PACIFIC ENVIRONMENTAL
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29th September 2021

AUSINO GROUP
Attention: Mr. Robin Sang
By email: robinsang@ausino.com.au Ref: 2048A

Dear Sir,

Reference: Acid Sulphate Soil Investigation – 71-73 Thomas Street Parramatta, NSW

At your direction we investigated the soils at the above property; with a view to determining if Acid Sulphate Soils are present to a depth of up to 1.7m m BGL (where TC Bit refusal was encountered at shale rock). The field testing and laboratory testing confirms that the site soils at depth are **not affected by Actual or Potential ASS.** The site soils are nominally 200m of topsoil, over brown silty clay then weathered shale at 1.3 to 1.7m GBL. The criteria for Potential Acid Sulphate Soils (ref.: Acid Sulphate Soil Manual August 1998Sction 2) at peroxide test are:

1. Change in colour of the soil from grey tones to brown tones;
2. Effervescence
3. The release of sulfur smelling gases such as sulfur dioxide or hydrogen sulfide;
4. A lowering of the pH by at least one unit;
5. A final pH <3.5 and preferably <3;
6. In addition, the presence of groundwater and /or shell.

Actual Acid Sulphate soils are quoted, by the ASS Manual, as not being present if initial pH readings are >4. On the basis of the field and laboratory testing of the soils at the site are not affected by Acid Sulphates. The presence of organics in the soils and previous usage of fertilizers has affected the soils and resulted in a lowering of the pH when exposed to peroxide. Exposure to air at the site over 2 hours did not result in a lowering of the soil pH. Soils above the rock profile are not ASS impacted and any foundations/footings in this range will not require an ASS Management Plan, however, to maintain long term stability of the proposed structures below ground it is recommended that the concrete in this area (below ground) utilize acid sulphate resistant cement.

The investigation involved the coring of four (4) test holes 1.3m to 1.7m BGL, where TC Bit refusal at shale rock was encountered. Fifteen (15) field samples (at nominally 0.5m intervals) were field tested with 30% peroxide and pH tested with an electronic

handheld meter – in accordance with the ASS manual Appendix1. The head space above each test sample was teste with a Honeywell BW Ultra meter for the presence of H_2S, following the addition of 30% peroxide.

The Parramatta LEP 2011 Acid Sulphate Soils Map 009, has identified the potential presence of acid sulphate soils at the site as Class 5, being :

"Works within 500m of adjacent Class 1,2,3 or 4 land that is below 5m Australian Height Datum by which the water table is likely to be lowered below 1m Australian Height Datum on adjacent Class 1, 2, 3 or 4 land." Ref: Parramatta LEP 2011 Section 6.1.

The no site groundwater was encountered at between 0.00 and 1.7m BGL. Additionally, the site topographical map indicates that the site is at 17m AHD at the lowest level. As the site works are proposed to encompass works below natural surface and up to 2.5m BGL, it is expected that acid sulphate soils may be encountered. Thus, a preliminary Acid Sulphate Soil Assessment was determined as required.

On the 8th September 2021 a field assessment was undertaken of the site soils, using the "Field pH and the Peroxide Test" methodology as detailed by the:

- *"Acid Sulfate Soil Manual* – NSW Acid Sulfate Soil Management Advisory Committee August 1988".

Fifteen (15) field tests were conducted at Four (4) sites(A, B, C and D) each a soil inspection bore. All samples at site were limited in depth due to the presence of rock. The field testing of the soils at between 1.0 m and 3.5 m BGL resulted in a negative peroxide tests, when tested with 30% peroxide. The samples were negative to the field peroxide test as:

- There was no change in colour from grey/white to brown tones;
- There was moderate effervescence due the presence of organic material, with reactions being rated at 1.0 to 2,0;
- There was no release of H_2S gases;
- There was no lowering of the soil pH to less than 3.5;
- The final pH was greater than 3.0.

All initial pH values ranged from 7.1 to 6.6 when tested on site.

As the shallow site soils (to 1.7m BGL) contained organic matter the field peroxide test is regarded as an accurate indicator that Acid Sulphate Soils are not present in the soils to be disturbed at the site by reference to the initial pH, final peroxided pH and the lack of sulfurous odours.

The two (2) quality control samples, taken for laboratory analysis confirmed the above findings. Sample A (taken at 1.3m BGL and Sample E(taken at 0.5m BGL) confirmed the lack of ASS at these depths. The analysis is attached to this report.

The site groundwater will likely be in intersected by the proposed excavation.

The field and laboratory reaction results are:

Bore No.	Sample No. & Depth BGL	Initial pH	Final pH	Reaction Rating*
A	A 0.4	6.8	4.2	1.0
A	A 0.9	6.7	4.0	1.0
A	A 1.2	6.9	3.4	2.0
A	A 1.2 Lab	6.9	3.3	2.0
B	B 0.4	6.8	3.6	2.0
B	B 0.9	6.6	3.7	1.0
B	B 1.4	6.7	3.5	1.0
B	B 1.7	6.6	3.5	1.0
C	Abandoned due to stormwater concreted encasement services			
D	D 0.4	6.8	4.2	2.0
D	D1.0	6.8	4.0	1.0
D	D 1.3	6.9	3.5	1.0
E	E 0.4	6.8	3.7	2.0
E	E 0.4 Lab	6.6	3.8	1.0
E	E 0.9	6.7	3.5	1.0
E	E 1.3	6.6	3.7	1.0
E	E 1.7	6.8	3.6	1.0

*Reaction Ratings are: 1.0 no reaction to slight; 2 moderate reaction; 3 strong reaction; 4 extreme reaction.

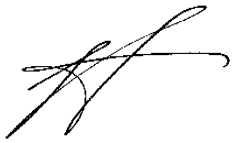
The presence of Potential Acid Sulphate Soil marked thus.

CONCLUSION

Site building foundations placed in the soils up to 2.5 m BGL will not be ASS affected and hence no ASS Management Plan will be required in this case (allowing for a 0.5m freeboard buffer). Any foundations located below ground level should be installed with a procedure that recognizes that Acid conditions may be generated by

the organics present in the soils and as such those foundations between the rock and surface soils should have acid resistant cement utilized. Such activities will not require an ASS Management Plant if the soils are not exposed to air. Should any structures be placed after exposure to air, they could be the subject to a pH ranging from 3.3 to 4.2 and as such you should discuss, with your structural engineer, the method of installing foundations required and if any acid reduction/protection measures that may be necessary.

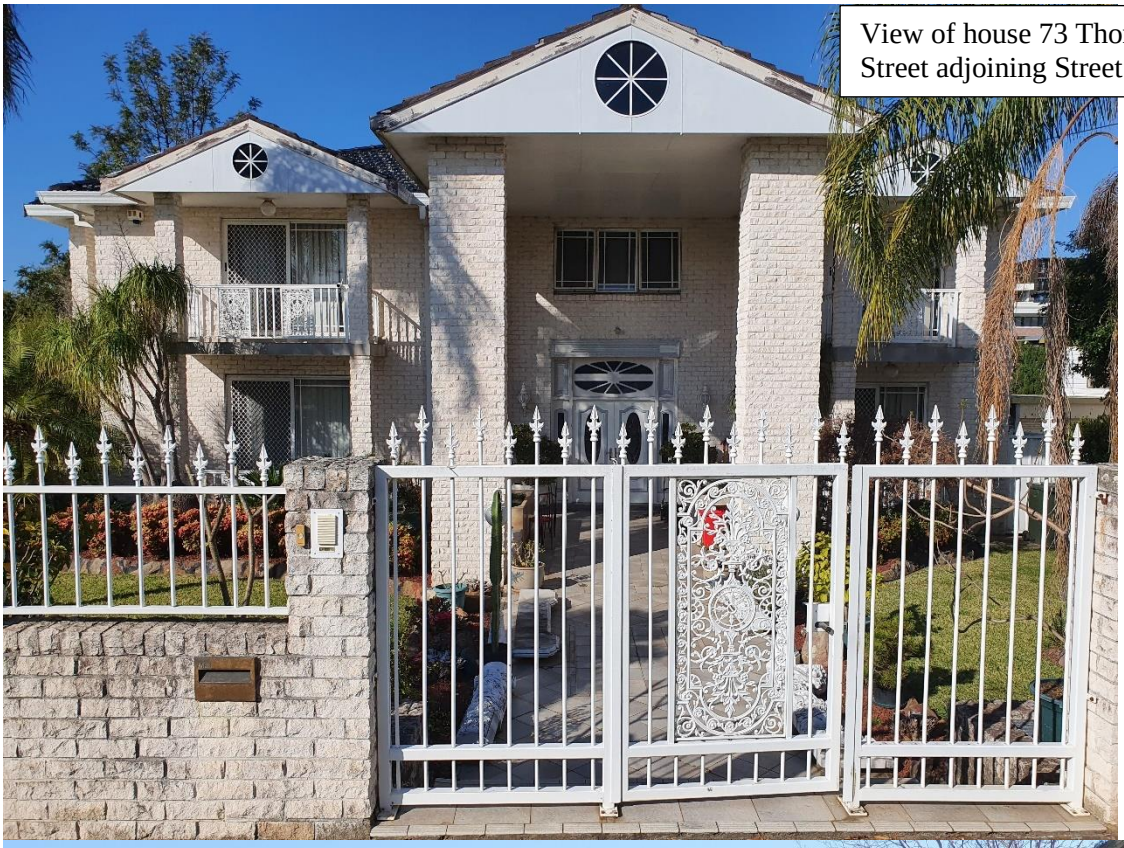
Please note: whilst it is impossible to test every m^3 of the site soil the profile tested appears typical of the soils on site. Care should be taken when excavating soils at the site and if evidence of ASS is uncovered (i.e. acidic conditions or sulfurous odours) work should stop, the excavation covered, and this office contacted immediately. If you have any questions or require any further information in this matter, please do not hesitate to contact Mr. Stephen Smith on 9543 2825 or 0416 270451



Yours faithfully
Steve Smith
BSc Eng. (Civil), MEng Sci., CPENG
Certified: CPCCDE3014A;
Certified: CPCCBC4051A;
Certified: CPCCBC5014A;
LAA 00491
NPCRS Accredited;
Director Pacific Environmental Australia Pty Ltd
Attached: A - Site Photographs;
B - Site Plan;
D - Site Location Plan;
E - Laboratory Report.

ATTACHMENT A - SITE PHOTOGRAPHS

View of front of house 71 Thomas Street adjoining Street



View of house 73 Thomas Street adjoining Street.

View of rear yard of 71 Thomas Street

View of rear yard of 73 Thomas Street. Grassed comprises area is 500mm silty clay fill

ATTACHMENT B- SITE BORE LOGS

PACIFIC ENVIRONMENTAL AUSTRALIA TEST BORE LOG

JOB : 71 Thomas Street Parramatta		TEST Bore No. A	
Surface elevation	17.8m AHD	TEST PIT LOCATION: Northwestern end of 71 Thomas Street	
Date:08/09/21 Logged By: S. Smith		Drill Type: Mechanical auger Checked By : S. Winter	

SOIL DESCRIPTION	DEPTH (M)	GRAPHIC LOG	UNIFIED CLASSIFICATION SYMBOL	FIELD MONITORING	SAMPLE INTERVALS
Grass and topsoil 50mm thick	0.2		OL		
alluvial silty clay	1.4		CO	Organic material present Initial pH 6.9 no odour	**Field 7 Lab Sample 1.2 BGL**
Shale weathered end of hole 1.3			Sh		

SHEET NO. 1 OF 4

TEST PIT LOG : PE A

PACIFIC ENVIRONMENTAL AUSTRALIA TEST BORE LOG

JOB : 71 Thomas Street Parramatta		TEST Bore No. B			
Surface elevation 17.4m AHD		TEST PIT LOCATION: Northeastern of 73 Thomas Street			
Date:8/09/21 Logged By: S. Smith		Drill Type: Mechanical auger Checked By : S. Winter			
SOIL DESCRIPTION	DEPTH (M)	GRAPHIC LOG	UNIFIED CLASSIFICATION SYMBOL	FIELD MONITORING	SAMPLE INTERVALS
Grass and topsoil 300mm thick	0.3		OL		
Silty clay	0.8		CO	Organic material present Initial pH 6.6 no odour Peroxide sample 3.5 no effervescence	**Field Sample BB 1.6 BGL Reaction 1**
			Sh		
Weathered Shale end of hole 1.7m BGL					
SHEET NO. 2 OF 4		**TEST PIT LOG : PE B**			

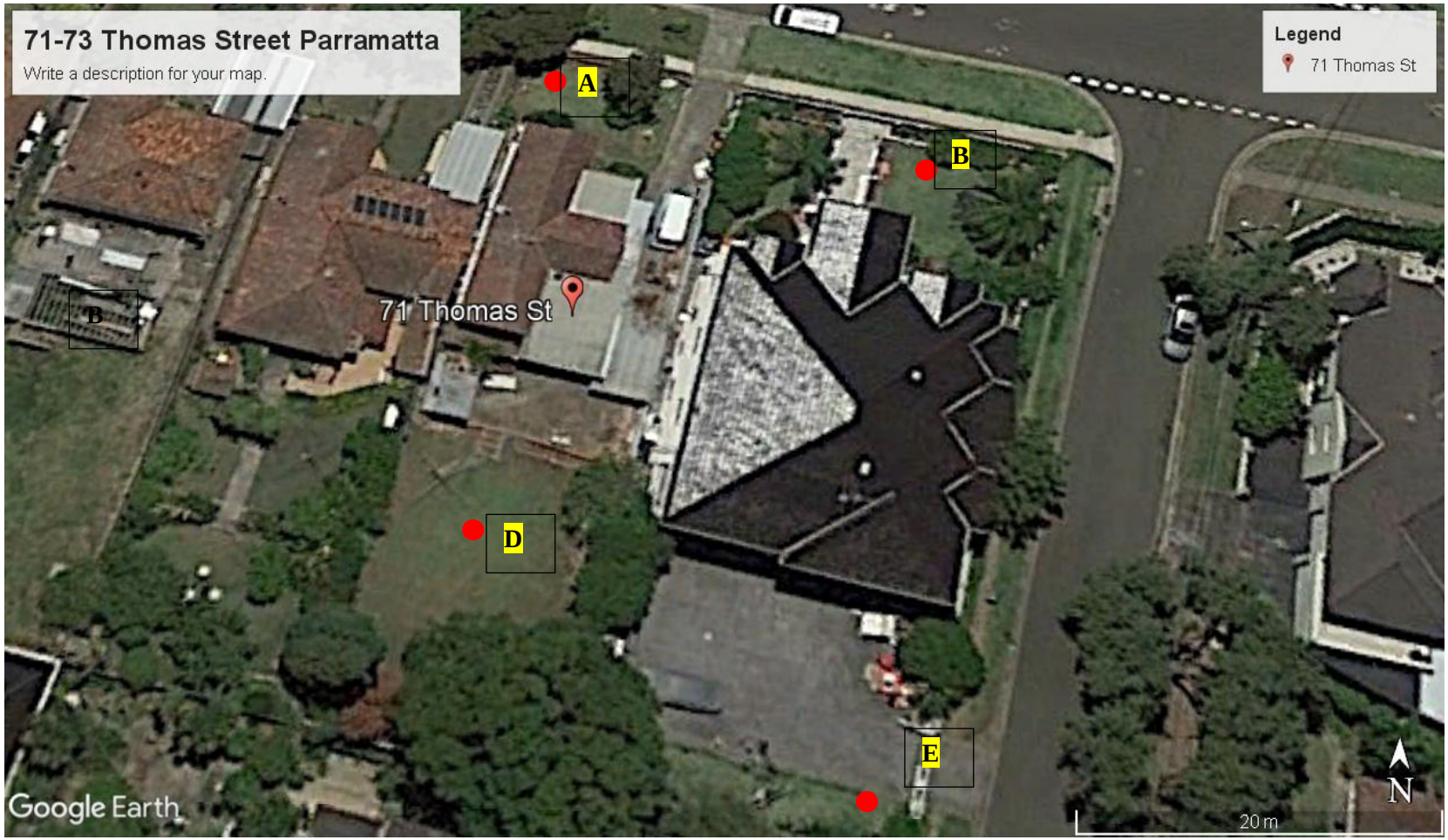
PACIFIC ENVIRONMENTAL AUSTRALIA TEST BORE LOG

JOB : 71 Thomas Street Parramatta		TEST Bore No. D			
Surface elevation 15.8m AHD		TEST PIT LOCATION: Southwestern portion of 71 Thomas Street.			
Date:8/09/21 Logged By: S. Smith		Drill Type: Hand auger Checked By : S. Winter			
SOIL DESCRIPTION	DEPTH (M)	GRAPHIC LOG	UNIFIED CLASSIFICATION SYMBOL	FIELD MONITORING	SAMPLE INTERVALS
Grass and topsoil 50mm thick	0.3		OL		
Silty clay Fill	0.5		CO	Organic material present Initial pH 6.9 no odour	**Field Sample**
Alluvial Silty clay	1.4		CO	Peroxide sample 3.5 no effervescence	**Reaction 1**
Shale End of hole 1.5m BGL	1.4		Sh		
SHEET NO. 3 OF 4				**TEST PIT LOG : PE D**	

PACIFIC ENVIRONMENTAL AUSTRALIA TEST BORE LOG

JOB : 71 Thomas Street Parramatta	TEST Bore NO. E				
Surface elevation 15.6m AHD	TEST PIT LOCATION: Southeastern portion of 73 Thomas Street				
Date:8/09/21 Logged By: S. Smith	Drill Type: Mechanical auger. Checked By : S. Winter				
SOIL DESCRIPTION	DEPTH (M)	GRAPHIC LOG	UNIFIED CLASSIFICATION SYMBOL	FIELD MONITORING	SAMPLE INTERVALS
Grass and topsoil 50mm thick	0.05		OL		
Silty Clay Fill	0.5		CO	Organic material present Initial pH 6.0 no odour	**Field & Lab Sample E 0.4 BGL**
Alluvial Silty Clay	1.5			Peroxide sample 4.2 no effervescence	
Weathered Shale End of hole 1.5m BGL			SC		
SHEET NO. 4 OF 4		**TEST PIT LOG : PE E**			

ATTACHMENT C- SAMPLING BORES LOCATIONS



SAMPLING BORE LOCATIONS

ATTACHMENT D – SITE LOCATION

SITE

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Certificate of Analysis

Pacific Environmental
50 Jervis Dr
Illawong
NSW 2234

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Stephen Smith**

Report **822849-S**
Project name 2048
Received Date Sep 08, 2021

Client Sample ID			**A**	**E**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**S21-Se14041**	**S21-Se14042**
Date Sampled			**Sep 08, 2021**	**Sep 08, 2021**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	6.9	6.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	3.8
Reaction Ratings*[S05]	-	comment	2.0	2.0
% Moisture	1	%	8.8	-

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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
Acid Sulfate Soils Field pH Test	Sydney	Sep 13, 2021	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Sydney	Sep 08, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 1254

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

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

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35 O'Rorke Road
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IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name:	Pacific Environmental	**Order No.:**		**Received:**	Sep 8, 2021 2:29 PM
Address:	50 Jervis Dr Illawong NSW 2234	**Report #:**	822849	**Due:**	Sep 15, 2021
		Phone:	(02) 9543 2825	**Priority:**	5 Day
		Fax:	(02) 9543 2823	**Contact Name:**	Stephen Smith
Project Name:	2048				

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Add Sulfate Soils Field pH Test	Moisture Set
Melbourne Laboratory - NATA Site # 1254							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory - NATA Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	A	Sep 08, 2021		Soil	S21-Se14041	X	X
2	E	Sep 08, 2021		Soil	S21-Se14042	X	
Test Counts						2	1

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food 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. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

**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	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Se19429	NCP	%	12	12	2.0	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

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Emma Beesley Analytical Services Manager

Glenn Jackson
General 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.