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 Client : National Integrated Creative Solutions
 Project : NICS HANWHA1



The quality control term Matrix Spike (MS) refers to an in-laboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Spike Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: B01L

Laboratory sample ID	Client sample ID	Method/Compound	QA Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
				Low	High		
EK055: Ammonia as N (QCLot:769229)							
ES1704201-002	HANWHA88 1B	EK055: Ammonia as N	76641-7	50 mg/kg	84.9	70	130
EK055: Ammonia as N (QCLot:769230)							
ES1704201-021	HANWHA88 6A	EK055: Ammonia as N	76641-7	50 mg/kg	91.4	70	130
EK057 G: Nitrite as N by Discrete Analyser (QCLot:768021)							
ES1702672-029	Anonymous	EK057G: Nitrite as N (Sol)	14797-66-0	2.5 mg/kg	74.8	70	130
EK057 G: Nitrite as N by Discrete Analyser (QCLot:768027)							
ES1704201-018	HANWHA88 5B B	EK057G: Nitrite as N (Sol)	14797-66-0	2.5 mg/kg	# Not Determined	70	130
EK059 G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot:768022)							
ES1702672-029	Anonymous	EK059G: Nitrite + Nitrate as N (Sol)	--	2.5 mg/kg	96.7	70	130
EK059 G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot:768023)							
ES1704201-018	HANWHA88 5B B	EK059G: Nitrite + Nitrate as N (Sol)	--	2.5 mg/kg	83.3	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot:767475)							
ES1704038-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	--	500 mg/kg	# 61.6	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot:767481)							
ES1704201-020	HANWHA88 5C	EK061G: Total Kjeldahl Nitrogen as N	--	500 mg/kg	96.6	70	130
EK067 G: Total Phosphorus as P by Discrete Analyser (QCLot:767478)							
ES1704038-002	Anonymous	EK067G: Total Phosphorus as P	--	100 mg/kg	100	70	130
EK067 G: Total Phosphorus as P by Discrete Analyser (QCLot:767480)							
ES1704201-020	HANWHA88 5C	EK067G: Total Phosphorus as P	--	100 mg/kg	77.1	70	130
EP080071: Total Petroleum Hydrocarbon (QCLot:765536)							
ES1704201-001	HANWHA88 1A	EP080: C6 - C9 Fraction	--	32.5 mg/kg	102	70	130
EP080071: Total Petroleum Hydrocarbon (QCLot:765550)							
ES1702672-037	Anonymous	EP080: C6 - C9 Fraction	--	32.5 mg/kg	83.5	70	130
EP080071: Total Petroleum Hydrocarbon (QCLot:765726)							
ES1704201-001	HANWHA88 1A	EP071: C10 - C14 Fraction	--	523 mg/kg	86.4	73	137
		EP071: C15 - C28 Fraction	--	2319 mg/kg	105	53	131
		EP071: C29 - C36 Fraction	--	1714 mg/kg	107	52	132
EP080071: Total Petroleum Hydrocarbon (QCLot:765808)							
ES1704201-001	Anonymous	EP071: C10 - C14 Fraction	--	523 mg/kg	82.2	73	137
		EP071: C15 - C28 Fraction	--	2319 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	--	1714 mg/kg	108	52	132

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Sub-Matrix: BOIL				Matrix Spike (MS) Report				
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Method / Component	MS Number	Concentration	MS	Low	High	
EP08071: Total Recoverable Hydrocarbons - NEPM 2013 Fraction (QC Lot: 765550)								
ES1704201-001	HANWHA88 1A	EP080: C6 - C10 Fraction	06_C10	37.5 mg/kg	102	70	130	
EP08071: Total Recoverable Hydrocarbons - NEPM 2013 Fraction (QC Lot: 765550)								
ES1702572-037	Anonymous	EP080: C6 - C10 Fraction	06_C10	37.5 mg/kg	81.7	70	130	
EP08071: Total Recoverable Hydrocarbons - NEPM 2013 Fraction (QC Lot: 765720)								
ES1704201-001	HANWHA88 1A	EP071: >C10 - C16 Fraction	--	860 mg/kg	92.3	73	137	
		EP071: >C16 - C3+ Fraction	--	3223 mg/kg	104	53	131	
		EP071: >C3+ - C40 Fraction	--	1058 mg/kg	110	52	132	
EP08071: Total Recoverable Hydrocarbons - NEPM 2013 Fraction (QC Lot: 765502)								
ES1704220-001	Anonymous	EP071: >C10 - C16 Fraction	--	860 mg/kg	80.7	73	137	
		EP071: >C16 - C3+ Fraction	--	3223 mg/kg	101	53	131	
		EP071: >C3+ - C40 Fraction	--	1058 mg/kg	88.4	52	132	
EP080: BTEXN (QC Lot: 765550)								
ES1704201-001	HANWHA88 1A	EP080: Benzene	71-43-2	2.5 mg/kg	85.1	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	96.5	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	89.1	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	91.4	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	93.5	70	130	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.8	70	130	
EP080: BTEXN (QC Lot: 765550)								
ES1702572-037	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	93.1	70	130	
		EP080: Toluene	108-88-3	2.5 mg/kg	77.8	70	130	
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.8	70	130	
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.8	70	130	
			106-42-3					
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.7	70	130	
		EP080: Naphthalene	91-20-3	2.5 mg/kg	94.5	70	130	



QA/QC Compliance Assessment to assist with Quality Review

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Client	: National Integrated Creative Solutions	Laboratory	: Environmental Diagnostics Sydney
Contact	: MR NICOLAS ISRAEL	Telephone	: +61-2-8784 8555
Project	: NICS HANWHA 1	Date Samples Received	: 22-Feb-2017
Site	: —	Issue Date	: 11-Apr-2017
Sampler	: NICOLAS ISRAEL	No. of samples received	: 23
Order number	: —	No. of samples analysed	: 23

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This submitted reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal experts and external Auditors review. Many components of this report contribute to the overall DGO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers tagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Laboratory Control outliers occur.
- Duplicate outliers exist - please see following pages for full details.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



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Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: BOLL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Date	Limit	Comment
Duplicate (DUP) RPDs							
E0670: Total Phosphorus as P by Discrete Analyser	ES1704201-020	HANWHASS 90	Total Phosphorus as P	---	138 %	0% - 20%	RPD exceeded CLOR based limits
Matrix Spike (MS) Recoveries							
E0610: Total Kjeldahl Nitrogen By Discrete Analyser	ES1704038-002	Anonymous	Total Kjeldahl Nitrogen as N	---	61.6 %	70-130%	Recovery less than lower data quality objective

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (retreating USEPA SW 846, APHA, AS and NERM) based on the sample container provided. Dates reported represent the date of extraction or analysis and preclude subsequent dilutions and retests. A listing of breaches (if any) is provided here in.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive. Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: BOLL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Out for extraction	Evaluation	Date analysed	Out for analysis	Evaluation	
E066: Moisture Content								
Boll GlassJar - Unpreserved (E066-103)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1 CC, HANWHASS 2AA,	20-Feb-2017	---	---	---	28-Feb-2017	06-Mar-2017	✔
Boll GlassJar - Unpreserved (E066-103)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 6B,	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	---	---	---	28-Feb-2017	07-Mar-2017	✔

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Matrix: B011		Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.						
Method	Sample Date	Extraction + Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
Container/Client Sample ID(s)								
EK066: Ammonia a c N								
01 GlassJar - Unpreserved (EK066)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1CC, HANWHASS 2AA,	20-Feb-2017	---	---	---	27-Feb-2017	19-Aug-2017	✔
01 GlassJar - Unpreserved (EK066)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 6B,	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	---	---	---	27-Feb-2017	20-Aug-2017	✔
EK067G: Nitrite a c N by Diacetyl Analyser								
01 GlassJar - Unpreserved (EK067G)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1CC, HANWHASS 2AA,	20-Feb-2017	27-Feb-2017	19-Aug-2017	✔	27-Feb-2017	19-Aug-2017	✔
01 GlassJar - Unpreserved (EK067G)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 6B,	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	27-Feb-2017	20-Aug-2017	✔	27-Feb-2017	20-Aug-2017	✔

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Matrix: BOLL		Evaluation: * = Holding time breach ; ✓ = WHT in holding time.						
Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EK0680: Nitrite plus Nitrate as N (NOx) by Diazotite Analyser								
Boll GlassJar - Unpreserved (EK0680)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1 CC, HANWHASS 2AA, HANWHASS 2B	20-Feb-2017	27-Feb-2017	19-Aug-2017	✓	27-Feb-2017	19-Aug-2017	✓
Boll GlassJar - Unpreserved (EK0680)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 5B	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	27-Feb-2017	20-Aug-2017	✓	27-Feb-2017	20-Aug-2017	✓
EK0810: Total Kjeldahl Nitrogen By Diazotite Analyser								
Boll GlassJar - Unpreserved (EK0810)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1 CC, HANWHASS 2AA, HANWHASS 2B	20-Feb-2017	24-Feb-2017	19-Aug-2017	✓	24-Feb-2017	19-Aug-2017	✓
Boll GlassJar - Unpreserved (EK0810)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 5B	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	24-Feb-2017	20-Aug-2017	✓	24-Feb-2017	20-Aug-2017	✓

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Matrix: BOLL		Evaluation: * = Holding time breach ; ✓ = Within holding time.						
Method	Sample Date	Extraction + Preparation			Analyse			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
Container/Client Sample ID(s)								
EX087G: Total Petroleum Hydrocarbon (TPH) by Discrete Analyser								
Boll GlassJar - Unpreserved (EX087G)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1 CC, HANWHASS 2AA,	20-Feb-2017	24-Feb-2017	19-Aug-2017	✓	24-Feb-2017	19-Aug-2017	✓
Boll GlassJar - Unpreserved (EX087G)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 6B,	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	24-Feb-2017	20-Aug-2017	✓	24-Feb-2017	20-Aug-2017	✓
EP030.W1: Total Petroleum Hydrocarbon								
Boll GlassJar - Unpreserved (EP030)								
HANWHASS 1A, HANWHASS 1C, HANWHASS 2A, HANWHASS 2B	HANWHASS 1B, HANWHASS 1 CC, HANWHASS 2AA,	20-Feb-2017	23-Feb-2017	06-Mar-2017	✓	24-Feb-2017	06-Mar-2017	✓
Boll GlassJar - Unpreserved (EP030)								
HANWHASS 2C, HANWHASS 3B, HANWHASS 3C, HANWHASS 4B, HANWHASS 5A, HANWHASS 5BB, HANWHASS 5C, HANWHASS 6B,	HANWHASS 3A, HANWHASS 3BB, HANWHASS 4A, HANWHASS 4C, HANWHASS 5B, HANWHASS 5BBB, HANWHASS 6A, HANWHASS 6C	21-Feb-2017	23-Feb-2017	07-Mar-2017	✓	24-Feb-2017	07-Mar-2017	✓

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Matrix: BOLL		Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.						
Method	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
Container / Client Sample ID(s)								
EP030:OT 1: Total Recoverable Hydrocarbon c- NERM 2013 Fraction c								
Oil GlassJar - Unpreserved (EP030)								
HANWHA55 1A, HANWHA55 1C, HANWHA55 2A, HANWHA55 2B	HANWHA55 1B, HANWHA55 1 CC, HANWHA55 2AA,	20-Feb-2017	23-Feb-2017	05-Mar-2017	✔	24-Feb-2017	05-Mar-2017	✔
Oil GlassJar - Unpreserved (EP030)								
HANWHA55 2C, HANWHA55 3B, HANWHA55 3C, HANWHA55 4B, HANWHA55 5A, HANWHA55 5BB, HANWHA55 5C, HANWHA55 6B,	HANWHA55 3A, HANWHA55 3BB, HANWHA55 4A, HANWHA55 4C, HANWHA55 5B, HANWHA55 5BBB, HANWHA55 6A, HANWHA55 6C	21-Feb-2017	23-Feb-2017	07-Mar-2017	✔	24-Feb-2017	07-Mar-2017	✔
EP030 : ET EXM								
Oil GlassJar - Unpreserved (EP030)								
HANWHA55 1A, HANWHA55 1C, HANWHA55 2A, HANWHA55 2B	HANWHA55 1B, HANWHA55 1 CC, HANWHA55 2AA,	20-Feb-2017	23-Feb-2017	05-Mar-2017	✔	24-Feb-2017	05-Mar-2017	✔
Oil GlassJar - Unpreserved (EP030)								
HANWHA55 2C, HANWHA55 3B, HANWHA55 3C, HANWHA55 4B, HANWHA55 5A, HANWHA55 5BB, HANWHA55 5C, HANWHA55 6B,	HANWHA55 3A, HANWHA55 3BB, HANWHA55 4A, HANWHA55 4C, HANWHA55 5B, HANWHA55 5BBB, HANWHA55 6A, HANWHA55 6C	21-Feb-2017	23-Feb-2017	07-Mar-2017	✔	24-Feb-2017	07-Mar-2017	✔



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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: BOLL

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type Analytical Methods	Method	Count		Rate (%)		Evaluation	Quality Control Specification
		D/C	Recover	Actual	Expected		
Laboratory Duplicates (DUP)							
Budi Ammonia	EKD65	3	23	18.04	10.00	✔	MEPM 2013 83 S.ALS QC Standard
Molecule Content	EAD65-103	4	34	11.78	10.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite and Nitrate as N (NO _x) - Soluble by Discrete Analyser	EKD590	3	26	11.64	10.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EKD570	3	26	11.64	10.00	✔	MEPM 2013 83 S.ALS QC Standard
TKN as N By Discrete Analyser	EKD610	3	25	12.00	8.62	✔	MEPM 2013 83 S.ALS QC Standard
Total Phosphorus By Discrete Analyser	EKD670	3	25	12.00	10.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH - Semi-volatile Fraction	EPD71	4	38	10.63	10.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH Volatiles/BTEX	EPD80	4	40	10.00	10.00	✔	MEPM 2013 83 S.ALS QC Standard
Laboratory Control Samples (LCS)							
Budi Ammonia	EKD65	2	23	8.70	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite and Nitrate as N (NO _x) - Soluble by Discrete Analyser	EKD590	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EKD570	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TKN as N By Discrete Analyser	EKD610	6	25	24.00	14.28	✔	MEPM 2013 83 S.ALS QC Standard
Total Phosphorus By Discrete Analyser	EKD670	6	25	24.00	16.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH - Semi-volatile Fraction	EPD71	2	38	6.28	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH Volatiles/BTEX	EPD80	2	40	6.00	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Method Blanks (MB)							
Budi Ammonia	EKD65	2	23	8.70	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite and Nitrate as N (NO _x) - Soluble by Discrete Analyser	EKD590	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EKD570	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TKN as N By Discrete Analyser	EKD610	2	25	8.00	4.78	✔	MEPM 2013 83 S.ALS QC Standard
Total Phosphorus By Discrete Analyser	EKD670	2	25	8.00	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH - Semi-volatile Fraction	EPD71	2	38	6.28	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH Volatiles/BTEX	EPD80	2	40	6.00	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Matrix Spikes (MS)							
Budi Ammonia	EKD65	2	23	8.70	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite and Nitrate as N (NO _x) - Soluble by Discrete Analyser	EKD590	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EKD570	2	26	7.88	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TKN as N By Discrete Analyser	EKD610	2	25	8.00	4.78	✔	MEPM 2013 83 S.ALS QC Standard
Total Phosphorus By Discrete Analyser	EKD670	2	25	8.00	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH - Semi-volatile Fraction	EPD71	2	38	6.28	6.00	✔	MEPM 2013 83 S.ALS QC Standard
TRH Volatiles/BTEX	EPD80	2	40	6.00	6.00	✔	MEPM 2013 83 S.ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In-house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	E0255-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Biological Ammonia	E0255	SOIL	In house: Referenced to APHA 4500-NH3 B&G. H Samples are steam distilled (bioc) prior to analysis and quantified using titration, FA or Discrete Analyser.
Nitrite as N - Soluble by Discrete Analyser	E02570	SOIL	In house: Referenced to APHA 4500-NO3- B. Nitrite in a water extract is determined by direct colorimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	E02580	SOIL	In house: Referenced to APHA 4500-NO3- F. Nitrate in the 1:5 soil/water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colorimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx)-Soluble by Discrete Analyser	E02590	SOIL	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by Chemical Reduction, and direct colorimetry by Discrete Analyser.
TKN as N By Discrete Analyser	E02610	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	E02620	SOIL	In house: Referenced to APHA 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrogen, each determined separately as N.
Total Phosphorus By Discrete Analyser	E02670	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
TRH - Semi-volatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A. Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	E0261/E0267	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
1:5 solid /water leach for soluble analytes	EN34	SOIL	10g of soil is mixed with 50 mL of distilled water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Methanol: Extraction of Solids for Purge and Trap	0 RG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Timber Extracts of Solids	0 RG17	SOIL	In house: Mechanical agitation (tumble). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCMAcetic by end over end tumble. The solution is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Attachment 9: Chain of Custody Forms

SOIL

LOCATION: EASTERN PORTION - 1216 ROAD DATE: 20+21/02/17

SAMPLING STATION ID	SAMPLE NAME	TIME	DEPTH	COMMENTS
	HANWHA51A	6.05pm	0.1m	PID=
HANWHA 1	HANWHA51B	6.10pm	0.3m	0.224 ppm
	HANWHA51C	6.35pm	0.7m	20/2/17
	HANWHA51C*	6.37pm	0.7m	20/2/17
	HANWHA52A	7.26 pm	0.1 m	20/2/17 PID=
HANWHA 2	HANWHA52A*	7.27 pm	0.1m	20/2/17 0.220
	HANWHA52B	7.48 pm	0.3m	20/2/17 ppm
	HANWHA52C	9.00 am	0.65m	21/2/17
	HANWHA53A	9.24 am	0.1m	21/2/17 PID=
HANWHA 3	HANWHA53B	9.40 am	0.3m	21/2/17 0.232
	HANWHA53B*	9.42 am	0.3m	21/2/17 ppm
	HANWHA53C	13.00 pm	0.65m	21/2/17
	HANWHA54A	13.22 pm	0.10m	21/2/17 PID=
HANWHA 4	HANWHA54B	13.25 pm	0.30m	21/2/17 0.234
	HANWHA54C	14.00 pm	0.70m	21/2/17 ppm
	HANWHA55A	14.10	0.10m	21/2/17 PID=
HANWHA 5	HANWHA55B	14.25	0.30m	21/2/17 0.226
	HANWHA55B*	14.26	0.30m	21/2/17 ppm
	HANWHA55B*	14.27	0.30m	21/2/17
	HANWHA55C	15.05	0.70m	21/2/17
	HANWHA56A	15.20	0.1m	21/2/17 PID=
	HANWHA56B	15.35	0.3m	21/2/17 0.231
HANWHA 6	HANWHA56C	16.15	0.65m	21/2/17 ppm

RUNGE WATER * DUPLICATES ** TRIPPLICATE

