Appendix J Data Quality Indicators and Quality Assurance / Quality Control Review

J1. Data Quality Indicators

Specific data quality indicator (DQI) limits for the Stage 5 EA works were adopted in accordance with the ASC NEPM (NEPC 2013) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data was assessed against appropriate DQIs established in relation to precision, accuracy, representativeness, comparability and completeness and sensitivity (PARCCS parameters), as follows:

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples;
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards;
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy;
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods;
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study; and
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting.

The DQIs adopted as part of the assessment are summarised in **Table J1.1**.

Table J1.1: Summary of DQIs

Data Quality Indicators	Frequency & Data Quality Criteria
Precision	
Intra-laboratory Duplicate	• 1 in 20 samples. • RPD <30%.
Inter-laboratory Duplicate	• 1 in 20 samples. • RPD <30%.
Laboratory Internal Duplicates	• 1 in 20 samples. • RPD <30%.
Accuracy	
Laboratory control samples	• 1 per laboratory batch. • Within laboratory prescribed recovery range.
Matrix spikes	• 1 per laboratory batch. • Within laboratory prescribed recovery range.
Representativeness	
Sampling appropriate media and analytes	• All sampling conducted in accordance with JBS&G procedures.
Samples extracted within holding time	• All samples extracted within holding time (groundwater samples).
No potential ingress of ambient air into samples during transport	• No more than -5 inHg loss per sample during transit for Summa canister samples.
Leak test (soil vapour sampling)	• Shroud samples collected at 1 in 20. • All samples <10% tracer (helium or isopropanol).
No potential cross contamination	• Approximate decontamination procedures implemented for use of non-dedicated equipment and collection of rinsate samples to validate these decontamination procedures (installation of groundwater wells and soil vapour probes, and sampling of groundwater wells). • Dedicated equipment used for collection of all samples (soil vapour / crawlspace / service pit samples).
Laboratory blanks	• 1 per laboratory batch. • All results < laboratory limits of reporting (LOR).
Trip blanks	• 1 per laboratory batch. • All results < LOR.
Trip spikes	• 1 per laboratory batch. • All results within 70 to 130 %.
Comparability	
Standard operating procedures for sample collection and handling	• All sampling conducted in accordance with JBS&G procedures. • Consistent field staff to complete program using consistent operating procedure.
Standard analytical methods used for all analyses	• Use of National Association of Testing Authorities (NATA) accredited laboratories. • Standard analytical methods (details on the laboratory certificates of analysis).
Consistent field conditions, sampling staff and laboratory analysis	• Field program completed in September and October 2017. • Consistent field staff to complete program using consistent operating procedure. • Consistent primary laboratory (Eurofins MGT for groundwater; Envirolab for soil vapour / crawlspace / service pit samples; SMS Geotechnical for geotechnical samples) and secondary laboratory for QC purposes (Envirolab for groundwater; ALS for soil vapour / crawlspace / service pit samples).
Limits of reporting appropriate and consistent	Maximum groundwater sample LORs as follows: • Tetrachloroethene: 1 µg/L; • Trichloroethene: 1 µg/L; • cis-1,2-dichloroethene: 1 µg/L; • trans-1,2-dichloroethene: 1 µg/L; • 1,1-dichloroethene: 1 µg/L; and • Vinyl chloride: 0.05 µg/L.

Data Quality Indicators	Frequency & Data Quality Criteria
	Maximum soil vapour sample LORs as follows: • Tetrachloroethene: 10 µg/m³; • Trichloroethene: 5 µg/m³; • cis-1,2-dichloroethene: 10 µg/m³; • trans-1,2-dichloroethene: 10 µg/m³; • 1,1-dichloroethene: 10 µg/m³; and • Vinyl chloride: 5 µg/m³. Maximum crawlspace / service pit sample LORs as follows: • Tetrachloroethene: 5 µg/m³; • Trichloroethene: 2 µg/m³; • cis-1,2-dichloroethene: 2 µg/m³; • trans-1,2-dichloroethene: 2 µg/m³; • 1,1-dichloroethene: 2 µg/m³; and • Vinyl chloride: 2 µg/m³.
Completeness	
Sample description and Chain of Custody (COC) documentation completed and appropriate	• All COCs to be completed appropriately.
Satisfactory frequency and result for QC samples	• QC samples to be collected at frequencies as outlined above.
Sensitivity	
Analytical methods and limits of recovery appropriate for media and adopted assessment criteria	• Use of NATA accredited laboratories. • Maximum LORs as detailed above.

J2. Groundwater

Table J2.1 summarises the quality assurance (QA) and quality control (QC) activities undertaken to ensure integrity of the groundwater data collected and conformance with the DQIs outlined in **Section J1**. Any departures from the DQIs are noted in **Table J2.1**.

Table J2.1: Groundwater QA/QC Program

QA/QC Item	Detail
QA	
Field Procedures	Field procedures were undertaken in accordance with relevant guidelines outlined in **Section 6**.
Decontamination of Equipment	All drilling equipment used during the installation of groundwater wells (MW38-MW43) was decontaminated prior to the commencement of drilling at each location with phosphate free detergent followed by rinsing with deionised water. Rinsate samples were collected on every day of groundwater well drilling / installation works to validate the decontamination process. All low-density polyethylene (LDPE) tubing and footvalves used during the development of wells was dedicated to a specific well. All LDPE twin tubing used during the sampling of wells were dedicated to a specific well. The IP, low flow pump and water quality meter were used for all wells sampled and hence were decontaminated prior to the commencement of sampling at each groundwater well with phosphate free detergent followed by rinsing with deionised water. Rinsate samples were collected on every day of groundwater sampling to validate the decontamination process.
Laboratories used and NATA accreditation	Eurofins MGT (primary laboratory) and Envirolab (secondary laboratory for QC purposes) are NATA accredited for the analyses undertaken.

QA/QC Item	Detail
Sample Tracking	COC documentation was used for the transport of all samples to the laboratory and is included in **Appendix K** (along with the laboratory certificates of analysis).
Sample Preservation and Storage	Samples were collected in laboratory supplied bottles with specific preservation for the chemicals of interest, and were kept in a chilled insulated box and transported to the laboratory.
Holding Times	Samples were analysed within specified holding times by both the primary and secondary laboratory.
Data Transcription	Summary results tables are appended to this report, which were generated from laboratory supplied ESdat files, minimising the potential for transcription errors.
Laboratory Limits of Reporting (LORs)	The LORs are presented in the groundwater laboratory certificates of analysis (**Appendix K**) and included in the **Summary Tables**. The LORs outlined in the DQIs were achieved with the exception of the required LOR for VC for 7 primary samples (MW12, MW36, MW37, MW39-MW41 and MW43). It is noted ultra-trace analysis was undertaken for all chlorinated hydrocarbons (including VC), however, the LORs were raised due to matrix interference for some samples which resulted in VC having an LOR above the adopted screening level in some samples.
QC	
Intra-laboratory Duplicate Samples	One intra-laboratory duplicate sample was collected during the groundwater monitoring program. This frequency was in accordance with the DQIs. The following intra-laboratory duplicate sample pair was collected: • 'DUP01' was collected with primary sample 'MW37' on 29 September 2017. Both samples were analysed for CEs. A total of six RPD values were calculated. All RPD results were within the acceptable range (0 % to 30%) outlined in the DQIs. The groundwater intra-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**.
Inter-laboratory Duplicate Samples	One inter-laboratory duplicate sample was collected during the groundwater monitoring program. This frequency was in accordance with the DQIs. The following inter-laboratory duplicate sample pair was collected: • 'SPLIT01' was collected with primary sample 'MW37' on 29 September 2017. Both samples were analysed for CEs. A total of six RPD values were calculated. All RPD results were within the acceptable range (0 % to 30%) outlined in the DQIs. The groundwater inter-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**.
Rinsate Blank Samples	**Groundwater Well Installation** Rinsate samples were collected on every day of groundwater well installation works in order to validate the decontamination procedures undertaken for the drilling equipment. This frequency was in accordance with the DQIs. Three rinsate samples were collected during the installation of groundwater wells, as follows: • 'RB01' on 21 September 2017; • 'RB02' on 22 September 2017; and • 'RB03' on 25 September 2017. All rinsate samples were collected by running deionised water over the clean lead auger head. All rinsate samples were analysed for CEs. All results were below laboratory reporting limits, as required by the DQIs. **Groundwater Well Sampling** Rinsate samples were collected on every day of groundwater sampling works in order to validate the decontamination procedures undertaken for the sampling equipment. This frequency was in accordance with the DQIs.

QA/QC Item	Detail
	Two rinsate samples were collected during the groundwater sampling program, as follows: • 'RB04' on 29 September 2017; and • 'RB05' on 3 October 2017. All rinsate samples were collected by running deionised water through the clean low flow pump. All rinsate samples were analysed for CEs. All results were below laboratory reporting limits, as required by the DQIs. The results of the rinsate samples are summarised in the **Summary Tables** and included in the laboratory certificates of analysis in **Appendix K**.
Trip Blank Samples	One trip blank sample ('TRIPBLANK01') was transported to and from site, and treated in the same manner as the groundwater samples collected on 3 and 4 October 2017 (MW12, MW24, MW36 and MW38-MW43) to ensure samples were not impacted during transport. It is noted a trip blank sample was not transported with the samples collected on 29 September 2017 (primary sample MW37 and duplicate samples) and hence the frequency of trip blank samples was not in accordance with the DQIs. Given the consistent sampling and transportation procedures implemented, this is not considered to impact on the outcomes of the investigation. In addition, it is noted the Stage 5 EA Works results for MW37 were similar (within 30 %) to the Stage 4 EA Works results for all chemicals. The trip blank sample was analysed for CEs. All results were below laboratory reporting limits, as required by the DQIs. The results of the trip blank sample are included summarised in the **Summary Tables** and included in the laboratory certificates of analysis in **Appendix K**.
Trip Spike Samples	One trip spike sample ('TRIPSPIKE01') was transported to and from site, and treated in the same manner as the groundwater samples collected on 3 and 4 October 2017 (MW12, MW24, MW36 and MW38-MW43) to ensure there was no significant loss of volatiles during transport. It is noted a trip spike sample was not transported with the samples collected on 29 September 2017 (primary sample MW37 and duplicate samples) and hence the frequency of trip spike samples was not in accordance with the DQIs. Given the consistent sampling and transportation procedures implemented, this is not considered to impact on the outcomes of the investigation. In addition, it is noted the Stage 5 EA Works results for MW37 were similar (within 30 %) to the Stage 4 EA Works results for all chemicals. The trip spike sample was pre-dosed with, and analysed for, benzene, toluene, ethylbenzene and xylenes (BTEX). The trip spike sample recoveries ranged between 77 % and 95 %, indicating no significant loss of volatiles during transport – this is within the acceptable range of 70 % to 130 % outlined in the DQIs. It is noted the trip spike samples were in transit for twice as long as the groundwater samples and hence any loss reported in the trip spike sample is likely to be greater than that of the groundwater samples. The results of the trip spike sample are included summarised in the **Summary Tables** and included in the laboratory certificates of analysis in **Appendix K**.
Laboratory Internal QC	Eurofins MGT (primary laboratory) and Envirolab (secondary laboratory for QC purposes) undertook internal QA procedures and internal QC testing, including laboratory blank samples (both laboratories), spike samples (both laboratories) and laboratory duplicate samples (Eurofins MGT only). The following was noted: • Laboratory blank samples: All results were below the laboratory reporting limits; • Spike samples: The recoveries from the laboratory control spike samples were within the specified range for each chemical; and • Laboratory duplicate samples: The RPD values reported for all internal duplicate pairs were within the acceptable range outlined within the ASC NEPM (NEPC 2013).

J3. Soil Vapour

Table J3.1 summarises the QA and QC activities undertaken to ensure integrity of the soil vapour data collected and conformance with the DQIs outlined in **Section J1**. Any departures from the DQIs are noted in **Table J3.1**.

Table J3.1: Soil Vapour QA/QC Program

QA/QC Item	Detail
QA	
Field Procedures	Field procedures were undertaken in accordance with the references in **Section 7**.
Decontamination of Equipment	All drilling equipment used during the installation of soil vapour probes (VP67-VP72) was decontaminated prior to the commencement of drilling at each location with phosphate free detergent followed by rinsing with deionised water. Rinsate samples were collected on every day of soil vapour probe drilling / installation works to validate the decontamination process. Dedicated soil vapour sampling equipment was used at each sampling location.
Laboratories used and NATA accreditation	Envirolab (primary laboratory) and ALS (secondary laboratory for QC purposes) are NATA accredited for the analyses undertaken.
Sample Tracking	COC documentation was used for the transport of all samples to the laboratory.
Sample Preservation and Storage	Summa canisters were stored in laboratory supplied pelican cases and transported to the laboratory.
Data Transcription	Summary results tables are appended to this report, which were generated from laboratory supplied ESdat files, minimising the potential for transcription errors.
Laboratory Detection Limits	The LORs are presented in the soil vapour laboratory certificates of analysis (**Appendix N**) and included in the **Summary Tables**. The required LORs outlined in the DQIs were achieved with the exception of the following: • PCE – two primary samples (VP71 and VP72); • TCE – two primary samples (VP71 and VP72); • cis-1,2-DCE – 7 primary samples (VP44, VP66 and VP68-VP72); • trans-1,2-DCE – 7 primary samples (VP44, VP66 and VP68-VP72); • 1,1-DCE – three primary samples (VP70-VP72); and • VC – 9 primary samples (VP18, VP29, VP44, VP66 and VP68-VP72). The LORs in VP18, VP29, VP44, VP66 and VP68-VP71 were raised due the presence of elevated concentrations of other CEs (except the LOR for isopropanol in VP18 and the LORs for CEs in VP71 which were raised due to the presence of elevated concentrations of analytes other than those being tested). With the exception of VP71 (discussed further below), the raised LORs in these soil vapour probes are not considered to impact on the conclusions of this report as the LOR outlined in the DQIs for the key chemical driving risk at the site (TCE) was achieved. The LORs in VP72 were raised due to the lower volume of available sample – a lower sample volume was obtained for this soil vapour probe due to low vapour yield despite an increased sampling time. Further consideration should be given to the potential for elevated CE vapour concentrations (particularly the key chemical driving risk at the site [TCE)]) to be present at VP71 and VP72, particularly when assessing delineation of the soil vapour plume. However, it should be noted TCE concentrations at these locations were below 80 µg/m^3 (the LOR for the samples) which is significantly lower than the highest TCE concentration reported during the September 2017 soil vapour monitoring event (18,000 µg/m^3 at VP29) and hence these elevated LORs for these samples are not considered to impact on the conclusions of this report regarding risks to human health.

QA/QC Item	Detail
QC	
Rinsate Blank Samples	As outlined above, rinsate samples were collected on every day of soil vapour probe installation works to validate the decontamination procedures undertaken for the drilling equipment. This frequency was in accordance with that outlined in the DQIs. Three rinsate samples were collected during the installation of soil vapour probes, as follows: • 'RB01' on 21 September 2017; • 'RB02' on 22 September 2017; and • 'RB03' on 25 September 2017. All rinsate samples were collected by running deionised water over the clean lead auger head. All rinsate samples were analysed for CEs. All results were below laboratory reporting limits, as required by the DQIs. The results of the rinsate samples are summarised in the **Summary Tables** and included in Laboratory Certificates of Analysis in **Appendix K**.
Certification of Summa Canisters	All Summa canisters were certified as clean by the primary laboratory (Envirolab) prior to dispatch, with all Summa canisters provided returning results for all VOCs below the LOR.
Integrity Testing – Helium Leak Test	All soil vapour probes passed the helium leak test, given the concentration reported in the soil vapour probes was below 10 % of that reported in the shroud, as required by the DQIs. This indicates adequate soil vapour probe construction. Helium leak test results are included in the **Summary Tables**.
Integrity Testing – Isopropanol Leak Test	One shroud sample ('SHROUD01') was collected during the soil vapour monitoring event and analysed for isopropanol. An isopropanol concentration of 1,300,000 µg/m^3 was reported in the shroud sample. The concentration of isopropanol within the soil vapour samples was compared to the acceptable concentration outlined in the DQIs (10 % of that reported in the shroud sample – 130,000 µg/m^3). All soil vapour samples reported isopropanol concentrations below this acceptable concentration and hence passed the isopropanol leak test, indicating acceptable ingress of ambient air during sampling. Isopropanol leak test results are included in the **Summary Tables**.
Receipt Pressure of Samples (Summa Canister Samples)	The pre- and post-sampling pressure, and the final pressure of the passivated canisters on receipt at the laboratory are summarised in the **Summary Tables**. The pre-sampling pressure was -30 inHg for all canisters used in the soil vapour sampling, indicating negligible loss of pressure between shipping from the laboratory to receipt for sampling. The post-sampling pressure was compared to the final laboratory receipt pressure, with the difference below 1 inHg for all soil vapour samples (below the maximum of 5 inHg outlined in the DQIs). The results indicate little loss of pressure and low potential for ambient air ingress during transit for all summa canister samples.
Intra-Laboratory Duplicate Samples	One intra-laboratory duplicate sample pair was collected and analysed as part of the soil vapour monitoring program for a total of 11 primary samples. This frequency is in accordance with the required frequency outlined in the DQIs. The following intra-laboratory duplicate sample was collected: • 'DUP01' was collected with primary sample 'VP70' on 27 September 2017. The intra-laboratory duplicate sample pair was analysed for the chemicals of interest (CEs). A total of six RPD values were calculated – all RPDs were within the acceptable range (0 % to 30 %) outlined in the DQIs. The soil vapour intra-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**. Laboratory results are included in Laboratory Certificates of Analysis in **Appendix N.**
Inter-Laboratory Duplicate Samples	One inter-laboratory duplicate sample pair was collected and analysed as part of the soil vapour monitoring program for a total of 11 primary samples. This frequency is

QA/QC Item	Detail
	in accordance with the required frequency outlined in the DQIs. The following inter-laboratory duplicate sample was collected: • 'DUP02' was collected with primary sample 'VP67' on 27 September 2017. The inter-laboratory duplicate sample pair was analysed for the chemicals of interest (CEs). A total of six RPD values were calculated – all RPDs were within the acceptable range (0 % to 30%) outlined in the DQIs. The soil vapour inter-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**. Laboratory results are included in Laboratory Certificates of Analysis in **Appendix N.**
Laboratory Internal QC	Envirolab (primary laboratory) and ALS (secondary laboratory for QC purposes) undertook internal QA procedures and internal QC testing, including: • Laboratory blank samples - All results were below the laboratory reporting limits. • Duplicate samples - The RPD values reported for all internal duplicate pairs within the acceptable range; and • Spike samples - The recoveries from the laboratory control spike samples were within the specified range for each chemical.

J4. Service Pits

Table J4.1 summarises the QA and QC activities undertaken to ensure integrity of the service pit data collected and conformance with the DQIs outlined in **Section J1**. Any departures from the DQIs are noted in **Table J4.1**.

Table J4.1: Service Pit QA/QC Program

QA/QC Item	Detail
QA	
Field Procedures	Field procedures were undertaken in accordance with the references in **Section 7**.
Decontamination of Equipment	Dedicated sampling equipment was used at each sampling location.
Laboratories used and NATA accreditation	Envirolab (primary laboratory) and ALS (secondary laboratory for QC purposes) are NATA accredited for the analyses undertaken.
Sample Tracking	COC documentation was used for the transport of all samples to the laboratory.
Sample Preservation and Storage	Radiello samplers were wrapped in bubble wrap and placed in a transport box for transit to the laboratory.
Data Transcription	Summary results tables are appended to this report, which were generated from laboratory supplied ESdat files, minimising the potential for transcription errors.
Laboratory Detection Limits	The LORs are presented in the soil vapour laboratory certificates of analysis (**Appendix P**) and included in the **Summary Tables**. The LORs outlined in the DQIs were achieved.
QC	
Intra-Laboratory Duplicate Samples	One intra-laboratory duplicate sample pair was collected and analysed as part of the service pit monitoring program for a total of 10 primary samples. This frequency is in accordance with the required frequency outlined in the DQIs. The following intra-laboratory duplicate sample was collected: • 'DUP_SP01' was collected with primary sample 'SP01' on 4 October 2017. The intra-laboratory duplicate sample pair was analysed for the chemicals of interest (CEs). A total of 6 RPD values were calculated – all RPDs were within the acceptable range (0 % to 30 %) outlined in the DQIs with the exception of that for PCE which slightly exceeded the acceptable range (33 %). This elevated RPD is attributed to the low concentrations reported in these samples (2.5 µg/m^3 for SP01; 3.5 µg/m3 for DUP_SP01). The higher PCE concentration was reported in the

QA/QC Item	Detail
	duplicate sample and this concentration has been adopted in the assessment of results. The service pit intra-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**. Laboratory results are included in Laboratory Certificates of Analysis in **Appendix P.**
Inter-Laboratory Duplicate Samples	One inter-laboratory duplicate sample pair was collected and analysed as part of the service pit monitoring program for a total of 10 primary samples. This frequency is in accordance with the required frequency outlined in the DQIs. The following inter-laboratory duplicate sample was collected: • 'DUP_SP02' was collected with primary sample 'SP02' on 4 October 2017. The inter-laboratory duplicate sample pair was analysed for PCE and TCE. A total of two RPD values were calculated – both RPDs exceeded the acceptable range (0 % to 30 %) outlined in the DQIs, with significantly higher concentrations reported for both chemicals in the primary sample, as follows: • PCE (RPD of 155 %): 19 µg/m^3 in SP02; 2.41 µg/m^3 in DUP_SP02; and • TCE (RPD of 128 %): 19 µg/m^3 in SP02; 4.15 µg/m^3 in DUP_SP02. These results were reviewed and it was considered that the discrepancy was between the total concentrations (in ng/tube) reported by the laboratories for the samples (i.e. calculation of concentration in µg/m^3 had been completed correctly as based on sampling time). Both laboratories were contacted regarding these results (correspondence is included in **Appendix T**). The following was noted: • Envirolab (primary laboratory): The results were reviewed by the analyst – no errors were identified and the QC was appropriate. The laboratory noted these results were above the calibration range (i.e. the results may be higher than those reported); and • ALS (secondary laboratory for QC purposes): The results were reviewed by the analyst – no errors were identified and the QC was appropriate. The sample was re-analysed, and results of the second analysis confirmed the initial results. Based on the above, analytical procedure does not appear to be the cause of the discrepancy in results between the two laboratories. There is a possibility the difference in the concentrations may be attributed to potential issues with the diffusive body used for sampling (i.e. blockages etc), however, no visible abnormalities were observed during sampling. The higher PCE and TCE concentrations reported (those in the primary sample) have been adopted in the assessment of results. The service pit inter-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**. Laboratory results are included in Laboratory Certificates of Analysis in **Appendix P.**
Trip Blank Samples (Radiello Samples)	One trip blank Radiello sample ('Blank 01') was collected as part of the service pit monitoring program for a total of 10 primary service pit samples. This frequency is in accordance with the frequency outlined in the DQIs. The trip blank Radiello sample was transported to and from site and treated in the same manner as the primary samples in order to ensure elevated concentrations of the chemicals of interest (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE and VC) were not introduced during transport. All trip blank Radiello samples were analysed for the chemicals of interest (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE and VC). All results were below laboratory reporting limits, as required by the DQIs. The results of the trip blank Radiello samples are summarised in the **Summary Tables** and included in Laboratory Certificates of Analysis in **Appendix P**.
Laboratory Internal QC	Envirolab (primary laboratory) and ALS (secondary laboratory for QC purposes) undertook internal QA procedures and internal QC testing, including: • Laboratory blank samples - All results were below the laboratory reporting limits; and

QA/QC Item	Detail
	• Spike samples - The recoveries from the laboratory control spike samples were within the specified range for each chemical.

J5. Crawlspace Sampling

Table J5.1 summarises the QA and QC activities undertaken to ensure integrity of the crawlspace data collected and conformance with the DQIs outlined in **Section J1**. Any departures from the DQIs are noted in **Table J5.1**.

Table J5.1: Crawlspace Sample QA/QC Program

QA/QC Item	Detail
QA	
Field Procedures	Field procedures were undertaken in accordance with the references in **Section 7**.
Decontamination of Equipment	Dedicated crawlspace sampling equipment was used at each sampling location.
Laboratories used and NATA accreditation	Envirolab (primary laboratory) are NATA accredited for the analyses undertaken. It is noted inter-laboratory duplicate sample analysis was completed at EPAs request (and hence no secondary laboratory for QC purposes was employed).
Sample Tracking	COC documentation was used for the transport of all samples to the laboratory.
Sample Preservation and Storage	Summa canisters were stored in laboratory supplied pelican cases and transported to the laboratory.
Data Transcription	Summary results tables are appended to this report, which were generated from laboratory supplied ESdat files, minimising the potential for transcription errors.
Laboratory Detection Limits	The LORs are presented in the crawlspace laboratory certificates of analysis (**Appendix R**) and included in the **Summary Tables**. The LORs outlined in the DQIs were achieved.
QC	
Certification of Summa Canisters	All Summa canisters were certified as clean by the primary laboratory (Envirolab) prior to dispatch, with all Summa canisters provided returning results for all VOCs below the LOR.
Integrity Testing – Helium Leak Test	All soil vapour probes passed the helium leak test, given the concentration reported in the crawlspace sample train was below 10 % of that reported in the shroud, as required by the DQIs. This indicates adequate crawlspace sample setup. Helium leak test results are included in the **Summary Tables**.
Receipt Pressure of Samples (Summa Canister Samples)	The pre- and post-sampling pressure, and the final pressure of the Summa canisters on receipt at the laboratory are summarised in the **Summary Tables**. The pre-sampling pressure was -30 inHg for all canisters used in the crawlspace sampling, indicating negligible loss of pressure between shipping from the laboratory to receipt for sampling. The post-sampling pressure was compared to the final laboratory receipt pressure, with the difference below 1 inHg for all crawlspace samples (below the maximum of 5 inHg outlined in the DQIs). The results indicate little loss of pressure and low potential for ambient air ingress during transit for all crawlspace samples.
Intra-Laboratory Duplicate Samples	One intra-laboratory duplicate sample pair was collected and analysed as part of the crawlspace monitoring program for a total of three primary samples. This frequency is in accordance with the required frequency outlined in the DQIs. The following intra-laboratory duplicate sample was collected: • 'DUPC1' was collected with primary sample 'P01_C2' on 24 October 2017. The intra-laboratory duplicate sample pair was analysed for the chemicals of interest (CEs). A total of 6 RPD values were calculated – all RPDs were within the acceptable range (0 % to 30 %) outlined in the DQIs.

QA/QC Item	Detail
	The crawlspace sample intra-laboratory duplicate sample pair results and RPD values have been summarised in the **Summary Tables**. Laboratory results are included in Laboratory Certificates of Analysis in **Appendix R**.
Inter-Laboratory Duplicate Samples	No inter-laboratory duplicate sample collection / analysis was completed at EPA's request.
Laboratory Internal QC	Envirolab (primary laboratory) undertook internal QA procedures and internal QC testing, including: • Laboratory blank samples - All results were below the laboratory reporting limits. • Duplicate samples - The RPD values reported for all internal duplicate pairs within the acceptable range; and • Spike samples - The recoveries from the laboratory control spike samples were within the specified range for each chemical.

Appendix K Groundwater Laboratory Certificates of Analysis and Chain of Custody Documentation

eurofins | mgt

Certificate of Analysis

JBS & G Australia (SA) P/L
38 Dequetteville Terrace
Kent Town
SA 5067

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Luke Silvester**

Report **565138-W**
Project name EDWARDSTOWN
Project ID 54089
Received Date Sep 27, 2017

Client Sample ID			**RB01**	**RB02**	**RB03**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Se32661**	**M17-Se32662**	**M17-Se32663**
Date Sampled			**Sep 21, 2017**	**Sep 22, 2017**	**Sep 25, 2017**
Test/Reference	LOR	Unit			
Volatile Organics					
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001

Client Sample ID			RB01	RB02	RB03
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Se32661**	**M17-Se32662**	**M17-Se32663**
Date Sampled			**Sep 21, 2017**	**Sep 22, 2017**	**Sep 25, 2017**
Test/Reference	LOR	Unit			
Volatile Organics					
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005
4-Bromofluorobenzene (surr.)	1	%	76	73	67
Toluene-d8 (surr.)	1	%	82	80	74

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Volatile Organics	Melbourne	Sep 27, 2017	7 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1254
Site# 14271

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Company Name:	JBS & G Australia (SA) P/L	**Order No.:**	
Address:	38 Dequetteville Terrace	**Report #:**	565138
	Kent Town	**Phone:**	08 8431 7113
	SA 5067	**Fax:**	08 8431 7115
Project Name:	EDWARDSTOWN		
Project ID:	54089		

Received:	Sep 27, 2017 9:14 AM
Due:	Oct 5, 2017
Priority:	5 Day
Contact Name:	Luke Silvester

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Volatile Organics
elbourne Laboratory - NATA Site # 1254 & 14271						X
rdney Laboratory - NATA Site # 18217						
isbane Laboratory - NATA Site # 20794						
erth Laboratory - NATA Site # 23736						
ternal Laboratory						
o	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
	RB01	Sep 21, 2017		Water	M17-Se32661	X
	RB02	Sep 22, 2017		Water	M17-Se32662	X
	RB03	Sep 25, 2017		Water	M17-Se32663	X
st Counts						3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	87			70-130	Pass	
1.2-Dichlorobenzene	%	126			70-130	Pass	
1.2-Dichloroethane	%	106			70-130	Pass	
Benzene	%	121			70-130	Pass	
Ethylbenzene	%	121			70-130	Pass	
m&p-Xylenes	%	125			70-130	Pass	
Toluene	%	119			70-130	Pass	
Trichloroethene	%	95			70-130	Pass	
Xylenes - Total	%	124			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Sarah Gould	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY DOCUMENTATION

JBS&G (Australia) Pty Ltd

Adelaide
38 Dequetteville Tce KENT TOWN SA 5067
T: +61 8 8431 7113 · F: +61 8 8431 7115
ACN 100 220 479 · ABN 62 100 220 479

JBS&G

CLIENT: EPA	LABORATORY: MGT	LABORATORY BATCH NO.:
SITE/PROJECT NAME: Edwardstown	COC Reference #: 4736	SAMPLERS: LS
SEND REPORT TO: JBS&G Australia Pty Ltd	SEND INVOICE TO: JBS&G Australia Pty Ltd	PHONE: 08 8431 7113 FAX: 08 8431 7115
DATA NEEDED BY: 5 day T/A	REPORT NEEDED BY: 5 day T/A	REPORT FORMAT: HARD: NO FAX: NO E-MAIL: YES
SITE/PROJECT NUMBER: 54089	QUOTE #:	JBS&G OFFICE TO SEND RESULTS: South Australia

RELINQUISHED BY: Luke Silvester		RECEIVED BY		
NAME : Luke Silvester	DATE: 27/09/17	NAME : [signature]	DATE: 27/9	METHOD OF SHIPMENT: Overnight
OF: JBS&G (Australia) Pty Ltd	TIME:	OF: ef	TIME: 9:14	CONSIGNMENT NOTE NO.
NAME: kate Lough	DATE: 27/09/17	NAME :	DATE:	TRANSPORT CO. NAME.
OF:	TIME:	OF:	TIME:	

P.O. NO.:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Please forward results and invoice to:
labresults@jbsg.com.au, klough@jbsg.com.au

FOR LAB USE ONLY
COOLER SEAL
Yes ...... No ......
Broken ...... Intact ......
COOLER TEMP: deg.C

*Container Type and Preservative Codes: P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Jar; S = Solvent Washed Glass Bottle; VC = HCL Preserved Vial; PC = HCL Preserved Plastic; PS = Sulfuric Acid Preserved Plastic; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; ST =Sodium Thiosuplhate Preserved Plastic, E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

SAMPLE DATA				CONTAINER DATA			ANALYSIS REQUIRED															
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH field	VOC's															*NOTES
RB01	Water	21-09-17		VC			X															
RB02	Water	22-09-17		VC			X															
RB03	Water	25-09-17		VC			X															
						TOTAL	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

565138

1

Enviro Sample Vic

From: Sarah Gould
Sent: Wednesday, 27 September 2017 9:14 AM
To: Enviro Sample Vic
Subject: FW: 54089 COC Rinsates
Attachments: COC_Rinsates_4736.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Sarah Gould
Phone : +61 3 8564 5053
Email : SarahGould@eurofins.com

From: Luke Silvester [mailto:lsilvester@jbsg.com.au]
Sent: Wednesday, 27 September 2017 9:13 AM
To: Sarah Gould
Cc: Kate Lough
Subject: 54089 COC Rinsates

Hi Sarah

Please see attached COC for samples you would have received yesterday sorry for the delay on the COC.

Please let me know if there are any issues.

Kind Regards

Luke

Luke Silvester | Project Scientist | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
38 Dequetteville Terrace, Kent Town Adelaide SA 5067
T: 08 8431 7113 | M: 0418 623 800 | www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Environmental Impact Assessment | Auditing and Compliance | Hygiene and Hazardous Materials | Due Diligence and Liability

eurofins | mgt

Certificate of Analysis

JBS & G Australia (SA) P/L
38 Dequetteville Terrace
Kent Town
SA 5067

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Luke Silvester**

Report **565866-W**
Project name EDWARDSTOWN
Received Date Oct 02, 2017

Client Sample ID			**MW37**	**DUP01**	**RB04**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Oc01676**	**M17-Oc01677**	**M17-Oc01678**
Date Sampled			**Sep 29, 2017**	**Sep 29, 2017**	**Sep 29, 2017**
Test/Reference	LOR	Unit			
Volatile Organics					
1.1-Dichloroethene	0.001	mg/L	0.054	0.055	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	0.010	0.011	< 0.001
Tetrachloroethene	0.001	mg/L	0.17	0.18	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	0.39	0.40	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Volatile Organics	Melbourne	Oct 05, 2017	7 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261 Site # 14271

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Company Name: JBS & G Australia (SA) P/L
Address: 38 Dequetteville Terrace
Kent Town
SA 5067

Project Name: EDWARDSTOWN

Order No.:
Report #: 565866
Phone: 08 8431 7113
Fax: 08 8431 7115

Received: Oct 2, 2017 10:26 PM
Due: Oct 10, 2017
Priority: 5 Day
Contact Name: Luke Silvester

Eurofins | mgt Analytical Services Manager : Sarah Gould

Eurofins | mgt 2-5 Kingston Town Close, Oakleigh, Victoria, Australia, 3166
ABN : 50 005 085 521 Telephone: +61 3 8564 5000

Sample Detail						1.1-Dichloroethene	cis-1.2-Dichloroethene	Tetrachloroethene	trans-1.2-Dichloroethene	Trichloroethene	Vinyl chloride
elbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
ydney Laboratory - NATA Site # 18217											
isbane Laboratory - NATA Site # 20794											
erth Laboratory - NATA Site # 23736											
ternal Laboratory											
o	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
	MW37	Sep 29, 2017		Water	M17-Oc01676	X	X	X	X	X	X
	DUP01	Sep 29, 2017		Water	M17-Oc01677	X	X	X	X	X	X
	RB04	Sep 29, 2017		Water	M17-Oc01678	X	X	X	X	X	X
st Counts						3	3	3	3	3	3

Date Reported:Oct 10, 2017

mgt

eurofins

Internal Quality Control Review and Glossary

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5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Volatile Organics							
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	114			70-130	Pass	
Trichloroethene	%	79			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M17-Se34202	NCP	%	121			70-130	Pass	
Trichloroethene	M17-Se34202	NCP	%	84			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethene	M17-Se34191	NCP	mg/L	0.001	0.001	<1	30%	Pass	
cis-1.2-Dichloroethene	M17-Se34191	NCP	mg/L	0.16	0.17	6.0	30%	Pass	
Tetrachloroethene	M17-Se34191	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	M17-Se34191	NCP	mg/L	0.002	0.002	<1	30%	Pass	
Trichloroethene	M17-Se34191	NCP	mg/L	0.004	0.005	6.0	30%	Pass	
Vinyl chloride	M17-Se34191	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Sarah Gould	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY DOCUMENTATION

JBS&G (Australia) Pty Ltd

Adelaide
38 Dequetteville Tce KENT TOWN SA 5067
T: +61 8 8431 7113 · F: +61 8 8431 7115
ACN 100 220 479 · ABN 62 100 220 479

#565866

JBS&G

CLIENT: EPA	LABORATORY: MGT	LABORATORY BATCH NO.:	
SITE/PROJECT NAME: Edwardstown	COC Reference #: 4738	SAMPLERS: LS	
SEND REPORT TO: JBS&G Australia Pty Ltd	SEND INVOICE TO: JBS&G Australia Pty Ltd	PHONE: 08 8431 7113 FAX: 08 8431 7115	
DATA NEEDED BY: 5 Day T/A	REPORT NEEDED BY: 5 day T/A	REPORT FORMAT: HARD: NO FAX: NO E-MAIL: YES	
SITE/PROJECT NUMBER:	QUOTE #:	JBS&G OFFICE TO SEND RESULTS: South Australia	
RELINQUISHED BY: Luke Silvester		RECEIVED BY	METHOD OF SHIPMENT: Overnight
NAME: Luke Silvester	DATE: 29/09/17	NAME: Personal DATE: 29/09	CONSIGNMENT NOTE NO.
OF: JBS&G (Australia) Pty Ltd	TIME:	OF: Eurofins MGT TIME: 4:30pm	
NAME: Kate Lough	DATE: 29/09/17	NAME: PHAND DATE: 02/10	TRANSPORT CO. NAME.
OF:	TIME:	OF: Eurofins TIME: 1100	

P.O. NO.:	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:
FOR LAB USE ONLY COOLER SEAL Yes ..... No ..... Broken ..... Intact ..... COOLER TEMP: deg.C	Please forward results and invoice to: labresults@jbsg.com.au, klough@jbsg.com.au

SAMPLE DATA				CONTAINER DATA			ANALYSIS REQUIRED															
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH field	TCE	PCE	CIS - 1,2 - DCE	Trans - 1,2 - DCE	1,1 - DCE	Vinyl Chloride										
MW37	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
Dup 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
Split 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X	(Envirolab)									
RB04	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
						TOTAL	4	4	4	4	4	4	1	0	0	0	0	0	0	0	0	0

*Container Type and Preservative Codes:
P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Jar; S = Solvent W Glass Bottle; VC = HCL Preserved Vial; PC = HCL Preserved Plastic; PS = Sulfuric Acid Preserved Plastic; BS = Sulfuric A Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; S =Sodium Thiosuplhate Preserved Plastic, E = EDTA Preserv Bottles; ST = Sterile Bottle; O = Other.

'NOTES

All samples need to be tested for ultra trace

Please send Split01 to Envirolab with a copy of this COC

1

CHAIN OF CUSTODY DOCUMENTATION

JBS&G (Australia) Pty Ltd

Adelaide
38 Dequetteville Tce KENT TOWN SA 5067
T: +61 8 8431 7113 · F: +61 8 8431 7115
ACN 100 220 479 · ABN 62 100 220 479

JBS&G

CLIENT: EPA	LABORATORY: MGT	LABORATORY BATCH NO.:	
SITE/PROJECT NAME: Edwardstown	COC Reference #: 4738	SAMPLERS: LS	
SEND REPORT TO: JBS&G Australia Pty Ltd	SEND INVOICE TO: JBS&G Australia Pty Ltd	PHONE: 08 8431 7113 FAX: 08 8431 7115	
DATA NEEDED BY: 5 Day T/A	REPORT NEEDED BY: 5 day T/A	REPORT FORMAT: HARD: NO FAX: NO E-MAIL: YES	
SITE/PROJECT NUMBER:	QUOTE #:	JBS&G OFFICE TO SEND RESULTS: South Australia	
RELINQUISHED BY: Luke Silvester		RECEIVED BY	METHOD OF SHIPMENT: Overnight
NAME : Luke Silvester	DATE: 29/09/17	NAME: Pat Email DATE: 29/09	CONSIGNMENT NOTE NO.
OF: JBS&G (Australia) Pty Ltd	TIME:	OF: Envirolab MGT TIME: 4:30pm	
NAME: Kate Lough	DATE: 29/09/17	NAME: DATE:	TRANSPORT CO. NAME.
OF:	TIME:	OF: TIME:	
P.O. NO.:	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	ANALYSIS REQUIRED	

FOR LAB USE ONLY
COOLER SEAL
Yes ..... No .....
Broken ..... Intact .....
COOLER TEMP: deg.C

Please forward results and invoice to:
labresults@jbsg.com.au, klough@jbsg.com.au

*Container Type and Preservative Codes:
P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Jar; S = Solvent Wa Glass Bottle; VC = HCL Preserved Vial; PC = HCL Preserved Plastic; PS = Sulfuric Acid Preserved Plastic; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; ST =Sodium Thiosuplhate Preserved Plastic, E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

SAMPLE DATA				CONTAINER DATA																		
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH field	TCE	PCE	CIS - 1,2 - DCE	Trans - 1,2 - DCE	1,1 - DCE	Vinyl Chloride										'NOTES
MW37	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										All samples need to be tested for ultra trace
Dup 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
Split 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X	(Envirolab)									Please send Split01 to Envirolab with a copy of this COC
RB04	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
						TOTAL	4	4	4	4	4	4	1	0	0	0	0	0	0	0	0	0	

COPY

eurofins | mgt

Certificate of Analysis

JBS & G Australia (SA) P/L
38 Dequetteville Terrace
Kent Town
SA 5067

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Kate Lough**

Report **566437-W-V2**
Project name EDWARDSTOWN
Received Date Oct 05, 2017

Client Sample ID			**MW12**	**MW24**	**MW36**	**MW38**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Oc05998**	**M17-Oc05999**	**M17-Oc06000**	**M17-Oc06001**
Date Sampled			**Oct 03, 2017**	**Oct 04, 2017**	**Oct 03, 2017**	**Oct 03, 2017**
Test/Reference	LOR	Unit				
Halogenated Volatile Organics (selected analytes by SIM)						
1.1-Dichloroethene	0.001	mg/L	0.042	< 0.001	0.040	0.013
cis-1.2-Dichloroethene (SIM)	0.00001	mg/L	0.015	< 0.00001	0.014	0.0037
Tetrachloroethene (SIM)	0.00002	mg/L	0.13	0.00007	0.16	0.096
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene (SIM)	0.00001	mg/L	0.51	0.0011	0.54	0.086
Vinyl chloride (SIM)	0.00005	mg/L	< 0.001	< 0.00005	< 0.001	< 0.00005
Fluorobenzene (surr.)	1	%	68	80	61	74

Client Sample ID			**MW39**	**MW40**	**MW41**	**MW42**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Oc06002**	**M17-Oc06003**	**M17-Oc06004**	**M17-Oc06005**
Date Sampled			**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**
Test/Reference	LOR	Unit				
Halogenated Volatile Organics (selected analytes by SIM)						
1.1-Dichloroethene	0.001	mg/L	0.016	0.060	0.043	< 0.001
cis-1.2-Dichloroethene (SIM)	0.00001	mg/L	0.0022	0.011	0.011	0.0014
Tetrachloroethene (SIM)	0.00002	mg/L	0.052	0.093	0.096	0.0056
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene (SIM)	0.00001	mg/L	0.32	0.74	0.43	0.078
Vinyl chloride (SIM)	0.00005	mg/L	< 0.001	< 0.001	< 0.001	< 0.00005
Fluorobenzene (surr.)	1	%	76	80	83	85

Client Sample ID			**MW43**	**RB05**	**TRIP BLANK 01**	**TRIP SPIKE 01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Oc06006**	**M17-Oc06007**	**M17-Oc06008**	**M17-Oc06009**
Date Sampled			**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**
Test/Reference	LOR	Unit				
BTEX						
Comments						R20
Benzene	0.001	mg/L	-	-	-	110
Toluene	0.001	mg/L	-	-	-	77
Ethylbenzene	0.001	mg/L	-	-	-	95
m&p-Xylenes	0.002	mg/L	-	-	-	94

Client Sample ID			MW43	RB05	TRIP BLANK 01	TRIP SPIKE 01
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M17-Oc06006**	**M17-Oc06007**	**M17-Oc06008**	**M17-Oc06009**
Date Sampled			**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**	**Oct 03, 2017**
Test/Reference	LOR	Unit				
BTEX						
o-Xylene	0.001	mg/L	-	-	-	84
Xylenes - Total	0.003	mg/L	-	-	-	91
4-Bromofluorobenzene (surr.)	1	%	-	-	-	125
Halogenated Volatile Organics (selected analytes by SIM)						
1.1-Dichloroethene	0.001	mg/L	0.002	< 0.001	< 0.001	-
cis-1.2-Dichloroethene (SIM)	0.00001	mg/L	0.0026	< 0.00001	< 0.00001	-
Tetrachloroethene (SIM)	0.00002	mg/L	0.052	< 0.00002	< 0.00002	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichloroethene (SIM)	0.00001	mg/L	0.37	< 0.00001	< 0.00001	-
Vinyl chloride (SIM)	0.00005	mg/L	< 0.001	< 0.00005	< 0.00005	-
Fluorobenzene (surr.)	1	%	74	70	67	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Oct 11, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Halogenated Volatile Organics (selected analytes by SIM)	Melbourne	Oct 06, 2017	7 Day
- Method: USEPA 8260 MGT 350A Halogenated Volatile Organics			

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261 Site # 14271

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Company Name:	JBS & G Australia (SA) P/L	**Order No.:**	
Address:	38 Dequetteville Terrace	**Report #:**	566437
	Kent Town	**Phone:**	08 8431 7113
	SA 5067	**Fax:**	08 8431 7115
Project Name:	EDWARDSTOWN		

Received:	Oct 5, 2017 10:18 AM
Due:	Oct 12, 2017
Priority:	5 Day
Contact Name:	Kate Lough

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						BTEX	Halogenated Volatile Organics (selected analytes by SIM)
elbourne Laboratory - NATA Site # 1254 & 14271						X	X
ydney Laboratory - NATA Site # 18217							
isbane Laboratory - NATA Site # 20794							
erth Laboratory - NATA Site # 23736							
ternal Laboratory							
o	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
	MW12	Oct 03, 2017		Water	M17-Oc05998		X
	MW24	Oct 04, 2017		Water	M17-Oc05999		X
	MW36	Oct 03, 2017		Water	M17-Oc06000		X
	MW38	Oct 03, 2017		Water	M17-Oc06001		X
	MW39	Oct 03, 2017		Water	M17-Oc06002		X
	MW40	Oct 03, 2017		Water	M17-Oc06003		X
	MW41	Oct 03, 2017		Water	M17-Oc06004		X
	MW42	Oct 03, 2017		Water	M17-Oc06005		X
	MW43	Oct 03, 2017		Water	M17-Oc06006		X
	RB05	Oct 03, 2017		Water	M17-Oc06007		X

Eurofins | mgt 2-5 Kingston Town Close, Oakleigh, Victoria, Australia, 3166
ABN : 50 005 085 521 Telephone: +61 3 8564 5000

First Reported:Oct 13, 2017
Date Reported:Oct 16, 2017

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261 Site # 14271

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Company Name:	JBS & G Australia (SA) P/L	**Order No.:**	
Address:	38 Dequetteville Terrace Kent Town SA 5067	**Report #:**	566437
		Phone:	08 8431 7113
		Fax:	08 8431 7115
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Received:	Oct 5, 2017 10:18 AM
Due:	Oct 12, 2017
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Contact Name:	Kate Lough

Eurofins | mgt Analytical Services Manager : Sarah Gould

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ydney Laboratory - NATA Site # 18217							
isbane Laboratory - NATA Site # 20794							
erth Laboratory - NATA Site # 23736							
	TRIP BLANK 01	Oct 03, 2017		Water	M17-Oc06008		X
	TRIP SPIKE 01	Oct 03, 2017		Water	M17-Oc06009	X	
st Counts						1	11

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

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Results <10 times the LOR : No Limit

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Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
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5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Halogenated Volatile Organics (selected analytes by SIM)							
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene (SIM)	mg/L	< 0.00001			0.00001	Pass	
Tetrachloroethene (SIM)	mg/L	< 0.00002			0.00002	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
Trichloroethene (SIM)	mg/L	< 0.00001			0.00001	Pass	
Vinyl chloride (SIM)	mg/L	< 0.00005			0.00005	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
Xylenes - Total	%	105			70-130	Pass	
LCS - % Recovery							
Halogenated Volatile Organics (selected analytes by SIM)							
1.1-Dichloroethene	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Oc04730	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M17-Oc04730	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M17-Oc04730	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M17-Oc04730	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M17-Oc04730	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M17-Oc04730	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

V2 - amended report to show analytes of interest

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Sarah Gould	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

CHAIN OF CUSTODY DOCUMENTATION

JBS&G (Australia) Pty Ltd

Adelaide
38 Dequetteville Tce KENT TOWN SA 5067
T: +61 8 8431 7113 · F: +61 8 8431 7115
ACN 100 220 479 · ABN 62 100 220 479

JBS&G

CLIENT: EPA	LABORATORY: MGT	LABORATORY BATCH NO.:
SITE/PROJECT NAME: Edwardstown	COC Reference #: 4740	SAMPLERS: LS
SEND REPORT TO: JBS&G Australia Pty Ltd	SEND INVOICE TO: JBS&G Australia Pty Ltd	PHONE: 08 8431 7113 FAX: 08 8431 7115
DATA NEEDED BY: 5 Day T/A	REPORT NEEDED BY: 5 day T/A	REPORT FORMAT: HARD: NO FAX: NO E-MAIL: YES
SITE/PROJECT NUMBER:	**QUOTE #:**	JBS&G OFFICE TO SEND RESULTS: South Australia
RELINQUISHED BY: Luke Silvester		**RECEIVED BY**
NAME : Luke Silvester	DATE: 04/10/17	NAME : LIAM DATE: 5/10/17
OF: JBS&G (Australia) Pty Ltd	TIME:	OF: ENVIRONMENT TIME: 10.18am
NAME: Kate Lough	DATE: 04/10/17	NAME : DATE:
OF:	TIME:	OF: TIME:

P.O. NO.:	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	METHOD OF SHIPMENT: Overnight
FOR LAB USE ONLY COOLER SEAL Yes ..... No ..... Broken ..... Intact ..... COOLER TEMP: deg.C	**Please forward results and invoice to:** **labresults@jbsg.com.au, klough@jbsg.com.au**	CONSIGNMENT NOTE NO. TRANSPORT CO. NAME.

SAMPLE DATA				CONTAINER DATA			ANALYSIS REQUIRED															
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH field	TCE	PCE	CIS - 1,2 - DCE	Trans - 1,2 - DCE	1, 1 - DCE	Vinyl Chloride										
MW12	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW24	Water	04-10-17	-	VC	4	-	X	X	X	X	X	X										
MW36	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW38	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW39	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW40	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW41	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW42	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
MW43	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
RB05	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
Trip Blank 01	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
Trip Spike 01	Water	03-10-17	-	VC	4	-	X	X	X	X	X	X										
						TOTAL	12	12	12	12	12	12	0	0	0	0	0	0	0	0	0	0

***Container Type and Preservative Codes**:
P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Jar; S = Solvent Washed Glass Bottle; VC = HCL Preserved Vial; PC = HCL Preserved Plastic; PS = Sulfuric Acid Preserved Plastic; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; ST =Sodium Thiosuplhate Preserved Plastic, E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

'NOTES
All samples need to be tested for ultra trace

1

566437

Enviro Sample Vic

From: Sarah Gould
Sent: Thursday, 5 October 2017 8:40 AM
To: Enviro Sample Vic
Subject: FW: 54089 Groundwater Samples COC Edwardstown Amendment
Attachments: COC_4740 GW sampling COC.PDF

Sarah Gould
Phone: +61 3 8564 5053
Email: SarahGould@eurofins.com

From: Luke Silvester [mailto:lsilvester@jbsg.com.au]
Sent: Wednesday, 4 October 2017 5:42 PM
To: Sarah Gould
Cc: Kate Lough
Subject: 54089 Groundwater Samples COC Edwardstown Amendment

Hi Sarah

Disregard the first email this is an updated COC for samples, please note I forgot to label Trip Spike and Trip Blank samples, could you please refer to the COC for those un labeled QA/QC samples?

If you have any issues let me know.

Kind Regards

Luke

Luke Silvester | Project Scientist | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
38 Dequetteville Terrace, Kent Town Adelaide SA 5067
T: 08 8431 7113 | M: 0418 623 800 | www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Environmental Impact Assessment | Auditing and Compliance | Hygiene and Hazardous Materials | Due Diligence and Liability

4 5/10/17
566437

1 Dalmore Drive, Scoresby VIC 3179
+61 3 9763 2500

melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 645 - 002

CERTIFICATE OF ANALYSIS 11950

Client:
JBS & G Australia Pty Ltd
Level 2, 155 Queen Street
Melbourne
VIC 3000

Attention: Luke Silvester

Sample log in details:

Your Reference:	**Edwardstown**		
No. of samples:	1 water		
Date samples received / completed instructions received	04/10/2017	/	04/10/2017

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	11/10/17	/	11/10/17
Date of Preliminary Report:	Not Issued		

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

Pamela Adams
Laboratory Manager

VHC's in water		
Our Reference:	UNITS	11950-1
Your Reference	----------	Split 01
Date Sampled	----------	29/09/2017
Type of sample		Water
Date extracted	-	09/10/2017
Date analysed	-	09/10/2017
Dichlorodifluoromethane	µg/L	<100
Chloromethane	µg/L	<100
Vinyl Chloride	µg/L	<100
Bromomethane	µg/L	<100
Chloroethane	µg/L	<100
Trichlorofluoromethane	µg/L	<100
1,1-Dichloroethene	µg/L	45
Trans-1,2-dichloroethene	µg/L	<10
1,1-dichloroethane	µg/L	<10
Cis-1,2-dichloroethene	µg/L	10
Bromochloromethane	µg/L	<10
Chloroform	µg/L	<10
2,2-dichloropropane	µg/L	<10
1,2-dichloroethane	µg/L	<10
1,1,1-trichloroethane	µg/L	<10
1,1-dichloropropene	µg/L	<10
Carbon tetrachloride	µg/L	<10
Dibromomethane	µg/L	<10
1,2-dichloropropane	µg/L	<10
Trichloroethene	µg/L	470
Bromodichloromethane	µg/L	<10
trans-1,3-dichloropropene	µg/L	<10
cis-1,3-dichloropropene	µg/L	<10
1,1,2-trichloroethane	µg/L	<10
1,3-dichloropropane	µg/L	<10
Dibromochloromethane	µg/L	<10
1,2-dibromoethane	µg/L	<10
Tetrachloroethene	µg/L	130
1,1,1,2-tetrachloroethane	µg/L	<10
Chlorobenzene	µg/L	<10
Bromoform	µg/L	<10
1,1,2,2-tetrachloroethane	µg/L	<10
1,2,3-trichloropropane	µg/L	<10
Bromobenzene	µg/L	<10
2-chlorotoluene	µg/L	<10
4-chlorotoluene	µg/L	<10
1,3-dichlorobenzene	µg/L	<10
1,4-dichlorobenzene	µg/L	<10

VHC's in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	11950-1 Split 01 29/09/2017 Water
1,2-dichlorobenzene	µg/L	<10
1,2-dibromo-3-chloropropane	µg/L	<10
1,2,4-trichlorobenzene	µg/L	<10
Hexachlorobutadiene	µg/L	<10
1,2,3-trichlorobenzene	µg/L	<10
Surrogate Dibromofluoromethane	%	92
Surrogate toluene-d8	%	96
Surrogate 4-BFB	%	115

Method ID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL VHC's in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2017	[NT]	[NT]	LCS-1	09/10/2017
Date analysed	-			09/10/2017	[NT]	[NT]	LCS-1	09/10/2017
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	96%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	102%
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	96%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	99%
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	98%
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	99%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	94%
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	LCS-1	96%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VHC's in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	102	[NT]	[NT]	LCS-1	96%
Surrogate toluene-d8	%		Org-013	101	[NT]	[NT]	LCS-1	100%
Surrogate 4-BFB	%		Org-013	106	[NT]	[NT]	LCS-1	100%

Report Comments:

VCH: PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY DOCUMENTATION

JBS&G (Australia) Pty Ltd

Adelaide
38 Dequetteville Tce KENT TOWN SA 5067
T: +61 8 8431 7113 · F: +61 8 8431 7115
ACN 100 220 479 · ABN 82 100 220 479

JBS&G

5

CLIENT: EPA	LABORATORY: MGT	LABORATORY BATCH NO.:	
SITE/PROJECT NAME: Edwardstown	CCC Reference #: 4738	SAMPLERS: LS	
SEND REPORT TO: JBS&G Australia Pty Ltd	SEND INVOICE TO: JBS&G Australia Pty Ltd	PHONE: 08 8431 7113 FAX: 08 8431 7115	
DATA NEEDED BY: 5 Day T/A	REPORT NEEDED BY: 5 day T/A	REPORT FORMAT: HARD: NO FAX: NO E-MAIL: YES	
SITE/PROJECT NUMBER:	QUOTE #:	JBS&G OFFICE TO SEND RESULTS: South Australia	
RELINQUISHED BY: Luke Silvester		RECEIVED BY	METHOD OF SHIPMENT: Overnight
NAME: Luke Silvester	DATE: 29/09/17	NAME: Paul Imal	DATE: 29/9/17
OF: JBS&G (Australia) Pty Ltd	TIME:	OF: Envirolab MGT	TIME: 4:30pm
NAME: Kate Lough	DATE: 29/09/17	NAME:	DATE:
OF:	TIME:	OF:	TIME:
P.O. NO.:	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		CONSIGNMENT NOTE NO.
FOR LAB USE ONLY COOLER SEAL Yes ..... No ..... Broken ..... Intact ..... COOLER TEMP: deg.C	Please forward results and invoice to: labresults@jbsg.com.au, klough@jbsg.com.au		TRANSPORT CO. NAME.

SAMPLE DATA				CONTAINER DATA			ANALYSIS REQUIRED															
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.	pH field	TCE	PCE	CIS - 1,2 - DCE	Trans - 1,2 - DCE	1,1 - DCE	Vinyl Chloride										
MW37	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
Dup 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
Split 01	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X	(Envirolab)									
RB04	Water	29/09/2017	-	VC	5	-	X	X	X	X	X	X										
						TOTAL	4	4	4	4	4	4	1	0	0	0	0	0	0	0	0	0

*Container Type and Preservative Codes:
P = Neutral Plastic; N = Nitric Acid Preserved; C = Sodium Hydroxide Preserved; J = Solvent Washed Jar; S = Solvent Washed Glass Bottle; VC = HCL Preserved Vial; PC = HCL Preserved Plastic; PS = Sulfuric Acid Preserved Plastic; BS = Sulfuric Acid Preserved Glass Bottle; Z = Zinc Acetate Preserved Bottle; ST =Sodium Thiosulphate Preserved Plactic, E = EDTA Preserved Bottles; ST = Sterile Bottle; O = Other.

'NOTES

All samples need to be tested for ultra trace

Please send Split01 to Envirolab with a copy of this COC

ENVIROLAB GROUP
Envirolab Services
1a Dalmore Drive
Caribbean Park
Scoresby VIC 3179
Ph: (03) 9763 2500

Job No: 11950

Date Received: 29/9/17 8.5°C
Time Received: 9:10
Received by: PA
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

1

Appendix L Soil Vapour Probe Logs and Soil Vapour Probe Construction Detail

VP67

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 21-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 55

Eastings (GDA 94): 278259.53
Northings (GDA 94): 6125690.92
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 27.31

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Gravelly SAND, light grey brown, fine to medium grained sand, fine to coarse gravels with brick inclusions and trace slag inclusions, dry	VP67_0.0 PID = 0 ppm	
				0.30		Fill	Fill - Silty Sandy CLAY, red brown with dark brown mottling, medium plasticity, silt fines and fine to coarse grained sand, with fine gravel inclusions, moist	VP67_0.3 PID = 0 ppm	
			0.5						
			1.0						
				1.40		Fill	Fill - Sandy GRAVEL, brown, Fine to medium gravels, fine to medium grained sand, moist	VP67_1.4 PID = 0 ppm	
			1.5	1.50			Borehole VP67 terminated at 1.5m		

VP68

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 22-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 55

Eastings (GDA 94): 278341.6
Northings (GDA 94): 6125613.18
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 27.96

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Bitumen		
				0.05		Fill	Fill - Gravelly SAND, grey, fine to medium grained sand, fine to medium gravels, dry to moist	VP68_0.05 PID = 0 ppm	
				0.20		CL-ML	Silty CLAY, red brown, medium plasticity, silt fines, moist to dry	VP68_0.2 PID = 0 ppm	
			0.5						
			1.0						
				1.10		CL-SC	Sandy CLAY, orange brown, medium plasticity, fine grain sand, dry	VP68_1.1 PID = 0 ppm	
			1.5						
				1.50			Borehole VP68 terminated at 1.5m		

VP69

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 21-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 55

Eastings (GDA 94): 278270.98
Northings (GDA 94): 6125559.96
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 27.16

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Bitumen	VP70_0.0 PID = 0 ppm	
				0.02		Fill	Fill - Gravelly SAND, dark brown, fine to medium grained sand, fine to medium gravels, dry	VP69_0.02 PID = 0 ppm	
				0.10		CL-ML	Silty CLAY, red brown, medium to high plasticity, silt fines, with trace fine to coarse gravels, moist to dry	VP69_0.1 PID = 0 ppm	
			0.5						
			1.0						
			1.5						
				1.50			Borehole VP69 terminated at 1.5m		

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VP70

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 25-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 55

Eastings (GDA 94): 278203.6
Northings (GDA 94): 6125495.35
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 26.4

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Gravelly SAND, red brown, fine to medium grained sand, fine to coarse gravels with trace brick and slag inclusions, dry		
				0.05		Fill	Fill - Sandy CLAY, dark brown, medium plasticity, fine to medium grained sand, dry	VP70_0.05 PID = 0 ppm	
			0.5	0.50		CL-ML	Silty CLAY, red brown, medium to high plasticity, silt fines, dry	VP70_0.5 PID = 0 ppm	
			1.0	1.10		CL-ML	Silty CLAY, brown with cream mottling, medium plasticity, silt fines, with trace fine to coarse gravels, dry	VP70_1.1 PID = 0 ppm	
			1.5	1.50			Borehole VP70 terminated at 1.5m		

VP71

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 25-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 55

Eastings (GDA 94): 278331.31
Northings (GDA 94): 6125480.17
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 27.4

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Silty SAND, dark brown, Fine - medium grained sand, silt fines with fine to medium gravel inclusions, moist	VP71_0.0 PID = 0 ppm	
				0.20		Fill	Fill - Silty SAND, dark grey/ black, fine to medium grained sand, silt fines with fine gravel inclusions, moist	VP71_0.2 PID = 0 ppm	
			0.5	0.40		CL-ML	Silty CLAY, orange brown, medium to high plasticity, silt fines with fine gravel inclusions, moist to dry	VP71_0.4 PID = 0 ppm	
			1.0						
			1.5	1.50			Borehole VP71 terminated at 1.5m		

VP72

Project Number: 54089
Client: EPA
Project Name: South East Edwardstown
Site Address: Edwardstown

Date: 22-Sep-17
Logged By: LS
Contractor: A&S Drilling
Total Hole Depth (mbgs): 1.55
Bore Diameter (mm): 55

Eastings (GDA 94): 278420.11
Northings (GDA 94): 6125397.32
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m): 28.04

Surface Finish: Gatic
Construction: Teflon 5mm
Probe Depth (mbgs): 1.45
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube						Fill	Fill - Bitumen		
				0.05		Fill	Fill - Gravelly SAND, yellow brown, fine to medium grained sand, fine to coarse gravels, moist	VP72_0.05 PID = 0.1 ppm	
			0.5	0.30		CL-ML	Silty CLAY, red brown, medium to high plasticity, silt fines, with trace fine grain sand, dry	VP72_0.3 PID = 0.1 ppm	
			1.0	1.00		CL-ML	Silty CLAY, dark brown, medium plasticity, silt fines, with trace fine grain sand, moist to dry	VP72_1.0 PID = 0 ppm	
			1.5	1.50					
							Borehole VP72 terminated at 1.55m		