				<16	-	-	-	-	-	-	-	-	-	-	-	-				
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				<8	-	-	-	-	-	-	-	-	-	-	-	-				
Coal Tar (Bap as surrogate marker)	µg/L				<4	-	-	-	-	-	-	-	-	-	-	-	-				
SVOC	2-methylnaphthalene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-bromophenyl phenyl ether	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chlorophenyl phenyl ether	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Azobenzene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Bis(2-chloroethoxy) methane	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Bis(2-chloroethyl)ether	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Carbazole	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Dibenzofuran	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachlorocyclopentadiene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachloroethane	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Bis(2-chloroisopropyl) ether	-				0	-	-	-	-	-	-	-	-	-	-	-	-			
Phenolics	2-methylphenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2-nitrophenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4-dimethylphenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chloro-3-methylphenol	µg/L	1	40 ⁴⁶		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-methylphenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-nitrophenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Phenol	µg/L	1	7.7 ⁴²		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2-chloronaphthalene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
PCBs	1,1-Biphenyl	-				0	-	-	-	-	-	-	-	-	-	-	-	-			
Amino Aliphatics																					
	N-nitrosodi-n-propylamine	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
Anilines																					
	Aniline	-				0	-	-	-	-	-	-	-	-	-	-	-	-			
	2-nitroaniline	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	3-nitroaniline	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chloroaniline	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
4-nitroaniline	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-				
Explosives																					
	2,4-Dinitrotoluene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2,6-dinitrotoluene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Nitrobenzene	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
Halogenated Benzenes																					
	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		<1	-	-	-	-	-	-	-	-	-	-	-	-			
	Chlorobenzene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	Bromobenzene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	2-chlorotoluene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chlorotoluene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	1,3-dichlorobenzene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	1,4-dichlorobenzene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2-dichlorobenzene	µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		<1	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		<1	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachlorobenzene	µg/L	1	0.05 ⁴³		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Trichlorobenzene (total)	µg/L		0.4 ⁴³		<3	-	-	-	-	-	-	-	-	-	-	-	-			
	Halogenated Hydrocarbons																				
Dichlorodifluoromethane		µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
Bromomethane		µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
Trichlorofluoromethane		µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
1,2-dibromoethane		µg/L	1			<1	-	-	-	-	-	-	-	-	-	-	-	-			
Halogenated Phenols																					
	2,3,4,6-tetrachlorophenol	-				0	-	-	-	-	-	-	-	-	-	-	-	-			
	2,6-dichlorophenol	µg/L	1	50 ⁴⁶		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²		<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4,5-trichlorophenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4,6-trichlorophenol	µg/L	1			<4	-	-	-	-	-	-	-	-	-	-	-	-			
	Pentachlorophenol	µg/L	1	0.4 ⁴³		<4	-	-	-	-	-	-	-	-	-	-	-	-			

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

							Location		CP1				CP1		CP1		CP1	CP1	CP2			CP2		
							Well		d				d	m		m	s			d		d		
							Date		29/09/2015	14/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	07/02/2017	22/02/2017	16/12/2015	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017
							Sample Type		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC		SampleCode		12156117	12651479	CP1_05 Aug 16d	CP1_07 Feb 17d	CP1_22 Feb 17d	CP1_01 Aug 17d	CP1_01 Aug 17d	12660938	CP1_07 Feb 17m	CP1_22 Feb 17m	12650937	12651482	CP2_05 Aug 16d	CP2_07 Feb 17d	CP2_22 Feb 17d	CP2_01 Aug 17d
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ^{d2}			59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ^{d2}			<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 th			<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 th			<20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Diethylphthalate	µg/L	1	200 th			<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dimethyl phthalate	µg/L	1	800 th			<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solvents	Carbon disulfide	µg/L	1				<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Isophorone	µg/L	1				<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methanol	µg/L					-	-	0	0	-	-	-	0	-	0	-	-	-	0	0	-	-	-
Metals	Aluminium	µg/L		15 th			-	-	0	0	-	-	-	0	-	0	-	-	-	0	0	-	-	-
	Arsenic	µg/L		50 ^{d2}			-	-	21.231	0	-	-	-	13.0627	-	0	-	-	-	18.471	0	-	-	-
	Arsenic (Filtered)	µg/L	0.12	50 ^{d2}			1.89	28.1	-	-	-	-	-	-	-	-	-	-	14.8	-	-	-	-	
	Barium (Filtered)	µg/L	0.03				201	103	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	
	Beryllium (Filtered)	µg/L	0.07				<0.07	<0.07	-	-	-	-	-	-	-	-	-	-	<0.07	-	-	-	-	
	Boron	µg/L		2,000 th			-	-	2,099	0	-	-	-	1,810	-	0	-	-	-	2,195	0	-	-	-
	Boron (Filtered)	µg/L	9.4	2,000 th			1,860	2,140	-	-	-	-	-	-	-	-	-	-	2,240	-	-	-	-	
	Cadmium	µg/L		0.08 ^{d3}			-	-	1,039	0	-	-	-	0	-	0	-	-	-	0	0	-	-	
	Cadmium (Filtered)	µg/L	0.1	0.08 ^{d3}			<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	
	Calcium	mg/L					160	174	180.1	0	-	-	-	161.6	-	0	-	-	-	1,226	0	-	-	
	Calcium (Filtered)	mg/L	0.012				-	-	0	0	-	-	-	-	-	0	-	-	-	1,280	-	-	-	
	Chromium (II+VI)	µg/L					8.85	4.02	-	-	-	-	-	0	-	0	-	-	-	0	0	-	-	
	Chromium (III+VI) (Filtered)	µg/L	0.22				-	-	0	0	-	-	-	0	-	0	-	-	-	0	0	-	-	
	Copper	µg/L		1 ^{d2}	6 th		<0.85	1.49	-	-	-	-	-	-	-	-	-	-	-	4.57	-	-	-	-
	Copper (Filtered)	µg/L	0.85	1 ^{d2}	6 th		-	-	2,731	0	-	-	-	3,223	-	0	-	-	-	-	12,631	0	-	-
	Iron	µg/L		1,000 ^{d2}			<190	2,800	-	-	-	-	-	-	-	-	-	-	-	11,700	-	-	-	-
	Iron (Filtered)	µg/L	19	1,000 ^{d2}			-	-	0	0	-	-	-	0	-	0	-	-	-	0	0	-	-	-
	Lead	µg/L		1.2 ^{d3}			0.06	0.165	-	-	-	-	-	-	-	-	-	-	-	0.254	0	-	-	-
	Lead (Filtered)	µg/L	0.02	1.2 ^{d3}			291	389	266.9	0	-	-	-	140.7	-	0	-	-	-	339	0	-	-	-
	Magnesium	mg/L					-	-	2,403	0	-	-	-	2,460	-	0	-	-	-	732	-	-	-	-
	Magnesium (Filtered)	mg/L	0.036				-	-	43,176	0	-	-	-	0	-	0	-	-	-	2,792	0	-	-	-
	Manganese	µg/L		12 ^{d2}			<0.01	<0.01	-	-	-	-	-	-	<0.01	-	-	<0.01	<0.01	-	-	-	-	-
	Mercury	µg/L		0.07 ^{d1}			-	-	0	0	-	-	-	0	-	0	-	-	-	3,233	0	-	-	-
	Mercury (Filtered)	µg/L	0.01	0.07 ^{d1}			-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nickel	µg/L		4 ^{d3}			3.37	4.89	-	-	-	-	-	-	-	-	-	-	-	20.8	-	-	-	-
	Nickel (Filtered)	µg/L	0.15	4 ^{d3}			-	-	0	0	-	-	-	0	-	0	-	-	-	0	0	-	-	-
	Selenium	µg/L					<0.39	30.4	-	-	-	-	-	-	-	-	-	-	-	18.5	-	-	-	-
	Selenium (Filtered)	µg/L	0.39				5.38	0.967	-	-	-	-	-	-	-	-	-	-	-	0.274	-	-	-	-
	Vanadium (Filtered)	µg/L	0.24	20 th			<0.41	2.84	3,584	0	-	-	-	1,9707	-	0	-	-	-	-	3,301	0	-	-
	Zinc	µg/L		10.9 ^{d2}			126	164	-	-	-	-	-	-	-	-	-	-	-	273	-	-	-	-
	Zinc (Filtered)	µg/L	0.41	10.9 ^{d2}			-	-	0	0	-	-	-	0	-	0	-	-	-	-	0	0	-	-
	Potassium (Filtered)	mg/L	1				<30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tin	µg/L		25 th																				
	Chromium (hexavalent)	µg/L	30	3.4 ^{d2}																				
Organics	Dissolved Organic Carbon	mg/L	3				13.7	9.78	-	-	-	-	-	-	-	-	-	-	6.74	-	-	-	-	
Inorganics	Acidity	mg/L	4				-	49.3	-	-	-	-	-	-	-	-	-	-	40.2	-	-	-	-	
	BOD	mg/L	1				4.78	<1	-	-	-	-	-	-	-	6.67	-	-	<5	<1	-	-	-	
	Sulphur	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076				3,170	3,830	-	-	-	-	-	-	-	-	-	-	-	4,160	-	-	-	
	Bromide	µg/L	20				13,900	26,500	-	-	-	-	-	-	-	14,900	-	-	10,800	29,600	-	-	-	
	Chloride	mg/L	2	250 th			5,410	6,770	-	-	-	-	-	-	-	3,660	-	-	2,620	11,700	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3				<0.3	<0.3	-	-	-	-	-	-	-	<0.3	-	-	<0.3	<0.3	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05				<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	0.112	<0.05	-	-	-	
	Ortho Phosphate as P	mg/L	0.02				0.665	1.67	-	-	-	-	-	-	-	0.0698	-	-	0.134	<0.02	-	-	-	
	Sulphide	mg/L	0.01				0.025	<0.01	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2				1,230	1,020	-	-	-	-	-	-	-	-	-	-	-	525	-	-	-	
	Hardness as CaCO3	mg/L					-	-	1,549	0	-	-	-	982.9	-	0	-	-	-	-	4,457	0	-	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				1,230	880	-	-	-	-	-	-	-	-	-	-	-	525	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ^{d2}			7.56	11.2	-	-	-	-	-	-	-	8.07	-	-	5.67	12.8	-	-	-	
	Sulphate (soluble)	mg/L	2				476	559	-	-	-	-	-	-	-	269	-	-	499	376	-	-	-	
	COD	mg/L	7				746	263	-	-	-	-	-	-	-	583	-	-	233	366	-	-	-	
	pH (Lab)	pH_Units	1				7.6	7.95	-	-	-	-	-	-	-	-	-	-	-	7.45	-	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		CP1				CP1		CP1		CP1	CP1	CP2			CP2			
			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well		d				d		d	m		m	s	d			d		
		Date						29/09/2015	14/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	07/02/2017	22/02/2017	16/12/2015	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	
		Sample Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
		SampleCode						12156117	12651479	CP1_05 Aug 16d	CP1_07 Feb 17d	CP1_22 Feb 17d	CP1_01 Aug 17d	CP1_01 Aug 17d	12680938	CP1_07 Feb 17m	CP1_22 Feb 17m	12680937	12651482	CP2_05 Aug 16d	CP2_07 Feb 17d	CP2_22 Feb 17d	CP2_01 Aug 17d	
Other	Benzene acetic acid (TIC)	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dodecamethylcyclohexasiloxane	µg/L						-	-	0	0	-	-	0	-	0	-	-	-	0	0	-	-	
	Unknown 5 VOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methylsilanetriol	ppm						-	-	-	-	0	0	-	-	-	0	-	-	-	-	2.3	2	
	Unknown 1 SVOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 5 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	ethyltrimethylsilanol	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDisilazane, Bis(trimethylsilyl)amine	µg/L							-	-	0	0	-	-	0	-	0	-	-	-	0	0	-	-
	HexamethylDisiloxane	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm							-	-	-	-	7.4	10.9	-	-	-	3.1	-	-	-	-	15.7	21.1
	Trimethylsilanol	µg/L				124 [#]			-	-	0	0	-	-	0	-	0	-	-	-	2,000	0	-	-
	Trimethylsilanol isomer	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilyl fluoride	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Volatile TIC	-							0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L							-	-	0	0	-	-	0	-	0	-	-	-	0	0	-	-
	Benzenepropanoic acid	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzenesulfonamide, -methyl-	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 SVOC_151219-32	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 VOC_151219-32	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 VOC_151218-69	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unknown 2 SVOC_151218-69	µg/L							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Comments
#1 WFD England/Wales. 2015 - MAC-EQS Inland
#2 WFD England/Wales. 2015 - Freshwater Standards
#3 WFD England/Wales. 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- -: Not analysed

Key
XXX Exceedance of GAC Protective of Fresh Water Receptor
XXX Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	CP2				CP2		CP2		CP2		CP2		
						Well	d		m		m		s		s		s		
						Date	01/08/2017	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	CP2_01 Aug 17s	12660939	CP2_05 Aug 16m	CP2_07 Feb 17m	CP2_22 Feb 17m	CP2_01 Aug 17m	CP2_01 Aug 17m	12660942	CP2_05 Aug 16s	CP2_07 Feb 17s	CP2_22 Feb 17s	CP2_01 Aug 17s	CP2_01 Aug 17s
TPH	GRO >C5-C12	µg/L	50				-	-	-	-	-	-	-	-	-	-	-	-	
	>C5-C6 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C6-C8 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C8-C10 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C10-C12 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C12-C16 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C16-C21 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C16-C35 Aliphatics	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
	>C21-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C12-C35 Aliphatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC5-EC7 Aromatics	µg/L	10	10 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	>EC7-EC8 Aromatics	µg/L	10	74 ¹²			-	-	-	-	-	-	-	-	-	-	-	-	
	>EC8-EC10 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC10-EC12 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC12-EC16 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC16-EC21 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC21-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>EC12-EC35 Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-	-	-	-	-	-	-	-	-	-	-	-	
	BTEX	Benzene	µg/L	1	10 ¹³			0	-	0	0	-	-	0	-	0	0	-	0
Toluene		µg/L		74 ¹²			0	-	0	0	-	-	0	-	0	0	-	0	
Ethylbenzene		µg/L	1	20 ¹⁶			0	-	4.282	0	-	-	0	-	3.772	0	-	0	
Xylene (m & p)		µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
Xylene (m)		µg/L					0	-	0	0	-	-	0	-	0	0	-	0	
Xylene (p)		µg/L					3.995	-	0	0	-	-	4.325	-	0	0	-	5.242	
Xylene Total		µg/L	2	30 ¹⁶			5.68	-	0	0	-	-	6.359	-	0	0	-	7.544	
Xylene (o)		µg/L	1				1.685	-	0	0	-	-	2.034	-	0	0	-	2.302	
Total BTEX	µg/L	28				5.68	-	4.282	0	-	-	6.359	-	3.772	0	-	7.544		
Oxygenates	MTBE	µg/L	1	5,100 ¹⁷			-	-	-	-	-	-	-	-	-	-	-	-	
	Terf Amyl Methyl Ether	µg/L	1	510 ¹⁷			-	-	-	-	-	-	-	-	-	-	-	-	
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Vinyl chloride	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Chloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,1-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Dichloromethane	µg/L	3	20 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	trans-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,1-dichloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	cis-1,2-dichloroethene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Chloroform	µg/L	1	2.6 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	1,1,1-trichloroethane	µg/L	1	100 ¹⁶			-	-	-	-	-	-	-	-	-	-	-	-	
	Carbon tetrachloride	µg/L	1	12 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	Trichloroethene	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	1,1,2-trichloroethane	µg/L	1	400 ¹⁶			-	-	-	-	-	-	-	-	-	-	-	-	
	Tetrachloroethene	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	Sum of PCE and TCE	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
	TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
PCE+TCE+DCE+VC	µg/L					-	-	-	-	-	-	-	-	-	-	-	-		
VOC	2,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Bromochloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,1-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,2-dichloroethane	µg/L	1	10 ¹³			-	-	-	-	-	-	-	-	-	-	-	-	
	1,2-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Dibromomethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Bromodichloromethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	cis-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	trans-1,3-dichloropropene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,3-dichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Chlorodibromomethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,1,1,2-tetrachloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Styrene	µg/L	1	50 ¹⁶			-	-	-	-	-	-	-	-	-	-	-	-	
	Bromoform	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Isopropylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²			-	-	-	-	-	-	-	-	-	-	-	-	
	1,2,3-trichloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	n-propylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,3,5-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	tert-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,2,4-trimethylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	sec-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	p-isopropyltoluene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	n-butylbenzene	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	1,2-dibromo-3-chloropropane	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	
	Hexachlorobutadiene	µg/L	1	0.6 ¹¹			-	-	-	-	-	-	-	-	-	-	-	-	
	1,2-Dichloroethene	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
	Trihalomethanes	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	
Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-		
Cyclotetrasiloxane, octamethyl-	µg/L					0	-	0	0	-	-	0	-	0	0	-	0		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location	CP2				CP2		CP2				CP2		CP2
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	d	m			m		m	s			s		s
						Date	01/08/2017	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						Sample Code	CP2_01 Aug 17s...	1260939	CP2_05 Aug 16m...	CP2_07 Feb 17m...	CP2_22 Feb 17m...	CP2_01 Aug 17m...	CP2_01 Aug 17m...	1260942	CP2_05 Aug 16s...	CP2_07 Feb 17s...	CP2_22 Feb 17s...	CP2_01 Aug 17s...	CP2_01 Aug 17s...
PAH	Naphthalene	µg/L	1	2 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	µg/L	1	0.1 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	µg/L	1	0.0063 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁴¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PAHs (sum of 4)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coal Tar (Bap as surrogate marker)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOC	2-methylnaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-bromophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chlorophenyl phenyl ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Azobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bis(2-chloroethyl)ether	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carbazole	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenzofuran	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorocyclopentadiene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenolics	Bis(2-chloroisopropyl) ether	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dimethylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	µg/L	1	40 ⁴⁶		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-methylphenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenol	µg/L	1	7.7 ⁴²		-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs	2-chloronaphthalene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Biphenyl		-				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anilines	Aniline	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitroaniline	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dinitrotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chlorotoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,3-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,4-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dichlorobenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	µg/L	1	0.05 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorobenzene (total)	µg/L		0.4 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bromomethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trichlorofluoromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,2-dibromoethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dichlorophenol	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	µg/L	1	50 ⁴⁶		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,5-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	µg/L	1	0.4 ⁴³		-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	CP2				CP2	CP2		CP2			CP2	CP2	
						Well	d		m		m		s		s			s	
						Date	01/08/2017	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	CP2_01 Aug 17s	12605939	CP2_05 Aug 16m	CP2_07 Feb 17m	CP2_22 Feb 17m	CP2_01 Aug 17m	CP2_01 Aug 17m	12605942	CP2_05 Aug 16s	CP2_07 Feb 17s	CP2_22 Feb 17s	CP2_01 Aug 17s	CP2_01 Aug 17s
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³		-	-	-	-	-	-	-	-	-	-	-	-		
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²		-	-	-	-	-	-	-	-	-	-	-	-		
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶		-	-	-	-	-	-	-	-	-	-	-	-		
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶		-	-	-	-	-	-	-	-	-	-	-	-		
	Diethylphthalate	µg/L	1	200 ¹⁶		-	-	-	-	-	-	-	-	-	-	-	-		
	Dimethyl phthalate	µg/L	1	800 ¹⁶		-	-	-	-	-	-	-	-	-	-	-	-		
Solvents	Carbon disulfide	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Isophorone	µg/L	1			-	-	-	-	-	-	-	-	-	-	-	-		
	Methanol	µg/L				0	-	0	0	-	-	0	-	0	0	-	0		
Metals	Aluminium	µg/L		15 ¹⁶		0	-	0	0	-	-	0	-	0	0	-	-	0	
	Arsenic	µg/L		50 ¹²		0	-	0	0	-	-	11.6991	-	0	0	-	-	0	
	Arsenic (Filtered)	µg/L	0.12	50 ¹²		-	13.7	-	-	-	-	-	-	15.7	-	-	-	-	
	Barium (Filtered)	µg/L	0.03			-	189	-	-	-	-	-	-	185	-	-	-	-	
	Beryllium (Filtered)	µg/L	0.07			-	<0.07	-	-	-	-	-	-	0.157	-	-	-	-	
	Boron	µg/L		2,000 ¹⁶		1,941	-	622.494	0	-	-	1,807	-	2,329	0	-	-	1,772	
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶		-	2,030	-	-	-	-	-	-	212	-	-	-	-	
	Cadmium	µg/L		0.08 ¹³		0	-	0	0	-	-	0	-	0	0	-	-	0	
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³		-	<0.1	-	-	-	-	-	-	0.166	-	-	-	-	
	Calcium	mg/L				1,110	-	574	0	-	-	1,168	-	1,150	0	-	-	1,105	
	Calcium (Filtered)	mg/L	0.012			-	1,400	-	-	-	-	-	-	226	-	-	-	-	
	Chromium (III+VI)	µg/L				2,6589	-	0	0	-	-	4,9419	-	0	0	-	-	0	
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	4.49	-	-	-	-	-	-	7.45	-	-	-	-	
	Copper	µg/L		1 ¹²	6 ¹⁶	0	-	0	0	-	-	0	-	0	0	-	-	0	
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁶	-	5.07	-	-	-	-	-	-	15.5	-	-	-	-	
	Iron	µg/L		1,000 ¹²		8,598	-	169.704	0	-	-	12.090	-	9,291	0	-	-	2,698	
	Iron (Filtered)	µg/L	19	1,000 ¹²		-	14,100	-	-	-	-	-	-	4,140	-	-	-	-	
	Lead	µg/L		1.2 ¹³		10.7323	-	0	0	-	-	10.9903	-	0	0	-	-	9.7991	
	Lead (Filtered)	µg/L	0.02	1.2 ¹³		-	0.71	-	-	-	-	-	-	12.2	-	-	-	-	
	Magnesium	mg/L				156.7	-	303.1	0	-	-	153.6	-	349.6	0	-	-	156.9	
	Magnesium (Filtered)	mg/L	0.036			-	774	-	-	-	-	-	-	238	-	-	-	-	
	Manganese	µg/L		123 ¹²		2,351	-	3,657	0	-	-	2,530	-	2,571	0	-	-	2,727	
	Mercury	µg/L		0.07 ¹³		0	-	9.387	0	-	-	0	-	15.379	0	-	-	0	
	Mercury (Filtered)	µg/L	0.01	0.07 ¹³		-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	-	
	Nickel	µg/L		4 ¹³		0	-	3.878	0	-	-	0	-	0	0	-	-	16.8245	
	Nickel (Filtered)	µg/L	0.15	4 ¹³		-	15.7	-	-	-	-	-	-	12.4	-	-	-	-	
	Selenium	µg/L				0	-	0	0	-	-	0	-	0	0	-	-	0	
Selenium (Filtered)	µg/L	0.39			-	14.3	-	-	-	-	-	-	37.6	-	-	-	-		
Vanadium (Filtered)	µg/L	0.24	20 ¹⁶		-	<0.24	-	-	-	-	-	-	10.6	-	-	-	-		
Zinc	µg/L		10.9 ¹³		2,105	-	4,346	0	-	-	1,6877	-	3,583	0	-	-	8.2277		
Zinc (Filtered)	µg/L	0.41	10.9 ¹³		-	2.19	-	-	-	-	-	-	32.4	-	-	-	-		
Potassium (Filtered)	mg/L	1			-	280	-	-	-	-	-	-	92.3	-	-	-	-		
Tin	µg/L		25 ¹⁶		0	-	0	0	-	-	0	-	0	0	-	-	0		
Chromium (hexavalent)	µg/L	30	3.4 ¹²		-	-	-	-	-	-	-	-	-	-	-	-	-		
Organics	Dissolved Organic Carbon	mg/L	3			-	8.11	-	-	-	-	-	-	14.6	-	-	-	-	
Inorganics	Acidity	mg/L	4			-	45.6	-	-	-	-	-	-	49.3	-	-	-	-	
	BOD	mg/L	1			-	<1	-	-	-	-	-	-	<1	-	-	-	-	
	Sulphur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076			-	4,590	-	-	-	-	-	-	3,480	-	-	-	-	
	Bromide	µg/L	20			-	29,200	-	-	-	-	-	-	16,100	-	-	-	-	
	Chloride	mg/L	2	250 ¹⁶		-	11,700	-	-	-	-	-	-	6,030	-	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3			-	<0.3	-	-	-	-	-	-	<0.3	-	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05			-	<0.05	-	-	-	-	-	-	<0.05	-	-	-	-	
	Ortho Phosphate as P	mg/L	0.02			-	<0.02	-	-	-	-	-	-	<0.02	-	-	-	-	
	Sulphide	mg/L	0.01			-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2			-	505	-	-	-	-	-	-	455	-	-	-	-	
	Hardness as CaCO3	mg/L				3,418	-	2,682	0	-	-	3,548	-	4,310	0	-	-	3,404	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	505	-	-	-	-	-	-	455	-	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	525	-	-	-	-	-	-	470	-	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²		-	12.7	-	-	-	-	-	-	1.6	-	-	-	-	
	Sulphate (soluble)	mg/L	2			-	345	-	-	-	-	-	-	637	-	-	-	-	
	COD	mg/L	7			-	380	-	-	-	-	-	-	626	-	-	-	-	
	pH (Lab)	pH_Units	1			-	7.53	-	-	-	-	-	-	7.77	-	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	CP2				CP2		CP2				CP2		CP2	
						Well	m				m		s				s		s	
						Date	01/08/2017	15/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	16/12/2015	05/08/2016	07/02/2017	22/02/2017	01/08/2017	01/08/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						SampleCode	CP2_01 Aug 17s_	12605939	CP2_05 Aug 16m_	CP2_07 Feb 17m_	CP2_22 Feb 17m_	CP2_01 Aug 17m_	CP2_01 Aug 17m_	12605942	CP2_05 Aug 16s_	CP2_07 Feb 17s_	CP2_22 Feb 17s_	CP2_01 Aug 17s_	CP2_01 Aug 17s_	
Other	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dodecamethylcyclohexasiloxane	µg/L				0	-	0	0	-	-	0	-	0	-	-	-	0		
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	methylsilanetriol	ppm				-	-	-	-	3	4.3	-	-	-	-	2.6	4	-		
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	ethyl dimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Cyclic octaatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Dioxo-, trisilacyclohexane, -hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	-	0	0	-	-	0	-	0	0	-	-	0		
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Silicic Acid	ppm				-	-	-	-	21	31.1	-	-	-	-	12.3	29.6	-		
	Trimethylsilanol	µg/L			124 ¹⁸	1,830	-	1,890	0	-	-	2,140	-	1,650	0	-	-	1,850		
	Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Volatile TIC	-				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Decamethylcyclopentasiloxane	µg/L				0	-	0	0	-	-	0	-	0	0	-	-	0		
	Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Benzenesulfonamide, -methyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 2 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 2 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
	Unknown 2 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-		
Unknown 2 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-			

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	XXX	Exceedance of GAC Protective of Fresh Water Receptor
	XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

[illegible]

Table E2
Water Analytical Results
Landfill Assessment
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[illegible]

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

				GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E1																														
							Well Date	d										m										s									
								18/02/2015		08/09/2015		16/12/2015		23/03/2016		03/08/2016		06/02/2017		31/07/2017		18/02/2015		08/09/2015		16/12/2015		23/03/2016		03/08/2016		06/02/2017		31/07/2017			
								Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
								Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	Sample Type	
Units	Method	Detection Limit				E1_18 Feb 15d	E1_08 Sep 15d	E1_16 Dec 15d	E1_23 Mar 16d	E1_03 Aug 16d	E1_06 Feb 17d	E1_31 Jul 17d	E1_18 Feb 15m	E1_08 Sep 15m	E1_16 Dec 15m	E1_23 Feb 16m	E1_03 Aug 16m	E1_06 Feb 17m	E1_31 Jul 17m	E1_18 Feb 15s	E1_08 Sep 15s	E1_16 Dec 15s	E1_23 Feb 16s	E1_03 Aug 16s	E1_06 Feb 17s	E1_31 Jul 17s											
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.9 ^{E2}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
	Butyl benzyl phthalate	µg/L	1	7.5 ^{E2}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Di-n-butyl phthalate	µg/L	1	8 ^{E6}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Di-n-octyl phthalate	µg/L	5	20 ^{E6}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Diethylphthalate	µg/L	1	200 ^{E6}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Dimethyl phthalate	µg/L	1	800 ^{E6}			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Solvents	Carbon disulfide	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Isophorone	µg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Methanol	µg/L				0	0	-	0	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0										
Metals	Aluminium	µg/L		15 ^{E6}			0	0	-	0	0	0	0	2.548	142.344	-	271.248	0	0	4.2592	0	0	-	0	0	0	0	0									
	Arsenic	µg/L		50 ^{E2}			0	0	-	0	0	10.6538	10.3437	27.1079	51.8058	-	47.496	35.721	39.9907	40.02	35.1553	44.2403	-	31.939	19.224	23.5787	32.5722										
	Arsenic (Filtered)	µg/L	0.12	50 ^{E2}			-	-	6.04	-	-	-	-	-	-	55.7	-	-	-	-	-	-	44.6	-	-	-	-										
	Barium (Filtered)	µg/L	0.03				-	-	91.6	-	-	-	-	-	-	775	-	-	-	-	-	-	988	-	-	-	-										
	Beryllium (Filtered)	µg/L	0.07				-	-	<0.07	-	-	-	-	-	-	<0.07	-	-	-	-	-	-	<0.07	-	-	-	-										
	Boron	µg/L		2,000 ^{E6}			153.451	201.82	-	159.084	158.977	154.4271	152.6147	1,761	1,522	-	1,116	1,538	1,375	1,363	1,364	1,291	-	1,577	1,742	1,596	1,316										
	Boron (Filtered)	µg/L	9.4	2,000 ^{E6}			-	-	138	-	-	-	-	-	-	1,100	-	-	-	-	-	-	1,210	-	-	-	0										
	Cadmium	µg/L		0.08 ^{E3}			0	0	-	0	0	1.3843	0	0.737	1.5379	-	0	0.978	1.6233	0	0.8271	1.4877	-	0	0.639	4.4646	0										
	Cadmium (Filtered)	µg/L	0.1	0.08 ^{E3}			-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-										
	Calcium	mg/L				190.8	197.9	-	223	214.7	217.7	161.3	196.2	180.2	125.5	-	87.4	0	98.8	124	125.4	107.8	-	134.7	240.7	168.5	135.9										
	Calcium (Filtered)	mg/L	0.012			-	-	-	-	-	-	-	-	-	-	139	-	-	-	-	-	-	171	-	-	-	-										
	Chromium (III+VI)	µg/L				0	0	-	0	0	0	0	0	6.048	3.896	-	10.69	3.245	14.0195	8.1098	4.86	3.399	-	12.624	0	13.0647	6.2316										
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	-	-	2.3	-	-	-	-	-	-	7.43	-	-	-	-	-	-	8.74	-	-	-	-										
	Copper	µg/L		1 ^{E2}		6 ^{E6}	0	0	-	3.925	2.952	0	0	0	39.272	-	66.176	0	0	0	0	0	17.948	-	0	0	0	0									
	Copper (Filtered)	µg/L	0.85	1 ^{E2}		6 ^{E6}	-	-	-	1.54	-	-	-	-	-	1.05	-	-	-	-	-	-	<0.85	-	0	0	0	0									
	Iron	µg/L		1,000 ^{E2}			28.566	171.506	-	38.794	0	1,760	1,171	23,220	10,859	-	11,671	15,443	18,037	16,009	15,639	9,449	-	16,604	19,878	18,165	11,971										
	Iron (Filtered)	µg/L	19	1,000 ^{E2}			-	-	-	19.6	-	-	-	-	-	14,000	-	-	-	-	-	-	20,300	-	-	-	-	-									
	Lead	µg/L		1 ^{E3}			0	0	-	0	0	3.205	0	0	8.5621	-	10.798	0	6.6173	0	0	0	-	0	0	10.8638	0										
	Lead (Filtered)	µg/L	0.02	1 ^{E3}			-	-	-	0.286	-	-	-	-	-	0.197	-	-	-	-	-	-	0.21	-	0	0	10.8638	0									
	Magnesium	mg/L				129.6	132	-	160	127.7	134.4	87.4	95.9	190.3	94.2	-	57.1	87.5	63.2	74.8	90.8	78	-	104.7	240.5	130.1	93.1										
	Magnesium (Filtered)	mg/L	0.036			5.99	43.528	-	13.13	4.404	48.7934	21.7929	1,697	882.828	-	605.917	931.831	774.0648	911.0035	961.449	743.786	-	1,056	1,637	1,262	897.4429											
	Mercury	µg/L		0.07 ^{E1}		0	3.5309	-	0	0	19.8571	0	0	6.8417	0	0	0	0	9.0676	0	0	41.5247	-	0	0	17.8759	3.6907										
	Mercury (Filtered)	µg/L	0.01	0.07 ^{E1}		-	-	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	-	-	-	<0.01	-	-	-	-	-									
	Nickel	µg/L		4 ^{E3}		0	0.923	-	0	0	0	0	0	0	3.832	-	4.886	0	0	0	0	2.243	-	0	0	0	0										
	Nickel (Filtered)	µg/L	0.15	4 ^{E3}		-	-	-	3.66	-	-	-	-	-	-	3.3	-	-	-	-	-	-	3.1	-	-	-	-										
	Selenium	µg/L				0	0	-	0	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0										
	Selenium (Filtered)	µg/L	0.39			-	-	-	12.6	-	-	-	-	-	-	27.9	-	-	-	-	-	-	34.9	-	-	-	-										
	Vanadium (Filtered)	µg/L	0.24		20 ^{E6}			-	1.6	-	-	-	-	-	-	3.3	-	-	-	-	-	-	3.01	-	-	-	-										
	Zinc	µg/L			3.129	4.509	-	4.961	2.582	5.0374	0.5641	2.514	34.817	-	1.47	-	34.888	2.975	8.1134	5.1145	4.027	34.12	-	0.564	-	-	-										
	Zinc (Filtered)	µg/L	0.41		-	-	-	-	1.42	-	-	-	-	-	-	34.7	-	-	-	-	-	-	59.1	-	-	-	-										
	Potassium (Filtered)	mg/L	1		-	-	-	-	24.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
	Tin	µg/L		25 ^{E6}		0	0	-	0	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	2.4435										
	Chromium (hexavalent)	µg/L	30		3.4 ^{E2}		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Organics	Dissolved Organic Carbon	mg/L	3			-	-	<3	-	-	-	-	-	-	20.8	-	-	-	-	-	-	-	20.3	-	-	-	-										
Inorganics	Acidity	mg/L	4			-	-	18.3	-	-	-	-	-	-	29.2	-	-	-	-	-	-	34.7	-	-	-	-											
	BOD	mg/L	1			-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-											
	Sulphur	µg/L				-	-	925	-	-	-	-	-	-	-	707	-	-	-	-	-	-	1,230	-	-	-											
	Sodium (Filtered)	mg/L	0.076			-	-	8,050	-	-	-	-	-	-	-	8,790	-	-	-	-	-	-	12,400	-	-	-											
	Bromide	µg/L	20			-	-	2,090	-	-	-	-	-	-	-	1,060	-	-	-	-	-	-	2,270	-	-	-											
	Chloride	mg/L	2		250 ^{E6}		-	-	1.87	-	-	-	-	-	-	<0.3	-	-	-	-	-	-	<0.3	-	-	-											
	Nitrate (as NO3-)	mg/L	0.3			-	-	<0.05	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	-	-	-											
	Nitrite (as NO2-)	mg/L	0.05			-	-	0.0323	-	-	-	-	-	-	<0.02	-	-	-	-	-	-	<0.02	-	-	-	-											
	Ortho Phosphate as P	mg/L	0.02			-	-	<0.01	-	-	-	-	-	-	0.305	-	-	-	-	-	-	<0.01	-	-	-	-											
	Sulphide	mg/L	0.01			-	-	320	-	-	-	-	-	-	810	-	-	-	-	-	-	900	-	-	-	-											
	Alkalinity (total) as CaCO3	mg/L	2			1.010	1.038	-	1.062	1.097	762.7	884.9	1,234	701.3	-	453.4	0	506.8	617.7	687.1	590.5	-	767.3	1,591	956.3	722.7											
	Hardness as CaCO3	mg/L			-	-	-	320	-	-	-	-	-	-	810	-	-	-	-	-	-	900	-	-	-	-											
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	-	320	-	-	-	-	-	-	800	-	-	-	-	-	-	905	-	-	-	-											
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	-	<0.2	-	-	-	-	-	-	2.86	-	-	-	-	-	-	5.45	-	-	-	-											
	Ammoniacal Nitrogen as N	mg/L	0.2		300 (total ammonia as nitrogen) ^{E2}		-	-	244	-	-	-	-	-	<2	-	-	-	-	-	-	3.5	-	-	-	-											
	Sulphate (soluble)	mg/L	2			-	-	49.6	-	-	-	-	-	-	110	-	-	-	-	-	-	91.8	-	-	-	-											
	COD	mg/L	7			-	-	7.67	-	-	-	-	-	-	7.42	-	-	-	-	-	-	7.42	-	-	-	-											
	pH (Lab)	pH_Units	1																																		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E1																							
						Well	d								m								s							
						Date	18/02/2015	08/09/2015	16/12/2015	23/03/2016	03/08/2016	06/02/2017	31/07/2017	18/02/2015	08/09/2015	16/12/2015	23/02/2016	03/08/2016	06/02/2017	31/07/2017	18/02/2015	08/09/2015	16/12/2015	23/02/2016	03/08/2016	06/02/2017	31/07/2017			
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal			
						SampleCode	E1_18 Feb 15d	E1_08 Sep 15d	12660936	E1_23 Mar 16d	E1_03 Aug 16d	E1_06 Feb 17d	E1_31 Jul 17d	E1_18 Feb 15m	E1_08 Sep 15m	12660944	E1_23 Feb 16m	E1_03 Aug 16m	E1_06 Feb 17m	E1_31 Jul 17m	E1_18 Feb 15s	E1_08 Sep 15s	12660943	E1_23 Feb 16s	E1_03 Aug 16s	E1_06 Feb 17s	E1_31 Jul 17s			
Other	Benzene acetic acid (TIC)	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dodecamethylcyclohexasiloxane	µg/L					0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Unknown 5 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methylsilanetriol	ppm					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 5 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ethyltrimethylsilanol	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HexamethylDisiloxane	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilanol	µg/L				124 [#]	0	0	-	0	100	0	0	0	100	-	0	0	0	0	0	0	80	-	110	280	630	0		
Trimethylsilanol isomer	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trimethylsilyl fluoride	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Volatile TIC	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Decamethylcyclopentasiloxane	µg/L					0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Benzenepropanoic acid	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzenesulfonamide, -methyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project specific GAC	Location	E4		E5				E5	E5				E5	E5			
						Well	d	s	d	d	d	d	d	m	m	m	s	s	s			
						Date	18/02/2015	18/02/2015	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	E4_18 Feb 15d	E4_18 Feb 15s	12671994	E5_04 Aug 16d	E5_08 Feb 17d	E5_31 Jul 17d	E5_01 Aug 17s	12671995	E5_04 Aug 16m	E5_08 Feb 17m	E5_31 Jul 17m	E5_01 Aug 17m	12671997	E5_04 Aug 16s	E5_08 Feb 17s	E5_31 Jul 17s
TPH	GRO >C5-C12	µg/L	50			-	-	1,140	-	-	-	-	-	964	-	-	-	-	1,500	-	-	-
	>C5-C6 Aliphatics	µg/L	10			-	-	833	-	-	-	-	-	639	-	-	-	-	980	-	-	-
	>C6-C8 Aliphatics	µg/L	10			-	-	175	-	-	-	-	-	96	-	-	-	-	186	-	-	-
	>C8-C10 Aliphatics	µg/L	10			-	-	64	-	-	-	-	-	87	-	-	-	-	145	-	-	-
	>C10-C12 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-	41	-	-	-	-	54	-	-	-
	>C12-C16 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-	<10	-	-	-	-	<10	-	-	-
	>C16-C21 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-	<10	-	-	-	-	<10	-	-	-
	>C16-C35 Aliphatics	µg/L				-	-	<20	-	-	-	-	-	<20	-	-	-	-	<20	-	-	-
	>C21-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-	<10	-	-	-	-	<10	-	-	-
	>C12-C35 Aliphatics	µg/L	10			-	-	<10	-	-	-	-	-	<10	-	-	-	-	<10	-	-	-
	>EC5-EC7 Aromatics	µg/L	10	10 ¹³			-	-	<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-
	>EC7-EC8 Aromatics	µg/L	10	74 ¹²			-	-	<10	-	-	-	-	13	-	-	-	-	<10	-	-	-
	>EC8-EC10 Aromatics	µg/L	10				-	-	43	-	-	-	-	61	-	-	-	-	100	-	-	-
	>EC10-EC12 Aromatics	µg/L	10				-	-	<10	-	-	-	-	27	-	-	-	-	36	-	-	-
	>EC12-EC16 Aromatics	µg/L	10				-	-	<10	-	-	-	-	13	-	-	-	-	25	-	-	-
	>EC16-EC21 Aromatics	µg/L	10				-	-	<10	-	-	-	-	16	-	-	-	-	13	-	-	-
	>EC21-EC35 Aromatics	µg/L	10				-	-	<10	-	-	-	-	11	-	-	-	-	13	-	-	-
	>EC12-EC35 Aromatics	µg/L	10				-	-	<10	-	-	-	-	40	-	-	-	-	51	-	-	-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-	-	1,140	-	-	-	-	1,000	-	-	-	-	1,550	-	-	-
BTEX	Benzene	µg/L	1	10 ¹³		0	0	<1	0	0	0	-	<7 - 2.48	2,123	2,797	3,755	-	<7 - 3.67	0	4,215	4,069	
	Toluene	µg/L	1	74 ¹²		0	0	<1 - 7	0	0	0	-	3.27 - 13	4,599	4,486	8,18	-	<4 - 6.27	0	7,656	10,094	
	Ethylbenzene	µg/L	1	20 ¹⁶		0	0	<1	12,928	0	0	-	<1	0	0	0	-	<1	11,839	1,566	1,359	
	Xylene (m & p)	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<8 - 2.3	-	-	-	
	Xylene (m)	µg/L				0	0	-	0	0	0	-	-	0	0	2.17	-	-	0	3,393	3,861	
	Xylene (p)	µg/L				0	0	-	0	16,054	14,346	-	-	0	16,401	16,118	-	-	0	19,577	17,903	
	Xylene Total	µg/L	2	30 ¹⁶		0	0	<2	1,202	21,441	19,214	-	<2	1,728	18,535	38,084	-	<11 - 2.3	3,956	25,358	43,237	
	Xylene (o)	µg/L	1			0	0	<1	1,202	5,387	4,868	-	<1	1,728	2,134	19,796	-	<1	3,956	2,388	21,473	
Total BTEX	µg/L	28			0	0	<28	14.13	21,441	19,214	-	<28	8.45	25,818	50,019	-	<28	15,795	38,795	58,759		
Oxygenates	MTBE	µg/L	1	5,100 ¹⁷		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Terf Amyl Methyl Ether	µg/L	1	510 ¹⁷		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Vinyl chloride	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Chloroethane	µg/L	1			-	-	<1	-	-	-	-	2.34	-	-	-	-	4.74	-	-	-	
	1,1-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Dichloromethane	µg/L	3	20 ¹³		-	-	<3	-	-	-	-	<3	-	-	-	-	<3	-	-	-	
	trans-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1-dichloroethane	µg/L	1			-	-	<1	-	-	-	-	1.13	-	-	-	-	2.43	-	-	-	
	cis-1,2-dichloroethene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Chloroform	µg/L	1	2,6 ¹³		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1,1-trichloroethane	µg/L	1	100 ¹⁶		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Carbon tetrachloride	µg/L	1	12 ¹³		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Trichloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1,2-trichloroethane	µg/L	1	400 ¹⁶		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Tetrachloroethene	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Sum of PCE and TCE	µg/L				-	-	<2	-	-	-	-	<2	-	-	-	-	<2	-	-	-	
TCE+DCE+VC	µg/L				-	-	<5	-	-	-	-	<5	-	-	-	-	<5	-	-	-		
PCE+TCE+DCE+VC	µg/L				-	-	<6	-	-	-	-	<6	-	-	-	-	<6	-	-	-		
VOC	2,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bromochloromethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2-dichloroethane	µg/L	1	10 ¹³		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Dibromomethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bromodichloromethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	cis-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	trans-1,3-dichloropropene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,3-dichloropropane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Chlorodibromomethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1,1,2-tetrachloroethane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Styrene	µg/L	1	50 ¹⁶		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bromoform	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Isopropylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹²		-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2,3-trichloropropane	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	n-propylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,3,5-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	tert-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2,4-trimethylbenzene	µg/L	1			-	-	<1	-	-	-	-	1.48	-	-	-	-	<1	-	-	-	
	sec-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	p-isopropyltoluene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	n-butylbenzene	µg/L	1			-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2-dibromo-3-chloropropane																					

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E4		E5				E5	E5				E5	E5			
			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	d	s		d				d	m				m	s			
						Date	18/02/2015	18/02/2015	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
		Units				SampleCode	E4_18 Feb 15d	E4_18 Feb 15s	12671994	E5_04 Aug 16d	E5_08 Feb 17d	E5_31 Jul 17d	E5_01 Aug 17d	12671995	E5_04 Aug 16m	E5_08 Feb 17m	E5_31 Jul 17m	E5_01 Aug 17m	12671997	E5_04 Aug 16s	E5_08 Feb 17s	E5_31 Jul 17s	
PAH	Naphthalene	µg/L	1	2 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Acenaphthylene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Acenaphthene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Fluorene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Phenanthrene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Anthracene	µg/L	1	0.1 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Fluoranthene	µg/L	1	0.0063 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Pyrene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Benz(a)anthracene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Chrysene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Benzo(a) pyrene	µg/L	1	0.00017 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Dibenz(a,h)anthracene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Benzo(g,h,i)perylene	µg/L	1	0.0082 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Benzo(b)fluoranthene	µg/L	1	0.017 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Benzo(k)fluoranthene	µg/L	1	0.017 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-		
Benzo(b)&(k)fluoranthene	µg/L	1			-	-	<2	-	-	-	-	-	<2	-	-	-	-	<2	-	-	-		
PAHs (sum of 4)	µg/L				-	-	<4	-	-	-	-	-	<4	-	-	-	-	<4	-	-	-		
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	<2	-	-	-	-	-	<2	-	-	-	-	<2	-	-	-		
Coal Tar (Bap as surrogate marker)	µg/L				-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-		
SVOC	2-methylnaphthalene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-bromophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-chlorophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Azobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bis(2-chloroethyl)ether	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Carbazole	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Dibenzofuran	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Hexachlorocyclopentadiene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Hexachloroethane	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Bis(2-chloroisopropyl) ether	-				-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-		
Phenolics	2-methylphenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2-nitrophenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2,4-dimethylphenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-chloro-3-methylphenol	µg/L	1	40 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-methylphenol	µg/L	1			-	-	<1	-	-	-	-	-	17.3	-	-	-	-	11.2	-	-	-	
	4-nitrophenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Phenol	µg/L	1	7.7 nd		-	-	<1	-	-	-	-	-	14	-	-	-	-	<1	-	-	-	
	2-chloronaphthalene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
PCBs	1,1-Biphenyl	-				-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-	
	N-nitrosodi-n-propylamine	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Anilines	Aniline	-				-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-	
	2-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	3-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-chloroaniline	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
4-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-		
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2,6-dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Nitrobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Halogenated Benzenes	Chlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Bromobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	4-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,3-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,4-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Hexachlorobenzene	µg/L	1	0.05 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Trichlorobenzene (total)	µg/L	1	0.4 nd		-	-	<3	-	-	-	-	-	<3	-	-	-	-	<3	-	-	-	
	Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
Bromomethane		µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Trichlorofluoromethane		µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
1,2-dibromoethane		µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-	
	2,6-dichlorophenol	-				-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-	
	2-chlorophenol	µg/L	1	50 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2,4-dichlorophenol	µg/L	1	4.2 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2,4,5-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	2,4,6-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	
	Pentachlorophenol	µg/L	1	0.4 nd		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location	E4		E5				E5	E5				E5	E5			
						Well	d	s	d				d	m				m	s			
						Date	18/02/2015	18/02/2015	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	E4_18 Feb 15d	E4_18 Feb 15s	12671994	E5_04 Aug 16s	E5_08 Feb 17d	E5_31 Jul 17d	E5_01 Aug 17d	12671995	E5_04 Aug 16m	E5_08 Feb 17m	E5_31 Jul 17m	E5_01 Aug 17m	12671997	E5_04 Aug 16s	E5_08 Feb 17s	E5_31 Jul 17s
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³		-	-	<2	-	-	-	-	-	<2	-	-	-	-	<2	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶		-	-	<5	-	-	-	-	-	<5	-	-	-	-	<5	-	-	-
	Diethylphthalate	µg/L	1	200 ¹⁶		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
	Dimethyl phthalate	µg/L	1	800 ¹⁶		-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
Solvents	Carbon disulfide	µg/L	1			-	-	<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-
	Isophorone	µg/L	1			-	-	<1	-	-	-	-	-	<2	-	-	-	-	<1	-	-	-
	Methanol	µg/L				0	0	-	0	0	0	0	-	-	0	0	0	0	-	0	0	0
Metals	Aluminium	µg/L		15 ¹⁶		0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	0	3.8238
	Arsenic	µg/L		50 ¹²		0	0	-	0	0	0	-	-	-	13.249	11.8157	0	-	-	14.045	9.0743	0
	Arsenic (Filtered)	µg/L	0.12	50 ¹²		-	-	8.78	-	-	-	-	-	7.34	-	-	-	-	5.75	-	-	-
	Barium (Filtered)	µg/L	0.03			-	-	266	-	-	-	-	-	2.790	-	-	-	-	2.480	-	-	-
	Beryllium (Filtered)	µg/L	0.07			-	-	<0.07	-	-	-	-	-	<0.07	-	-	-	-	<0.07	-	-	-
	Boron	µg/L		2,000 ¹⁶		1.810	1.994	-	2.089	1.902	1.872	-	-	-	443.075	361.562	365.5131	-	-	434.84	337.097	338.3373
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶		-	-	1.990	-	-	-	-	-	321	-	-	-	-	275	-	-	-
	Cadmium	µg/L		0.08 ¹³		0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	0.4504	0.5104
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³		-	-	<0.1	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
	Calcium	mg/L				74.3	155.3	497	360.6	339.7	350.4	-	-	3,950	3,178	3,122	3,212	-	3,298	3,406	3,466	
	Calcium (Filtered)	mg/L	0.012			0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	0	0
	Chromium (III+VI)	µg/L				-	-	5.69	-	-	-	-	-	1.32	-	-	-	-	1.33	-	-	-
	Chromium (III+VI) (Filtered)	µg/L	0.22			0	0	-	0	0	0	-	-	-	7.724	0	0	-	-	5.1	0	0
	Copper	µg/L		1 ¹²	6 ¹⁶	-	-	3.47	-	-	-	-	-	12.1	-	-	-	-	13	-	-	-
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁶	2.997	0	-	916.041	828.3946	631.8952	-	-	-	689.139	1,300	1,489	-	-	165.261	42.1222	10.4222
	Iron	µg/L		1,000 ¹²		-	-	1,500	-	-	-	-	-	3,020	-	-	-	-	960	-	-	-
	Iron (Filtered)	µg/L	19	1,000 ¹²		0	0	-	13.734	19.7816	14.992	-	-	-	32.114	53.5494	48.4919	-	-	33.721	58.9614	50.251
	Lead	µg/L		1.2 ¹³		-	-	0.073	-	-	-	-	-	0.383	-	-	-	-	0.07	-	-	-
	Lead (Filtered)	µg/L	0.02	1.2 ¹³		130.4	280.4	632	301.8	212.1	154.6	-	-	-	29.2	39.2	40.6	-	-	19	14.5	5.9
	Magnesium	mg/L	0.036			274.326	986.347	-	979.177	958.8596	788.6686	-	-	-	450.426	1,107	1,300	-	16.3	242.725	144.207	37.8439
	Magnesium (Filtered)	mg/L		123 ¹²		0	0	-	3.925	0	10.8063	-	-	-	3.728	0	3.7196	-	-	17.479	0	14.1635
	Manganese	µg/L		0.07 ¹³		-	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	<0.01	-	-	-
	Mercury	µg/L		4 ¹³		0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	0	0
	Mercury (Filtered)	µg/L	0.01	0.07 ¹³		-	-	8.34	-	-	-	-	-	33.7	-	-	-	-	37.8	-	-	-
	Nickel	µg/L	0.15	4 ¹³		0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	6.3837	0
	Nickel (Filtered)	µg/L				-	-	52.1	-	-	-	-	-	1.93	-	-	-	-	2.38	-	-	-
Selenium	µg/L	0.39			-	-	1.13	-	-	-	-	-	0.839	-	-	-	-	0.817	-	-	-	
Selenium (Filtered)	µg/L	0.24	20 ¹⁶		2,051	0	-	1.677	5.1847	0	-	-	-	1,901	4.0565	0.8238	-	-	1.695	3.8359	0	
Vanadium (Filtered)	µg/L		10.9 ¹²		-	-	14.8	-	-	-	-	-	10.9	-	-	-	-	8.25	-	-	-	
Zinc	µg/L	0.41	10.9 ¹²		-	-	221	-	-	-	-	-	25.8	-	-	-	-	26.5	-	-	-	
Zinc (Filtered)	mg/L	1			0	0	-	0	0	0	-	-	-	0	0	0	-	-	0	0	0	
Potassium (Filtered)	µg/L		25 ¹⁶		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tin	µg/L	30	3.4 ¹²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chromium (hexavalent)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Organics	Dissolved Organic Carbon	mg/L	3			-	-	28.8	-	-	-	-	-	55.1	-	-	-	-	62.4	-	-	-
Inorganics	Acidity	mg/L	4			-	-	63.9	-	-	-	-	-	32.9	-	-	-	-	16.4	-	-	-
	BOD	mg/L	1			-	-	5.19	-	-	-	-	-	26.2	-	-	-	-	34.8	-	-	-
	Sulphur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sodium (Filtered)	mg/L	0.076			-	-	3.640	-	-	-	-	-	129	-	-	-	-	112	-	-	-
	Bromide	µg/L	20			-	-	23.100	-	-	-	-	-	596	-	-	-	-	734	-	-	-
	Chloride	mg/L	2	250 ¹⁶		-	-	9.880	-	-	-	-	-	6.160	-	-	-	-	7.980	-	-	-
	Nitrate (as NO3-)	mg/L	0.3			-	-	<0.3	-	-	-	-	-	<0.3	-	-	-	-	<0.3	-	-	-
	Nitrite (as NO2-)	mg/L	0.05			-	-	<0.05	-	-	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-
	Ortho Phosphate as P	mg/L	0.02			-	-	1.51	-	-	-	-	-	<0.02	-	-	-	-	<0.02	-	-	-
	Sulphide	mg/L	0.01			-	-	7.77	-	-	-	-	-	0.0425	-	-	-	-	0.461	-	-	-
	Alkalinity (total) as CaCO3	mg/L	2			-	-	830	-	-	-	-	-	175	-	-	-	-	85	-	-	-
	Hardness as CaCO3	mg/L				722.6	1,542	-	2,143	1,722	1,512	-	-	-	8,055	7,957	8,187	-	-	8,314	8,565	8,679
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	-	830	-	-	-	-	-	175	-	-	-	-	85	-	-	-
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	-	820	-	-	-	-	-	145	-	-	-	-	85	-	-	-
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²		-	-	17.3	-	-	-	-	-	2.15	-	-	-	-	3.11	-	-	-
	Sulphate (soluble)	mg/L	2			-	-	289	-	-	-	-	-	<2	-	-	-	-	<2	-	-	-
	COD	mg/L	7			-	-	343	-	-	-	-	-	437	-	-	-	-	517	-	-	-
	pH (Lab)	pH_Units	1			-	-	7.7	-	-	-	-	-	7.15	-	-	-	-	7.57	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E4		E5				E5	E5				E5	E5			
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	d	s	d	d	d	d	d	m	m	m	m	s	s	s	s		
						Date	18/02/2015	18/02/2015	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						SampleCode	E4_18 Feb 15d	E4_18 Feb 15s	12671994	E5_04 Aug 16s	E5_08 Feb 17d	E5_31 Jul 17d	E5_01 Aug 17d	12671995	E5_04 Aug 16m	E5_08 Feb 17m	E5_31 Jul 17m	E5_01 Aug 17m	12671997	E5_04 Aug 16s	E5_08 Feb 17s	E5_31 Jul 17s	
Other	Benzene acetic acid (TIC)	µg/L					-	-	-	-	-	-	-	40.4	-	-	-	-	-	61.3	-	-	-
	Dodecamethylcyclohexasiloxane	µg/L					0	0	-	0	0	0	-	-	0	0	0	-	-	0	0	0	
	Unknown 5 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methylsilanetriol	ppm					-	-	-	-	-	-	1.1	-	-	-	-	89.4	-	-	-	-	
	Unknown 1 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151218-69	µg/L					-	-	39.4	-	-	-	-	10.4	-	-	-	-	-	40.5	-	-	-
	Unknown 3 VOC_151218-69	µg/L					-	-	13.7	-	-	-	-	-	-	-	-	-	-	107	-	-	-
	Unknown 4 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	19.6	-	-	-
	Unknown SVOC_151218-69	µg/L					-	-	50.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	17	-	-	-	-	-	20.5	-	-	-
	Unknown 3 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	12.1	-	-	-	-	-	13.8	-	-	-
	Unknown 5 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ethyltrimethylsilanol	µg/L					-	-	32.6	-	-	-	-	18.8	-	-	-	-	-	30.3	-	-	-
	tert-Butyldimethylsilanol	µg/L					-	-	1,070	-	-	-	-	835	-	-	-	-	-	1,060	-	-	-
	Benzene, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L					-	-	32.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L					-	-	17.3	-	-	-	-	32.9	-	-	-	-	-	46.2	-	-	-
	Hexanoic Acid	mg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo-,trisilacyclohexane-,hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L					0	0	-	0	0	0	-	-	0	0	0	-	-	0	0	0	0
	HexamethylDisiloxane	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	20.5	-	-	-
	Pentamethylbenzoic acid	µg/L					-	-	-	-	-	-	-	46.8	-	-	-	-	-	44.6	-	-	-
	Silicic Acid	ppm					-	-	-	-	-	-	33.1	-	-	-	-	-	14.9	-	-	-	-
	Trimethylsilanol	µg/L				124 nd	0	0	-	2,540	2,280	2,510	-	-	-	4,020	4,290	5,920	-	-	4,070	4,540	5,440
Trimethylsilanol isomer	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trimethylsilyl fluoride	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	12.4	-	-	-	
Volatile TIC	-					-	-	1	-	-	-	-	-	1	-	-	-	-	1	-	-	-	
Decamethylcyclopentasiloxane	µg/L					0	0	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	
Benzenepropanoic acid	µg/L					-	-	-	-	-	-	-	-	17.9	-	-	-	-	21.7	-	-	-	
Benzenesulfonamide,-methyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	10.9	-	-	-	
Unknown 2 SVOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151219-32	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151218-69	µg/L					-	-	17.9	-	-	-	-	30.8	-	-	-	-	-	16.1	-	-	-	
Unknown 2 SVOC_151218-69	µg/L					-	-	-	-	-	-	-	11.8	-	-	-	-	-	11.7	-	-	-	

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E5	E5	E6				E6	E6				
						Well	s	s2	d	d				d	m				
						Date	01/08/2017	17/12/2015	16/12/2015	04/08/2016	06/02/2017	31/07/2017	01/08/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	16/12/2015	
						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						Sample Code	E5_01 Aug 17s	12671993	12660935	E6_04 Aug 16d	E6_06 Feb 17d	E6_31 Jul 17d	E6_01 Aug 17d	12660940	E6_04 Aug 16m	E6_06 Feb 17m	E6_31 Jul 17m	12660941	
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC														
TPH	GRO >C5-C12	µg/L	50			-	379	316	-	-	-	-	-	306	-	-	-	131	
	>C5-C6 Aliphatics	µg/L	10			-	232	251	-	-	-	-	-	242	-	-	-	98	
	>C6-C8 Aliphatics	µg/L	10			-	47	40	-	-	-	-	-	39	-	-	-	<10	
	>C8-C10 Aliphatics	µg/L	10			-	35	<10	-	-	-	-	-	<10	-	-	-	<10	
	>C10-C12 Aliphatics	µg/L	10			-	26	<10	-	-	-	-	-	<10	-	-	-	10	
	>C12-C16 Aliphatics	µg/L	10			-	<10	<10	-	-	-	-	-	<10	-	-	-	<10	
	>C16-C21 Aliphatics	µg/L	10			-	<10	<10	-	-	-	-	-	<10	-	-	-	<10	
	>C16-C35 Aliphatics	µg/L				-	<20	<20	-	-	-	-	-	<20	-	-	-	15	
	>C21-C35 Aliphatics	µg/L	10			-	<10	<10	-	-	-	-	-	<10	-	-	-	10	
	>C12-C35 Aliphatics	µg/L	10			-	<10	<10	-	-	-	-	-	<10	-	-	-	10	
	>EC5-EC7 Aromatics	µg/L	10	10 ¹⁰³		-	<10	<10	-	-	-	-	-	<10	-	-	-	<10	
	>EC7-EC8 Aromatics	µg/L	10	74 ¹⁰²		-	<10	<10	-	-	-	-	-	<10	-	-	-	<10	
	>EC8-EC10 Aromatics	µg/L	10			-	23	<10	-	-	-	-	-	<10	-	-	-	<10	
	>EC10-EC12 Aromatics	µg/L	10			-	17	<10	-	-	-	-	-	<10	-	-	-	<10	
	>EC12-EC16 Aromatics	µg/L	10			-	17	<10	-	-	-	-	-	<10	-	-	-	43	
	>EC16-EC21 Aromatics	µg/L	10			-	10	<10	-	-	-	-	-	<10	-	-	-	44	
	>EC21-EC35 Aromatics	µg/L	10			-	<10	<10	-	-	-	-	-	<10	-	-	-	14	
	>EC12-EC35 Aromatics	µg/L	10			-	20	<10	-	-	-	-	-	<10	-	-	-	101	
	>C5-C35 Aliphatics & Aromatics	µg/L	10			-	399	316	-	-	-	-	-	305	-	-	-	243	
BTEX	Benzene	µg/L	1	10 ¹⁰³		-	<1	<1	0	0	0	-	-	<1	0	0	0	<1	
	Toluene	µg/L	1	74 ¹⁰²		-	<4	1.26	<1	0	0	0	-	<1	0	0	0	<1	
	Ethylbenzene	µg/L	1	20 ¹⁰⁵		-	<1	<1	0	0	0	-	-	<1	5.034	0	0	<1	
	Xylene (m & p)	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	5.334	
	Xylene (m)	µg/L				-	-	-	0	0	0	-	-	-	0	0	0	-	
	Xylene (p)	µg/L				-	-	-	0	7.234	5.535	-	-	-	0	6.916	5.157	-	
	Xylene Total	µg/L	2	30 ¹⁰⁵		-	<2	<2	0	7.234	7.173	-	-	<2	0	6.916	6.549	<2	
	Xylene (o)	µg/L	1			-	<1	<1	0	0	1.638	-	-	<1	0	0	1.392	<1	
Total BTEX	µg/L	28			-	<28	<28	0	7.234	7.173	-	-	<28	5.034	6.916	6.549	<28		
Oxygenates	MTBE	µg/L	1	5.100 ¹⁰⁷		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Tert Amyl Methyl Ether	µg/L	1	510 ¹⁰⁷		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Vinyl chloride	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Chloroethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1-dichloroethene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Dichloromethane	µg/L	3	20 ¹⁰³		-	<3	<3	-	-	-	-	-	<3	-	-	-	<3	
	trans-1,2-dichloroethene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1-dichloroethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	cis-1,2-dichloroethene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Chloroform	µg/L	1	2.5 ¹⁰³		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1,1-trichloroethane	µg/L	1	100 ¹⁰⁵		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Carbon tetrachloride	µg/L	1	12 ¹⁰³		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Trichloroethene	µg/L	1	10 ¹⁰³		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1,2-trichloroethane	µg/L	1	400 ¹⁰⁵		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Tetrachloroethene	µg/L	1	10 ¹⁰³		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Sum of PCE and TCE	µg/L				-	<2	<2	-	-	-	-	-	<2	-	-	-	<2	
	TCE+DCE+VC	µg/L				-	<5	<5	-	-	-	-	-	<5	-	-	-	<5	
	PCE+TCE+DCE+VC	µg/L				-	<6	<6	-	-	-	-	-	<6	-	-	-	<6	
VOC	2,2-dichloropropane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Bromochloromethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1-dichloropropene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2-dichloroethane	µg/L	1	10 ¹⁰³		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2-dichloropropane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Dibromomethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Bromodichloromethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	cis-1,3-dichloropropene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	trans-1,3-dichloropropene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,3-dichloropropane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Chlorodibromomethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1,1,2-tetrachloroethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Styrene	µg/L	1	50 ¹⁰⁵		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Bromoform	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Isopropylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,1,2,2-tetrachloroethane	µg/L	1	140 ¹⁰²		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2,3-trichloropropane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	n-propylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,3,5-trimethylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	tert-butylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2,4-trimethylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	sec-butylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	p-isopropyltoluene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	n-butylbenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2-dibromo-3-chloropropane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	Hexachlorobutadiene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	
	1,2-Dichloroethene	µg/L		0.6 ¹⁰³		-	<2	<2	-	-	-	-	-	<2	-	-	-	<2	
	Trihalomethanes	µg/L				-	<4	<4	-	-	-	-	-	<4	-	-	-	<4	
	Cyclotrisiloxane, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclotetrasiloxane, octamethyl-	µg/L				-	-	-	0	0	0	0	-	-	0	0	0	0	0

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E5	E5	E6				E6	E6							
			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	s	s2		d				d	m				s			
		Units				Date	01/08/2017	17/12/2015	16/12/2015	04/08/2016	06/02/2017	31/07/2017	01/08/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						Sample Code	E5_01 Aug 17s	12871993	12609935	E6_04 Aug 16d	E6_06 Feb 17d	E6_31 Jul 17d	E6_01 Aug 17d	12609940	E6_04 Aug 16m	E6_06 Feb 17m	E6_31 Jul 17m	12609941	E6_04 Aug 16s	E6_06 Feb 17s	E6_31 Jul 17s	
PAH	Naphthalene	µg/L	1	2 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Acenaphthylene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Acenaphthene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	1.02	-	-	-	
	Fluorene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Phenanthrene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	1.96	-	-	-	
	Anthracene	µg/L	1	0.1 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Fluoranthene	µg/L	1	0.0063 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Pyrene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benz(a)anthracene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Chrysene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benzo(a) pyrene	µg/L	1	0.00017 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Dibenz(a,h)anthracene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benzo(g,h,i)perylene	µg/L	1	0.0082 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benzo(b)fluoranthene	µg/L	1	0.017 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benzo(k)fluoranthene	µg/L	1	0.017 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Benzo(b)&(k)fluoranthene	µg/L				-	<2	<2	-	-	-	-	-	<2	-	-	-	<2	-	-	-	
	PAHs (sum of 4)	µg/L				-	<4	<4	-	-	-	-	-	<4	-	-	-	<4	-	-	-	
	benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	<2	<2	-	-	-	-	-	<2	-	-	-	<2	-	-	-	
Coal Tar (BaP as surrogate marker)	µg/L				-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-		
SVOC	2-methylnaphthalene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-bromophenyl phenyl ether	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-chlorophenyl phenyl ether	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Azobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Bis(2-chloroethoxy) methane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Bis(2-chloroethyl)ether	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Carbazole	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Dibenzofuran	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Hexachlorocyclopentadiene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Hexachloroethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Bis(2-chloroisopropyl) ether	-				-	0	0	-	-	-	-	-	0	-	-	-	0	-	-	-	
Phenolics	2-methylphenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2-nitrophenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2,4-dimethylphenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-chloro-3-methylphenol	µg/L	1	40 th		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-methylphenol	µg/L	1			-	43.6	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-nitrophenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Phenol	µg/L	1	7.7 nd		-	16.9	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
PCBs	2-chloronaphthalene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,1-Biphenyl	-				-	0	0	-	-	-	-	-	0	-	-	-	0	-	-	-	
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
Anilines	Aniline	-				-	0	0	-	-	-	-	-	0	-	-	-	0	-	-	-	
	2-nitroaniline	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	3-nitroaniline	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-chloroaniline	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-nitroaniline	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
Explosives	2,4-Dinitrotoluene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2,6-dinitrotoluene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Nitrobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Chlorobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Bromobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2-chlorotoluene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	4-chlorotoluene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,3-dichlorobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,4-dichlorobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,2-dichlorobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,2,4-trichlorobenzene	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,2,3-trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Hexachlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Trichlorobenzene (total)	µg/L	1	0.05 th		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
Halogenated Hydrocarbons	Trichlorobenzene (total)	µg/L	1	0.4 th		-	<3	<3	-	-	-	-	-	<3	-	-	-	<3	-	-	-	
	Dichlorodifluoromethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Bromomethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Trichlorofluoromethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	1,2-dibromoethane	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	0	0	-	-	-	-	-	0	-	-	-	0	-	-	-	
	2,6-dichlorophenol	-				-	0	0	-	-	-	-	-	0	-	-	-	0	-	-	-	
	2-chlorophenol	µg/L	1	50 th		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2,4-dichlorophenol	µg/L	1	4.2 nd		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2,4,5-trichlorophenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	2,4,6-trichlorophenol	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	
	Pentachlorophenol	µg/L	1	0.4 th		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E5	E5	E6				E6		E6							
						Well	s	s2		d				d		m				s			
						Date	01/08/2017	17/12/2015	16/12/2015	04/08/2016	06/02/2017	31/07/2017	01/08/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017		
						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
						Sample Type	E5_01 Aug 17s	12871993	12660935	E6_04 Aug 16d	E6_06 Feb 17d	E6_31 Jul 17d	E6_01 Aug 17s	12660940	E6_04 Aug 16m	E6_06 Feb 17m	E6_31 Jul 17m	12660941	E6_04 Aug 16s	E6_06 Feb 17s	E6_31 Jul 17s		
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	SampleCode																	
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ^{E3}		-	<2	<2	-	-	-	-	-	3.75	-	-	-	<2	-	-	-	-	
	Butyl benzyl phthalate	µg/L	1	7.5 ^{E2}		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
	Di-n-butyl phthalate	µg/L	1	8 ^{E6}		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
	Di-n-octyl phthalate	µg/L	5	20 ^{E6}		-	<5	<5	-	-	-	-	-	<5	-	-	-	<5	-	-	-	-	
	Diethylphthalate	µg/L	1	200 ^{E6}		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
	Dimethyl phthalate	µg/L	1	800 ^{E6}		-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
Solvents	Carbon disulfide	µg/L	1			-	<1	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
	Isophorone	µg/L	1			-	<2	<1	-	-	-	-	-	<1	-	-	-	<1	-	-	-	-	
	Methanol	µg/L				-	-	-	0	0	0	-	-	-	0	0	0	-	0	0	0	0	
Metals	Aluminium	µg/L		15 ^{E6}		-	-	-	0	0	0	-	-	-	0	0	0	-	0	0	30.7401	36.0438	
	Arsenic	µg/L		50 ^{E2}		-	-	-	14.71	8.7973	0	-	-	-	13.44	10.4344	0	-	14.291	11.0463	0	0	
	Arsenic (Filtered)	µg/L	0.12	50 ^{E2}		-	6.7	14.3	-	-	-	-	-	15.1	-	-	-	14.9	-	-	-	-	
	Barium (Filtered)	µg/L	0.03			-	1.540	7.050	-	-	-	-	-	7.110	-	-	-	61.7	-	-	-	-	
	Beryllium (Filtered)	µg/L	0.07			-	<0.07	<0.07	-	-	-	-	-	<0.07	-	-	-	<0.07	-	-	-	-	
	Boron	µg/L		2,000 ^{E6}		-	-	-	788.063	719.9612	666.5706	-	-	-	797.781	727.6731	685.9979	-	311.45	256.2224	288.4048		
	Boron (Filtered)	µg/L	9.4	2,000 ^{E6}		-	311	273	-	0	0.6591	0	-	-	282	-	-	-	228	-	-	-	
	Cadmium	µg/L		0.08 ^{E3}		-	-	-	-	0	0.6591	0	-	-	-	0	0	0	-	0	0	0	
	Cadmium (Filtered)	µg/L	0.1	0.08 ^{E3}		-	<0.1	<0.1	-	-	-	-	-	<0.1	-	-	-	<0.1	-	-	-	-	
	Calcium	mg/L				-	-	-	1.616	1.616	1.627	-	-	-	1.608	1.642	1.607	-	95.3	86.9	85.6		
	Calcium (Filtered)	mg/L	0.012			-	2,210	1,940	-	-	-	-	-	1,900	-	-	-	82.1	-	-	-	-	
	Chromium (III+VI)	µg/L				-	-	-	0	14.103	6.9847	-	-	-	0	14.587	7.4332	-	0	0	0	0	
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	1.8	5.06	-	-	-	-	-	5.78	-	-	-	0.581	-	-	-	-	
	Copper	µg/L		1 ^{E2}	6 ^{E9}	-	-	-	0	0	0	-	-	-	0	0	0	0	-	0	0	0	
	Copper (Filtered)	µg/L	0.85	1 ^{E2}	6 ^{E9}	-	11.7	4.18	-	-	-	-	-	3.98	-	-	-	1.42	-	-	-	-	
	Iron	µg/L		1,000 ^{E2}		-	-	-	18,400	18,393	15,311	-	-	-	19,165	19,713	16,182	-	423.032	483.449	803.7494		
	Iron (Filtered)	µg/L	19	1,000 ^{E2}		-	4,930	25,600	-	-	-	-	-	26,600	-	-	-	129	-	-	-	-	
	Lead	µg/L		1.2 ^{E3}		-	-	-	0	13.4849	12.5532	-	-	-	0	13.1529	12.4869	-	0	5.0352	3.8515		
	Lead (Filtered)	µg/L	0.02	1.2 ^{E3}		-	0.102	0.378	-	-	-	-	-	0.39	-	-	-	0.115	-	-	-	-	
	Magnesium	mg/L				-	-	-	300.8	184.1	147.3	-	-	-	300.5	183.7	146.1	-	0	7	6.8		
	Magnesium (Filtered)	mg/L	0.036			-	35.4	593	-	-	-	-	-	594	-	-	-	4.87	-	-	-	-	
	Manganese	µg/L		123 ^{E2}		-	-	-	9,174	10,150	10,212	-	-	-	9,184	10,090	9,961	-	230.088	239.1092	226.1608		
	Mercury	µg/L		0.07 ^{E1}		-	-	-	2,912	2,229	0	-	-	-	0.915	0	0	-	4.261	0	0	0	
	Mercury (Filtered)	µg/L	0.01	0.07 ^{E1}		-	0.0135	<0.01	-	-	-	-	-	<0.01	-	-	-	<0.01	-	-	-	-	
	Nickel	µg/L		4 ^{E3}		-	-	-	0	3.475	3.1782	-	-	-	0	2.673	3.1925	-	0	3.4247	3.4683		
	Nickel (Filtered)	µg/L	0.15	4 ^{E3}		-	21.3	27.3	-	-	-	-	-	27.7	-	-	-	4.25	-	-	-	-	
	Selenium	µg/L				-	-	-	0	0	0	-	-	-	0	0	0	-	0	0	0	0	
	Selenium (Filtered)	µg/L	0.39			-	1.81	14.8	-	-	-	-	-	15.3	-	-	-	15.6	-	-	-	-	
	Vanadium (Filtered)	µg/L	0.24	20 ^{E6}		-	1.76	<0.24	-	-	-	-	-	0.61	-	-	-	1.37	-	-	-	-	
	Zinc	µg/L		10.9 ^{E2}		-	-	-	5,092	9,9547	3,7064	-	-	-	4,228	10,2111	3,4824	-	2,871	6,3519	0,5628		
	Zinc (Filtered)	µg/L	0.41	10.9 ^{E2}		-	8.91	3.94	-	-	-	-	-	3.19	-	-	-	1.18	-	-	-	-	
	Potassium (Filtered)	mg/L	1			-	13.6	72.9	-	-	-	-	-	74.7	-	-	-	17.1	-	-	-	-	
	Tin	µg/L		25 ^{E6}		-	-	-	0	0	0	-	-	-	0	0	0	-	0	0	0	0	
	Chromium (hexavalent)	µg/L	30	3.4 ^{E2}		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Organics	Dissolved Organic Carbon	mg/L	3			-	58.2	11.1	-	-	-	-	-	11.4	-	-	-	24.3	-	-	-	-	
Inorganics	Acidity	mg/L	4			-	23.7	89.4	-	-	-	-	-	58.4	-	-	-	<4	-	-	-	-	
	BOD	mg/L	1			-	38	<1	-	-	-	-	-	<1	-	-	-	3.74	-	-	-	-	
	Sulphur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	33.4	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076			-	73.4	860	-	-	-	-	-	868	-	-	-	81.8	-	-	-	-	
	Bromide	µg/L	20			-	352	6,840	-	-	-	-	-	7,070	-	-	-	2,160	-	-	-	-	
	Chloride	mg/L	2	250 ^{E6}		-	3,590	6,840	-	-	-	-	-	6,810	-	-	-	265	-	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3			-	<0.3	<0.3	-	-	-	-	-	<0.3	-	-	-	<0.3	-	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05			-	<0.05	<0.05	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	
	Ortho Phosphate as P	mg/L	0.02			-	<0.02	<0.02	-	-	-	-	-	<0.02	-	-	-	0.06	-	-	-	-	
	Sulphide	mg/L	0.01			-	<0.01	0.0274	-	-	-	-	-	0.0564	-	-	-	<0.01	-	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2			-	170	335	-	-	-	-	-	340	-	-	-	80	-	-	-	-	
	Hardness as CaCO3	mg/L				-	-	-	5,273	4,793	4,670	-	-	-	5,253	4,857	4,613	-	0	245.9	241.6		
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	170	335	-	-	-	-	-	340	-	-	-	60	-	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	160	345	-	-	-	-	-	370	-	-	-	20	-	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ^{E2}		-	0.561	4.33	-	-	-	-	-	4.38	-	-	-	3.85	-	-	-	-	
	Sulphate (soluble)	mg/L	2			-	<2	<2	-	-	-	-	-	<2	-	-	-	30.7	-	-	-	-	
	COD	mg/L	7			-	423	157	-	-	-	-	-	222	-	-	-	86	-	-	-	-	
	pH (Lab)	pH_Units	1			-	7.13	6.98	-	-	-	-	-	6.92	-	-	-	9.63	-	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E5	E5	E6				E6	E6							
						Well	s	s2	s2	d				d	m				s			
		Date	01/08/2017	17/12/2015	16/12/2015	04/08/2016	06/02/2017	31/07/2017	01/08/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	16/12/2015	04/08/2016	06/02/2017	31/07/2017	
		Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
		SampleCode	E5_01 Aug 17s	12871993	12660935	E6_04 Aug 16d	E6_06 Feb 17d	E6_31 Jul 17d	E6_01 Aug 17d	12660940	E6_04 Aug 16m	E6_06 Feb 17m	E6_31 Jul 17m	12660941	E6_04 Aug 16s	E6_06 Feb 17s	E6_31 Jul 17s	12660941	E6_04 Aug 16s	E6_06 Feb 17s	E6_31 Jul 17s	
Other	Benzene acetic acid (TIC)	µg/L	-	56.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Dodecamethylcyclohexasiloxane	µg/L	-	-	-	0	0	0	-	-	0	0	0	-	0	0	0	-	0	0	0	
	Unknown 5 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methylsilanetriol	ppm	-	87.3	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 4 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 1 SVOC_151218-69	µg/L	-	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 3 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Unknown 5 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	ethyl dimethylsilanol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	tert-Butyldimethylsilanol	µg/L	-	289	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Benzene, hexamethyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Cyclic octaatomic sulfur	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	methoxytrimethylsilane	µg/L	-	13.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hexanoic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0211	-	-	-	-	
	Dioxa, -trisilacyclohexane, -hexamethyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hexamethyldioxatrisilacyclohexane isomer	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L	-	-	-	0	0	0	0	-	-	0	0	0	-	0	0	0	-	0	0	0
	Hexamethyldisiloxane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Pentamethylbenzoic acid	µg/L	-	44.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Silicic Acid	ppm	14.3	-	-	-	-	-	-	16.5	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilanol	µg/L	-	-	209	970	1,060	980	-	211	950	880	690	85	350	420	360	-	-	-	-	-
	Trimethylsilanol isomer	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Trimethylsilyl fluoride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Volatile TIC	-	-	1	1	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L	-	-	-	0	0	0	0	-	-	0	0	0	-	0	0	0	-	0	0	0
	Benzenepropanoic acid	µg/L	-	41.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzenesulfonamide, -methyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unknown 2 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151218-69	µg/L	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
-: Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E6	E7					E7	E7				E7	E7	E8				E8																																					
						Well ID	Date	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal																																				
																										Sample Type	SampleCode	01/08/2017	18/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	18/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	18/12/2015	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017																	
																																													E6 - 01 Aug 17s	1267370	E7 - 04 Aug 16s	E7 - 08 Feb 17s	E7 - 31 Jul 17s	E7 - 01 Aug 17s	1267371	E7 - 04 Aug 16m	E7 - 08 Feb 17m	E7 - 31 Jul 17m	E7 - 01 Aug 17m	1267372	1267003	E8 - 04 Aug 16s	E8 - 08 Feb 17s	E8 - 31 Jul 17s	E8 - 01 Aug 17s
TPH	GRO >C5-C12	µg/L	50			-	784	-	-	-	-	867	-	-	-	-	623	204	-	-	-	-																																							
	>C5-C6 Aliphatics	µg/L	10			-	452	-	-	-	-	461	-	-	-	-	356	124	-	-	-	-																																							
	>C6-C8 Aliphatics	µg/L	10			-	136	-	-	-	-	137	-	-	-	-	88	35	-	-	-	-																																							
	>C8-C10 Aliphatics	µg/L	10			-	87	-	-	-	-	114	-	-	-	-	75	19	-	-	-	-																																							
	>C10-C12 Aliphatics	µg/L	10			-	30	-	-	-	-	47	-	-	-	-	33	<10	-	-	-	-																																							
	>C12-C16 Aliphatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>C16-C21 Aliphatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>C16-C35 Aliphatics	µg/L				-	<20	-	-	-	-	<20	-	-	-	-	<20	<20	-	-	-	-																																							
	>C21-C35 Aliphatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>C12-C35 Aliphatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>EC5-EC7 Aromatics	µg/L	10	10 ^{R3}		-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>EC7-EC8 Aromatics	µg/L	10	74 ^{R2}		-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>EC8-EC10 Aromatics	µg/L	10			-	58	-	-	-	-	76	-	-	-	-	50	13	-	-	-	-																																							
	>EC10-EC12 Aromatics	µg/L	10			-	20	-	-	-	-	32	-	-	-	-	22	<10	-	-	-	-																																							
	>EC12-EC16 Aromatics	µg/L	10			-	15	-	-	-	-	20	-	-	-	-	12	<10	-	-	-	-																																							
	>EC16-EC21 Aromatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>EC21-EC35 Aromatics	µg/L	10			-	<10	-	-	-	-	<10	-	-	-	-	<10	<10	-	-	-	-																																							
	>EC12-EC35 Aromatics	µg/L	10			-	15	-	-	-	-	20	-	-	-	-	12	<10	-	-	-	-																																							
	>C5-C35 Aliphatics & Aromatics	µg/L	10			-	799	-	-	-	-	886	-	-	-	-	635	204	-	-	-	-																																							
BTX	Benzene	µg/L	1	10 ^{R3}		-	<1	0	0	0	-	<1	0	0	0	-	<1	<1	0	0	0	-																																							
	Toluene	µg/L	1	74 ^{R2}		-	<1	0	0	0	-	<1	0	0	0	-	<1	<1	0	0	0	-																																							
	Ethylbenzene	µg/L	1	20 ^{R6}		-	<1	9.567	0	0	-	<1	4.459	0	0	-	<1	<1	4.593	0	0	-																																							
	Xylene (m & p)	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Xylene (m)	µg/L				-	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	-																																							
	Xylene (p)	µg/L				-	-	0	10.972	9.162	-	-	0	11.15	9.302	-	-	-	1.161	0	5.198	-																																							
	Xylene Total	µg/L	2	30 ^{R6}		-	<2	1.707	12.76	13.482	-	<2	0	12.381	13.307	-	<2	<2	2.213	0	7.771	-																																							
	Xylene (o)	µg/L	1			-	<1	1.707	1.788	4.32	-	<1	0	1.231	4.005	-	<1	<1	1.052	0	2.573	-																																							
Total BTX	µg/L	28			-	<28	11.274	12.76	13.482	-	<28	4.459	12.381	13.307	-	<28	<28	6.806	0	7.771	-																																								
Oxygenates	MTBE	µg/L	1	5.100 ^{R7}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Tert Amyl Methyl Ether	µg/L	1	510 ^{R7}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Vinyl chloride	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Chloroethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1-dichloroethene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Dichloromethane	µg/L	3	20 ^{R3}		-	<3	-	-	-	-	<3	-	-	-	-	<3	<3	-	-	-	-																																							
	trans-1,2-dichloroethene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1-dichloroethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	cis-1,2-dichloroethene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Chloroform	µg/L	1	2.5 ^{R3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1,1-trichloroethane	µg/L	1	100 ^{R6}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Carbon tetrachloride	µg/L	1	12 ^{R3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Trichloroethene	µg/L	1	10 ^{R3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1,2-trichloroethane	µg/L	1	400 ^{R6}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Tetrachloroethene	µg/L	1	10 ^{R3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Sum of PCE and TCE	µg/L				-	<2	-	-	-	-	<2	-	-	-	-	<2	<2	-	-	-	-																																							
	TCE+DCE+VC	µg/L				-	<5	-	-	-	-	<5	-	-	-	-	<5	<5	-	-	-	-																																							
PCE+TCE+DCE+VC	µg/L				-	<6	-	-	-	-	<6	-	-	-	-	<6	<6	-	-	-	-																																								
VOC	2,2-dichloropropane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Bromochloromethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1-dichloropropene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,2-dichloroethane	µg/L	1	10 ^{R3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,2-dichloropropane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Dibromomethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Bromodichloromethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	cis-1,3-dichloropropene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	trans-1,3-dichloropropene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,3-dichloropropane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Chlorodibromomethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1,1,2-tetrachloroethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Styrene	µg/L	1	50 ^{R6}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Bromoform	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	Isopropylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,1,2,2-tetrachloroethane	µg/L	1	140 ^{R2}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,2,3-trichloropropane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	n-propylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,3,5-trimethylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	tert-butylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	1,2,4-trimethylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	sec-butylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
	p-isopropyltoluene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																							
n-butylbenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-																																								
1,2-dibromo-3-chloropropane	µg/L	1			-																																																								

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location		E6	E7				E7	E7				E7	E7	E8				E8			
						Well ID	Date	d				m				s				d							
								Normal				Normal				Normal				Normal				Normal			
								Sample Type				Sample Type				Sample Type				Sample Type				Sample Type			
								SampleCode				SampleCode				SampleCode				SampleCode				SampleCode			
PAH	Naphthalene	µg/L	1	2 ^{#3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Acenaphthylene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Acenaphthene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Fluorene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Phenanthrene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Anthracene	µg/L	1	0.1 ^{#3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Fluoranthene	µg/L	1	0.0063 ^{#3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Pyrene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Benz(a)anthracene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Chrysene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Benzo(a) pyrene	µg/L	1	0.00017 ^{#3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ^{#4}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Dibenz(a,h)anthracene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ^{#1}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Benzo(b)fluoranthene	µg/L	1	0.017 ^{#1}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Benzo(k)fluoranthene	µg/L	1	0.017 ^{#1}		-	<2	-	-	-	-	<2	-	-	-	-	<2	<2	-	-	-	-					
PAHs (sum of 4)	µg/L				-	<4	-	-	-	-	<4	-	-	-	-	<4	<4	-	-	-	-						
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	<2	-	-	-	-	<2	-	-	-	-	<2	<2	-	-	-	-						
Coal Tar (BaP as surrogate marker)	µg/L				-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-						
SVOC	2-methylnaphthalene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-bromophenyl phenyl ether	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-chlorophenyl phenyl ether	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Azobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Bis(2-chloroethoxy) methane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Bis(2-chloroethyl)ether	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Carbazole	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Dibenzofuran	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Hexachlorocyclopentadiene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Hexachloroethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Bis(2-chloroisopropyl) ether	-				-	0	-	-	-	-	0	-	-	-	-	0	0	-	-	-	-					
Phenolics	2-methylphenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2-nitrophenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2,4-dimethylphenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-chloro-3-methylphenol	µg/L	1	40 ^{#6}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-methylphenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-nitrophenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Phenol	µg/L	1	7.7 ^{#2}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2-chloronaphthalene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
PCBs	1,1-Biphenyl	-			-	0	-	-	-	-	0	-	-	-	-	0	0	-	-	-	-						
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-						
Anilines	Aniline	-			-	0	-	-	-	-	0	-	-	-	-	-	0	0	-	-	-	-					
	2-nitroaniline	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	3-nitroaniline	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-chloroaniline	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-nitroaniline	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
Explosives	2,4-Dinitrotoluene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2,6-dinitrotoluene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Nitrobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Chlorobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Bromobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2-chlorotoluene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	4-chlorotoluene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,3-dichlorobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,4-dichlorobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,2-dichlorobenzene	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,2,4-trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,2,3-trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Hexachlorobenzene	µg/L	1	0.05 ^{#1}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Trichlorobenzene (total)	µg/L		0.4 ^{#3}		-	<3	-	-	-	-	<3	-	-	-	-	<3	<3	-	-	-	-					
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Bromomethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Trichlorofluoromethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	1,2-dibromoethane	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-			-	0	-	-	-	-	0	-	-	-	-	-	0	0	-	-	-	-					
	2,6-dichlorophenol	µg/L	1	50 ^{#6}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2-chlorophenol	µg/L	1	4.2 ^{#2}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2,4-dichlorophenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2,4,5-trichlorophenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	2,4,6-trichlorophenol	µg/L	1			-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					
	Pentachlorophenol	µg/L	1	0.4 ^{#3}		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-					

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

				Project-specific GAC	Location Well Date Sample Type SampleCode	E6	E7				E7	E7				E7	E7	E8				E8					
						01/08/2017 Normal	18/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal	18/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal	18/12/2015 Normal	17/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal	17/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal
Units						16_01 Aug 17s	12677370	E7_04 Aug 16s	E7_08 Feb 17s	E7_31 Jul 17s	E7_01 Aug 17s	12677373	E7_04 Aug 16s	E7_08 Feb 17s	E7_31 Jul 17s	E7_01 Aug 17s	12677372	12677001	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s	E8_01 Aug 17s					
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³	-	<2	-	-	-	-	<2	-	-	-	-	<2	<2	-	-	-	-	-					
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²	-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-	-					
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶	-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-	-					
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶	-	<5	-	-	-	-	<5	-	-	-	-	<5	<5	-	-	-	-	-					
	Diethylphthalate	µg/L	1	200 ¹⁵	-	<1	-	-	-	-	<1	-	-	-	-	<1	1.42	-	-	-	-	-					
	Dimethyl phthalate	µg/L	1	800 ¹⁶	-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-	-					
Solvents	Carbon disulfide	µg/L	1		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-	-					
	Isophorone	µg/L	1		-	<1	-	-	-	-	<1	-	-	-	-	<1	<1	-	-	-	-	-					
	Methanol	µg/L			-	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	-	-					
Metals	Aluminium	µg/L		15 ¹⁶	-	-	0	0	0	-	-	0	0	16.5681	-	-	-	0	0	0	-	-					
	Arsenic	µg/L		50 ¹²	-	-	0	7.1988	0	-	-	0	0	0	-	-	-	0	0	0	-	-					
	Arsenic (Filtered)	µg/L	0.12	50 ¹²	-	0.856	-	-	-	-	6.7	-	-	-	-	4.24	5.23	-	-	-	-	-					
	Barium (Filtered)	µg/L	0.03		-	1.450	-	-	-	-	809	-	-	-	-	420	628	-	-	-	-	-					
	Beryllium (Filtered)	µg/L	0.07		-	<0.07	-	-	-	-	<0.07	-	-	-	-	<0.07	<0.07	-	-	-	-	-					
	Boron	µg/L		2,000 ¹⁶	-	-	892.436	843.8548	772.4811	-	-	449.788	454.0288	486.1954	-	-	-	1,923	1,823	1,733	-	-					
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶	-	669	-	-	-	-	417	-	-	-	-	246	1,760	-	-	-	-	-					
	Cadmium	µg/L		0.08 ¹³	-	-	0	0	0	-	-	0	0.6899	0.5939	-	-	246	1,760	0	0	0	-					
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³	-	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	<0.1	-	-	-	-	-					
	Calcium	mg/L			-	-	6,473	4,353	3,940	-	-	1,011	1,229	1,123	-	-	786	3,580	3,277	3,238	3,208	-					
	Calcium (Filtered)	mg/L	0.012		-	5,030	-	-	-	-	1,830	-	0	3,4503	0	-	786	3,580	0	8,9431	4,4688	-					
	Chromium (III+VI)	µg/L			-	-	0	6.5161	4.0815	-	-	1.05	-	-	-	1.07	8.38	-	-	-	-	-					
	Chromium (III+VI) (Filtered)	µg/L	0.22		-	2.23	-	-	-	-	1.05	-	-	-	-	1.07	8.38	-	-	-	-	-					
	Copper	µg/L		1 ¹²	6 ¹⁹	-	-	0	0	0	-	-	0	0	11.6286	-	-	-	0	0	1.2679	-	-				
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁹	-	21	-	-	-	-	9.81	-	-	-	23.8	15.4	-	-	-	-	-	-				
	Iron	µg/L		1,000 ¹²		-	-	7,699	10,774	11,101	-	-	3,171	4,994	2,309	-	-	-	13,368	13,742	13,145	-	-				
	Iron (Filtered)	µg/L	19	1,000 ¹²		-	6,880	-	-	-	-	561	-	-	-	121	10,500	-	-	-	-	-	-				
	Lead	µg/L		1.2 ¹³		-	-	29.02	51.3431	42.932	-	-	32.237	59.0437	44.2831	-	-	-	11.323	19.7363	20.365	-	-				
	Lead (Filtered)	µg/L	0.02	1.2 ¹³		-	0.093	-	-	-	-	0.06	-	-	-	-	0.119	2.9	-	-	-	-	-				
	Magnesium	mg/L				-	-	117.8	56.7	53.4	-	-	24.2	28.5	23.5	-	37.3	652	292.5	168.8	137.1	-	-				
	Magnesium (Filtered)	mg/L	0.036			-	143	-	-	-	-	25.4	-	-	-	-	37.3	652	-	-	-	-	-				
	Manganese	µg/L		123 ¹²		-	-	4,257	4,806	4,773	-	-	2,513	3,008	1,776	-	-	-	3,498	3,736	3,891	-	-				
	Mercury	µg/L		0.07 ¹¹		-	-	0.511	0	0	-	-	0.978	0	0	-	-	-	2,716	0	0	-	-				
	Mercury (Filtered)	µg/L	0.01	0.07 ¹¹		-	<0.01	-	-	-	-	<0.01	-	-	-	<0.01	<0.01	-	-	-	-	-	-				
	Nickel	µg/L		4 ¹³		-	-	24.428	21.8742	25.4967	-	-	0	0	0	-	-	-	5.395	5.6663	6.5937	-	-				
	Nickel (Filtered)	µg/L	0.15	4 ¹³		-	59.2	-	-	-	-	23.8	-	-	-	-	10.1	40.3	-	-	-	-	-				
	Selenium	µg/L				-	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	-	-				
	Selenium (Filtered)	µg/L	0.39			-	<0.39	-	-	-	-	1.3	-	-	-	-	25	7.38	-	-	-	-	-				
	Vanadium (Filtered)	µg/L	0.24	20 ¹⁶		-	0.746	-	-	-	-	0.768	-	-	-	-	0.517	3.41	-	-	-	-	-				
	Zinc	µg/L		10.9 ¹²		-	-	7,994	8,8395	5,7847	-	-	2,902	4,8978	5,9438	-	-	-	5,002	7,3102	6,8148	-	-				
	Zinc (Filtered)	µg/L	0.41	10.9 ¹²		-	12.4	-	-	-	-	3.35	-	-	-	-	1.57	10.4	-	-	-	-	-				
	Potassium (Filtered)	mg/L	1			-	61	-	-	-	-	13.1	-	-	-	-	17.7	193	-	-	-	-	-				
	Tin	µg/L		25 ¹⁶		-	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	-	-				
	Chromium (hexavalent)	µg/L	30	3.4 ¹²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Organics	Dissolved Organic Carbon	mg/L	3		-	-	31.7	-	-	-	69.1	-	-	-	-	53.5	16.7	-	-	-	-	-					
Inorganics	Acidity	mg/L	4		-	43.8	-	-	-	-	12.8	-	-	-	-	11	52.9	-	-	-	-	-					
	BOD	mg/L	1		-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-					
	Sulphur	µg/L			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Sodium (Filtered)	mg/L	0.076		-	1,420	-	-	-	-	70.9	-	-	-	-	138	3,840	-	-	-	-	-					
	Bromide	µg/L	20		-	3,160	-	-	-	-	571	-	-	-	-	415	26,000	-	-	-	-	-					
	Chloride	mg/L	2	250 ¹⁶		-	10,600	-	-	-	3,080	-	-	-	-	1,620	15,800	-	-	-	-	-					
	Nitrate (as NO3-)	mg/L	0.3		-	<0.3	-	-	-	-	<0.3	-	-	-	-	4.72	<0.3	-	-	-	-	-					
	Nitrite (as NO2-)	mg/L	0.05		-	<0.05	-	-	-	-	<0.05	-	-	-	-	0.461	<0.05	-	-	-	-	-					
	Ortho Phosphate as P	mg/L	0.02		-	<0.02	-	-	-	-	<0.02	-	-	-	-	<0.02	<0.02	-	-	-	-	-					
	Sulphide	mg/L	0.01		-	<0.01	-	-	-	-	<0.01	-	-	-	-	<0.01	0.0176	-	-	-	-	-					
	Alkalinity (total) as CaCO3	mg/L	2		-	170	-	-	-	-	85	-	-	-	-	105	675	-	-	-	-	-					
	Hardness as CaCO3	mg/L			-	-	16,648	11,103	10,058	-	-	2,624	3,187	2,900	-	-	-	9,388	8,780	8,573	-	-					
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2		-	170	-	-	-	-	85	-	-	-	-	105	675	-	-	-	-	-					
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2		-	165	-	-	-	-	80	-	-	-	-	95	665	-	-	-	-	-					
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²		-	5.81	-	-	-	-	1.17	-	-	-	0.783	15.5	-	-	-	-	-					
	Sulphate (soluble)	mg/L	2		-	424	-	-	-	-	-	11.3	-	-	-	-	83.3	286	-	-	-	-	-				
	COD	mg/L	7		-	623	-	-	-	-	-	480	-	-	-	-	290	354	-	-	-	-	-				
	pH (Lab)	pH_Units	1		-	7.37	-	-	-	-	-	7.63	-	-	-	-	7.86	7.22	-	-	-	-	-				

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

Other																						
	Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	E6 s	E7 d				E7 d	E7 m				E7 m	E7 s	E8 d				E8 d
					Date	01/08/2017 Normal	18/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal	18/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal	18/12/2015 Normal	17/12/2015 Normal	04/08/2016 Normal	08/02/2017 Normal	31/07/2017 Normal	01/08/2017 Normal
	Sample Type				SampleCode	E6 - 01 Aug 17s	12677370	E7 - 04 Aug 16s	E7 - 08 Feb 17s	E7 - 31 Jul 17s	E7 - 01 Aug 17d	12677371	E7 - 04 Aug 16m	E7 - 08 Feb 17m	E7 - 31 Jul 17m	E7 - 01 Aug 17m	12677372	12672001	E8 - 04 Aug 16d	E8 - 08 Feb 17d	E8 - 31 Jul 17d	E8 - 01 Aug 17d
	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dodecamethylcyclhexasiloxane	µg/L				-	-	0	0	0	-	-	0	0	0	-	-	-	0	0	0	-
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-
	methylsilanetriol	ppm				0.4	-	-	-	-	150.8	-	-	-	-	169.6	-	-	-	-	-	29.2
	Unknown 1 SVOC_151219-32	µg/L				-	23	-	-	-	-	255	-	-	-	-	22.1	-	-	-	-	-
	Unknown 1 VOC_151219-32	µg/L				-	15	-	-	-	-	22	-	-	-	-	16	-	-	-	-	-
	Unknown 3 SVOC_151219-32	µg/L				-	17.2	-	-	-	-	213	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151219-32	µg/L				-	14	-	-	-	-	12	-	-	-	-	11	-	-	-	-	-
	Unknown 4 VOC_151219-32	µg/L				-	17	-	-	-	-	38	-	-	-	-	24	-	-	-	-	-
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ethylidimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L				-	414	-	-	-	-	532	-	-	-	-	475	139	-	-	-	-
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	197	-	-	-	-	-	-	-	-	-	-
	Cyclic octatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L				-	13	-	-	-	-	19	-	-	-	-	18	-	-	-	-	-
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-
	HexamethylDisilazane, Bis(trimethylsilyl)amine	µg/L				-	-	0	0	0	-	-	0	0	0	0	-	0	0	0	0	-
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L				-	11.5	-	-	-	-	89.6	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm				6.9	-	-	-	-	18.2	-	-	-	-	16.9	-	-	-	-	-	29.9
	Trimethylsilanol	µg/L		124 [®]		-	-	1,730	1,870	1,640	-	-	1,130	1,690	1,950	-	-	-	1,020	1,190	1,110	-
	Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	13	-	-	-	-	12	-	-	-	-	-
	Volatile TIC	-				-	1	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-
	Decamethylcyclopentasiloxane	µg/L				-	-	0	0	0	-	-	0	0	0	-	-	0	0	0	-	-
	Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzenesulfonamide, -methyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 SVOC_151219-32	µg/L				-	10.8	-	-	-	-	208	-	-	-	-	17.2	-	-	-	-	-
	Unknown 2 VOC_151219-32	µg/L				-	13	-	-	-	-	11	-	-	-	-	24	-	-	-	-	-
	Unknown 2 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 2 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						Location		E8				E8		E8			
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Well	Date	m				m		s			
						Sample Type	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	18/12/2015	04/08/2016	08/02/2017	31/07/2017		
						SampleCode	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal		
							12672002	E8_04 Aug 16m_	E8_08 Feb 17m_	E8_31 Jul 17m_	E8_01 Aug 17m_	12672889	E8_04 Aug 16m_	E8_08 Feb 17m_	E8_31 Jul 17m_		
TPH	GRO >C5-C12	µg/L	50				645	-	-	-	-	572	-	-	-	-	-
	>C5-C6 Aliphatics	µg/L	10				317	-	-	-	-	274	-	-	-	-	-
	>C6-C8 Aliphatics	µg/L	10				106	-	-	-	-	83	-	-	-	-	-
	>C8-C10 Aliphatics	µg/L	10				96	-	-	-	-	93	-	-	-	-	-
	>C10-C12 Aliphatics	µg/L	10				37	-	-	-	-	36	-	-	-	-	-
	>C12-C16 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>C16-C21 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>C16-C35 Aliphatics	µg/L					<20	-	-	-	-	<20	-	-	-	-	-
	>C21-C35 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>C12-C35 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>EC5-EC7 Aromatics	µg/L	10	10 ^{#3}			<10	-	-	-	-	<10	-	-	-	-	-
	>EC7-EC8 Aromatics	µg/L	10	74 ^{#2}			<10	-	-	-	-	<10	-	-	-	-	-
	>EC8-EC10 Aromatics	µg/L	10				64	-	-	-	-	62	-	-	-	-	-
	>EC10-EC12 Aromatics	µg/L	10				25	-	-	-	-	24	-	-	-	-	-
	>EC12-EC16 Aromatics	µg/L	10				22	-	-	-	-	<10	-	-	-	-	-
	>EC16-EC21 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>EC21-EC35 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	-
	>EC12-EC35 Aromatics	µg/L	10				22	-	-	-	-	<10	-	-	-	-	-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				667	-	-	-	-	572	-	-	-	-	-
BTX	Benzene	µg/L	1	10 ^{#3}			<7 - 1.75	0	1.115	1.294	-	<1	0	0	2.788		
	Toluene	µg/L	1	74 ^{#2}			<1	0	0	-	-	<1	0	0	0		
	Ethylbenzene	µg/L	1	20 ^{#6}			<1	3.857	0	0	-	<1	5.905	0	0		
	Xylene (m & p)	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Xylene (m)	µg/L					-	0	0	0	-	-	0	0	0		
	Xylene (p)	µg/L					-	0	5.799	4.826	-	-	0	8.17	8.208		
	Xylene Total	µg/L	2	30 ^{#6}			<2	0	6.805	7.114	-	<2	0	8.17	12.663		
	Xylene (o)	µg/L	1				<1	0	1.006	2.288	-	<1	0	0	4.455		
	Total BTX	µg/L	28				<28	3.857	7.92	8.408	-	<28	5.905	8.17	15.451		
Oxygenates	MTBE	µg/L	1	5.100 ^{#2}			<1	-	-	-	-	<1	-	-	-		
	Tert Amyl Methyl Ether	µg/L	1	510 ^{#2}			<1	-	-	-	-	<1	-	-	-		
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Vinyl chloride	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Chloroethane	µg/L	1				11	-	-	-	-	6.12	-	-	-		
	1,1-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Dichloromethane	µg/L	3	20 ^{#3}			<3	-	-	-	-	<3	-	-	-		
	trans-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,1-dichloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	cis-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Chloroform	µg/L	1	2.4 ^{#3}			<1	-	-	-	-	<1	-	-	-		
	1,1,1-trichloroethane	µg/L	1	100 ^{#6}			<1	-	-	-	-	<1	-	-	-		
	Carbon tetrachloride	µg/L	1	12 ^{#3}			<1	-	-	-	-	<1	-	-	-		
	Trichloroethene	µg/L	1	10 ^{#3}			<1	-	-	-	-	<1	-	-	-		
	1,1,2-trichloroethane	µg/L	1	400 ^{#6}			<1	-	-	-	-	<1	-	-	-		
	Tetrachloroethene	µg/L	1	10 ^{#3}			<1	-	-	-	-	<1	-	-	-		
	Sum of PCE and TCE	µg/L					<2	-	-	-	-	<2	-	-	-		
	TCE+DCE+VC	µg/L					<5	-	-	-	-	<5	-	-	-		
	PCE+TCE+DCE+VC	µg/L					<6	-	-	-	-	<6	-	-	-		
VOC	2,2-dichloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Bromochloromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,1-dichloropropene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,2-dichloroethane	µg/L	1	10 ^{#3}			<1	-	-	-	-	<1	-	-	-		
	1,2-dichloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Dibromomethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Bromodichloromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	cis-1,3-dichloropropene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	trans-1,3-dichloropropene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,3-dichloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Chlorodibromomethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,1,1,2-tetrachloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Styrene	µg/L	1	50 ^{#6}			<1	-	-	-	-	<1	-	-	-		
	Bromoform	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Isopropylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,1,2,2-tetrachloroethane	µg/L	1	140 ^{#2}			<1	-	-	-	-	<1	-	-	-		
	1,2,3-trichloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	n-propylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,3,5-trimethylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	tert-butylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,2,4-trimethylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	sec-butylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	p-isopropyltoluene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	n-butylbenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	1,2-dibromo-3-chloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-		
	Hexachlorobutadiene	µg/L	1	0.6 ^{#1}			<1	-	-	-	-	<1	-	-	-		
	1,2-Dichloroethene	µg/L					<2	-	-	-	-	<2	-	-	-		
	Trihalomethanes	µg/L					<4	-	-	-	-	<4	-	-	-		
	Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-		
	Cyclotetrasiloxane, octamethyl-	µg/L					-	0	0	0	-	-	0	0	0		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E8				E8	E9			
						Well	m				m	s			
						Date	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	18/12/2015	04/08/2016	08/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	12672002	E8: 04 Aug 16m	E8: 08 Feb 17m	E8: 31 Jul 17m	E8: 01 Aug 17m	12677369	E8: 04 Aug 16m	E8: 08 Feb 17m	E8: 31 Jul 17m
PAH	Naphthalene	µg/L	1	2 ⁴³			<1	-	-	-	-	<1	-	-	-
	Acenaphthylene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Acenaphthene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Fluorene	µg/L	1	<1			<1	-	-	-	-	<1	-	-	-
	Phenanthrene	µg/L	1	<1			<1	-	-	-	-	<1	-	-	-
	Anthracene	µg/L	1	0.1 ⁴³			<1	-	-	-	-	<1	-	-	-
	Fluoranthene	µg/L	1	0.0063 ⁴³			<1	-	-	-	-	<1	-	-	-
	Pyrene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Benz(a)anthracene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Chrysene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³			<1	-	-	-	-	<1	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴			<1	-	-	-	-	<1	-	-	-
	Dibenzo(a,h)anthracene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁴¹			<1	-	-	-	-	<1	-	-	-
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹			<1	-	-	-	-	<1	-	-	-
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹			<1	-	-	-	-	<1	-	-	-
	Benzo(b)&(k)fluoranthene	µg/L	1				<2	-	-	-	-	<2	-	-	-
	PAHs (sum of 4)	µg/L	1				<4	-	-	-	-	<4	-	-	-
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L	1				<2	-	-	-	-	<2	-	-	-	
Coal Tar (BaP as surrogate marker)	µg/L	1				<1	-	-	-	-	<1	-	-	-	
SVOC	2-methylnaphthalene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	4-bromophenyl phenyl ether	µg/L	1				<1	-	-	-	-	<1	-	-	-
	4-chlorophenyl phenyl ether	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Azobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Bis(2-chloroethyl)ether	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Carbazole	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Dibenzofuran	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Hexachlorocyclopentadiene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Hexachloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-
Bis(2-chloroisopropyl) ether	-					0	-	-	-	-	0	-	-	-	
Phenolics	2-methylphenol	µg/L	1				1.04	-	-	-	-	<1	-	-	-
	2-nitrophenol	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2,4-dimethylphenol	µg/L	1				<1	-	-	-	-	<1	-	-	-
	4-chloro-3-methylphenol	µg/L	1	40 ⁴⁶			<1	-	-	-	-	<1	-	-	-
	4-methylphenol	µg/L	1				2.76	-	-	-	-	<1	-	-	-
	4-nitrophenol	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Phenol	µg/L	1	7.7 ⁴²			<1	-	-	-	-	<1	-	-	-
	2-chloronaphthalene	µg/L	1				<1	-	-	-	-	<1	-	-	-
PCBs	1,1-Biphenyl	-				0	-	-	-	-	0	-	-	-	-
Amino Aliphatics															
	N-nitrosodi-n-propylamine	µg/L	1				<1	-	-	-	-	<1	-	-	-
Anilines															
	Aniline	-					0	-	-	-	-	0	-	-	-
	2-nitroaniline	µg/L	1				<1	-	-	-	-	<1	-	-	-
	3-nitroaniline	µg/L	1				<1	-	-	-	-	<1	-	-	-
	4-chloroaniline	µg/L	1				<1	-	-	-	-	<1	-	-	-
Explosives															
	4-nitroaniline	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2,4-Dinitrotoluene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2,6-dinitrotoluene	µg/L	1				<1	-	-	-	-	<1	-	-	-
Halogenated Benzenes															
	Nitrobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,3,5-Trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			<1	-	-	-	-	<1	-	-	-
	Chlorobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Bromobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2-chlorotoluene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	4-chlorotoluene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,3-dichlorobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,4-dichlorobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,2-dichlorobenzene	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			<1	-	-	-	-	<1	-	-	-
1,2,3-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			<1	-	-	-	-	<1	-	-	-	
Halogenated Hydrocarbons															
	Hexachlorobenzene	µg/L	1	0.05 ⁴⁴			<1	-	-	-	-	<1	-	-	-
	Trichlorobenzene (total)	µg/L	1	0.4 ⁴³			<3	-	-	-	-	<3	-	-	-
	Dichlorodifluoromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Bromomethane	µg/L	1				<1	-	-	-	-	<1	-	-	-
Halogenated Phenols															
	Trichlorofluoromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-
	1,2-dibromoethane	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2,3,4,6-tetrachlorophenol	-					0	-	-	-	-	0	-	-	-
	2,6-dichlorophenol	-					<0	-	-	-	-	<0	-	-	-
	2-chlorophenol	µg/L	1	50 ⁴⁶			<1	-	-	-	-	<1	-	-	-
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²			<1	-	-	-	-	<1	-	-	-
	2,4,5-trichlorophenol	µg/L	1				<1	-	-	-	-	<1	-	-	-
	2,4,6-trichlorophenol	µg/L	1				<1	-	-	-	-	<1	-	-	-
	Pentachlorophenol	µg/L	1				<1	-	-	-	-	<1	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location		E8				E8		E8										
						Well	Date	m				m												
								Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal									
																SampleCode	E8_04 Aug 16m_	E8_06 Feb 17m_	E8_31 Jul 17m_	E8_01 Aug 17m_	1267269	E8_04 Aug 16s_	E8_06 Feb 17s_	E8_31 Jul 17s_
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³			<2	-	-	-	-	<2	-	-	-									
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²			<1	-	-	-	-	<1	-	-	-									
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶			<1	-	-	-	-	<1	-	-	-									
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶			<5	-	-	-	-	<5	-	-	-									
	Diethylphthalate	µg/L	1	200 ¹⁶			<1	-	-	-	-	<1	-	-	-									
	Dimethyl phthalate	µg/L	1	800 ¹⁶			<1	-	-	-	-	<1	-	-	-									
Solvents	Carbon disulfide	µg/L	1				<1	-	-	-	-	<1	-	-	-									
	Isophorone	µg/L	1				<1	-	-	-	-	<1	-	-	-									
	Methanol	µg/L					-	0	0	0	-	-	0	0	0									
Metals	Aluminium	µg/L		15 ¹⁶			-	0	0	0	-	-	0	0	4.6257									
	Arsenic	µg/L		50 ¹²			-	0	7.4749	0	-	-	0	0	0									
	Arsenic (Filtered)	µg/L	0.12	50 ¹²			18	-	-	-	-	8.24	-	-	-									
	Barium (Filtered)	µg/L	0.03				2,620	-	-	-	-	503	-	-	-									
	Beryllium (Filtered)	µg/L	0.07				<0.07	-	-	-	-	<0.07	-	-	-									
	Boron	µg/L		2,000 ¹⁶			-	423.054	488.1712	413.188	-	-	448.451	426.8397	398.0738									
	Boron (Filtered)	µg/L	9.4	2,000 ¹⁶			491	-	-	-	-	362	-	-	-									
	Cadmium	µg/L		0.08 ¹³			-	0	0	0	-	-	0	0	0									
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³			<0.1	-	-	-	-	<0.1	-	-	-									
	Calcium	mg/L					-	1,850	2,682	2,037	-	-	1,199	1,193	1,050									
	Calcium (Filtered)	mg/L	0.012				4,480	-	-	-	-	1,510	-	-	-									
	Chromium (III+VI)	µg/L					-	0	2,0919	0	-	-	0	0	0									
	Chromium (III+VI) (Filtered)	µg/L	0.22				2.26	-	-	-	-	1.39	-	-	-									
	Copper	µg/L		1 ¹²	6 ¹⁹		-	0	0	0	-	-	0	0	0									
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁹		15.1	-	-	-	-	12.5	-	-	-									
	Iron	µg/L		1,000 ¹²			-	2,430	4,255	2,854	-	-	2,164	1,467	1,772									
	Iron (Filtered)	µg/L	19	1,000 ¹²			5,300	-	-	-	-	1,830	-	-	-									
	Lead	µg/L		1.2 ¹³			-	13.909	29.5705	20.4691	-	-	25.924	38.6051	30.3569									
	Lead (Filtered)	µg/L	0.02	1.2 ¹³			0.078	-	-	-	-	0.574	-	-	-									
	Magnesium	mg/L					-	129.6	101.3	96.7	-	-	48.5	52.5	38.2									
	Magnesium (Filtered)	mg/L	0.036				102	-	-	-	-	57.3	-	-	-									
	Manganese	µg/L		123 ¹²			-	1,611	2,828	2,353	-	-	1,066	1,044	977.8708									
	Mercury	µg/L		0.07 ¹³			-	0.494	0	0	-	-	0	0	0									
	Mercury (Filtered)	µg/L	0.01	0.07 ¹³			<0.01	-	-	-	-	<0.01	-	-	-									
	Nickel	µg/L		4 ¹³			-	18.669	24.0413	20.624	-	-	0	0	0									
	Nickel (Filtered)	µg/L	0.15	4 ¹³			60.1	-	-	-	-	15.7	-	-	-									
Selenium	µg/L					-	0	0	0	-	-	0	0	0										
Selenium (Filtered)	µg/L	0.39				1.87	-	-	-	-	3.32	-	-	-										
Vanadium (Filtered)	µg/L	0.24	20 ¹⁶			0.539	-	-	-	-	1.03	-	-	-										
Zinc	µg/L		10.9 ¹²			-	6.056	11.7344	4.1882	-	-	2.931	4.2716	0.6943										
Zinc (Filtered)	µg/L	0.41	10.9 ¹²			8.05	-	-	-	-	21.6	-	-	-										
Potassium (Filtered)	mg/L	1				47.5	-	-	-	-	30.6	-	-	-										
Tin	µg/L		25 ¹⁶			-	0	0	0	-	-	0	0	0										
Chromium (hexavalent)	µg/L	30	3.4 ¹²			-	-	-	-	-	-	-	-	-										
Organics	Dissolved Organic Carbon	mg/L	3				35.1	-	-	-	-	51.5	-	-	-									
Inorganics	Acidity	mg/L	4				25.6	-	-	-	-	5.48	-	-	-									
	BOD	mg/L	1				<1	-	-	-	-	-	-	-	-									
	Sulphur	µg/L					-	-	-	-	-	-	-	-	-									
	Sodium (Filtered)	mg/L	0.076				671	-	-	-	-	791	-	-	-									
	Bromide	µg/L	20				2,160	-	-	-	-	1,700	-	-	-									
	Chloride	mg/L	2	250 ¹⁶			12,100	-	-	-	-	3,280	-	-	-									
	Nitrate (as NO3-)	mg/L	0.3				<0.3	-	-	-	-	<0.3	-	-	-									
	Nitrite (as NO2-)	mg/L	0.05				<0.05	-	-	-	-	<0.05	-	-	-									
	Ortho Phosphate as P	mg/L	0.02				<0.02	-	-	-	-	<0.02	-	-	-									
	Sulphide	mg/L	0.01				<0.01	-	-	-	-	<0.01	-	-	-									
	Alkalinity (total) as CaCO3	mg/L	2				105	-	-	-	-	135	-	-	-									
	Hardness as CaCO3	mg/L					-	5,153	7,113	5,484	-	-	3,194	3,196	2,779									
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				105	-	-	-	-	135	-	-	-									
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				105	-	-	-	-	115	-	-	-									
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²			3.49	-	-	-	-	1.85	-	-	-									
	Sulphate (soluble)	mg/L	2				101	-	-	-	-	101	-	-	-									
	COD	mg/L	7				474	-	-	-	-	476	-	-	-									
	pH (Lab)	pH_Units	1				7.2	-	-	-	-	-	7.38	-	-	-								

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location		E8				E8				E8			
						Well	Date	m				m				s			
								Sample Type	SampleCode	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Other	Benzene acetic acid (TIC)	µg/L						17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	18/12/2015	04/08/2016	08/02/2017	31/07/2017			
	Dodecamethylcyclohexasiloxane	µg/L						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal			
	Unknown 5 VOC_151219-32	µg/L						12672002	E8_04 Aug 16m	E8_08 Feb 17m	E8_31 Jul 17m	E8_01 Aug 17m	12677369	E8_04 Aug 16s	E8_08 Feb 17s	E8_31 Jul 17s			
	methylsilanetriol	ppm						-	-	-	-	-	-	-	-	-			
	Unknown 1 SVOC_151219-32	µg/L						-	0	0	0	-	-	0	0	0			
	Unknown 1 VOC_151219-32	µg/L						-	-	-	-	-	-	-	-	-			
	Unknown 3 SVOC_151219-32	µg/L						-	-	-	-	56.5	-	-	-	-			
	Unknown 3 VOC_151219-32	µg/L						-	-	-	-	-	18.9	-	-	-			
	Unknown 4 VOC_151219-32	µg/L						-	-	-	-	-	13	-	-	-			
	Unknown 1 VOC_151218-69	µg/L						-	-	-	-	-	29	-	-	-			
	Unknown 3 VOC_151218-69	µg/L						-	-	-	-	-	11	-	-	-			
	Unknown 4 SVOC_151218-69	µg/L						17	-	-	-	-	-	-	-	-			
	Unknown 4 VOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-			
	Unknown SVOC_151218-69	µg/L						12.9	-	-	-	-	-	-	-	-			
	Unknown 1 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-			
	Unknown 3 SVOC_151218-69	µg/L						-	-	-	-	-	-	-	-	-			
	Unknown 5 SVOC_151218-69	µg/L						12.4	-	-	-	-	-	-	-	-			
	ethylidimethylsilanol	µg/L						40.4	-	-	-	-	-	-	-	-			
	tert-Butyldimethylsilanol	µg/L						17	-	-	-	-	-	-	-	-			
	Benzene, hexamethyl-	µg/L						469	-	-	-	-	299	-	-	-			
	Cyclic octaatomic sulfur	µg/L						12.5	-	-	-	-	10.9	-	-	-			
	methoxytrimethylsilane	µg/L						-	-	-	-	-	-	-	-	-			
	Hexanoic Acid	mg/L						16.4	-	-	-	-	12	-	-	-			
	Dioxo-, -trisilacyclohexane, -hexamethyl-	µg/L						-	-	-	-	-	-	-	-	-			
	HexamethylDioxatrisilacyclohexane isomer	µg/L						24.3	-	-	-	-	-	-	-	-			
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L						-	-	-	-	-	-	-	-	-			
	HexamethylDisiloxane	µg/L						-	0	0	0	-	-	0	0	0			
	Pentamethylbenzoic acid	µg/L						-	-	-	-	-	-	-	-	-			
	Silicic Acid	ppm						15.7	-	-	-	-	26.2	-	-	-			
	Trimethylsilanol	µg/L					124 nd	-	-	-	-	13.5	-	-	-	-			
Trimethylsilanol isomer	µg/L						-	740	1,330	960	-	-	1,120	2,620	1,810				
Trimethylsilyl fluoride	µg/L						-	-	-	-	-	-	-	-	-				
Volatile TIC	-						1	-	-	-	-	1	-	-	-				
Decamethylcyclopentasiloxane	µg/L						-	0	0	0	-	-	0	0	0				
Benzenepropanoic acid	µg/L						-	-	-	-	-	-	-	-	-				
Benzenesulfonamide, -methyl-	µg/L						-	-	-	-	-	-	-	-	-				
Unknown 2 SVOC_151219-32	µg/L						-	-	-	-	-	27.9	-	-	-				
Unknown 2 VOC_151219-32	µg/L						-	-	-	-	-	14	-	-	-				
Unknown 2 VOC_151218-69	µg/L						18.1	-	-	-	-	-	-	-	-				
Unknown 2 SVOC_151218-69	µg/L						25.4	-	-	-	-	-	-	-	-				

Comments
#1 WFD England/Wales. 2015 - MAC-EQS Inland
#2 WFD England/Wales. 2015 - Freshwater Standards
#3 WFD England/Wales. 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
xxx	Exceedance of GAC Protective of Fresh Water Receptor
xxx	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location		E9				E9				E9				E9				LF4		LF6		LF7															
						Well	Date	d				d				m				m																							
								17/12/2015				01/08/2017				17/12/2015				01/08/2017				25/03/2015		09/09/2015		14/12/2015		25/03/2015		09/09/2015		14/12/2015		24/02/2016		03/08/2016		09/02/2017		01/08/2017	
								Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal				
						Sample Type	SampleCode	12671998	E9_04 Aug 16s	E9_08 Feb 17d	E9_31 Jul 17d	E9_01 Aug 17d	12671999	E9_04 Aug 16m	E9_08 Feb 17m	E9_31 Jul 17m	E9_01 Aug 17m	12672000	E9_04 Aug 16s	E9_08 Feb 17s	E9_31 Jul 17s	LF4_25 Mar 15	LF4_09 Sep 15	12642679	LF7_25 Mar 15	LF7_09 Sep 15	12642680	LF7_24 Feb 16	LF7_03 Aug 16	LF7_09 Feb 17	LF7_01 Aug 17												
TPH	GRO >C5-C12	µg/L	50				238	-	-	-	-	148	-	-	-	-	<50	-	-	-	-	-	<50	-	-	77	-	-	-	-	-												
	>C5-C6 Aliphatics	µg/L	10				142	-	-	-	-	98	-	-	-	-	<10	-	-	-	-	-	<10	-	-	45	-	-	-	-	-												
	>C6-C8 Aliphatics	µg/L	10				44	-	-	-	-	26	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>C8-C10 Aliphatics	µg/L	10				21	-	-	-	-	10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>C10-C12 Aliphatics	µg/L	10				10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>C12-C16 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>C16-C21 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>C16-C35 Aliphatics	µg/L					<20	-	-	-	-	<20	-	-	-	-	<20	-	-	-	-	-	1,740	-	-	<20	-	-	-	-	-												
	>C21-C35 Aliphatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	1,550	-	-	<10	-	-	-	-	-												
	>C12-C35 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	1,890	-	-	<10	-	-	-	-	-												
	>EC5-EC7 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>EC7-EC8 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>EC8-EC10 Aromatics	µg/L	10				14	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>EC10-EC12 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	<10	-	-	<10	-	-	-	-	-												
	>EC12-EC16 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	243	-	-	<10	-	-	-	-	-												
	>EC16-EC21 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	532	-	-	<10	-	-	-	-	-												
	>EC21-EC35 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	1,990	-	-	<10	-	-	-	-	-												
	>EC12-EC35 Aromatics	µg/L	10				<10	-	-	-	-	<10	-	-	-	-	<10	-	-	-	-	-	2,760	-	-	<10	-	-	-	-	-												
	>C5-C35 Aliphatics & Aromatics	µg/L	10				238	-	-	-	-	148	-	-	-	-	<10	-	-	-	-	-	4,650	-	-	76	-	-	-	-	-												
BTX	Benzene	µg/L	1				<1	0	0	0	-	<1	0	0	0	-	<1	0	0	0	0	<1	0	0	<1	0	0	0	0	0	0												
	Toluene	µg/L	1				<1	0	0	0	-	<1	0	0	0	-	<1	0	0	0	0	<1	0	0	<1	0	0	0	0	0	0												
	Ethylbenzene	µg/L	1				<1	3,567	0	0	-	<1	0	0	0	-	<1	0	0	0	0	<1	0	0	<1	0	0	0	0	0	0												
	Xylene (m & p)	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	-												
	Xylene (m)	µg/L					-	0	0	0	-	-	0	0	0	-	-	0	0	0	0	-	0	0	-	0	0	0	0	0	0												
	Xylene (p)	µg/L					-	1,228	3,788	5,024	-	-	0	0	0	-	-	0	0	0	0	3,363	0	-	0	0	-	0	0	0	0												
	Xylene Total	µg/L	2				<2	1,228	3,788	6,211	-	<2	0	0	0	-	<2	0	0	0	0	4,674	0	<2	0	0	<2	0	0	0	0												
	Xylene (o)	µg/L	1				<1	0	0	1,187	-	<1	0	0	0	-	<1	0	0	0	0	1,311	0	<1	0	0	<1	0	0	0	0												
Total BTX	µg/L	28				<28	4,795	3,788	6,211	-	<28	0	0	0	-	<28	0	0	0	0	4,674	0	<28	0	0	<28	0	0	0	0													
Oxygenates	MTBE	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Tert Amyl Methyl Ether	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Vinyl chloride	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Chloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	1,1-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Dichloromethane	µg/L	3				<3	-	-	-	-	<3	-	-	-	-	<3	-	-	-	-	<3	-	-	<3	-	-	-	-	-													
	trans-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	1,1-dichloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	cis-1,2-dichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Chloroform	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	1,1,1-trichloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Carbon tetrachloride	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Trichloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	1,1,2-trichloroethane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Tetrachloroethene	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
	Sum of PCE and TCE	µg/L					<2	-	-	-	-	<2	-	-	-	-	<2	-	-	-	-	<2	-	-	<2	-	-	-	-	-													
	TCE+DCE+VC	µg/L					<5	-	-	-	-	<5	-	-	-	-	<5	-	-	-	-	<5	-	-	<5	-	-	-	-	-													
	PCE+TCE+DCE+VC	µg/L					<6	-	-	-	-	<6	-	-	-	-	<6	-	-	-	-	<6	-	-	<6	-	-	-	-	-													
	VOC	2,2-dichloropropane	µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-												
Bromochloromethane		µg/L	1				<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-													
1,1-dichloropropene		µg/L	1				<1	-	-	-	-	<																															

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E9										LF4		LF6	LF7										
						Well	E9					E9					E9					LF4		LF6	LF7					
						Date	E9					E9					E9					LF4		LF6	LF7					
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SampleCode	12671998	E9_04 Aug 16s	E9_08 Feb 17s	E9_31 Jul 17s	E9_01 Aug 17s	12671999	E9_04 Aug 16m	E9_08 Feb 17m	E9_31 Jul 17m	E9_01 Aug 17m	12672000	E9_04 Aug 16s	E9_08 Feb 17s	E9_31 Jul 17s	LF4_25 Mar 15	LF4_09 Sep 15	12642679	LF7_25 Mar 15	LF7_09 Sep 15	12642680	LF7_24 Feb 16	LF7_03 Aug 16	LF7_09 Feb 17	LF7_01 Aug 17						
PAH	Naphthalene	µg/L	1	2 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	
	Acenaphthylene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Acenaphthene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Fluorene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Phenanthrene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Anthracene	µg/L	1	0.1 st		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Fluoranthene	µg/L	1	0.0063 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Pyrene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Benz(a)anthracene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Chrysene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Benzo(a) pyrene	µg/L	1	0.00017 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Dibenz(a,h)anthracene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Benzo(g,h,i)perylene	µg/L	1	0.0082 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Benzo(b)fluoranthene	µg/L	1	0.017 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Benzo(k)fluoranthene	µg/L	1	0.017 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	PAHs (sum of 4)	µg/L				<2	-	-	-	-	<2	-	-	-	-	<2	-	-	-	-	<16	-	-	<4	-	-	-	-	-	
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				<4	-	-	-	-	<4	-	-	-	-	<4	-	-	-	-	<32	-	-	<8	-	-	-	-	-		
Coal Tar (Bap as surrogate marker)	µg/L				<2	-	-	-	-	<2	-	-	-	-	<2	-	-	-	-	<16	-	-	<4	-	-	-	-	-		
<1	-	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	<8	-	-	<2	-	-	-	-	-		
SVOC	2-methylnaphthalene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-bromophenyl phenyl ether	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-chlorophenyl phenyl ether	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Azobenzene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Bis(2-chloroethoxy) methane	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Bis(2-chloroethyl)ether	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Carbazole	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Dibenzofuran	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Hexachlorocyclopentadiene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Hexachloroethane	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
Bis(2-chloroisopropyl) ether	-				0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-		
Phenolics	2-methylphenol	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	2-nitrophenol	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	2,4-dimethylphenol	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-chloro-3-methylphenol	µg/L	1	40 th		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-methylphenol	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-nitrophenol	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Phenol	µg/L	1	7.7 nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	2-chloronaphthalene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
PCBs	1,1-Biphenyl	-				0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	0	-	-	-	-	-	
	Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
Anilines	Aniline	-				0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	0	-	-	-	-	-	
	2-nitroaniline	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	3-nitroaniline	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	4-chloroaniline	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
4-nitroaniline	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-		
Explosives	2,4-Dinitrotoluene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	2,6-dinitrotoluene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
	Nitrobenzene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<8	-	-	<2	-	-	-	-	-	
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" nd		<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	
	Chlorobenzene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	
	Bromobenzene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	
	2-chlorotoluene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1	-	-	<1	-	-	-	-	-	
	4-chlorotoluene	µg/L	1			<1	-	-	-	-	<1	-	-	-	-	<1	-	-	-	-	<1									

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

[illegible]

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	E9				E9	E9				LF4		LF6	LF7												
						Well	d				d	m				s															
						Date	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	01/08/2017	17/12/2015	04/08/2016	08/02/2017	31/07/2017	25/03/2015	09/09/2015	14/12/2015	25/03/2015	09/09/2015	14/12/2015	24/02/2016	03/08/2016	09/02/2017	01/08/2017	
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	12671998	E9_04 Aug 16d	E9_08 Feb 17d	E9_31 Jul 17d	E9_01 Aug 17d	12671999	E9_04 Aug 16m	E9_08 Feb 17m	E9_31 Jul 17m	E9_01 Aug 17m	12672000	E9_04 Aug 16s	E9_08 Feb 17s	E9_31 Jul 17s	LF4_25 Mar 15	LF4_09 Sep 15	12642679	LF7_25 Mar 15	LF7_09 Sep 15	12642680	LF7_24 Feb 16	LF7_03 Aug 16	LF7_09 Feb 17	LF7_01 Aug 17	
Other	Benzene acetic acid (TIC)	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Dodecamethylcyclohexasiloxane	µg/L	-	0	0	0	-	-	-	0	0	0	-	-	0	0	0	-	0	0	-	0	0	0	0	0					
	Unknown 5 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	methylsilanetriol	ppm	-	-	-	-	9.1	-	-	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 1 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 1 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 3 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 3 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 4 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 1 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 3 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 4 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 4 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 1 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 3 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Unknown 5 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
	ethyl dimethylsilanol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	tert-Butyldimethylsilanol	µg/L	163	-	-	-	-	126	-	-	-	-	15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Benzene, hexamethyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Cyclic octaatomic sulfur	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	methoxytrimethylsilane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Hexanoic Acid	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	HexamethylDioxatrisilacyclohexane isomer	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L	-	0	0	0	-	-	0	0	0	-	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0				
HexamethylDisiloxane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Pentamethylbenzoic acid	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Silicic Acid	ppm	-	-	-	-	45.1	-	-	-	-	26.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Trimethylsilanol	µg/L	-	770	790	850	-	-	0	170	210	-	-	0	150	220	0	690	-	0	90	-	200	0	160	0	0					
Trimethylsilanol isomer	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.6	-	-	-	-	-					
Trimethylsilyl fluoride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Volatile TIC	-	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	0	-	-	1	-	-	-	-	-					
Decamethylcyclopentasiloxane	µg/L	-	0	0	0	-	-	0	0	0	-	-	0	0	0	0	0	-	0	0	-	0	0	0	0	0					
Benzenepropanoic acid	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Benzenesulfonamide -methyl-	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Unknown 2 SVOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Unknown 2 VOC_151219-32	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Unknown 2 VOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Unknown 2 SVOC_151218-69	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

Comments
#1 WFD England/Wales. 2015 - MAC-EQS Inland
#2 WFD England/Wales. 2015 - Freshwater Standards
#3 WFD England/Wales. 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	South Pond						SW2 Cadoxton River										
							Date	-					-										
								Sample Type	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	09/02/2017	31/07/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017
									Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
									SampleCode	South Pond_18 Feb 15_	South Pond_08 Sep 15_	12677373	South Pond_23 Feb 16_	South Pond_03 Aug 16_	South Pond_09 Feb 17_	South Pond_31 Jul 17_	South Pond_01 Aug 17_	SW2 Cadoxton River_18 Feb 15_	SW2 Cadoxton River_08 Sep 15_	SW2 Cadoxton River_24 Feb 16_	SW2 Cadoxton River_03 Aug 16_	SW2 Cadoxton River_09 Feb 17_	SW2 Cadoxton River_22 Feb 17_
TPH	GRO >C5-C12	µg/L	50				-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-		
	>C5-C6 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C6-C8 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C9-C10 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C10-C12 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C12-C16 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C16-C21 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C16-C35 Aliphatics	µg/L					-	-	<20	-	-	-	-	-	-	-	-	-	-	-	-		
	>C21-C35 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C12-C35 Aliphatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC5-EC7 Aromatics	µg/L	10	10 ⁶³			-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC7-EC8 Aromatics	µg/L	10	74 ⁶²			-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC8-EC10 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC10-EC12 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC12-EC16 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC16-EC21 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC21-EC35 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>EC12-EC35 Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-	-	<10	-	-	-	-	-	-	-	-	-	-	-	-		
BTEx	Benzene	µg/L	1	10 ⁶³			0	0	<1	0	0	0	0	-	0	0	0	0	0	-	0		
	Toluene	µg/L	1	74 ⁶²			0	0	<1	0	0	0	0	-	0	0	0	0	0	-	0		
	Ethylbenzene	µg/L	1	20 ⁶⁶			0	0	<1	0	0	0	0	-	0	0	0	0	0	-	0		
	Xylene (m & p)	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Xylene (m)	µg/L					0	0	-	0	0	0	-	0	0	0	0	0	-	0	0		
	Xylene (p)	µg/L					0	0	-	0	0	0	-	0	0	0	0	0	-	0	0		
	Xylene Total	µg/L	2	30 ⁶⁶			0	0	<2	0	0	0	-	0	0	0	0	0	-	0	0		
	Xylene (o)	µg/L	1				0	0	<1	0	0	0	-	0	0	0	0	0	-	0	0		
	Total BTEx	µg/L	28				0	0	<28	0	0	0	-	0	0	0	0	0	-	0	0		
Oxygenates	MTBE	µg/L	1	5.100 ⁶⁷			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Tert Amyl Methyl Ether	µg/L	1	510 ⁶⁷			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Vinyl chloride	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Chloroethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1-dichloroethene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Dichloromethane	µg/L	3	20 ⁶³			-	-	<3	-	-	-	-	-	-	-	-	-	-	-	-		
	trans-1,2-dichloroethene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1-dichloroethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	cis-1,2-dichloroethene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Chloroform	µg/L	1	2.5 ⁶³			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1,1-trichloroethane	µg/L	1	100 ⁶⁶			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Carbon tetrachloride	µg/L	1	12 ⁶³			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Trichloroethene	µg/L	1	10 ⁶³			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1,2-trichloroethane	µg/L	1	400 ⁶⁶			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Tetrachloroethene	µg/L	1	10 ⁶³			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Sum of PCE and TCE	µg/L					-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-		
TCE+DCE+VC	µg/L					-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-			
PCE+TCE+DCE+VC	µg/L					-	-	<6	-	-	-	-	-	-	-	-	-	-	-	-			
VOC	2,2-dichloropropane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Bromochloromethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1-dichloropropene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-dichloroethane	µg/L	1	10 ⁶³			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-dichloropropane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Dibromomethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Bromodichloromethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	cis-1,3-dichloropropene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	trans-1,3-dichloropropene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,3-dichloropropane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Chlorodibromomethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1,1,2-tetrachloroethane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Styrene	µg/L	1	50 ⁶⁶			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Bromoform	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Isopropylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,1,2,2-tetrachloroethane	µg/L	1	140 ⁶²			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2,3-trichloropropane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	n-propylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,3,5-trimethylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	tert-butylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2,4-trimethylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	sec-butylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	p-isopropyltoluene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	n-butylbenzene	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-dibromo-3-chloropropane	µg/L	1				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	Hexachlorobutadiene	µg/L	1	0.6 ⁶¹			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-		
	1,2-Dichloroethene	µg/L					-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-		
	Trihalomethanes	µg/L					-	-	<4	-	-	-	-	-	-	-	-	-	-	-	-		
	Cyclotrisiloxane, hexamethyl-	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cyclotetrasiloxane, octamethyl-	µg/L					0	0	-	0	0	0	-	0	0	0	0	0	-	0	0			

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	South Pond										SW2 Cadoxton River							
							Well	-										-						
								Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	09/02/2017	31/07/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017	
								Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
								SampleCode	South Pond_18 Feb 15_-	South Pond_08 Sep 15_-	12677373	South Pond_23 Feb 16_-	South Pond_03 Aug 16_-	South Pond_09 Feb 17_-	South Pond_31 Jul 17_-	South Pond_01 Aug 17_-	SW2 Cadoxton River_18 Feb 15_-	SW2 Cadoxton River_08 Sep 15_-	SW2 Cadoxton River_24 Feb 16_-	SW2 Cadoxton River_03 Aug 16_-	SW2 Cadoxton River_09 Feb 17_-	SW2 Cadoxton River_22 Feb 17_-	SW2 Cadoxton River_01 Aug 17_-	
PAH	Naphthalene	µg/L	1	2 ⁴³		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Acenaphthylene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Acenaphthene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Fluorene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Phenanthrene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Anthracene	µg/L	1	0.1 ⁴³		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Fluoranthene	µg/L	1	0.0063 ⁴³		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Pyrene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(a)anthracene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Chrysene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Dibenz(a,h)anthracene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁴¹		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Benzo(b)&(k)fluoranthene	µg/L				-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-				
PAHs (sum of 4)	µg/L				-	-	<4	-	-	-	-	-	-	-	-	-	-	-	-	-				
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L				-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-				
Coal Tar (BaP as surrogate marker)	µg/L				-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-				
SVOC	2-methylnaphthalene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-bromophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chlorophenyl phenyl ether	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Azobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bis(2-chloroethoxy) methane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bis(2-chloroethyl)ether	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Carbazole	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Dibenzofuran	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachlorocyclopentadiene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachloroethane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bis(2-chloroisopropyl) ether	-				-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-				
Phenolics	2-methylphenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2-nitrophenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4-dimethylphenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chloro-3-methylphenol	µg/L	1	40 ⁴⁶		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-methylphenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-nitrophenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Phenol	µg/L	1	7.7 ⁴²		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2-chloronaphthalene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,1-Biphenyl	-				-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-			
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Anilines	Aniline	-				-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	3-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chloroaniline	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-nitroaniline	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Explosives	2,4-Dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,6-dinitrotoluene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Nitrobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Chlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bromobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	4-chlorotoluene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,3-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,4-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2-dichlorobenzene	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2,4-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2,3-trichlorobenzene	µg/L	1	Refer to 'Trichlorobenzene (total)' ⁴⁴		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Hexachlorobenzene	µg/L	1	0.05 ⁴¹		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Trichlorobenzene (total)	µg/L		0.4 ⁴³		-	-	<3	-	-	-	-	-	-	-	-	-	-	-	-	-			
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Bromomethane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Trichlorofluoromethane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	1,2-dibromoethane	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-				-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,6-dichlorophenol	-				-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2-chlorophenol	µg/L	1	50 ⁴⁶		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4,5-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	2,4,6-trichlorophenol	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Pentachlorophenol	µg/L	1	0.4 ⁴³		-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-			

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	South Pond								SW2 Cadoxton River							
						-								-							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	09/02/2017	31/07/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	South Pond_18 Feb 15_-	South Pond_08 Sep 15_-	12677373	South Pond_23 Feb 16_-	South Pond_03 Aug 16_-	South Pond_09 Feb 17_-	South Pond_31 Jul 17_-	South Pond_01 Aug 17_-	SW2 Cadoxton River_18 Feb 15_-	SW2 Cadoxton River_08 Sep 15_-	SW2 Cadoxton River_24 Feb 16_-	SW2 Cadoxton River_03 Aug 16_-	SW2 Cadoxton River_09 Feb 17_-	SW2 Cadoxton River_22 Feb 17_-	SW2 Cadoxton River_01 Aug 17_-
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ¹³		-	-	<2	-	-	-	-	-	-	-	-	-	-	-		
	Butyl benzyl phthalate	µg/L	1	7.5 ¹²		-	-	<1	-	-	-	-	-	-	-	-	-	-			
	Di-n-butyl phthalate	µg/L	1	8 ¹⁶		-	-	<1	-	-	-	-	-	-	-	-	-	-			
	Di-n-octyl phthalate	µg/L	5	20 ¹⁶		-	-	<5	-	-	-	-	-	-	-	-	-	-			
	Diethylphthalate	µg/L	1	200 ¹⁶		-	-	<1	-	-	-	-	-	-	-	-	-	-			
	Dimethyl phthalate	µg/L	1	800 ¹⁶		-	-	<1	-	-	-	-	-	-	-	-	-	-			
Solvents	Carbon disulfide	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-			
	Isophorone	µg/L	1			-	-	<1	-	-	-	-	-	-	-	-	-	-			
	Methanol	µg/L				0	0	-	0	0	0	0	-	0	0	0	-	0			
Metals	Aluminium	µg/L		15 ¹⁶		12.196	0	-	0	181.099	6.1101	24.892	-	437.445	0	59.058	203.439	123.7221	-	67.8234	
	Arsenic	µg/L		50 ¹²		0	0	-	0	0	23.236	0	-	0	0	0	0	0	-	0	
	Arsenic (Filtered)	µg/L	0.12	50 ¹²		-	-	0.744	-	-	-	-	-	-	-	-	-	-	-	-	
	Barium (Filtered)	µg/L	0.03			-	-	135	-	-	-	-	-	-	-	-	-	-	-	-	
	Beryllium (Filtered)	µg/L	0.07			-	-	<0.07	-	-	-	-	-	-	-	-	-	-	-	-	
	Boron	µg/L		2.000 ¹⁶		133.299	0	-	120.132	101.139	56.1053	18.8559	-	49.735	0	48.869	57.625	28.5521	-	53.0893	
	Boron (Filtered)	µg/L	9.4	2.000 ¹⁶		-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	
	Cadmium	µg/L		0.08 ¹³		0	0	-	0	0	22.1925	0	-	0	0	0	1.4602	-	0		
	Cadmium (Filtered)	µg/L	0.1	0.08 ¹³		-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	
	Calcium	mg/L				289.5	283.3		222.1	258.5	154.6	195.8	-	88	0	81.4	0	64.1	-	76.9	
	Calcium (Filtered)	µg/L	0.012			-	-	232	-	-	-	-	-	-	-	-	-	-	-	-	
	Chromium (III+VI)	µg/L				0	0	-	0	0	0	0	-	0	0	4.627	0	0	-	0	
	Chromium (III+VI) (Filtered)	µg/L	0.22			-	-	1.43	-	-	-	-	-	-	-	-	-	-	-	-	
	Copper	µg/L		1 ¹²	6 ¹⁸	5.194	2.414	-	6.156	14.546	3.243	3.3145	-	2.955	0	7.006	3.83	2.7032	-	3.1637	
	Copper (Filtered)	µg/L	0.85	1 ¹²	6 ¹⁸	-	-	2.47	-	-	-	-	-	-	-	-	-	-	-	-	
	Iron	µg/L		1.000 ¹²		177.033	538.722	-	156.044	1.630	237.6749	314.2776	-	369.636	0	144.007	218.509	148.9879	-	147.5251	
	Iron (Filtered)	µg/L	19	1.000 ¹²		-	-	37.5	-	-	-	-	-	-	-	-	-	-	-	-	
	Lead	µg/L		1.2 ¹³		0	0	-	0	11.8	24.7247	0	-	0	0	0	0	3.8781	-	0	
	Lead (Filtered)	µg/L	0.02	1.2 ¹³		-	-	0.023	-	-	-	-	-	-	-	-	-	-	-	-	
	Magnesium	mg/L				16.9	18		12.9	16.4	10.3	13.2	-	19	0	17.2	0	13.1	-	12.9	
	Magnesium (Filtered)	µg/L	0.036			-	-	14.4	-	-	-	-	-	-	-	-	-	-	-	-	
	Manganese	µg/L		123 ¹²		182.129	378.225	-	95.019	730.763	109.0926	176.0343	-	33.514	0	25.896	28.678	12.0068	-	39.5068	
	Mercury	µg/L		0.07 ¹¹		0	3.5552	-	0	0	142.8485	0	-	0	0	0	0	53.1851	-	0	
	Mercury (Filtered)	µg/L	0.01	0.07 ¹¹		-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	
	Nickel	µg/L		4 ¹³		0	0	-	0	0	0	0	-	0	0	0	0	0	-	0	
	Nickel (Filtered)	µg/L	0.15	4 ¹³		-	-	2.65	-	-	-	-	-	-	-	-	-	-	-	-	
	Selenium	µg/L				0	0	-	0	0	20.9155	0	-	0	0	0	0	2.6146	-	0	
	Selenium (Filtered)	µg/L	0.39			-	-	<0.39	-	-	-	-	-	-	-	-	-	-	-	-	
	Vanadium (Filtered)	µg/L	0.24	20 ¹⁶		-	-	0.288	-	-	-	-	-	-	-	-	-	-	-	-	
	Zinc	µg/L		10.9 ¹²		6.229	9.578	-	9.055	23.261	7.1908	3.4477	-	9.993	0	11.775	8.889	10.8471	-	6.3692	
	Zinc (Filtered)	µg/L	0.41	10.9 ¹²		-	-	3.02	-	-	-	-	-	-	-	-	-	-	-	-	
	Potassium (Filtered)	mg/L	1			-	-	8.95	-	-	-	-	-	-	-	-	-	-	-	-	
	Tin	µg/L		25 ¹⁶		0	0	-	0	0	0	0	-	0	0	0	0	0	-	0	
	Chromium (hexavalent)	µg/L	30	3.4 ¹²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Organics	Dissolved Organic Carbon	mg/L	3			-	-	11.9	-	-	-	-	-	-	-	-	-	-	-	-	
Inorganics	Acidity	mg/L	4			-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	
	BOD	mg/L	1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sulphur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sodium (Filtered)	mg/L	0.076			-	-	477	-	-	-	-	-	-	-	-	-	-	-	-	
	Bromide	µg/L	20			-	-	371	-	-	-	-	-	-	-	-	-	-	-	-	
	Chloride	mg/L	2	250 ¹⁶		-	-	503	-	-	-	-	-	-	-	-	-	-	-	-	
	Nitrate (as NO3-)	mg/L	0.3			-	-	0.851	-	-	-	-	-	-	-	-	-	-	-	-	
	Nitrite (as NO2-)	mg/L	0.05			-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	
	Ortho Phosphate as P	mg/L	0.02			-	-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	
	Sulphide	mg/L	0.01			-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	
	Alkalinity (total) as CaCO3	mg/L	2			-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	
	Hardness as CaCO3	mg/L				792.3	781.4	-	608	713.2	428.3	543.4	-	298.1	0	274	0	214.1	-	245.1	
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2			-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2			-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ¹²		-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	
	Sulphate (soluble)	mg/L	2			-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	
	COD	mg/L	7			-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	
	pH (Lab)	pH_Units	1			-	-	7.85	-	-	-	-	-	-	-	-	-	-	-	-	

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

	Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location Well	South Pond								SW2 Cadoxton River							
						-								-							
						Date	18/02/2015	08/09/2015	18/12/2015	23/02/2016	03/08/2016	09/02/2017	31/07/2017	01/08/2017	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017
						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						Sample Type	SampleCode	South Pond_18 Feb 15_	South Pond_08 Sep 15_	12677373	South Pond_23 Feb 16_	South Pond_03 Aug 16_	South Pond_09 Feb 17_	South Pond_31 Jul 17_	South Pond_01 Aug 17_	SW2 Cadoxton River_18 Feb 15_	SW2 Cadoxton River_08 Sep 15_	SW2 Cadoxton River_24 Feb 16_	SW2 Cadoxton River_03 Aug 16_	SW2 Cadoxton River_09 Feb 17_	SW2 Cadoxton River_22 Feb 17_
Other	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Dodecamethylcyclohexasiloxane	µg/L				0	0	-	0	0	0	0	0	0	0	0	0				
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	methylsilanetriol	ppm				-	-	-	-	-	-	-	-	-	-	0.1	0.1				
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	ethylidimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Cyclic octatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Dioxo-,trisilacyclohexane,-hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-				
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	-	0	0	0	0	0	0	0	0	0	0			
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-			
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-			
	Silicic Acid	ppm				-	-	-	-	-	-	-	-	-	-	-	12.9	9.7			
	Trimethylsilanol	µg/L			124 [®]	0	0	-	0	0	0	0	0	0	0	0	-	-			
Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Volatile TIC	-				-	-	0	-	-	-	-	-	-	-	-	-	-				
Decamethylcyclopentasiloxane	µg/L				0	0	-	0	0	0	0	0	0	0	0	-	0				
Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Benzenesulfonamide,-methyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown 2 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown 2 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown 2 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				
Unknown 2 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-				

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed

Key	
XXX	Exceedance of GAC Protective of Fresh Water Receptor
XXX	Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	SW3 Cadotox River								Timber Pond								
						Location																
						Well	Date	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017	25/03/2015	09/09/2015	18/12/2015	24/02/2016	04/08/2016	08/02/2017	22/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	SW3 Cadotox River_18 Feb 15_-	SW3 Cadotox River_08 Sep 15_-	SW3 Cadotox River_24 Feb 16_-	SW3 Cadotox River_03 Aug 16_-	SW3 Cadotox River_09 Feb 17_-	SW3 Cadotox River_22 Feb 17_-	SW3 Cadotox River_01 Aug 17_-	Timber Pond_25 Mar 15_-	Timber Pond_09 Sep 15_-	12677374	Timber Pond_24 Feb 16_-	Timber Pond_04 Aug 16_-	Timber Pond_08 Feb 17_-	Timber Pond_22 Feb 17_-	Timber Pond_31 Jul 17_-	
TPH	GRO >C5-C12	µg/L	50			-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-		
	>C5-C6 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C6-C8 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C8-C10 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C10-C12 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C12-C16 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C16-C21 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C16-C35 Aliphatics	µg/L				-	-	-	-	-	-	-	-	-	-	<20	-	-	-	-		
	>C21-C35 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C12-C35 Aliphatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC5-EC7 Aromatics	µg/L	10		10 ⁰³	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC7-EC8 Aromatics	µg/L	10		74 ⁰²	-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC8-EC10 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC10-EC12 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC12-EC16 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC16-EC21 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC21-EC35 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>EC12-EC35 Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
	>C5-C35 Aliphatics & Aromatics	µg/L	10			-	-	-	-	-	-	-	-	-	-	<10	-	-	-	-		
BTX	Benzene	µg/L	1		10 ⁰³	0	0	0	0	0	-	0	0	0	0	<1	0	0	0	-	0	
	Toluene	µg/L	1		74 ⁰²	0	0	0	0	0	-	0	0	0	0	<1	0	0	0	-	0	
	Ethylbenzene	µg/L	1		20 ⁰⁶	0	0	0	0	0	-	0	0	0	0	<1	0	0	0	-	0	
	Xylene (m & p)	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Xylene (m)	µg/L				0	0	0	0	0	-	0	0	0	0	-	0	0	0	-	0	
	Xylene (p)	µg/L				0	0	0	0	0	-	0	0	0	0	-	0	0	0	-	0	
	Xylene Total	µg/L	2		30 ⁰⁶	0	0	0	0	0	-	0	0	0	0	<2	0	0	0	-	0	
	Xylene (o)	µg/L	1			0	0	0	0	0	-	0	0	0	0	<1	0	0	0	-	0	
Total BTX	µg/L	28			0	0	0	0	0	-	0	0	0	0	<28	0	0	0	-	0		
Oxygenates	MTBE	µg/L	1		5.100 ⁰⁷	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Tert Amyl Methyl Ether	µg/L	1		510 ⁰⁷	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
Chlorinated Hydrocarbons	Chloromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Vinyl chloride	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Chloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1-dichloroethene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Dichloromethane	µg/L	3		20 ⁰³	-	-	-	-	-	-	-	-	-	-	<3	-	-	-	-		
	trans-1,2-dichloroethene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1-dichloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	cis-1,2-dichloroethene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Chloroform	µg/L	1		2.5 ⁰³	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1,1-trichloroethane	µg/L	1		100 ⁰⁶	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Carbon tetrachloride	µg/L	1		12 ⁰³	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Trichloroethene	µg/L	1		10 ⁰³	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1,2-trichloroethane	µg/L	1		400 ⁰⁶	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Tetrachloroethene	µg/L	1		10 ⁰³	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Sum of PCE and TCE	µg/L				-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-		
	TCE+DCE+VC	µg/L				-	-	-	-	-	-	-	-	-	-	<5	-	-	-	-		
PCE+TCE+DCE+VC	µg/L				-	-	-	-	-	-	-	-	-	-	<6	-	-	-	-			
VOC	2,2-dichloropropane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Bromochloromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1-dichloropropene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2-dichloroethane	µg/L	1		10 ⁰³	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2-dichloropropane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Dibromomethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Bromodichloromethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	cis-1,3-dichloropropene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	trans-1,3-dichloropropene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,3-dichloropropane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Chlorodibromomethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1,1,2-tetrachloroethane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Styrene	µg/L	1		50 ⁰⁶	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Bromoform	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Isopropylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,1,2,2-tetrachloroethane	µg/L	1		140 ⁰²	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2,3-trichloropropane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	n-propylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,3,5-trimethylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	tert-butylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2,4-trimethylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	sec-butylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	p-isopropyltoluene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	n-butylbenzene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2-dibromo-3-chloropropane	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	Hexachlorobutadiene	µg/L	1			-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-		
	1,2-Dichloroethene	µg/L			0.6 ⁰⁴	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-		
	Trihalomethanes	µg/L				-	-	-	-	-	-	-	-	-	-	<4	-	-	-	-		
	Cyclotrisiloxane, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cyclotetrasiloxane, octamethyl-	µg/L				0	0	0	0	0	-	0	0	0	0	-	0	0	0	-	0		

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						SW3 Cadoston River							Timber Pond								
			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	SW3 Cadoston River							Timber Pond							
						Well	SW3 Cadoston River							Timber Pond							
						Date	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017	25/03/2015	09/09/2015	18/12/2015	24/02/2016	04/08/2016	08/02/2017	22/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Units				SampleCode	SW3 Cadoston River_18 Feb 15_-	SW3 Cadoston River_08 Sep 15_-	SW3 Cadoston River_24 Feb 16_-	SW3 Cadoston River_03 Aug 16_-	SW3 Cadoston River_09 Feb 17_-	SW3 Cadoston River_22 Feb 17_-	SW3 Cadoston River_01 Aug 17_-	Timber Pond_25 Mar 15_-	Timber Pond_09 Sep 15_-	12677374	Timber Pond_24 Feb 16_-	Timber Pond_04 Aug 16_-	Timber Pond_08 Feb 17_-	Timber Pond_22 Feb 17_-	Timber Pond_31 Jul 17_-
PAH	Naphthalene	µg/L	1	2 ⁴³			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Acenaphthylene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Acenaphthene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Fluorene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Phenanthrene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Anthracene	µg/L	1	0.1 ⁴³			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Fluoranthene	µg/L	1	0.0063 ⁴³			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Pyrene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benz(a)anthracene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Chrysene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benzo(a) pyrene	µg/L	1	0.00017 ⁴³			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ⁴⁴			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Dibenz(a,h)anthracene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ⁴¹			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benzo(b)fluoranthene	µg/L	1	0.017 ⁴¹			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benzo(k)fluoranthene	µg/L	1	0.017 ⁴¹			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Benzo(b)&(k)fluoranthene	µg/L					-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-
PAHs (sum of 4)	µg/L					-	-	-	-	-	-	-	-	-	<4	-	-	-	-	-	
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L					-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-	
Coal Tar (BaP as surrogate marker)	µg/L					-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	
SVOC	2-methylnaphthalene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-bromophenyl phenyl ether	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-chlorophenyl phenyl ether	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Azobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bis(2-chloroethoxy) methane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bis(2-chloroethyl)ether	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Carbazole	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Dibenzofuran	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Hexachlorocyclopentadiene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Hexachloroethane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Phenolics	Bis(2-chloroisopropyl) ether	-					-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
	2-methylphenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2-nitrophenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2,4-dimethylphenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-chloro-3-methylphenol	µg/L	1	40 ⁴⁶			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-methylphenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-nitrophenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Phenol	µg/L	1	7.7 ⁴²			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
PCBs	2-chloronaphthalene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,1-Biphenyl	-					-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Anilines	Aniline	-					-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
	2-nitroaniline	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	3-nitroaniline	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-chloroaniline	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-nitroaniline	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Explosives	2,4-Dinitrotoluene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2,6-dinitrotoluene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Nitrobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Chlorobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bromobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2-chlorotoluene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	4-chlorotoluene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,3-dichlorobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,4-dichlorobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-dichlorobenzene	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2,4-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2,3-trichlorobenzene	µg/L	1	Refer to "Trichlorobenzene (total)" ⁴⁴			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Hexachlorobenzene	µg/L	1	0.05 ⁴¹			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Trichlorobenzene (total)	µg/L		0.4 ⁴³			-	-	-	-	-	-	-	-	-	<3	-	-	-	-	-
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Bromomethane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Trichlorofluoromethane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	1,2-dibromoethane	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-					-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
	2,6-dichlorophenol	-					-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
	2-chlorophenol	µg/L	1	50 ⁴⁶			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2,4-dichlorophenol	µg/L	1	4.2 ⁴²			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2,4,5-trichlorophenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	2,4,6-trichlorophenol	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
	Pentachlorophenol	µg/L	1	0.4 ⁴³			-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						SW3 Cadoston River							Timber Pond						
						-							-						
						Location													
						Well													
						Date	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017	25/03/2015	09/09/2015	18/12/2015	24/02/2016	04/08/2016	08/02/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	SampleCode	SW3 Cadoston River_18 Feb 15_	SW3 Cadoston River_08 Sep 15_	SW3 Cadoston River_24 Feb 16_	SW3 Cadoston River_03 Aug 16_	SW3 Cadoston River_09 Feb 17_	SW3 Cadoston River_22 Feb 17_	SW3 Cadoston River_01 Aug 17_	Timber Pond_25 Mar 15_	Timber Pond_09 Sep 15_	12677374	Timber Pond_24 Feb 16_	Timber Pond_04 Aug 16_	Timber Pond_08 Feb 17_
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ^{E3}			-	-	-	-	-	-	-	-	-	<2	-	-	-
	Butyl benzyl phthalate	µg/L	1	7.5 ^{E2}			-	-	-	-	-	-	-	-	-	<1	-	-	-
	Di-n-butyl phthalate	µg/L	1	8 ^{E4}			-	-	-	-	-	-	-	-	-	<1	-	-	-
	Di-n-octyl phthalate	µg/L	5	20 ^{E6}			-	-	-	-	-	-	-	-	-	<5	-	-	-
	Diethylphthalate	µg/L	1	200 ^{E6}			-	-	-	-	-	-	-	-	-	<1	-	-	-
	Dimethyl phthalate	µg/L	1	800 ^{E6}			-	-	-	-	-	-	-	-	-	<1	-	-	-
Solvents	Carbon disulfide	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-
	Isophorone	µg/L	1				-	-	-	-	-	-	-	-	-	<1	-	-	-
	Methanol	µg/L					0	0	0	0	0	0	0	0	0	-	0	0	0
Metals	Aluminium	µg/L		15 ^{E6}			361.223	0	54.924	227.575	105.0466	-	54.2991	9.253	0	-	0	0	3.2134
	Arsenic	µg/L		50 ^{E2}			0	0	0	0	0	-	0	0	0	-	0	0	0
	Arsenic (Filtered)	µg/L	0.12	50 ^{E2}			-	-	-	-	-	-	-	-	-	1.28	-	-	-
	Barium (Filtered)	µg/L	0.03				-	-	-	-	-	-	-	-	-	334	-	-	-
	Beryllium (Filtered)	µg/L	0.07				-	-	-	-	-	-	-	-	-	<0.07	-	-	-
	Boron	µg/L		2,000 ^{E6}			56.289	0	55.941	87.034	43.863	-	102.7687	190.273	216.44	-	0	221.037	155.1423
	Boron (Filtered)	µg/L	9.4	2,000 ^{E6}			-	-	-	-	-	-	-	-	-	149	-	-	-
	Cadmium	µg/L		0.08 ^{E3}			0	0	0	1.5724	-	0	0	0	0	-	0	0.5899	-
	Cadmium (Filtered)	µg/L	0.1	0.08 ^{E3}			-	-	-	-	-	-	-	-	-	<0.1	-	-	-
	Calcium	mg/L					278.3	0	235.2	530	157.5	-	636.8	518.1	529.5	-	397.1	425	297
	Calcium (Filtered)	mg/L	0.012				-	-	-	-	-	-	-	-	-	466	-	-	386.2
	Chromium (III+VI)	µg/L					0	0	4.469	0	0	-	0	0	0	-	0	0	0
	Chromium (III+VI) (Filtered)	µg/L	0.22				-	-	-	-	-	-	-	-	-	1.1	-	-	-
	Copper	µg/L		1 ^{E2}	6 ^{E9}		16.033	0	10.22	17.76	5.5991	-	18.5354	10.916	7.557	-	14.87	4.845	10.3702
	Copper (Filtered)	µg/L	0.85	1 ^{E2}	6 ^{E9}		-	-	-	-	-	-	-	-	-	3.31	-	-	-
	Iron	µg/L		1,000 ^{E2}			351.66	0	134.003	339.636	138.3153	-	79.0449	146.623	139.93	-	0	138.667	49.9055
	Iron (Filtered)	µg/L	19	1,000 ^{E2}			-	-	-	-	-	-	-	-	-	<19	-	-	-
	Lead	µg/L		1.2 ^{E3}			0	0	0	9.926	7.1832	-	10.6698	0	6.293	-	0	6.998	9.2693
	Lead (Filtered)	µg/L	0.02	1.2 ^{E3}			-	-	-	-	-	-	-	-	-	0.034	-	-	-
	Magnesium	mg/L					20.9	0	17.7	0	13.6	-	14.3	18.1	19.5	-	14.6	16.5	12.3
	Magnesium (Filtered)	mg/L	0.036				-	-	-	-	-	-	-	-	-	17	-	-	14.4
	Manganese	µg/L		123 ^{E2}			38.529	0	28.549	38.102	17.2044	-	28.0216	206.756	178.979	-	0	179.043	36.4698
	Mercury	µg/L		0.07 ^{E4}			0	0	0	0	30.1581	-	0	6.504	0	-	0	15.9784	-
	Mercury (Filtered)	µg/L	0.01	0.07 ^{E4}			-	-	-	-	-	-	-	-	-	<0.01	-	-	0
	Nickel	µg/L		4 ^{E3}			0	0	0	0	0	-	0	0	0	-	0	0	0
	Nickel (Filtered)	µg/L	0.15	4 ^{E3}			-	-	-	-	-	-	-	-	-	4.83	-	-	-
	Selenium	µg/L					0	0	0	0	0	-	0	0	0	-	0	0	0
	Selenium (Filtered)	µg/L	0.39				-	-	-	-	-	-	-	-	-	0.639	-	-	-
	Vanadium (Filtered)	µg/L	0.24	20 ^{E6}			-	-	-	-	-	-	-	-	-	<0.24	-	-	-
	Zinc	µg/L		10.9 ^{E2}			14.068	0	10.703	19.815	16.1892	-	13.3615	2.159	5.713	-	7.947	2.765	5.5028
	Zinc (Filtered)	µg/L	0.41	10.9 ^{E2}			-	-	-	-	-	-	-	-	-	2.72	-	-	-
	Potassium (Filtered)	mg/L	1				-	-	-	-	-	-	-	-	-	13	-	-	-
	Tin	µg/L		25 ^{E6}			0	0	0	0	0	-	0	0	0	-	0	0	0
	Chromium (hexavalent)	µg/L	30	3.4 ^{E2}			-	-	-	-	-	-	-	-	-	-	-	-	-
Organics	Dissolved Organic Carbon	mg/L	3				-	-	-	-	-	-	-	-	-	20.2	-	-	-
Inorganics	Acidity	mg/L	4				-	-	-	-	-	-	-	-	-	11	-	-	-
	BOD	mg/L	1				-	-	-	-	-	-	-	-	-	-	-	-	-
	Sulphur	µg/L					-	-	-	-	-	-	-	-	-	-	-	-	-
	Sodium (Filtered)	mg/L	0.076				-	-	-	-	-	-	-	-	-	659	-	-	-
	Bromide	µg/L	20				-	-	-	-	-	-	-	-	-	472	-	-	-
	Chloride	mg/L	2	250 ^{E6}			-	-	-	-	-	-	-	-	-	950	-	-	-
	Nitrate (as NO3-)	mg/L	0.3				-	-	-	-	-	-	-	-	-	0.446	-	-	-
	Nitrite (as NO2-)	mg/L	0.05				-	-	-	-	-	-	-	-	-	<0.05	-	-	-
	Ortho Phosphate as P	mg/L	0.02				-	-	-	-	-	-	-	-	-	<0.02	-	-	-
	Sulphide	mg/L	0.01				-	-	-	-	-	-	-	-	-	<0.01	-	-	-
	Alkalinity (total) as CaCO3	mg/L	2				-	-	-	-	-	-	-	-	-	90	-	-	-
	Hardness as CaCO3	mg/L					781.1	0	660.3	0	449	-	1.649	1.368	1.403	-	1.052	1.129	792.3
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				-	-	-	-	-	-	-	-	-	90	-	-	-
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				-	-	-	-	-	-	-	-	-	90	-	-	-
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ^{E2}			-	-	-	-	-	-	-	-	-	<0.2	-	-	-
	Sulphate (soluble)	mg/L	2				-	-	-	-	-	-	-	-	-	15	-	-	-
	COD	mg/L	7				-	-	-	-	-	-	-	-	-	99.9	-	-	-
	pH (Lab)	pH_Units	1				-	-	-	-	-	-	-	-	-	7.8	-	-	-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

						SW3 Cadoston River							Timber Pond								
						Location							Well								
						Date	18/02/2015	08/09/2015	24/02/2016	03/08/2016	09/02/2017	22/02/2017	01/08/2017	25/03/2015	09/09/2015	18/12/2015	24/02/2016	04/08/2016	08/02/2017	22/02/2017	31/07/2017
						Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
						SampleCode	SW3 Cadoston River_18 Feb 15_-	SW3 Cadoston River_08 Sep 15_-	SW3 Cadoston River_24 Feb 16_-	SW3 Cadoston River_03 Aug 16_-	SW3 Cadoston River_09 Feb 17_-	SW3 Cadoston River_22 Feb 17_-	SW3 Cadoston River_01 Aug 17_-	Timber Pond_25 Mar 15_-	Timber Pond_09 Sep 15_-	12677374	Timber Pond_24 Feb 16_-	Timber Pond_04 Aug 16_-	Timber Pond_08 Feb 17_-	Timber Pond_22 Feb 17_-	Timber Pond_31 Jul 17_-
Other	Benzene acetic acid (TIC)	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dodecamethylcyclohexasiloxane	µg/L				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unknown 5 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methylsilanetriol	ppm				-	-	-	-	-	-	6	9.6	-	-	-	-	-	-	38.3	-
	Unknown 1 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 4 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 1 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 3 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unknown 5 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ethylidimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tert-Butyldimethylsilanol	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzene, hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclic octaatomic sulfur	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	methoxytrimethylsilane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexanoic Acid	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dioxo, -trisilacyclohexane, -hexamethyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HexamethylDioxatrisilacyclohexane isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexamethyldisilazane, Bis(trimethylsilyl)amine	µg/L				0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
	HexamethylDisiloxane	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentamethylbenzoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Silicic Acid	ppm				-	-	-	-	-	-	-	12.7	11.6	-	-	-	-	-	5.3	-
	Trimethylsilanol	µg/L				0	0	130	260	0	0	-	-	-	0	0	-	0	0	0	0
Trimethylsilanol isomer	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trimethylsilyl fluoride	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Volatile TIC	-				-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	
Decamethylcyclopentasiloxane	µg/L				0	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	
Benzenepropanoic acid	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzenesulfonamide, -methyl-	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151219-32	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 VOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Unknown 2 SVOC_151218-69	µg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Comments
#1 WFD England/Wales, 2015 - MAC-EQS Inland
#2 WFD England/Wales, 2015 - Freshwater Standards
#3 WFD England/Wales, 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015, AA-EQS Inland
#5 SEPA WAT-SG-53 Fresh EQS - MAC - 2015
#6 SEPA WAT-SG-53 Fresh EQS - AA - 2015
#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- -: Not analysed

Key
Exceedance of GAC Protective of Fresh Water Receptor
Exceedance of Project-specific GAC

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	
						Well	
						Date	01/08/2017
						Sample Type	Normal
						SampleCode	Timber Point_01 Aug 17_
TPH	GRO >C5-C12	µg/L	50				-
	>C5-C6 Aliphatics	µg/L	10				-
	>C6-C8 Aliphatics	µg/L	10				-
	>C8-C10 Aliphatics	µg/L	10				-
	>C10-C12 Aliphatics	µg/L	10				-
	>C12-C16 Aliphatics	µg/L	10				-
	>C16-C21 Aliphatics	µg/L	10				-
	>C16-C35 Aliphatics	µg/L					-
	>C21-C35 Aliphatics	µg/L	10				-
	>C12-C35 Aliphatics	µg/L	10				-
	>EC5-EC7 Aromatics	µg/L	10				-
	>EC7-EC8 Aromatics	µg/L	10	10 ^{#3}			-
	>EC8-EC10 Aromatics	µg/L	10	74 ^{#2}			-
	>EC10-EC12 Aromatics	µg/L	10				-
	>EC12-EC16 Aromatics	µg/L	10				-
	>EC16-EC21 Aromatics	µg/L	10				-
	>EC21-EC35 Aromatics	µg/L	10				-
	>EC12-EC35 Aromatics	µg/L	10				-
	>C5-C35 Aliphatics & Aromatics	µg/L	10				-
BTX	Benzene	µg/L	1	10 ^{#3}			-
	Toluene	µg/L	1	74 ^{#2}			-
	Ethylbenzene	µg/L	1	20 ^{#6}			-
	Xylene (m & p)	µg/L	1				-
	Xylene (m)	µg/L					-
	Xylene (p)	µg/L					-
	Xylene Total	µg/L	2	30 ^{#6}			-
	Xylene (o)	µg/L	1				-
	Total BTX	µg/L	28				-
Oxygenates	MTBE	µg/L	1	5,100 ^{#7}			-
	Tert Amyl Methyl Ether	µg/L	1	510 ^{#7}			-
Chlorinated Hydrocarbons	Chloromethane	µg/L	1				-
	Vinyl chloride	µg/L	1				-
	Chloroethane	µg/L	1				-
	1,1-dichloroethene	µg/L	1				-
	Dichloromethane	µg/L	3	20 ^{#3}			-
	trans-1,2-dichloroethene	µg/L	1				-
	1,1-dichloroethane	µg/L	1				-
	cis-1,2-dichloroethene	µg/L	1				-
	Chloroform	µg/L	1	2,5 ^{#3}			-
	1,1,1-trichloroethane	µg/L	1	100 ^{#6}			-
	Carbon tetrachloride	µg/L	1	12 ^{#3}			-
	Trichloroethene	µg/L	1	10 ^{#3}			-
	1,1,2-trichloroethane	µg/L	1	400 ^{#6}			-
	Tetrachloroethene	µg/L	1	10 ^{#3}			-
	Sum of PCE and TCE	µg/L					-
	TCE+DCE+VC	µg/L					-
	PCE+TCE+DCE+VC	µg/L					-
VOC	2,2-dichloropropane	µg/L	1				-
	Bromochloromethane	µg/L	1				-
	1,1-dichloropropene	µg/L	1				-
	1,2-dichloroethane	µg/L	1	10 ^{#3}			-
	1,2-dichloropropane	µg/L	1				-
	Dibromomethane	µg/L	1				-
	Bromodichloromethane	µg/L	1				-
	cis-1,3-dichloropropene	µg/L	1				-
	trans-1,3-dichloropropene	µg/L	1				-
	1,3-dichloropropane	µg/L	1				-
	Chlorodibromomethane	µg/L	1				-
	1,1,1,2-tetrachloroethane	µg/L	1				-
	Styrene	µg/L	1	50 ^{#6}			-
	Bromoform	µg/L	1				-
	Isopropylbenzene	µg/L	1				-
	1,1,2,2-tetrachloroethane	µg/L	1	140 ^{#2}			-
	1,2,3-trichloropropane	µg/L	1				-
	n-propylbenzene	µg/L	1				-
	1,3,5-trimethylbenzene	µg/L	1				-
	tert-butylbenzene	µg/L	1				-
	1,2,4-trimethylbenzene	µg/L	1				-
	sec-butylbenzene	µg/L	1				-
	p-isopropyltoluene	µg/L	1				-
	n-butylbenzene	µg/L	1				-
	1,2-dibromo-3-chloropropane	µg/L	1				-
	Hexachlorobutadiene	µg/L	1	0,6 ^{#1}			-
	1,2-Dichloroethene	µg/L					-
	Trihalomethanes	µg/L					-
	Cyclotrisiloxane, hexamethyl-	µg/L					-
	Cyclotetrasiloxane, octamethyl-	µg/L					-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	
						Well	
						Date	01/08/2017
						Sample Type	Normal
						SampleCode	Timber Point, 01 Aug 17
PAH	Naphthalene	µg/L	1	2 ^{#3}			-
	Acenaphthylene	µg/L	1				-
	Acenaphthene	µg/L	1				-
	Fluorene	µg/L	1				-
	Phenanthrene	µg/L	1				-
	Anthracene	µg/L	1	0.1 ^{#3}			-
	Fluoranthene	µg/L	1	0.0063 ^{#3}			-
	Pyrene	µg/L	1				-
	Benz(a)anthracene	µg/L	1				-
	Chrysene	µg/L	1				-
	Benzo(a) pyrene	µg/L	1	0.00017 ^{#3}			-
	Indeno(1,2,3-c,d)pyrene	µg/L	1	see BaP and notes ^{#4}			-
	Dibenzo(a,h)anthracene	µg/L	1				-
	Benzo(g,h,i)perylene	µg/L	1	0.0082 ^{#4}			-
	Benzo(b)fluoranthene	µg/L	1	0.017 ^{#1}			-
	Benzo(k)fluoranthene	µg/L	1	0.017 ^{#2}			-
	Benzo(b)&(k)fluoranthene	µg/L					-
	PAHs (sum of 4)	µg/L					-
	benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene	µg/L					-
	Coal Tar (BaP as surrogate marker)	µg/L					-
SVOC	2-methylnaphthalene	µg/L	1				-
	4-bromophenyl phenyl ether	µg/L	1				-
	4-chlorophenyl phenyl ether	µg/L	1				-
	Azobenzene	µg/L	1				-
	Bis(2-chloroethoxy) methane	µg/L	1				-
	Bis(2-chloroethyl)ether	µg/L	1				-
	Carbazole	µg/L	1				-
	Dibenzofuran	µg/L	1				-
	Hexachlorocyclopentadiene	µg/L	1				-
	Hexachloroethane	µg/L	1				-
Phenolics	Bis(2-chloroisopropyl) ether	-					-
	2-methylphenol	µg/L	1				-
	2-nitrophenol	µg/L	1				-
	2,4-dimethylphenol	µg/L	1				-
	4-chloro-3-methylphenol	µg/L	1	40 ^{#6}			-
	4-methylphenol	µg/L	1				-
	4-nitrophenol	µg/L	1				-
	Phenol	µg/L	1	7.7 ^{#2}			-
	2-chloronaphthalene	µg/L	1				-
PCBs	1,1-Biphenyl	-					-
Amino Aliphatics	N-nitrosodi-n-propylamine	µg/L	1				-
Anilines	Aniline	-					-
	2-nitroaniline	µg/L	1				-
	3-nitroaniline	µg/L	1				-
	4-chloroaniline	µg/L	1				-
	4-nitroaniline	µg/L	1				-
Explosives	2,4-Dinitrotoluene	µg/L	1				-
	2,6-dinitrotoluene	µg/L	1				-
	Nitrobenzene	µg/L	1				-
Halogenated Benzenes	1,3,5-Trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}			-
	Chlorobenzene	µg/L	1				-
	Bromobenzene	µg/L	1				-
	2-chlorotoluene	µg/L	1				-
	4-chlorotoluene	µg/L	1				-
	1,3-dichlorobenzene	µg/L	1				-
	1,4-dichlorobenzene	µg/L	1				-
	1,2-dichlorobenzene	µg/L	1				-
	1,2,4-trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}			-
	1,2,3-trichlorobenzene	µg/L	1	Refer to Trichlorobenzene (total) ^{#4}			-
	Hexachlorobenzene	µg/L	1	0.05 ^{#1}			-
	Trichlorobenzene (total)	µg/L		0.4 ^{#3}			-
Halogenated Hydrocarbons	Dichlorodifluoromethane	µg/L	1				-
	Bromomethane	µg/L	1				-
	Trichlorofluoromethane	µg/L	1				-
	1,2-dibromoethane	µg/L	1				-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	-					-
	2,6-dichlorophenol	-					-
	2-chlorophenol	µg/L	1	50 ^{#6}			-
	2,4-dichlorophenol	µg/L	1	4.2 ^{#2}			-
	2,4,5-trichlorophenol	µg/L	1				-
	2,4,6-trichlorophenol	µg/L	1				-
	Pentachlorophenol	µg/L	1	0.4 ^{#3}			-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

		Units	Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	
						Well	
						Date	01/08/2017
						Sample Type	Normal
						SampleCode	Timber Point, 01 Aug 17
Phthalates	Bis(2-ethylhexyl) phthalate	µg/L	2	1.3 ^{#3}			-
	Butyl benzyl phthalate	µg/L	1	7.5 ^{#2}			-
	Di-n-butyl phthalate	µg/L	1	8 ^{#6}			-
	Di-n-octyl phthalate	µg/L	5	20 ^{#6}			-
	Diethylphthalate	µg/L	1	200 ^{#6}			-
	Dimethyl phthalate	µg/L	1	800 ^{#6}			-
Solvents	Carbon disulfide	µg/L	1				-
	Isophorone	µg/L	1				-
	Methanol	µg/L					-
Metals	Aluminium	µg/L		15 ^{#6}			-
	Arsenic	µg/L		50 ^{#2}			-
	Arsenic (Filtered)	µg/L	0.12	50 ^{#2}			-
	Barium (Filtered)	µg/L	0.03				-
	Beryllium (Filtered)	µg/L	0.07				-
	Boron	µg/L		2,000 ^{#6}			-
	Boron (Filtered)	µg/L	9.4	2,000 ^{#6}			-
	Cadmium	µg/L		0.08 ^{#3}			-
	Cadmium (Filtered)	µg/L	0.1	0.08 ^{#3}			-
	Calcium	mg/L					-
	Calcium (Filtered)	mg/L	0.012				-
	Chromium (III+VI)	µg/L					-
	Chromium (III+VI) (Filtered)	µg/L	0.22				-
	Copper	µg/L		1 ^{#2}	6 ^{#9}		-
	Copper (Filtered)	µg/L	0.85	1 ^{#2}	6 ^{#9}		-
	Iron	µg/L		1,000 ^{#2}			-
	Iron (Filtered)	µg/L	19	1,000 ^{#2}			-
	Lead	µg/L		1.2 ^{#3}			-
	Lead (Filtered)	µg/L	0.02	1.2 ^{#3}			-
	Magnesium	mg/L					-
	Magnesium (Filtered)	mg/L	0.036				-
	Manganese	µg/L		123 ^{#2}			-
	Mercury	µg/L		0.07 ^{#1}			-
	Mercury (Filtered)	µg/L	0.01	0.07 ^{#1}			-
	Nickel	µg/L		4 ^{#3}			-
	Nickel (Filtered)	µg/L	0.15	4 ^{#3}			-
	Selenium	µg/L					-
	Selenium (Filtered)	µg/L	0.39				-
	Vanadium (Filtered)	µg/L	0.24	20 ^{#6}			-
	Zinc	µg/L		10.9 ^{#2}			-
	Zinc (Filtered)	µg/L	0.41	10.9 ^{#2}			-
	Potassium (Filtered)	mg/L	1				-
	Tin	µg/L		26 ^{#6}			-
	Chromium (hexavalent)	µg/L	30	3.4 ^{#2}			-
Organics							
		Dissolved Organic Carbon	mg/L	3			-
Inorganics	Acidity	mg/L	4				-
	BOD	mg/L	1				-
	Sulphur	µg/L					-
	Sodium (Filtered)	mg/L	0.076				-
	Bromide	µg/L	20				-
	Chloride	mg/L	2	250 ^{#6}			-
	Nitrate (as NO3-)	mg/L	0.3				-
	Nitrite (as NO2-)	mg/L	0.05				-
	Ortho Phosphate as P	mg/L	0.02				-
	Sulphide	mg/L	0.01				-
	Alkalinity (total) as CaCO3	mg/L	2				-
	Hardness as CaCO3	mg/L					-
	Alkalinity (Bicarbonate as CaCO3)	mg/L	2				-
	Alkalinity (Bicarbonate as CaCO3) (Filtered)	mg/L	2				-
	Ammoniacal Nitrogen as N	mg/L	0.2	300 (total ammonia as nitrogen) ^{#2}			-
	Sulphate (soluble)	mg/L	2				-
	COD	mg/L	7				-
	pH (Lab)	pH_Units	1				-

Table E2
Water Analytical Results
Landfill Assessment
Dow Corning Ltd

			Method Detection Limit	GAC Protective of Fresh Water Receptor	Project-specific GAC	Location	
		Units				Well	
						Date	01/08/2017
						Sample Type	Normal
						SampleCode	Timber Point, 01 Aug 17 -
Other	Benzene acetic acid (TIC)	µg/L					-
	Dodecamethylcyclohexasiloxane	µg/L					-
	Unknown 5 VOC_151219-32	µg/L					-
	methylsilanetriol	ppm					36
	Unknown 1 SVOC_151219-32	µg/L					-
	Unknown 1 VOC_151219-32	µg/L					-
	Unknown 3 SVOC_151219-32	µg/L					-
	Unknown 3 VOC_151219-32	µg/L					-
	Unknown 4 VOC_151219-32	µg/L					-
	Unknown 1 VOC_151218-69	µg/L					-
	Unknown 3 VOC_151218-69	µg/L					-
	Unknown 4 SVOC_151218-69	µg/L					-
	Unknown 4 VOC_151218-69	µg/L					-
	Unknown SVOC_151218-69	µg/L					-
	Unknown 1 SVOC_151218-69	µg/L					-
	Unknown 3 SVOC_151218-69	µg/L					-
	Unknown 5 SVOC_151218-69	µg/L					-
	ethyl dimethylsilanol	µg/L					-
	tert-Butyl dimethylsilanol	µg/L					-
	Benzene, hexamethyl-	µg/L					-
	Cyclic octaatomic sulfur	µg/L					-
	methoxytrimethylsilane	µg/L					-
	Hexanoic Acid	mg/L					-
	Dioxa, -trisilacyclohexane, -hexamethyl-	µg/L					-
	HexamethylDioxatrisilacyclohexane isomer	µg/L					-
	HexamethylDisilazane, Bis(trimethylsilyl)amine	µg/L					-
	HexamethylDisiloxane	µg/L					-
	Pentamethylbenzoic acid	µg/L					-
	Silicic Acid	ppm					3.3
	Trimethylsilanol	µg/L			124 ^{#8}		-
	Trimethylsilanol isomer	µg/L					-
	Trimethylsilyl fluoride	µg/L					-
	Volatile TIC	-					-
	Decamethylcyclopentasiloxane	µg/L					-
	Benzenepropanoic acid	µg/L					-
	Benzenesulfonamide, -methyl-	µg/L					-
	Unknown 2 SVOC_151219-32	µg/L					-
	Unknown 2 VOC_151219-32	µg/L					-
	Unknown 2 VOC_151218-69	µg/L					-
	Unknown 2 SVOC_151218-69	µg/L					-

Comments
#1 WFD England/Wales. 2015 - MAC-EQS Inland
#2 WFD England/Wales. 2015 - Freshwater Standards
#3 WFD England/Wales. 2015 - AA-EQS Inland
#4 Water Env't Regs (Scotland) 2015. AA-EQS Inland
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#7 PNEC (EU REACH) - Freshwater
#8 PNEC - data provided by Dow Corning
#9 Hardness - assumed value - data required.
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
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xxx	Exceedance of GAC Protective of Fresh Water Receptor
xxx	Exceedance of Project-specific GAC

