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Work Order : ES0818838
Client : C M JEWELL & ASSOC PTY LTD
Project : J1418

Laboratory Duplicate (DUP) Report

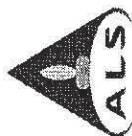
The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: WATER		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 852600)									
ES0818867-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	—	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
ES0818867-001	Anonymous	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	—	1	mg/L	<1	<1	0.0	No Limit
ED041: Sulfate (Turbidimetric) as SO4 2- (QC Lot: 852609)									
ES0818820-016	Anonymous	ED041: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ES0818839-001	Anonymous	ED041: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	518	531	2.5	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 850010)									
ES0818838-001	GW:1	ED045G: Chloride	16887-00-6	1	mg/L	324	320	1.1	0% - 20%
ES0818843-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	23	25	7.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 852102)									
ES0818838-004	GW:D	ED093F: Calcium	7440-70-2	1	mg/L	17	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	21	21	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	353	355	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 851138)									
ES0818837-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.033	0.033	0.0	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	0.008	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.29	0.29	0.0	No Limit
		EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
ES0818924-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit		



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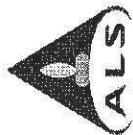
Sub-Matrix: WATER		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 851138) - continued									
ES0818924-002	Anonymous	EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-68-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 851274)									
ES0818809-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES0818898-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 850006)									
ES0818812-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.50	mg/L	9.54	9.71	1.8	0% - 50%
ES0818838-002	GW:2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.23	0.23	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 850225)									
ES0818825-020	Anonymous	EK057G: Nitrite as N	—	0.01	mg/L	0.02	<0.01	0.0	No Limit
ES0818825-031	Anonymous	EK057G: Nitrite as N	—	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: NOX as N by Discrete Analyser (QC Lot: 850084)									
ES0818825-020	Anonymous	EK059G: Nitrite + Nitrate as N	—	0.01	mg/L	5.83	5.58	4.4	0% - 20%
ES0818825-031	Anonymous	EK059G: Nitrite + Nitrate as N	—	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 850224)									
ES0818838-001	GW:1	EK071G: Reactive Phosphorus as P	—	0.01	mg/L	0.01	0.01	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 852578)									
ES0818777-011	Anonymous	EP002: Dissolved Organic Carbon	—	1	mg/L	3	3	0.0	No Limit
ES0818838-003	GW:3	EP002: Dissolved Organic Carbon	—	1	mg/L	3	3	0.0	No Limit
EP074D: Fumigants (QC Lot: 850557)									
ES0818883-005	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	<5	0.0	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 850557)									
ES0818883-005	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit



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Sub-Matrix: WATER		Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 850557) - continued									
ES0818883-005	Anonymous	EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit
		EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit
		EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit
		EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit
		EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: Iodomethane	74-88-4	5	µg/L	<5	<5	0.0	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Carbon Tetrachloride	56-23-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	<5	0.0	No Limit
		EP074: Trichloroethene	79-01-6	5	µg/L	<5	<5	0.0	No Limit
		EP074: Dibromomethane	74-95-3	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	<5	0.0	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	<5	0.0	No Limit
		EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	<5	0.0	No Limit
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	<5	0.0	No Limit		
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	<5	0.0	No Limit		
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	<5	0.0	No Limit		
EP074: 1,2,3-Trichloropropane	96-18-4	3	µg/L	<5	<5	0.0	No Limit		

ES0818861-006	Anonymous								
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Sub-Matrix: WATER		Client sample ID		Method: Compound		Laboratory Duplicate (DUP) Report								
Laboratory sample ID		Client sample ID		Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)			
EP074E: Halogenated Aliphatic Compounds (QC Lot: 850557) - continued														
ES0818861-006														
Anonymous		Anonymous	EP074: Pentachloroethane	76-01-7	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	<50	0.0	No Limit				
			EP074: Chloromethane	74-87-3	50	µg/L	<50	<50	0.0	No Limit				
			EP074: Vinyl chloride	75-01-4	50	µg/L	<50	<50	0.0	No Limit				
			EP074: Bromomethane	74-83-9	50	µg/L	<50	<50	0.0	No Limit				
			EP074: Chloroethane	75-00-3	50	µg/L	<50	<50	0.0	No Limit				
			EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	<50	0.0	No Limit				
			EP074F: Halogenated Aromatic Compounds (QC Lot: 850557)											
ES0818863-005														
Anonymous		Anonymous	EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Chlorobenzene	108-90-7	5	µg/L	<5	<5	0.0	No Limit				
Anonymous		Anonymous	EP074: Bromobenzene	108-86-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	<5	0.0	No Limit				
			EP074G: Trihalomethanes (QC Lot: 850557)											
			ES0818863-005											
Anonymous		Anonymous	EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Chloroform	67-66-3	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	<5	0.0	No Limit				
			EP074: Bromoform	75-25-2	5	µg/L	<5	<5	0.0	No Limit				
			EP080/071: Total Petroleum Hydrocarbons (QC Lot: 850556)											
			ES0818863-005											
Anonymous		Anonymous	EP080: C6 - C9 Fraction	—	20	µg/L	<20	<20	0.0	No Limit				



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Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ES0818861-006		Anonymous	EP080: Total Petroleum Hydrocarbons (QC Lot: 850556) - continued	—	20	µg/L	<20	<20	0.0
ES0818861-006		Anonymous	EP080: C6 - C9 Fraction	—	20	µg/L	<20	<20	0.0
ES0818883-005		Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0
ES0818883-005		Anonymous	EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0
ES0818883-005		Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0
ES0818883-005		Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0
ES0818883-005		Anonymous	EP080: ortho-Xylene	106-42-3	2	µg/L	<2	<2	0.0
ES0818883-005		Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0
ES0818883-005		Anonymous	EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0
ES0818883-005		Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0
ES0818883-005		Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0
ES0818883-005		Anonymous	EP080: ortho-Xylene	106-42-3	2	µg/L	<2	<2	0.0



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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER

Sub-Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Low	High	
Method: Compound									
ED037P: Alkalinity by PC Titrator (QCLot: 852600)									
ED037-P: Total Alkalinity as CaCO3	—	1	mg/L	—	200 mg/L	105	80.2	108	
ED041: Sulfate (Turbidimetric) as SO4 2- (QCLot: 852609)									
ED041: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	20 mg/L	91.2	76.1	126	
ED045G: Chloride Discrete analyser (QCLot: 850010)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	98.4	83.7	124	
ED093F: Dissolved Major Cations (QCLot: 852102)									
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.9	82.9	121	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	82.7	114	
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.3	77.4	113	
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.8	84.3	118	
EG020F: Dissolved Metals by ICP-MS (QCLot: 851138)									
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.4	79.2	117	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	85.1	110	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	104	87	117	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	103	80.6	115	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.8	84.1	114	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	84	116	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	83	115	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	81.1	115	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.0	79.2	116	
EG035F: Dissolved Mercury by FIMS (QCLot: 851274)									
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	99.8	80.3	122	
EK055G: Ammonia as N by Discrete Analyser (QCLot: 850006)									
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	97.0	79.6	122	
EK057G: Nitrite as N by Discrete Analyser (QCLot: 850225)									
EK057G: Nitrite as N	—	0.01	mg/L	0.01	0.96 mg/L	113	65.1	129	
EK059G: NOx as N by Discrete Analyser (QCLot: 850004)									
EK059G: Nitrite + Nitrate as N	—	0.01	mg/L	<0.01	0.96 mg/L	97.3	76.9	122	
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 850224)									
EK071G: Reactive Phosphorus as P	—	0.01	mg/L	<0.01	0.50 mg/L	101	83.8	122	
EP002: Dissolved Organic Carbon (DOC) (QCLot: 852578)									
EP002: Dissolved Organic Carbon	—	1	mg/L	<1	10 mg/L	110	90.8	121	
EP074D: Fumigants (QCLot: 850557)									



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Work Order : ES0818838
Client : C M JEWELL & ASSOC PTY LTD
Project : J1418

Sub-Matrix: WATER			Method Blank (MB) Report		Laboratory Control Spike (LCS) Report		
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)
EP074D: Fumigants (QCLot: 850557) - continued							
EP074: 2,2-Dichloropropane	594-20-7	5	µg/L	<5	10 µg/L	92.3	72.7 124
EP074: 1,2-Dichloropropane	78-87-5	5	µg/L	<5	10 µg/L	94.5	80.7 119
EP074: cis-1,3-Dichloropropylene	10061-01-5	10	µg/L	<10	10 µg/L	92.3	80.4 119
EP074: trans-1,3-Dichloropropylene	10061-02-6	10	µg/L	<10	10 µg/L	90.4	79.3 120
EP074: 1,2-Dibromoethane (EDB)	106-93-4	5	µg/L	<5	10 µg/L	99.5	79.1 123
EP074E: Halogenated Aliphatic Compounds (QCLot: 850557)							
EP074: Dichlorodifluoromethane	75-71-8	50	µg/L	<50	100 µg/L	126	60.6 138
EP074: Chloromethane	74-87-3	50	µg/L	<50	100 µg/L	115	67.4 130
EP074: Vinyl chloride	75-01-4	50	µg/L	<50	100 µg/L	96.8	69.4 129
EP074: Bromomethane	74-83-9	50	µg/L	<50	100 µg/L	100	88.9 131
EP074: Chloroethane	75-00-3	50	µg/L	<50	100 µg/L	106	73.9 126
EP074: Trichlorofluoromethane	75-69-4	50	µg/L	<50	100 µg/L	101	71.6 128
EP074: 1,1-Dichloroethene	75-35-4	5	µg/L	<5	10 µg/L	96.0	72.5 128
EP074: Iodomethane	74-88-4	5	µg/L	<5	10 µg/L	94.3	70.2 128
EP074: trans-1,2-Dichloroethene	156-60-5	5	µg/L	<5	10 µg/L	96.6	77.4 122
EP074: 1,1-Dichloroethane	75-34-3	5	µg/L	<5	10 µg/L	95.2	79.3 121
EP074: cis-1,2-Dichloroethene	156-59-2	5	µg/L	<5	10 µg/L	93.1	79.5 121
EP074: 1,1,1-Trichloroethane	71-55-6	5	µg/L	<5	10 µg/L	92.0	75.8 124
EP074: 1,1-Dichloropropylene	563-58-6	5	µg/L	<5	10 µg/L	93.2	77.8 121
EP074: Carbon Tetrachloride	58-23-5	5	µg/L	<5	10 µg/L	91.9	73.8 126
EP074: 1,2-Dichloroethane	107-06-2	5	µg/L	<5	10 µg/L	97.2	75.5 126
EP074: Trichloroethene	79-01-6	5	µg/L	<5	10 µg/L	89.5	76.7 123
EP074: Dibromomethane	74-95-3	5	µg/L	<5	10 µg/L	99.9	76.1 126
EP074: 1,1,2-Trichloroethane	79-00-5	5	µg/L	<5	10 µg/L	101	79.6 122
EP074: 1,3-Dichloropropane	142-28-9	5	µg/L	<5	10 µg/L	96.1	78.9 122
EP074: Tetrachloroethene	127-18-4	5	µg/L	<5	10 µg/L	94.8	75 124
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	5	µg/L	<5	10 µg/L	93.1	78.9 121
EP074: trans-1,4-Dichloro-2-butene	110-57-6	5	µg/L	<5	10 µg/L	86.5	61.4 136
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	5	µg/L	<5	10 µg/L	97.6	70.6 128
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	5	µg/L	<5	10 µg/L	99.6	77.8 126
EP074: 1,2,3-Trichloropropane	96-18-4	5	µg/L	<5	10 µg/L	94.9	74.1 128
EP074: Pentachloroethane	76-01-7	5	µg/L	<5	10 µg/L	91.9	71.8 126
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	5	µg/L	<5	10 µg/L	96.9	66.4 136
EP074: Hexachlorobutadiene	87-68-3	5	µg/L	<5	10 µg/L	93.3	67.2 129
EP074F: Halogenated Aromatic Compounds (QCLot: 850557)							
EP074: Chlorobenzene	108-90-7	5	µg/L	<5	10 µg/L	96.0	80.8 119
EP074: Bromobenzene	108-86-1	5	µg/L	<5	10 µg/L	92.5	79.3 119
EP074: 2-Chlorotoluene	95-49-8	5	µg/L	<5	10 µg/L	90.6	78.2 120
EP074: 4-Chlorotoluene	106-43-4	5	µg/L	<5	10 µg/L	90.1	79 119



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Client : CM JEWELL & ASSOC PTY LTD
Project : J1418

Sub-Matrix: WATER				Method Blank (MB) Report		Laboratory Control Spike (LCS) Report			
Method Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
Method Compound									
EP074F: Halogenated Aromatic Compounds (QCLot: 850557) - continued									
EP074: 1,3-Dichlorobenzene	541-73-1	5	µg/L	<5	10 µg/L	94.7	78.9	120	
EP074: 1,4-Dichlorobenzene	106-46-7	5	µg/L	<5	10 µg/L	91.3	79.9	119	
EP074: 1,2-Dichlorobenzene	95-50-1	5	µg/L	<5	10 µg/L	94.6	82.3	116	
EP074: 1,2,4-Trichlorobenzene	120-82-1	5	µg/L	<5	10 µg/L	95.6	67.8	129	
EP074: 1,2,3-Trichlorobenzene	87-61-6	5	µg/L	<5	10 µg/L	92.2	68.6	128	
EP074G: Trihalomethanes (QCLot: 850557)									
EP074: Chloroform	67-66-3	5	µg/L	<5	10 µg/L	93.5	78.2	122	
EP074: Bromodichloromethane	75-27-4	5	µg/L	<5	10 µg/L	91.6	76.9	123	
EP074: Dibromochloromethane	124-48-1	5	µg/L	<5	10 µg/L	95.6	78.5	124	
EP074: Bromoform	75-25-2	5	µg/L	<5	10 µg/L	96.4	73.5	126	
EP080/074: Total Petroleum Hydrocarbons (QCLot: 850556)									
EP080: C6 - C8 Fraction	—	20	µg/L	<20	260 µg/L	96.0	75	127	
EP080/074: Total Petroleum Hydrocarbons (QCLot: 854216)									
EP071: C10 - C14 Fraction	—	50	µg/L	<50	200 µg/L	89.5	58.9	131	
EP071: C15 - C28 Fraction	—	100	µg/L	<100	200 µg/L	80.5	73.9	138	
EP071: C29 - C36 Fraction	—	50	µg/L	<50	200 µg/L	77.5	62.7	131	
EP080: BTEX (QCLot: 850556)									
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	99.3	76.2	124	
EP080: Toluene	106-88-3	2	µg/L	<5	10 µg/L	93.2	74.4	124	
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.7	76.1	122	
EP080: meta- & para-Xylene	106-38-3	2	µg/L	<2	10 µg/L	97.9	75.7	123	
EP080: ortho-Xylene	106-42-3								
	95-47-6	2	µg/L	<2	10 µg/L	100	77.9	121	



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Work Order : ES0818838
Client : C M JEWELL & ASSOC PTY LTD
Project : J1418

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory 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. Static 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: WATER

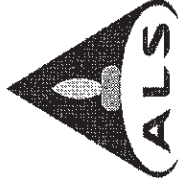
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Matrix Spike (MS) Report		
					Spike Recovery (%)	MS	Recovery Limits (%)
ED045G: Chloride-Discrete analyser (QCLot: 850010)							
ES0818838-001	GW:1	ED045G: Chloride	16887-00-6	250 mg/L	120	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 851138)							
ES0818837-001	Anonymous						
EG020A-F: Arsenic		7440-38-2		0.2 mg/L	102	70	130
EG020A-F: Cadmium		7440-43-9		0.05 mg/L	102	70	130
EG020A-F: Chromium		7440-47-3		0.2 mg/L	102	70	130
EG020A-F: Copper		7440-50-8		0.2 mg/L	101	70	130
EG020A-F: Lead		7439-92-1		0.2 mg/L	102	70	130
EG020A-F: Manganese		7439-96-5		0.2 mg/L	98.3	70	130
EG020A-F: Nickel		7440-02-0		0.2 mg/L	100	70	130
EG020A-F: Zinc		7440-66-6		0.2 mg/L	104	70	130
EG035F: Dissolved Mercury by FMS (QCLot: 851274)							
ES0818809-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	88.0	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 850005)							
ES0818812-001	Anonymous	EK055G: Ammonia as N	7664-41-7	.400 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 850225)							
ES0818825-020	Anonymous	EK057G: Nitrite as N	—	0.60 mg/L	87.5	70	130
EK059G: NOX as N by Discrete Analyser (QCLot: 850004)							
ES0818825-020	Anonymous	EK059G: Nitrite + Nitrate as N	—	0.60 mg/L	# Not Determined	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 850224)							
ES0818838-001	GW:1	EK071G: Reactive Phosphorus as P	—	0.50 mg/L	94.0	70	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 852578)							
ES0818784-004	Anonymous	EP002: Dissolved Organic Carbon	—	100 mg/L	111	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 850557)							
ES0818863-005	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	25 µg/L	120	70	130
		EP074: Trichloroethene	79-01-6	25 µg/L	114	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 850557)							
ES0818863-005	Anonymous	EP074: Chlorobenzene	108-90-7	25 µg/L	105	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 850556)							
ES0818863-005	Anonymous	EP080: C6 - C9 Fraction	—	250 µg/L	128	70	130
EP080: BTEX (QCLot: 850556)							
ES0818863-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	102	70	130
		EP080: Toluene	108-88-3	25 µg/L	104	70	130



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Client : C M JEWELL & ASSOC PTY LTD
Project : J1418

Sub-Matrix: WATER

Sub-Matrix: WATER							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Matrix Spike (MS) Report		
EP080: BTEX (QCLot: 880556) - continued ES0818883-005	Anonymous				Spike Recovery (%)	Recovery Limits (%)	
					MS	Low	High
		EP080: Ethylbenzene	100-41-4	25 µg/L	100	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	99.5	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	101	70	130



Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: ES0818838	Page	: 1 of 10
Client	: C M JEWELL & ASSOC PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR CRAIG WICENCIAK	Contact	: Charlie Pierce
Address	: P O BOX 10 WENTWORTH FALLS NSW, AUSTRALIA 2782	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: craig@cm-jewell.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 47593251	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 47593257	Facsimile	: +61-2-8784 8500
Project	: J1418	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: KIRRAWEE BRICK PIT	Date Samples Received	: 19-DEC-2008
C-O-C number	: —	Issue Date	: 05-JAN-2009
Sampler	: DVE/CBW	Nc. of samples received	: 6
Order number	: —	Nc. of samples analysed	: 6
Quote number	: SY/H00/08		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



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 Work Order : ES0818838
 Client : C M JEWELL & ASSOC PTY LTD
 Project : J1418

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analysis holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: WATER

Evaluation: x = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation		Analysis		
Container / Client Sample ID(s)	Date extracted		Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural							
GW:2,	19-DEC-2008	---	---	---	29-DEC-2008	02-JAN-2009	✓
GW:D,							
BH01							
GW:4,							
ED041: Sulfate (Turbidimetric) as SO4 2-							
Clear Plastic Bottle - Natural							
GW:1,	19-DEC-2008	---	---	---	24-DEC-2008	16-JAN-2009	✓
GW:2,							
GW:D,							
BH01							
ED045G: Chloride Discrete analyser							
Clear Plastic Bottle - Natural							
GW:1,	19-DEC-2008	---	---	---	22-DEC-2008	16-JAN-2009	✓
GW:2,							
GW:D,							
BH01							
ED053F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
GW:1,	19-DEC-2008	---	---	---	24-DEC-2008	16-JAN-2009	✓
GW:2,							
GW:D,							
BH01							
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered							
GW:1,	19-DEC-2008	---	---	---	23-DEC-2008	17-JUN-2009	✓
GW:2,							
GW:D,							
BH01							
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered							
GW:1,	19-DEC-2008	---	---	---	24-DEC-2008	16-JAN-2009	✓
GW:2,							
GW:D,							
BH01							



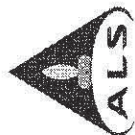
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 Work Order : ES0818838
 Client : CM JEWELL & ASSOC PTY LTD
 Project : J1418

Matrix: WATER		Evaluation: * = Holding time breach ; ✓ = Within holding time.			
Method	Sample Date	Extraction / Preparation		Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Date analysed	Due for analysis
EK055G: Ammonia as N by Discrete Analyser					
Clear Plastic Bottle - Natural					
GW:2, GW:D, BH01	19-DEC-2008	—	—	22-DEC-2008	20-DEC-2008
					*
EK057G: Nitrite as N by Discrete Analyser					
Clear Plastic Bottle - Natural					
GW:2, GW:D, BH01	19-DEC-2008	—	—	19-DEC-2008	21-DEC-2008
					✓
EK059G: NOX as N by Discrete Analyser					
Clear Plastic Bottle - Natural					
GW:2, GW:D, BH01	19-DEC-2008	—	—	22-DEC-2008	21-DEC-2008
					*
EK071G: Reactive Phosphorus as P by discrete analyser					
Clear Plastic Bottle - Natural					
GW:2, GW:D, BH01	19-DEC-2008	—	—	19-DEC-2008	21-DEC-2008
					✓
EP002: Dissolved Organic Carbon (DOC)					
DOC filtered- sulphuric preserved					
GW:2, GW:D, BH01	19-DEC-2008	—	—	24-DEC-2008	16-JAN-2009
					✓
EP074D: Fumigants					
Amber VOC Vial - HCl or NaHSO4					
GW:2, GW:D, BH01	19-DEC-2008	—	—	23-DEC-2008	02-JAN-2009
					✓
EP074E: Halogenated Aliphatic Compounds					
Amber VOC Vial - HCl or NaHSO4					
GW:2, GW:D, BH01	19-DEC-2008	—	—	23-DEC-2008	02-JAN-2009
					✓
EP074F: Halogenated Aromatic Compounds					
Amber VOC Vial - HCl or NaHSO4					
GW:2, GW:D, BH01	19-DEC-2008	—	—	23-DEC-2008	02-JAN-2009
					✓



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 Work Order : ES0818838
 Client : CM JEWELL & ASSOC PTY LTD
 Project : J1418

Matrix: WATER		Evaluation: * = Holding time breach ; ✓ = Within holding time.					
Method	Sample Date	Extraction / Preparation		Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074G: Trihalomethanes							
Amber VOC Vial - HCl or NaHSO4							
GW:1,	19-DEC-2008	—	—	—	23-DEC-2008	02-JAN-2009	✓
GW:3,							
GW:4,							
EP080:074: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
GW:4,	19-DEC-2008	24-DEC-2008	26-DEC-2008	✓	31-DEC-2008	09-FEB-2009	✓
Amber VOC Vial - HCl or NaHSO4							
GW:4,	19-DEC-2008	—	—	—	23-DEC-2008	02-JAN-2009	✓
EP080: BTEX							
Amber VOC Vial - HCl or NaHSO4							
GW:4,	19-DEC-2008	—	—	—	23-DEC-2008	02-JAN-2009	✓



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 Client : C M JEWELL & ASSOC PTY LTD
 Project : J1418

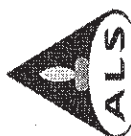
Quality Control Parameter Frequency Compliance

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: WATER

Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Matrix: WATER		Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods		Method	QC	Regular	Actual	Expected	Evaluation		
Laboratory Duplicates (DUP)									
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK055G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED045G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG035F	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG020A-F	2	16	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP002	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED093F	1	20	5.0	10.0	✗	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK059G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK057G	2	17	11.8	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK071G	1	6	16.7	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED041	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP080	2	16	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP074	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	Laboratory Control Samples (LCS)								
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK055G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED045G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG020A-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP002	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED093F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK059G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK057G	1	17	5.9	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EK071G	1	6	16.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED041	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP071	1	8	12.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP080	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP074	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
Method Blanks (MB)									
Alkalinity by PC Titrator	EK055G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	ED045G	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EG020A-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
	EP002	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		
Major Cations - Filtered	ED093F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement		



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 Work Order : ES0818638
 Client : C M JEWELL & ASSOC PTY LTD
 Project : J1418

Matrix: WATER							Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.		
Quality Control Sample Type							Quality Control Specification		
Analytical Methods									
Method									
Count									
OC									
Regular									
Actual									
Expected									
Rate (%)									
Evaluation									
Method									
Method Blanks (MB) - Continued									
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.0	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
Nitrite as N by Discrete Analyser	EK057G	1	17	5.9	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	16.7	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
Sulfate (Turbidimetric) as SO4 2-	ED041	1	20	5.0	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
TPH - Semivolatile Fraction	EP071	1	8	12.5	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
TPH Volatiles/BTEX	EP080	1	16	6.3	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	NEPM 1999	Schedule B(3) and ALS QCS3 requirement	
Matrix Spikes (MS)									
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	ALS QCS3	requirement	
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	ALS QCS3	requirement	
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	ALS QCS3	requirement	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	6.3	5.0	✓	ALS QCS3	requirement	
Dissolved Organic Carbon	EP002	1	20	5.0	5.0	✓	ALS QCS3	requirement	
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.0	5.0	✓	ALS QCS3	requirement	
Nitrite as N by Discrete Analyser	EK057G	1	17	5.9	5.0	✓	ALS QCS3	requirement	
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	6	16.7	5.0	✓	ALS QCS3	requirement	
TPH Volatiles/BTEX	EP080	1	16	6.3	5.0	✓	ALS QCS3	requirement	
Volatile Organic Compounds	EP074	1	11	9.1	5.0	✓	ALS QCS3	requirement	



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 Work Order : ES0818838
 Client : C M JEWELL & ASSOC PTY LTD
 Project : J1418

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
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by both manual measurement and automated measurement (e.g. PC Titrator) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2-	ED041	WATER	APHA 21st ed., 4500-SO4 Sulfate ions are precipitated in an acetic acid medium with barium chloride to form barium sulfate crystals. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride in the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Filtered	ED093F	WATER	APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QM1-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500 NH3+-G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500 NO3-B. Nitrite is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500 NO3--F. Nitrate is reduced to nitrite by way of a cadmium reduction column 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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500 NO3-F. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	APHA 21st ed., 4500 P-F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)



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Analytical Methods		Method	Matrix	Method Descriptions
Ionic Balance by PCT DA Turbidimetric and ICPAES Dissolved Organic Carbon TPH - Semivolatile Fraction	EN055 - TS	WATER	APHA 21st Ed. 1030F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)	
	EP002	WATER	APHA 21st ed., 5310 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)	
	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)	
	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)	
Volatile Organic Compounds				
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)	
Preparation Methods		Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.	



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Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QW/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK055C: Ammonia as N by Discrete Analyser	ES08188172-001	Anonymous	Ammonia as N	7664-41-7	Not Determined	—	MS recovery not determined, background level greater than or equal to 4x spike level.
EK059C: NOX as N by Discrete Analyser	ES0818825-020	Anonymous	Nitrite + Nitrate as N	—	Not Determined	—	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.

Regular Sample Surrogates

Sub-Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP074S: VOC Surrogates	ES0818838-002	GW/2	1,2-Dichloroethane-D4	17060-07-0	120 %	80-120 %	Recovery greater than upper data quality objective
EP074S: VOC Surrogates	ES0818838-004	GW/D	1,2-Dichloroethane-D4	17060-07-0	120 %	80-120 %	Recovery greater than upper data quality objective
EP074S: VOC Surrogates	ES0818838-001	GW/1	1,2-Dichloroethane-D4	17060-07-0	121 %	80-120 %	Recovery greater than upper data quality objective
EP074S: VOC Surrogates	ES0818838-002	GW/2	Toluene-D8	2037-26-5	86.6 %	88-110 %	Recovery less than lower data quality objective
EP074S: VOC Surrogates	ES0818838-004	GW/D	Toluene-D8	2037-26-5	87.7 %	88-110 %	Recovery less than lower data quality objective
EP074S: VOC Surrogates	ES0818838-003	GW/3	Toluene-D8	2037-26-5	86.0 %	88-110 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: WATER

Method	Extraction / Preparation	Analysis
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 Client : C M JEWELL & ASSOC PTY LTD
 Project : J1418

Matrix: WATER

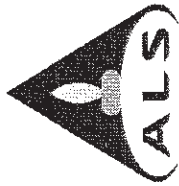
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK055G: Ammonia as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
GW:1, GW:3, GW:4, GW:2, GW:D, BH01	—	—	—	22-DEC-2008	20-DEC-2008	2
EK053G: NOx as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
GW:1, GW:3, GW:4, GW:2, GW:D, BH01	—	—	—	22-DEC-2008	21-DEC-2008	1

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: WATER

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification	
	QC	Regular	Actual	Expected		
Laboratory Duplicates (DUP)	1	20	5.0	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement	
Major Cations - Filtered						



Environmental Division

QUALITY CONTROL REPORT

Work Order	: ES0819019	Page	: 1 of 5
Client	: C M JEWELL & ASSOC PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR CRAIG WICENCIAK	Contact	: Charlie Pierce
Address	: P O BOX 10 WENTWORTH FALLS NSW, AUSTRALIA 2782	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: craig@cm-jewell.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 47593251	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 47593257	Facsimile	: +61-2-8784 8500
Project	: J141B	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: KIRRAWEE BRICK PIT	Date Samples Received	: 24-DEC-2008
C-O-C number	: —	Issue Date	: 08-JAN-2009
Sampler	: CW, DE	No. of samples received	: 16
Order number	: SY/100/08	No. of samples analysed	: 16
Quote number	: SY/100/08		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Stephen Hislop	Senior Inorganic Chemist	Inorganics

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Work Order : ES0819019
Client : C M JEWELL & ASSOC PTY LTD
Project : J141B

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key:

Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = Chemistry Abstract Services number

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC



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Work Order : ES0819019
Client : C M JEWELL & ASSOC PTY LTD
Project : J141B

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QM-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: SOIL

Laboratory sample ID		Client sample ID	Method: Compounding	CAS Number		LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)	Recovery Limits (%)
								Original Result	Duplicate Result		
EP005: Total Organic Carbon (TOC) (QC Lot: 856538)											
ES0819019-001		BP-01:0.05	EP005: Total Organic Carbon			0.02	%	11.0	10.4	5.5	0% - 20%
ES0819019-011		BP-06:0.05	EP005: Total Organic Carbon			0.02	%	1.05	1.09	3.7	0% - 20%



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Work Order : ES0819019
Client : C M JEWELL & ASSOC PTY LTD
Project : J141B

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: SOIL

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report			
Result		Spike Concentration		Spike Recovery (%)		Recovery Limits (%)	
Unit		LOR		CAS Number		Low	
EP005: Total Organic Carbon (TOC) (QC Lot: 856535)		0.02		—		70	
EP005: Total Organic Carbon		%		100 %		130	
<0.02				99.0			

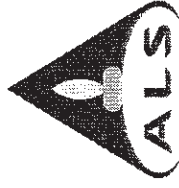


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Project : J141B

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory 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. Static Recovery Limits as per Laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) Results are required to be reported.**



Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: ES0819019	Page	: 1 of 5
Client	: C M JEWELL & ASSOC PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR CRAIG WICENCIAK	Contact	: Charlie Pierce
Address	: P O BOX 10 WENTWORTH FALLS NSW, AUSTRALIA 2782	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: craig@cm-jewell.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: +61 47593251	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 47593257	Facsimile	: +61-2-8784 8500
Project	: J141B	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: KIRRAWEE BRICK PIT	Date Samples Received	: 24-DEC-2008
C-O-C number	: —	Issue Date	: 08-JAN-2009
Sampler	: CW, DE	No. of samples received	: 16
Order number	: SY1100/08	No. of samples analysed	: 16
Quote number	: SY1100/08		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



Page : 2 of 5
 Work Order : ES0819019
 Client : C M JEWELL & ASSOC PTY LTD
 Project : J141B

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: SOIL

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation		Analysis	
		Date extracted	Due for extraction	Date analysed	Due for analysis
EP005: Total Organic Carbon (TOC)					
Soil Glass Jar - Unpreserved					
BP:01:0.05,	24-DEC-2008	07-JAN-2009	21-JAN-2009	✓	07-JAN-2009
BP:02:0.15,					
BP:03:0.15,					
BP:04:0.15,					
BP:05:0.15,					
BP:06:0.15,					
BP:07:0.15,					
BP:SD1,					
BP:SD2					



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Work Order : ES0819019
Client : C M JEWELL & ASSOC PTY LTD
Project : J141B

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: **SOIL**

Evaluation: * = Quality Control frequency not within specification, ✓ = Quality Control frequency within specification.

Matrix: SOIL							
Quality Control Sample Type	Count		Rate (%)		Quality Control Specification		
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Total Organic Carbon	EP005	2	16	12.5	10.0	✓	
NEPM 1999 Schedule B(3) and ALS QCS3 requirement							
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP005	1	16	6.3	5.0	✓	
NEPM 1999 Schedule B(3) and ALS QCS3 requirement							
Method Blanks (MB)							
total Organic Carbon	EP005	1	16	6.3	5.0	✓	
NEPM 1999 Schedule B(3) and ALS QCS3 requirement							



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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
Total Organic Carbon	EP005	SOIL	In-house. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO ₂) is automatically measured by infra-red detector.



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Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QW/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.



APPENDIX K

Site Survey Data